Facilitating rapid dissemination of knowledge : towards the development of a rapid review reporting guideline

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FACILITATING RAPID DISSEMINATION OF KNOWLEDGE: TOWARDS THE DEVELOPMENT OF A RAPID REVIEW REPORTING GUIDELINE

DOCTORAL DISSERTATION

Split, Croatia, 2019

University of Split, School of Medicine

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ACKNOWLEDGEMENTS

A doctorate, like any work that contributes to the productivity and furthering of society, is one that is never accomplished alone. Although one person may yield the rights and responsibilities with the acquisition of the degree, many others have played an important role in seeing it realized. Let me share who those individuals are for me.

Dr. David Moher is a senior scientist at the Ottawa Hospital Research Institute and Associate Professor at the University of Ottawa. David has other affiliations and held various leadership roles throughout his career. His lifetime achievements to date include several books or chapters thereof and an outstanding number of peer-reviewed journal articles. Few scientists, though, can claim other recognitions bestowed upon him, such as his several-time listing as a Clarivate Analytics Highly Cited Researcher and as one of the most influential researchers in biomedicine (Boyack EJCI 2013). These accomplishments would seem to be a hallmark of a person who has invested his life in high dedication to his profession – and it is, in the case of Dr. Moher. And yet those who know him well can attest to who he is as a person. A very kind man who greets with you with respect as a fellow person. One who holds his wife and two daughters in high regard and cherishes their presence in his life. A person who considers what is true and right in what he says and does. It is refreshing to hear of others speak time and again of his posture of humility – a characteristic that is not common among scientists of his stature. I am grateful for the mentorship and guidance that David has provided to me not only during my doctoral studies, but even more generally as a member of his research team. Although I will never attain the scientific recognitions that he holds, I can, at best, strive to emulate those personal qualities as I work with and learn from others throughout my career.

I owe much gratitude for the love and support provided by my family. In everything we do, we speak of ourselves as ‘Team Stevens’. My husband, Chris, has been a tireless and outspoken supporter of my professional work and doctoral studies. Despite a busy and demanding career, he has created space on the home front for me to focus my time to complete each phase of this degree. He and our daughters, Sparrow and Eden, have been a constant source of encouragement and accountability. I cannot overlook the fuel that they

have provided that has allowed me to persevere. Now, I look forward to reclaiming my personal time to devoting to my 'team' members in investing in their lives and various goals and pursuits. I would say they are each very happy to have my more fulsome attention, too!

There are many others who have provided support, whether professionally or personally. Mom and Dad Moroz, Bonnie and Blair Stevens, Chantelle Garritty, Mona Hersi, Larissa Shamseer, Brian Hutton, close friends, other extended family, other work colleagues, research collaborators, and my church family. The various conversations, scientific discussions, and words of encouragement collectively provided have been notable and valued.

There are others who have provided incredible learning experiences that were influential in bringing me to this point in my nearly 20-year career. Brian Haynes, Ann McKibbon, Nancy Wilczynski, Melissa Brouwers, and Jeremy Grimshaw would be high on this list.

Thank you to my thesis committee members, Professors Ivana Kolčić (Chair), Livia Puljak, and Tomislav Smoljanović for your careful examination of my thesis work. I am also thankful to Professor Damir Sapunar for his advice early during thesis scope formulation and participation during the thesis defence. I am grateful for a learning environment that has been collegial and holds a high regard for scientific rigour as cultivated by Professors Sapunar and Puljak for the TRIBE program. I am particularly indebted to Professor Puljak for her guidance throughout this journey. I have delighted in being a student of this program and interacting with the faculty members. My experience is one that I will miss as this degree draws to a close.

My utmost sense of purpose, fulfillment, and gratitude for this lifetime accomplishment comes from my faith. Some may feel that God wouldn't care much about the type of research they do. For me, this couldn't be further from the truth. Producing various types of knowledge synthesis, contributing to methodological advances in undertaking research, and holding the importance of the complete reporting of research has been about reducing bias, increasing transparency, and carefully considering what might represent the 'truth' in producing knowledge that is intended to better the lives of people. I see nothing more reflective of who I know Jesus Christ to be. He is my ultimate role model for what it is to truly love and serve people. I hope that I can live up to that kind of an example.

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AI	Artificial Intelligence
AHRQ	Agency for Healthcare Research and Quality
AMSTAR	A MeaSurement Tool to Assess systematic Reviews
BMJ	British Medical Journal
BRIDGES	Evidence-informed framework of building blocks of effective information packaging to supporting policymaking
CADTH	Canadian Agency for Drugs and Technologies in Health
CAM	Complementary and alternative medicine
CI	Confidence Interval
CONSORT	CONsolidated Standards Of Reporting Trials
DNA	Deoxyribonucleic acid
EPOC	Effective practice and organization of care
EQUATOR	Enhancing the QUAlity and Transparency Of health Research
EVD	Ebolavirus disease
GRADE	Grading of Recommendations Assessment, Development and Evaluation
HCW	Healthcare worker
HTA	Health technology assessment
ICC	Intracluster correlation coefficient
ICD	International Classification of Diseases
IMRAD	Introduction-Methods-Results-and-Discussion
INAHTA	International Network of Agencies for Health Technology Assessment
IQR	Interquartile range
KTA	Knowledge to Action
MID	Minimally important difference
MOOSE	Meta-analysis Of Observational Studies in Epidemiology
MVD	Marburgvirus disease
NHS	National Health Service
NMA	Network meta-analysis
OHRI	Ottawa Hospital Research Institute
PCR	Polymerase chain reaction
PICO	Participants, Intervention, Comparison, Outcome
PPE	Personal protective equipment

PRESS	Peer Review of Electronic Search Strategies
PRISMA	Preferred Reporting Items for Systematic Reviews and Meta-Analyses
PROSPERO	International prospective register of systematic reviews
QA	Quality assessment
QUADAS	QUality Assessment tool for Diagnostic Accuracy Studies
QUOROM	QUality Of Reporting Of Meta-analyses
RCT	Randomized controlled trial
REA	Rapid evidence assessment
REAL©	Rapid Evidence Assessment of the Literature
RG	Reporting Guideline
ROBIS	Risk Of Bias In Systematic reviews
RR	Risk Ratio
SD	Standard deviation
SR	Systematic Review
SS	Search strategy
STARD	STAndards for Reporting Diagnostic accuracy
STRICTA	Standards for Reporting Interventions in Clinical Trials of Acupuncture
STROBE	STrengthening the Reporting of OBservational studies in Epidemiology
SUPPORT	SUPporting POlicy relevant Reviews and Trials
SPARKS	Systematic Prospective Assessment of Rapid Knowledge Synthesis
TRIBE	Translational Research in Biomedicine
USPSTF	United States Preventive Services Task Force
VHF	Viral hemorrhagic fever
WHO	World Health Organization

1. INTRODUCTION

Systematic reviews are known to be the most reliable evidence to inform healthcare and health policy decisions, due to a rigorous process of development, relative to more traditional review methods. Such a robust approach is generally time consuming, though, typically taking years to complete (1). This is in contrast with decision-making circumstances, such as public health emergencies that require answers in a period of days or weeks. Rapid reviews have emerged to fill the need for timely evidence synthesis, such as urgent policy advice and coverage decisions (2–5).

To facilitate decision-making, any evidence synthesis product needs to be clearly and transparently reported to ensure that interested readers understand the work and could replicate the methods and findings. For example, the report needs to communicate essential information to understand its scope, how it was undertaken, what the synthesized research findings can tell us, and any additional considerations or limitations for its use. Although this may seem intuitive, two large studies on systematic reviews indicate a need for improvement (6,7). Rapid reviews would not be immune, and several articles have signaled reporting issues (8–11), including one empirical study (12).

1.1 Rapid Reviews

The concept and production of rapid reviews is understood to have originated from the realm of health technology assessment (HTA). Some HTA organizations, such as the ERCI Institute (formerly the 'Emergency Care Research Institute') in the United States, have been producing rapid reviews for more than 20 years (13), a timeframe that corresponds to the earliest published literature on rapid reviews. In 1997, Best and colleagues published a description of the South and West Development and Evaluation service in the former Wessex region, England, that produced 16-20 'rapid and responsive HTA' reports per year (2). Those reports, each taking about two months to produce, addressed the effectiveness and cost-effectiveness of technologies, mainly for National Health Service purchasers and to inform decisions at the time of purchasing (2). Literature in relation to rapid reviews in HTA has accumulated since that time (3,8,14–19).

Rapid review production and use have expanded in the wider health sciences domain and in social research (11,20,21). Examples of non-clinical or non-technology topics include the

effectiveness of institutional health partnerships (22), ethical aspects of pediatric nursing (23), and housing for chronically homeless people with serious mental health and substance use (24). Although produced mainly to directly inform decisions (whether clinical care, technology purchase, or policy formulation), other uses have emerged or been purported, such as to support grant applications (5) or to inform priority-setting (19,25).

With their increasing use and likely variety, it is important to understand what these knowledge synthesis products entail and what their validity is. Since they are likened or compared in some fashion to systematic reviews, it is important to understand how they differ from systematic reviews to meet a compressed timeframe, whether there are other differences, and whether circumstances exist in which rapid reviews should not be produced.

1.1.1 Nomenclature and Definition

Terms used to self-identify rapid review reports vary widely (9,10,26,27). Figure 1 provides an example of the breadth of terms identified in a sample of 100 rapid reviews, depicted in a word cloud that weighs the frequency of occurrence of a given term across the sample (11). The most frequently used term was ‘rapid review’, one study indicates that ‘rapid products’ may be the most helpful term to describe the umbrella of report types that would otherwise be identified as ‘rapid reviews’ (27). Some overlap in terms occurs with those identified in an earlier study by Ganann and colleagues (9). Terms such as ‘technotes’, ‘ultra rapid review’, and ‘succinct timely evaluated evidence system’ were perhaps reflective of earlier-produced rapid reviews, although frequencies were not reported (9). More recently, Aronson and colleagues have proposed the term ‘restricted review’ with the argument that timeliness is not as important as the aspect of simplifications and omissions of the methods of the systematic review process when considering an appropriate term (28). Propositions for change in nomenclature may not gain traction, however, if ‘rapid review’ has already become an established term.

Rapid reviews lack a formal, consensus definition, a view widely held by researchers in this area (8,11,20,26,29,30). Table 1 provides a convenience sample of definitions that have been provided or developed by authors of various methodological papers on rapid reviews. For

Figure 1. Word cloud for the frequency of terms.

articles that report or cite a definition, features vary but overlap across definitions; elements such as time, either generic or specific indication of concessions or streamlining in approach or methods, comparison with a comprehensive or systematic review, and, less frequently, acknowledgement that rapid reviews exist in a spectrum of approaches or products. From the sample shown here and from methodological research undertaken (31–33), variability exists in definition or description.

Table 1. Rapid review definitions as provided in select methodological papers.

Author	Term used	Rapid review definition	Source of definition
Definitions stated or cited by authors			
Watt 2008a, Watt 2008b (14,17)	Rapid review	Any HTA report or systematic review that has taken between 1 and 6 months to produce which contains the elements of a comprehensive literature search.	Authors
Ganaan 2010 (10)	Rapid review	Rapid reviews are literature reviews that use methods to accelerate or streamline traditional systematic review processes.	Authors
Khangura 2012 (20)	Rapid review/ Evidence summaries	Rapid reviews have emerged as a streamlined approach to synthesizing evidence in a timely manner – typically for the purpose of informing emergent decisions faced by decision makers in health care settings.	Authors
Thomas 2013 (21)	Rapid evidence assessment	The REA (or rapid review, or brief review) is essentially an attempt to obtain compromise between the expectation that a systematic review delivers the most rigorous and comprehensive synthesis of the available evidence base, and the requirement from the policy-making process for evidence to be available in a timely manner.	Authors
Featherstone 2015 (31)	Rapid reviews	Rapid review products are intended to synthesize available evidence and meet the time constraints of healthcare decision-makers.	Citation
Featherstone 2015 (31)	Rapid reviews	Rapid reviews are better understood as a spectrum of products: some use a different methodological approach compared to a standard SR, while others closely resemble a SR.	Authors
Varker 2015 (34)	Rapid evidence assessments	They generally describe the characteristics of a body of literature and are underpinned by a comprehensive literature review but can make concessions to the breadth or depth of the process, in order to suit a shorter time frame.	Authors
Tricco 2015 (35)	Rapid review	A rapid review is a type of knowledge synthesis in which the components of the systematic review process are simplified or omitted to produce information in a short period of time.	Citation
Wilson 2015 (35)	Rapid synthesis	Those requesting a rapid synthesis typically set the timeline within which it needs to be prepared (typically no more than a few weeks)…nature of the questions can take many forms, and relate to a problem, options or implementation considerations…typically include existing systematic reviews and occasionally single studies.	Authors
Wilson 2015 (35)	Rapid review	A rapid review is typically a comprehensive systematic review conducted in a condensed timeline (e.g., six months) rather than a more standard timeline like 1 or 2 years…effects of a single option…focus on single studies.	Authors

Author	Term used	Rapid review definition	Source of definition
Garritty 2016 (26)	Rapid review	…we define "rapid review" as a type of evidence review that is produced using accelerated and/or modified systematic review methods.	Citation
Patnode 2018 (36)	Rapid review	Rapid reviews are evidence synthesis products in which certain aspects of standard systematic review procedures are modified or omitted to produce more timely information.	Citation
Definition arising from methodological research			
Merlin 2014 (19)	Rapid review	Always • Describe the characteristics and current use of the technology, and • Evaluate safety and effectiveness issues Often • Conduct a review of only high level evidence or of recent evidence and may restrict the literature search to one or two databases Optionally critically appraise the quality of the evidence base. Optionally provide information on costs/financial impact.	Research
Kelly 2016 (37)	Rapid review	Rapid reviews • Are conducted in less time than a systematic review • Use a spectrum of approaches to complete an evidence synthesis related to a defined research question(s) using the most systematic or rigorous methods as a limited time frame allows • Have a protocol describing objectives, scope, PICO, and approach • Tailor the explicit, reproducible methods conventionally used in a systematic review in some manner to expedite the review process • Transparently report methods and findings with a level of detail needed to adequately answer the research question, meet the requirements of the decision-maker commissioning the review, and inform the audience for which the review is intended, while meeting a delivery time line agreed upon in advance	Research

Author	Term used	Rapid review definition	Source of definition
Kelly 2016 (37)	Rapid review	• Should be considered in the context of the decision at hand when emergent or urgent decisions are required • Choices to adapt workflow should be balanced against the yet undetermined impact to conclusions or validity of findings and this risk should be communicated to the end-user	

Abbreviations: Authors=as stated or defined by the authors of the methodological study; Citation=authors cite another report adjacent to the definition; Reports=definitions from across reports included in the methodological study; Research=primary research performed by the authors to derive a definition.

For two articles, the intent was to derive a definition or list of defining features (19,37). The definition proposed by Merlin and colleagues emerged from a Delphi consensus process of 45 HTA agencies and included information about the scope (i.e., characteristics and use of technology, evaluate safety and efficacy, costs) along with some specifications of approach (i.e., level of evidence, search, critical appraisal) (19). The list of defining features by Kelly and colleagues (37), also developed using a Delphi approach, is the most comprehensive of all definitions in Table 1 and covers all of the aforementioned features but adds specifications of a protocol, transparent reporting, meeting the requirements of the commissioner, and communication risk of validity of findings to the end user (37). However, given that calls for a consensus definition persist in the literature (11,26), it is yet to be determined whether Kelly's list of defining features meets the endorsement of an international consensus group (37).

1.1.2 How rapid review methods differ from that of systematic reviews

Since the concept of a rapid review stems from that of systematic reviews, it would seem intuitive to describe the undertaking of a rapid review relative to that of a systematic review. This section will follow the typical process of a systematic review, focusing on what would be typical for questions of interventions. The process would be similar for other types and tailored according to methodological and data type considerations. For the sake of simplicity, the discussion will begin with the formulation of a research question. In reality, there are other aspects to consider before starting with the question, but these will be addressed in Section 1.1.6.

One review of several methodological studies has shown that there is no agreed-upon methodology for conducting rapid reviews (32). If they are understood to be a tailored methodology, then conceivably tailoring or shortcuts could occur at any or multiple steps during conduct. Examples are included below.

1.1.2.1 Research question and eligibility criteria

The development of the research question is what guides all remaining aspects of undertaking a systematic review in relation to the content and requires important time to develop. Poorly

framed questions and insufficient thought put to scope and applicability can result in reviews at an increased risk of bias if decisions for inclusion are led by the scope and findings of the literature that is encountered during the process. Rapid review topics often arise from a pressing policy, guideline, or other decision-making need, and that 'important' time is much more compressed than for systematic reviews. Accordingly, this stage is just as important and fundamental for rapid reviews, and would require discussion, likely iteratively with the requestor to ensure the question meets their need (20,38).

Structured 'PICO' (Population, Intervention, Comparison, and Outcomes) and similar frameworks apply equally to rapid as with systematic reviews. Some studies have evaluated how well question development occurs in rapid reviews. Harker and Kleijnen evaluated a sample of 49 rapid reviews available through the HTA database of The Cochrane Library and on selected websites of HTA producers, published between 2000 and 2010, and found that 47% of their sample did not report a clear question (8). However, Tricco and colleagues, using a broader search of databases and grey literature, found that almost all of their sample of rapid reviews reported a clear question (99%, n=100, years 1997-2013) (35). The extent of overlap in the included rapid reviews between these studies is unknown.

As with any systematic review, the decision of a broad versus narrow question depends on the relevance or applicability. For rapid reviews, there is an added dimension of feasibility for the timeline that needs to be considered. Limiting scope has shown to be one key means of ensuring feasibility of conducting a rapid review (31,33,38). Any aspect of the PICO (and other) eligibility elements can be narrowed, including scope of interventions (38), types of outcomes (10,38), study designs (e.g., higher quality designs) (36), setting (10,36), date of the literature (10,11,35), and language (10,35). The number of questions has also shown to be limited (38). Quality assessment of reports can also be used as a selection criterion (11), if there is a need to limit the evidence to meet a timeframe. Limitations in date and language were shown to occur in 68% and 49% of rapid reviews, respectively, in one methodological study (35). This is an area where distinctions between rapid and systematic reviews may blur as restrictions for some aspects, such as language and setting, may also occur in systematic reviews in relation to applicability (e.g., setting) or understanding of the empirical evidence of bias (e.g., exclusion of non-English language may bias the results with complementary but not conventional medicine interventions (39)). Some of these restrictions, such as date and language may be reflected in the search strategy, are discussed below.

Another aspect of rapid reviews that may differ from systematic reviews is in the inclusion of secondary evidence. Many rapid review producers consider including systematic reviews or HTAs because it capitalizes on existing synthesized evidence to expedite an answer for the requestor, minimizes bias and error in reviewing primary studies quickly, and reduces waste in research by not undertaking unnecessary duplication (10,20). Abou-Setta and colleagues found that all organizations in the sample frequently searched for previous systematic reviews as the initial evidence base, with 78% also searching for recent primary studies (30). Some groups in that study only searched for systematic reviews, while others would consider primary studies only if secondary evidence was not available. These findings are supported by an earlier survey of HTA organizations where none excluded systematic reviews as evidence, and lower levels of evidence were more likely to be excluded (14,33). However, authors should be providing a rationale for their decisions (33).

1.1.2.2 Protocols

Protocols reduce reporting and selection biases in the development of the review by defining that information in advance (40). Rapid review producers are encouraged to write protocols before they undertake their review and, ideally, register them (38).

The PROSPERO register (https://www.crd.york.ac.uk/prospero/), launched in 2011 by the University of York's Centre for Reviews and Dissemination, is an open access and free-of-charge repository to house protocol information prospectively of two types of knowledge syntheses: systematic reviews and rapid reviews. Other searchable repositories, such as the Open Science Framework (https://osf.io/) hosted by the Centre for Open Science, are also available to post protocols as well as data sets and other information during and after review conduct is completed. By making protocol information publicly available and in a searchable repository, this will also help to reduce duplication of effort. Preprint servers are another option.

The use of rapid review protocols is incompletely described in the literature. One study reported that 84% of organizations in their sample commonly prepared protocols (30). However, a separate study evaluating a sample of both rapid review reports and evaluations of rapid reviews reported use in only 2% of reports (35).

Some rapid review producers employ decision-making during the conduct of the review, such as the inclusion of primary literature depending on the availability of secondary evidence as described above. In addition, other iterative processes involving decision-making during the conduct of the rapid review that are made once the nature and volume of evidence is known (41). Examples drawn from the candidate's experience:

- restricting inclusion criteria to higher levels of evidence if time cannot permit the selection and inclusion of studies with lower quality study designs,
- deciding on the breadth versus depth of data extraction that is undertaken for data tables; and
- deciding on the type of synthesis that will be undertaken depending on decisions made during the previous steps of the process (selection and data extraction) and the nature of the available data.

The iterative nature in this process involves discussions among the rapid review team and in consultation with the requestor to ensure decisions fit their needs. Conduct decisions that could be reasonably determined and firmed in advance is a standard expected of systematic review protocols; for rapid reviews, however, iterative decision-making reduces the reliability of the protocol and increases the risk for bias during conduct.

1.1.2.3 Literature searching

Approaches in addressing literature searching are the most frequently discussed in the rapid review literature. Conceptually, literature searching is the same for systematic and rapid reviews: consider sources and how you will search or consult them. Where they potentially differ is what sources are searched and any tailoring in search approach.

Empirical evidence shows that many rapid review producers use two or more databases for their literature searching. Two evaluations of samples of rapid review-producing organizations showed that most or all used at least three bibliographic databases (29,42), while another study on a sample of 100 rapid review reports showed that 82% used at least two databases and a small minority (2%) reported the use of only one database (35). Two smaller evaluation studies support these findings (3,15). Case study articles of rapid reviews

used for a specific decision-making circumstance also reported use of two or more databases (43–45).

Supplemental searching, such as consulting the websites of relevant organizations and contacting experts strives to reduce publication bias, whereby statistically positive study findings are more likely to be published than studies with null or negative results (40). Methodological studies indicate that grey literature searching is reduced or omitted in rapid reviews (9,31), with its use in 56% of organizations (30) and 70% of rapid review reports (35). In one study, authors noted that the decision to incorporate grey literature searching as a strategy was often topic-specific (30). Fifty percent of a sample of rapid reviews had scanned references (35). Restrictions in the literature search strategies for language, date, and study design filters have been reported (9,11,27,29,31).

Sagliocca and colleagues tested a searching approach for pragmatic (rapid) reviews that limits the acquisition of articles to those found in a pre-identified list of general and specialist journals (46). To do this, they used a systematic sample of Cochrane reviews in five clinical areas and restricted the pragmatic review to the studies in the Cochrane reviews that were in the list of journals and compared estimates. Of the analyses that could be replicated with the restricted strategy, all but two were similar between the pragmatic approach and the Cochrane reviews. How applicable this approach is to rapid reviews is uncertain; this type of approach would certainly need content expertise to guide the selection of journals.

Nussbaumer-Streit and colleagues evaluated the impact of 14 abbreviated literature searches on the conclusions for outcomes in 60 Cochrane reviews with the intent on informing rapid review approaches (47). The abbreviated literature searches took the form of using MEDLINE, Embase, and CENTRAL alone, in any combination among them, and then each of those with or without reference list searching using Scopus. They designed their study as a non-inferiority one using a previously defined threshold of 10%, which represents the maximum risk that decision-makers and guideline developers would be willing to make of getting an incorrect answer from a rapid review (48). They found that, depending on the strategy, 8% to 27% of Cochrane reviews would have had conclusions that deviated from the original systematic reviews, whether this was drawing the same conclusion but with less certainty, reaching a conclusion in the opposite direction, or no longer able to draw a conclusion (47). When focusing on conclusions that changed to the opposite direction, it was clear that MEDLINE alone, MEDLINE plus references, and Embase exceeded the non-

inferiority margin. Authors uphold current recommendations that at least two databases are needed for searching and that searching one database is never appropriate for rapid reviews. Lorenzetti and colleagues found that although MEDLINE and Embase are key resources for rapid HTAs, some topics may need specialized or topic-specific databases, such as CINAHL and PsycINFO, for study identification (49).

Unique to rapid reviews is that some producers also limit their retrieval of the evidence to readily accessible literature (5,9,21). This would mean not requesting articles through interlibrary loan but focusing only on those available through their local health library collections and electronic subscriptions. This is incorporated to facilitate timeliness of evidence production, although with the risk of introducing a location bias.

1.1.2.4 Selection process

Best practice guidance suggests that at least two people review each record or article to avoid bias and human error (40) with a process to resolve disagreements. Piloting of forms can help to increase consistency, thereby minimizing disagreements. Edwards and colleagues showed that a second reviewer maximizes inclusion and increased the identification of records by 9% on average (50). The ROBIS tool for evaluating the risk of bias of systematic reviews provides an option to use a second person to check the decision in full text screening (51). Commercially-available programs, such as Distiller Systematic Review (52), can be used to help with the management of citations and processing.

Concessions at this stage of rapid review conduct can take various forms, such as use of a single reviewer to make selections or use of a single reviewer with a second person to review all or a subset, whether that subset is a random sample or only those excluded by the first person. Different methods may be used depending on the stage of review (title/abstract versus full-text). Author contact may be omitted. For title and abstract screening, Tricco and colleagues found that 34% of rapid reviews had at least two independent reviewers, 18% used one reviewer, and 5% used a second verifier (35). In the same study, at least two reviewers were used for 24% of full-text screening while 11% used one reviewer only and 6% used second person verification (35). Authors were contacted in 22% of cases (35). Abou-Setta and colleagues similarly found variation in approaches with 38% using two independent reviewers (stage not specified), second person verification in 9%, and use of a single reviewer

in 41% of organizations' processes (30). In the study by Hartling and colleagues, many of the rapid reviews they evaluated did not use dual study selection, and the use of full-text review depended on what type of rapid review product was being produced (27). A survey conducted by Polisena and colleagues showed that for 16 organizations' self-reported information about their processes, 55% used two reviewers (stage not specified) (42). Another option is the use of a larger number of people to screen records that are more obviously relevant or not, while using a smaller group of people to decide on the more 'borderline' cases (21).

Rathbone and colleagues tested the use of a title-only screening approach that used the PIC (but not O) elements to identify potentially relevant studies with the intent on informing rapid and scoping review searching methods (53). The approach involved 5 independent reviewers deriving a list of synonyms for each of the P-I-C components and each developing a Boolean-based searching strategy in EndNote reference management software with those terms to perform the screening. Results were compared with those obtained in 10 completed systematic reviews. The median reduction in screening effort was 53%, as determined by the number of records that were deemed irrelevant. In nine of 10 systematic reviews, the recall was 100%. For the tenth review, four of the five reviewers missed the same included study. This may be an important strategy to give further consideration and evaluation of for rapid reviews, and authors suggest replicating this approach on more complex review topics such as health services research and non-drug interventions to inform its generalizability (53).

The advent of artificial intelligence (AI) is an emerging consideration for both systematic and rapid reviews. AI involves the use of text mining, which is the use of algorithms that turns text into data and then analyze those data using natural language processing to attempt to mimic human judgement. A training set is used to allow a process of machine learning to take place based on human decision-making, after which the machine can made predictions. Examples of research focus to date include evaluating an automated method for citation snowball searching (54), duplicate record detection (55), prioritizing references for selection (56–58), making selection decisions (59,60), data extraction (58,61), and risk of bias assessment (62). For study selection, recent guidance indicates that text mining to prioritize order of citations for screening is ready for routine use, but that use to serve as a second reviewer or to eliminate studies is premature (63). Few systems have been made available, a barrier to others in testing them out. Many more applications can be envisaged with the use of AI during the systematic review process, including expediting scoping efforts during topic development, writing the protocol, devising the search strategy itself, and writing the final

review report (64). From a conceptual perspective, it is reasonable to assume automation efforts will gain greater traction among rapid than systematic reviews to meet urgent time lines.

1.1.2.5 Data extraction and Quality assessment

As with selection, best practice guidance suggests that two independent reviewers collect and perform assessments, with the same considerations outlined above for handling disagreements. Forms here can also be pilot-tested. Guidance for the ROBIS tool for systematic reviews allows for a second person to verify the accuracy of extractions and quality assessment judgements (51). For rapid reviews, concessions as outlined for the selection process would be considered applicable for data extraction and quality assessment: use of one person or use of a second person for partial or complete checking of the first person's work, if not two people fully involved.

Empirically, Hartling and colleagues have shown that single data extractors ended up with more errors than when double extraction was employed (65). Data tables were present in 41% of rapid reviews produced by HTA agencies (19).

In Tricco and colleagues rapid review sample, use of one reviewer for extraction and quality assessment was used in 7% of cases, while use of two people for the two processes, whether independently or for verification, ranged from 10-23%; in only 7% of cases was quality assessment not undertaken (35).

In the Abou-Setta and colleagues' evaluation of organizations' guidance information, 41% used a single extractor and an indication of single or no quality assessment was made but not quantified; use of two reviewers in some fashion was reported for both but quantified only for extraction (22-25%) (30).

In the Polisena survey of organizations' self-reporting of methods, 48% used two reviewers for data extraction (additional details not specified), and 24% of organizations do not undertake quality assessment (42).

In their evaluation of a sample of rapid reviews, Harker and Kleijnen found that 61% used two reviewers, but only 40% of those clearly stated that independent appraisal and extraction were used (8). One-third of that sample used only one reviewer for extraction or did not

clearly report this information, while other rapid reviews provided indication that a varied number of reviewers and checking processes were used (8).

The study by Ganann and colleagues indicated that some restrictions in data extraction and quality assessment occur, but poor reporting precluded characterization (10). The risk of defining only a subset of features is lost information when trying to assess the extent of heterogeneity (11).

In the evaluation by Harker and Kleijnen, 47% of rapid reviews reported their quality assessment tool or analogous information (8). Featherstone and colleagues caution the lack of quality assessment in rapid reviews as it risks overreliance, misinterpretion, and misrepresentation of the evidence (31), and Ganann questions whether rapid reviews excluding a critical appraisal component should be called 'rapid reviews' (10).

1.1.2.6 Data synthesis and Interpretation

Consistent across methodological evaluations of rapid reviews is that the majority of producers use a narrative synthesis (8,10,11,29,31,42); where quantified, meta-analyses ranged from 2-22% (8,10,11,42). In some, vote counting was employed (10,30). Abrami and colleagues note that effect modification is eliminated or reduced (11); certainly, there is little indication of this elsewhere in the literature. Varker and colleagues note that few rapid evidence assessments comment on the strength of the evidence (34); otherwise, Abou-Setta and colleagues found no studies on the comparison between rapid and systematic reviews on the GRADE approach (30). However, Thayer and Schünemann have published a few examples in the application of GRADE for rapid reviews (66).

Abrami argues that reviews done quickly also affect the reviewer or team's ability to give careful thought about the conduct and interpretation of evidence (11). This would lend credence to including a 'rapid systematic review' as a rapid review type as there may be differences in the nuances in the interpretation and conclusions made or additional thought or commentary on applicability if no limits on time were posed.

Many studies have drawn attention to the certainty of conclusions made in rapid reviews in some manner, such as whether risk exists or to explore perceptions (2,3,9–11,17,29,31,32,32,47,48,67–69). The main concern is whether conclusions agree with a

systematic review performed on the same topic, due to missing studies or the inability to contact authors. Some researchers suggest that rapid reviews be viewed as interim reports and be followed up with a systematic review (3). Further, some researchers indicate that caution should be used in the framing of the rapid review findings (10). Section 1.1.4 elaborates on comparisons between the findings in rapid and systematic reviews.

1.1.2.7 Writing the report

As with any other research study, authors need to declare limitations of the rapid review approach and process to ensure an appropriate distinction between systematic reviews. Featherstone highlights the importance of this when critical appraisal is not undertaken and alludes to declaring whether conclusions are generalizable or only pertain to the healthcare organization that commissioned the work (31). There also needs to be a description of the potential implications of those limitations (11). Some papers found that few rapid reviews declared limitations or potential biases associated with the approach (8,10).

Peer review is another consideration in relation to rapid reviews as many of them are not published in the traditional sense (i.e., journal publication). In a survey of HTA organizations, although all systematic reviews included a peer review process, fewer rapid reviews did (61%); of those, external reviewers in used in almost 70% of cases (33). Authors also state that the more rapidly produced products were less likely to have been externally/peer reviewed, meaning that the shorter reports were not subject to appropriate critical review (33). Of consideration in this regard would be impact on the time of report production, and 60% indicated that it did lengthen the process (33). Other studies also comment on the lack of scrutiny when no peer review is elicited (11).

Disclaimers have been noted in rapid review reports. Harker and Kleijnen noted one organization's use of a broad disclaimer regarding limitations and methodological gaps of rapid reviews (8). Disclaimers can be used to convey the uncertainty of the completeness of the evidence and that the findings should not replace advice from a medical professional or to release the liability of funders. Disclaimer use in systematic reviews is not typically undertaken.

Consideration of optimal layout and length of rapid reviews has been proposed (34). Khangura and colleagues describe their process of deriving a report format that is designed

with the end users' need in mind (20). Their template evolved over time and was influenced by structured summaries of systematic reviews produced by the SUPPORT collaboration, evidence reviews completed by the Centre for Clinical Effectiveness, feedback received by end users, and brainstorming within the research team. Features include a key messages section at the beginning of the document to summarize overall findings, an adjacent sidebar that notes the intended audience and the nature of the content, 'bottom line' statements are called out in text boxes throughout the document to summarize the evidence under each subsection, and methods descriptions are moved to the back of the report. Mijumbi-Deve and colleagues also tested rapid review formats with a group of eight policymakers who were involved in the piloting of a rapid response service (70). In their study, they conducted user testing, modified the report format in light of that feedback, and solicited follow-up input. Participants found that the format was usable, credible, and valuable. Improvements in the template addressed frustrations with a crowded first page and communication about the type of document and its uses. Authors received conflicting feedback in relation to preferred length of the document. They note that further research is needed to address expectations in terms of including recommendations and report length (70).

Two studies are currently underway to examine the attributes in relation to rapid review report preparation. One study will assess the layout and content structure of a cross-section of rapid reviews (71). The second study will evaluate the BRIDGES criteria, which addresses the relevancy of content, quality of the evidence, reporting, and stakeholder engagement, along with an assessment of the readability of reports (72).

1.1.3 Rapid review classifications and decision tools

As demonstrated in the previous section, potentially any topic can be considered for a rapid review, but there is not a one-size-fits-all approach. Tricco and colleagues determined that 50 unique approaches were observed in their sample of 100 rapid reviews, of which only 16 approaches occurred more than once (35). A few sources have considered classification and decision tools that help to understand this specturum.

Hartling and colleagues developed a taxonomy to categorize the approaches of 36 rapid products produced by 20 organizations (27). This taxonomy is anchored in the synthesis approach as observed across those products (Table 2). Rapid reviews are specifically defined

Table 2. Taxonomy of rapid products based on the extent of evidence synthesis (27).

Category	Description
Evidence inventories	Provide a list of available evidence; no evidence synthesis
Rapid responses	No evidence synthesis, but usually report conclusions of existing systematic reviews or guidelines
Rapid reviews	Perform evidence synthesis (narrative, quantitative, or both) and possibly strength of evidence
Automated approaches	Computer program queries on databased of extracted study elements to generate quantitative meta-analytic synthesis

Redrawn from: Stevens A, Garritty C, Gartlehner G, Kamel C, King V. Commentary on: A taxonomy of rapid review links report types and methods to specific decision-making contexts. In: Chandler J, McKenzie J, Boutron I, Welch V, editors. Cochrane Methods. Cochrane Database of Systematic Reviews; 2016, Issue 10 (Suppl 1). dx.doi.org/10.1002/14651858.CD201601.

as those where evidence synthesis is performed by the authors (27). Rapid responses summarize the conclusions made by existing systematic reviews and other secondary evidence sources (27). Evidence inventories are simply a bibliography of relevant literature (27). A couple of automated approaches were located in their sample, whereby database queries yielded information to perform meta-analyses (27).

Further validation is needed to determine the generalizability of the classification. What is not apparent in the taxonomy are the methodological decisions underpinning the process of arriving at the (list of) evidence (73). It is also unclear where rapid scoping reviews or rapid evidence maps would be situated in the classification, as they are more than just a list of the available evidence and yet would not focus on conclusions of those reports nor synthesize them. Further evaluation is required to determine whether this classification is helpful for knowledge users seeking to understand what products may be available to meet their needs.

The Canadian Agency for Drugs and Technologies in Health (CADTH), a government-funded but independent Canadian health technology agency, has been providing a rapid review service for urgent Canadian healthcare decision-makers for over 10 years (74). They are an example of an agency that has developed a ‘menu’ of rapid review options for its users. Their program offers six rapid review products with varying levels of comprehensiveness, as shown in Table 3. Their ‘Reference List’ option would correspond to the Hartling ‘Evidence inventories’ type (27). Remaining product types focus on the unit of

Table 3. Rapid review product types offered by the Canadian Agency for Drugs and Technologies in Health (CADTH) (75).

Report Type	Description
Reference List	List of the best available evidence with abstracts and links to full-text documents, if available.
Summary of Abstracts	Summary based on the abstracts of the best available evidence. Includes the abstracts and links to full-text documents, if available.
Summary with Critical Appraisal	Written summary of the evidence from full-text articles, with a critical appraisal and policy implications.
Peer-reviewed Summary with Critical Appraisal	Summary of systematically selected evidence with a critical appraisal and policy implications. An external peer review is conducted.
Systematic review and meta-analysis	A systematic review of the evidence and a meta-analysis is performed, where appropriate. Authorship includes a content expert, and an external peer review is conducted.
Rapid HTA	A systematic review of clinical studies and an economic component that includes a systematic review of economic studies, an economic evaluation or a budget impact analysis. It excludes a review of the health services impact. Authorship includes a content expert, and an external peer review is conducted.

Sourced from CADTH's website, https://www.cadth.ca/about-cadth/what-we-do/products-services/rapid-response-service.

inclusion (e.g., abstracts versus full reports), use of critical appraisal, extent of synthesis (e.g., summarizing versus conducting meta-analysis), inclusion of policy implications, and whether peer review is conducted. What is not highlighted in the classification are timeline ranges that each product might take to produce; this might be helpful to a prospective requestor.

The McMaster Health Forum hosts a Rapid Response program that provides a knowledge and stakeholder engagement service (76). Their focus is on rapid products that can be produced in a three-, 10-, 30-, 60-, or 90-business day timeframe (77). With increasing timeline, the products build upon each other in terms of increasing sophistication of service. For example, a three-day policy analysis product will give you the key findings from systematic reviews, quality appraisals of those reviews, and indication as to which countries the evidence represents. From an evidence generation perspective, building on that sequentially would be the inclusion of key findings of primary studies, conducting key informant interviews as

additional evidence, more in-depth analysis and synthesis of findings, and conducting a scoping review. However, their description does not lend to an understanding that a formal quantitative synthesis, such as a meta-analysis, is undertaken. They also offer system analysis and political analysis products that may not be mutually exclusive with each other and that of the policy analysis but focus on information and context about how key aspects of a health or social system work and on political aspects in relation to government agenda-setting and decision-making, respectively. Therefore, depending on the product chosen and options within, the evidence aspect may align with the 'rapid response' category of the Hartling taxonomy but with added dimensions that may serve end user needs.

INAHTA, an international network of health technology agencies, has developed a classification of products, which include rapid reviews (19). In an effort to help with harmonization of processes and expectations, INAHTA member agencies are encouraged to review their own products to see which meet the parameters of those products. Further, they have developed INAHTA Product Type (IPT) Marks, one for each product, which is a small graphic that can be inserted on the front or inside page of reports (19). They have developed these so that end users can identify the product type, regardless of nomenclature used. Translating this idea for use with various rapid review types may be worth exploring, once a classification system has been further explored and with end-user input.

Few tools exist to facilitate decision-making during rapid review assessment. One that is uniquely positioned in the literature is a decision flow developed by Garritty and colleagues that guides reviewers through the process of deciding on synthesis approach, based on the evidence type (systematic review, primary study, or both) and its nature (e.g, rigour, overlapping of findings) (78). The decisional flow ends with reporting on one rigourous systematic review, reporting findings from several or overlapping reviews, and various approaches for a collation of primary studies (narrative, meta-analysis, both, or other analytical approach).

Continued empirical study will help to refine the above tools and, ideally, generate the development of others to guide the understanding and production of rapid reviews.

1.1.4 Comparing rapid and systematic review findings

Some studies have compared the difference in conclusions between rapid and systematic reviews (14,33,67,79). The most thorough of these studies was conducted by Reynen and colleagues (80). Authors used several sources to identify studies that compared systematic and rapid reviews and sought out the individual reports. Eligible reports were those that provided a clear research question that was similar between the systematic and rapid review pair, performed literature searches within 24 months of each other, and described their methods. Of 101 potential pairs, 16 were eligible for inclusion. In comparing report types, rapid reviews used abbreviated methods more often, (e.g., not search the grey literature and using one person for selection), included fewer studies, and were more poorly reported (80). Conclusions were similar between pairs, with two exceptions: one in which the systematic review missed a key study obtained by the rapid review and the other is a case of the rapid review failing to report a mortality outcome although the relevant studies were identified (80). Reynen and colleagues also noted that the systematic review conclusions were more detailed and nuanced. Authors described the retrospective and reporting issues made this study challenging to undertake (80). However, evaluations such as this one provides some evidence to suggest that rapid reviews may arrive at similar conclusions to that of systematic reviews, but the generalizability of which needs to be further explored.

1.1.5 Understanding the validity of rapid review approaches

As noted within Section 1.1.2, an understanding of biases in the conduct of systematic reviews is important when considering the potential for bias in the choice of methods for rapid reviews. Many of those biases are implied by theoretical concerns and, just as with systematic reviews, little empirical evidence exists to guide methods choices in rapid reviews (30). Most ideal would be a comparison of rapid and systematic review findings in evaluating each step of the process, such as the Nussbaumer-Streit (47) and Taylor-Phillips (81) studies, and with prospective study designs.

The SPARKS study is an example of a prospective study that is currently underway (82). SPARKS involves a comparison of prospectively undertaken systematic and rapid reviews on the same topic, working from the same study question and eligibility criteria, and searches will be executed within a short window of time. A specified methodology will be used for all

rapid reviews, so the study will not be able to inform methodological decisions at each step, but will provide more empirical information on what changes in results and conclusions that may occur with the rapid approach. Authors also intend to collect data on conduct time, cost, and staff expertise.

1.1.6 Whole program approaches to conducting rapid reviews

As is the case with organizations such as Cochrane (40), the Centre for Reviews and Dissemination (83), and the Joanna Briggs Institute (84) that have developed guidance for undertaking systematic reviews, some organizations or research units have established processes, some in the form of a manual or published guidance, for conducting rapid reviews. These manuals may contain operational aspects in addition to methods and processes. Published case study examples are shown in Table 4. Larger volume guides were recently published by the World Health Organization Alliance for Health Policy and Systems Research (38) and the National Collaborating Centre for Methods and Tools (85). This section focuses on information that is complementary to that discussed above. Where applicable, information is supplemented by empirical information.

In most of the case study examples shown in Table 4, groups have indicated their context or audience for undertaking rapid reviews, spanning the various levels of decision-making. In two cases, rapid reviews are produced for guideline development, and those purposes differed: use for one was in relation to developing recommendations for public health emergencies (78), while the other positioned the use of rapid reviews for reaffirming previous guideline recommendations where the potential for controversy or a change in practice or recommendations was low (36). Most of the case studies could be identified as specified rapid review organizations or units.

Use of experienced, established research teams were noted in some case studies (Table 4). Haby and colleagues report that some organizations use mentoring or internal training to build staff capacity (86). Other articles have also commented that the use of established teams allows the work to ramp up quickly and in a streamlined fashion (10,21). Use of experienced systematic reviewers also means that decisions on shortcuts in methodology are made with the understanding of how this could affect the validity of the rapid review; the WHO Alliance

Table 4. Convenience sample of published whole-process methodologies for conducting rapid reviews.

Characteristic	OHRI KTA 2012 (20)	CADTH 2014 (18)	Varker 2015 REA (34)	Samueli Institute REAL© 2015 (87)	WHO Rapid Advice Guidelines 2016 (78)	USPSTF 2018 (36)
Country	Canada	Canada	Australia	United States	Switzerland	United States
Context/Audience	Knowledge user involved in service delivery decision making in Canadian regional health authority. Uses: inform policy issue; support direction and evidence base for policy initiative; support clinical interventions and service programmes.	Canadian healthcare decision makers at federal, provincial, regional, local levels	No particular geographic context. Various knowledge users. Uses are the same as those for the OHRI KTA program.	Part of Samueli Institute's Scientific Evaluation and Review of Claims in Health Care Program, United States. Intended decision makers include insurance, regulatory agencies, clinical practice.	Guideline development through WHO.	Typically, Evidence-based Practice Centers will conduct evidence reviews for USPSTF. Use of rapid review intended for guideline topics, to reaffirm evidence. Contraindicating circumstances outlined in paper.
Specified as a rapid review unit or program?	Yes	Yes	No	Yes	Yes	Yes, through Evidence-based Practice Centers
Guideline context?	No	NR, not likely	NR	NR	Yes	Yes

Characteristic	OHRI KTA 2012 (20)	CADTH 2014 (18)	Varker 2015 REA (34)	Samueli Institute REAL© 2015 (87)	WHO Rapid Advice Guidelines 2016 (78)	USPSTF 2018 (36)
Research team information	NR except use of IS	NR, except IS below	Systematic/REA methodology, IS, topic expert. Have pre-existing team ready-to-go.	Several, well-trained. Specific roles: Principal Investigator, Review Manager, Search Expert, Reviewers, Reference Manager, Statistician, Experts. Conflicts of interests managed.	NR	Experienced and established external systematic review centre.
Intake process	Proposal by knowledge users with probing consultation by team. Needs assessment. Determine purpose and commitment of knowledge user during process.	Requests are refined in consultation with requestor: purpose, scope, deadline.	Proposal by knowledge users with probing consultation by team. Needs assessment.	NR	WHO Steering Group drafts question but development involves research team.	NR, but usual USPSTF process presumed

Characteristic	OHRI KTA 2012 (20)	CADTH 2014 (18)	Varker 2015 REA (34)	Samueli Institute REAL© 2015 (87)	WHO Rapid Advice Guidelines 2016 (78)	USPSTF 2018 (36)
Overall process information	Methodology evolved with time: experience and feedback. Adaptation of methods to address needs for more difficult topics.	No additional details of note.	Dynamic communication with knowledge users throughout.	Use of standard procedures ('rulebooks'). Involves: rapid literature identification; ≥1 grading system; summary of evidence; topic experts for input. Steering Committee (stakeholders) to provide guidance throughout. Not involved in conducting review. All decisions, processes, and outcomes relating to review conduct are maintained in a Review Documentation	Rapid review developed as part of guideline development process, that involves various WHO structures such as Technical Units, Secretariat, Steering Groups, and Guideline Development Groups.	Experts engaged during topic refinement and at key points during review process.

Characteristic	OHRI KTA 2012 (20)	CADTH 2014 (18)	Varker 2015 REA (34)	Samueli Institute REAL© 2015 (87)	WHO Rapid Advice Guidelines 2016 (78)	USPSTF 2018 (36)
Overall process information				Checklist, developed based on PRISMA.		
Scoping process	Knowledge user makes initial 1-2 hour investment to develop clear question. At times an environmental literature scan.	NR	NR	NR	1-2 days. Focused search for high-quality SRs and key primary studies. Brief summary of results prepared.	Mentioned but no elaboration on details.
Protocol	Refinement of question with knowledge user; iterative. In addition to typical protocol information, the proposal includes deliverables, timelines, knowledge user-research team agreements. Template used. PICO used	Some products. Posted on PROSPERO. PICO used	Develop question with eligibility with knowledge user; iterative. Parameters determined by scope, time, budget. Protocol document NR. PICO used and before project start.	Steering Committee involved in setting question and eligibility with team. PICO used	Review protocol included as part of proposal, which contains guideline process information and approach for translating evidence into recommendations. Proposal a living document,	Tailor scope in original guideline to focus on questions and outcomes that would inform decision making. PICO NR but assumed

Characteristic	OHRI KTA 2012 (20)	CADTH 2014 (18)	Varker 2015 REA (34)	Samueli Institute REAL© 2015 (87)	WHO Rapid Advice Guidelines 2016 (78)	USPSTF 2018 (36)
Protocol					amended as needed in relation to the fluid and iterative rapid review process. PICO used	

Abbreviations: NR=not reported; PICO=Population, Intervention, Comparator, Outcome; y=year.

manual further notes the responsibility that the review team has to convey this understanding to the requestor (38). All case study examples used an information specialist for expertise in searching. In addition, dedicating more of those experienced team members can help to expedite completion (11), especially for study selection and data extraction. Thomas and colleagues note that rapid reviews are not ideal to learn systematic reviewing (21).

The iterative and collaborative nature of rapid review development between the research team and the knowledge user was noted in previous sections and is a common feature across the case studies. This is evident even at the outset, when many organizations use an intake process to field potential rapid review requests (Table 4) (30). Intake processes are used in various settings, such as business and counselling, and are foundational to developing an ongoing relationship with the rapid review requestor (88). The process typically begins with a standardized form (88), where the requestor can provide pertinent information such as the question they are seeking an answer for, the type and context of the healthcare decision, and timing of the receipt of the report (89). As noted candidly in one article, the authors stated that knowledge users did not have a strong capacity for drafting effective questions (20), and it is likely that this is not an isolated experience. Groups can consider involving the use of a knowledge broker at the outset; Moore and colleagues showed that use of a knowledge broker to help policymakers develop rapid review proposals increased the perceived clarity of information in the proposals and reviewer confidence they could meet the needs of policymakers (90). This iterative dialogue at outset seems fundamental for ensuring that the final rapid review would meet the decision needs and timeline of the knowledge users. Cultivating a trusted, communication atmosphere and actively soliciting feedback throughout the process of conduct is an important function of the rapid review team (34,87) and was observed in other case studies (86).

The process of scoping topics to understand the nature and volume of literature helps to inform whether a rapid review can be undertaken, and if so, what that final product might look like. For example, the team might identify the existence of several systematic reviews and acknowledge that the report may entail a summary of those. For other topics, there might be little robust literature, and exploring lower levels of evidence may be of desire to the knowledge user. Use of a scoping exercise was reported by a subset of the groups (20,36,78). For the remainder, it is unknown whether this was an oversight in the reporting of their process. Other methodological studies did not comment on this aspect (29,42,86).

Protocols formed part of a larger proposal in two cases. The first, in which additional considerations such as project deliverables to the requestor, timelines for the stages of conduct, and knowledge-user-and-research-team agreements (such as knowledge user commitment to availability throughout the process) were detailed in the proposal (20). The second protocol was anchored within a document that outlined the guideline development process (78). Depending on the context, these proposals may be linked with a contract if the arrangement is a user-paid service. Haby and colleagues further acknowledges that contracts have a potential to slow down the process, but a decision may be made to proceed with the work while remaining contractual processes are finalized as a gesture of goodwill (86).

1.1.7 Consensus-derived approaches

Two studies undertook modified Delphi processes to develop consensus approaches for conducting rapid reviews. Tricco and colleagues initially surveyed INAHTA member organizations producing rapid reviews about the specific methods used to conduct rapid reviews and additional information such as timeframe to produce and rationale (91). Following this, the authors conducted two Delphi rounds by asking two mutually exclusive groups of informants to rank the feasibility, timeliness, comprehensiveness, and potential for risk of bias for six rapid review approaches; the second group completed the survey before and after a rapid review summit meeting. The highest-ranking approach entailed searching more than one database, including published literature only, limiting search strategies for both date and language, using one reviewer for study selection, and using a second person to verify both initial data extraction and risk of bias assessments (91). This approach was considered to be the most feasible and with the lowest perceived risk for bias, ranked second in timeliness, and ranked fifth for comprehensiveness (91).

Silva and colleagues surveyed researchers in HTA from Brazilian universities, research institutions, and hospitals (92). Their intent was to develop a rapid review process that delivers a product in about 35 days. Included in their process is the use of experienced reviewers, protocol development and registration, prioritization of outcomes, preferential use of secondary evidence, peer review of search strategies, MEDLINE searches with study design filters that are potentially supplemented by expert contact or other sources, two reviewers (selection, data extraction, critical appraisal), use of GRADE, tabular presentation of results, and use of a structured report with specific word counts for each section.

1.1.8 Other considerations in undertaking rapid reviews

Although there is merit in conducting further methodological research to understand the implications of choices for rapid review methodology, it still seems sensible that it will not be a one-size-fits all approach. Certainly, there is support to make those methodological judgements once scoping of the topic has taken place (33), and the timeline required will also be an important consideration. As others have pointed out, the flexibility and adaptability of the rapid review process is a strength of this approach (33). The use of external experts will help to ensure the subtleties of the topic have been given appropriate thought (33); however, it may not be possible to engage experts with limited timelines to get up-and-running (21). Securing this expertise through the requestor early in the process may be an option and should be considered during the initial negotiating process.

The notion of time and timeframe has been mentioned throughout the thesis thus far. Requestor timeframe for the product helps to drive whether the project can be undertaken and what methods will be employed to deliver a report. Various timeframes have been reported in the literature: several days to one year (11); one to nine months (10); and a median of three months (30). Some reviews used timeframes similar to systematic reviews yet call themselves 'rapid'. Harker and Kleijnen found that more robust rapid reviews tended to have a longer completion time, and that time from searching to publication might even take years for some rapid reviews (8). However, with the examination of other methods articles, conduct in a timeframe of years would be quite rare and questionable as to whether it is indeed a 'rapid review'. Regardless, rapid review producers need to consider what can be undertaken and with what methods during the suggested timeframes of requestors. In some cases, this may mean electing not to undertake the topic because of insufficient human resources or for the potential of risk. The risk of uncertainty of conclusions is higher with rapid than systematic reviews (11), and a recently published study determined that policymakers' and guideline developers' willingness to receive an incorrect answer from a rapid review was 10% (48).

Much of the literature has been anchored in more quantitative topics, such as the effectiveness of treatment or a health service. Rapid reviews assessing qualitative evidence exist and are increasing, along with a growing awareness and desire to consider patient and caregiver experiences related to healthcare decisions (93). However, their conduct may require additional consideration. For example, Thomas and colleagues note that relevant studies may be more difficult to find. A systematic mapping review of existing guidance and

examples is in progress (93); this information will be fundamental to the development of guidance for those rapid reviews.

1.1.9 Appropriateness of using a rapid review approach

In Cameron and colleagues' survey of HTA organizations, authors provided reasons for conducting their rapid review (33). Urgency was the most frequently reported answer, whether political (44%) or clinical (17%). Following this was limited time and resources (33%), to answer a specific question (31%), and uptake of technology (17%). Additional reasons included new technologies with potential pressure for incorporation, few data for a full assessment, and when no analysis was needed. They indicate that a focus on appropriate use of rapid reviews needs to be further considered (14).

Thomas and colleagues bring attention to the situations in which limited resourcing is the sole rationale for undertaking a rapid review. They rationalize that this may not be the most appropriate decision as it can put unnecessary constraints on the review that could otherwise be accomplished with limited staffing but over a longer period of time as a systematic review (21).

Guidance is currently lacking on circumstances in which undertaking rapid reviews may not be appropriate, and some have cautioned against topics that are potentially controversial (32). In the absence of specific guidance, the candidate proposes the following scenarios as ones to consider:

- Topics for where there is an important benefit-to-harm tradeoff, which may be sensitive to missing studies due to restricted or expedited search, such as a pharmacological topic;
- Topics where publication or location bias is highly plausible, suspected, or known and restricted/expedited searching may not be appropriate, such as the case of Tamiflu;
- Topics that are politically sensitive and performing rapid reviews may be risky, both in terms of findings and that of the producer's reputation, such as overdiagnosis in breast cancer screening;

- The nature of the topic is such that producers are not comfortable with a situation where expedited analyses would be required, such as time only allowing for a narrative synthesis where meta-analysis would be expected to be possible; and
- Producers are not comfortable with expedited methods where the complexity of the topic is such that important thought would be compromised due to the timeline of the required answers and (especially if) no systematic review exists.

The above needs to be further explored with a properly conducted evaluation.

Otherwise, as noted in Section 1.1.3, any topic could be potentially undertaken with a rapid review. Tricco and colleagues published a study characterizing a sample of various knowledge synthesis products: systematic reviews, network meta-analyses, scoping reviews, overviews of reviews, and rapid reviews (94). The scope of those topics was reported according to the International Classification of Diseases (ICD)-10 categorization. Of the 84 included rapid reviews, many addressed among a variety of health state or disease conditions: factors influencing health status and contact with health services (11%); multiple conditions in an article (11%); circulatory (7%); musculoskeletal and connective tissue (7%); mental and behavioural (6%); neoplasms (5%); respiratory system (5%); endocrine, nutritional, and metabolic (4%); external causes or morbidity and mortality (4%); nervous system (4%); infectious and parasitic (2%); skin and subcutaneous tissue (2%); genitourinary (1%); clinical and laboratory findings (1%); and pregnancy and childbirth (1%) (94). The remaining 30% of rapid reviews focused on social phenomena, such as the experience of community engagement, health care system transformation, and health inequalities (94).

1.1.10 End users of rapid reviews

In recent years there has been increasing effort invested in understanding users' perspectives about and experiences with using rapid reviews.

Moore and colleagues interviewed health policy agencies who commissioned rapid reviews to the Sax Institute's Evidence Check programme between 2006 and 2015 (95). They found that almost all rapid reviews had been used by the agencies in ways that would mean directly solving a problem or diffusing new ideas. They propose the high frequency of use may be a function of the processes put in place for the conduct of the rapid reviews, such as

collaborative engagement of the policy team and the programme's knowledge broker in developing review questions and the involvement of the policy team at key points during review conduct. For the few reviews that were not used, respondents identified contributing factors other than the rapid reviews themselves. Authors also learned that most reviews were used in more than one way; in addition to informing policy processes, rapid reviews were used to inform research development and agenda-setting.

Hartling and colleagues interviewed frequent users of AHRQ reviews (guideline developers, healthcare providers and organizations, funders, and insurers) to better understand their perspectives on the use and limitations of rapid products (68). The authors found that the credibility of the producers in terms of experience and organizational affiliation, relevance of key questions, and a trusted relationship between the user and producer were critical features (68). Rapid products were often viewed as interim products used in decision-making about next steps, whether to undertake a systematic review or to direct future research or funding (68). Rapid products were viewed less commonly as useful for endpoint decision-making, but rapid reviews would have been accepted for a shorter turnaround time if systematic reviews did not exist (68). For national guideline production, informants felt that systematic reviews were warranted (68). Of importance to informants were use of evidence tables, quality rating of studies, strength of evidence assessments, and summary tables for results and conclusions (68). Acceptable trade-offs in methodology were limiting the search dates or language and using single reviewers in the selection of evidence (68).

Peterson and colleagues surveyed the Veterans Health Administration in the United States regarding the rapid reviews developed by the Veterans Affairs Evidence-based Synthesis Program and found that reviews served multiple purposes and that perception of report content was positive (96). A majority of the rapid reviews were used immediately and informed high impact decisions.

1.2 Reporting of health research

Complete and transparent reporting facilitates the use of research for a variety of stakeholders such as clinicians, patients, and policy decision makers who use research findings; researchers who wish to replicate findings or incorporate those findings in future research; systematic reviewers; and editors who publish health research. As such, there is an

expectation from these various users of evidence that what is made available in research reports has all the available information needed for their various purposes.

This is, unfortunately, not the case. Several research studies have shown the reporting of health research is poor (6,97–101). Drawing from a list of issues presented by Altman and Moher (102), and as it pertains to knowledge synthesis, this can occur in a variety of ways, such as the incomplete reporting of the eligibility of reports, incomplete accounting for how selections were made and information extracted from reports, the selective reporting of the outcomes of interest, and an incomplete presentation of information, and a selective presentation or misinterpretation of the findings of studies. The impact is one of diminishing the evidence base of essential information that may then lead to biased and imprecise findings (102) that then the end user unknowingly accepts as a credible and reliable answer to an important heathcare question.

1.2.1 Reporting guidelines

Reporting guidelines have emerged in the healthcare literature as a means to remedy reporting issues. They are tools intended to help people preparing or reviewing a specific type of research and may include a minimum set of items to be reported (often in the form of a checklist) and possibly also a flow diagram (103,104). The earliest reporting guidelines to be developed were the Standardized Reporting of Trials (SORT) and the checklist developed by Asilomar Working Group in the early 1990s, both serving as the pre-cursor checklists to that of the Consolidated Standards of Reporting Trials (CONSORT) reporting guideline (105).

The interest and enthusiasm for reporting guidelines has grown over years and, in March 2006, a group of key epidemiologists, statisticians, and other methodologists launched The Enhancing the QUAlity and Transparency Of health Research (EQUATOR) Network. Initially intended to map activities in relation to health research reporting, develop a network of key individuals, and establish relationship with potential key stakeholders, EQUATOR continues to expand its reach and activity 12 years later. As part of its core activity is the maintenance of a freely accessible library that catalogues various reporting guidelines, organized in various ways, such as topic specialty and study design type, and provides other resources such as guidance on scientific writing, information on publication ethics, language

translations, where available. The library serves as a one-stop resource for tools to support complete and transparent reporting (https://www.equator-network.org/).

Within the EQUATOR Network Library (106), numerous health research reporting guidelines exist, such as:

- specialty-specific reporting guidelines for 38 specialities, including:
    - emergency medicine (11 reporting guidelines; e.g., standardized reporting guidelines for emergency department syncope risk-stratification research (107)),
    - public health (7 reporting guidelines; e.g., guidelines for the reporting of treatment trials for alcohol use disorders (108)), and
    - oncology (30 reporting guidelines; e.g., REporting recommendations for tumour MARKer prognostic studies [REMARK] (109));
- reporting guidelines by study type, including:
    - observational studies (121 reporting guidelines; e.g., The Strengthening the Reporting of Observational Studies in Epidemiology [STROBE] Statement (110),
    - case reports (26 reporting guidelines; e.g., The CARE guidelines: consensus-based clinical case reporting guideline development (111)), and
    - economic evaluations (17 reporting guidelines; e.g., Consolidated Health Economic Evaluation Reporting Standards [CHEERS] Statement (112); and
- by section of the report, such as figures/graphs (4 reporting guidelines; e.g., graphics and statistics for cardiology: designing effective tables for presentation and publication (113);

In addition, English-language reporting guidelines have been translated to 16 languages across guidelines.

The Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA) reporting guideline was originally published in 2009 (114); its predecessor was the Quality of Reporting Of Meta-analyses (QUOROM) guideline in 1999 (115). The PRISMA guidance

includes a 27-item checklist and flow diagram, structured according to the typical sections of a systematic review report. Although the guideline was developed for systematic reviews of randomized intervention trials, authors state the general concepts and topics are relevant to other research questions, such as prognostic, cost-effectiveness, and genetic associations, but that modification in some items may be needed (114). The accompanying Explanation and Elaboration document for PRISMA provides examples of properly reported items, the rationale for each item, and supporting evidence where available (116). This guideline is in the process of being updated as of the writing of this thesis (117).

Various extensions of the PRISMA reporting guideline have been developed. The PRISMA for Abstracts reporting guideline was published in 2013 to elaborate on the guidance provided by the PRISMA statement for the writing of structured abstracts (118). Authors indicate the guideline can be used dually for journal manuscripts and conference submissions. As with PRISMA, authors indicate that the checklist can be validly used for questions beyond that of an intervention focus, subject to pertinent modifications (118). Other PRISMA extensions:

- PRISMA-Equity, for authors of systematic reviews in identifying, extracting, and synthesizing evidence on equity aspects, such as assessing the effects of an intervention intended to reduce health inequality in a disadvantaged population (119);
- PRISMA-Harms, which provides four additional checklist items to that of PRISMA for any systematic review addressing the harms of an intervention (120);
- PRISMA for Individual Patient Data (PRISMA-IPD), where the systematic review undertakes a reanalysis of individual-level patient data obtained from eligible studies (121);
- PRISMA for Network Meta-analyses (PRISMA-NMA), where the systematic review compares multiple treatments using direct and indirect evidence in a network meta-analysis (122);
- PRISMA for Protocols (PRISMA-P), which provides guidance for systematic review protocols (123);

- PRISMA for Scoping Reviews (PRISMA-ScR) that provides guidance for authors of scoping reviews, which would differ from systematic reviews by mapping the literature in a particular area but not synthesizing it (124);
- PRISMA for Diagnotic Test Accuracy (PRISMA-DTA), for authors of systematic reviews that undertake a diagnostic test accuracy research question (125).

A systematic review evaluating the characteristics of health research reporting guidelines was published in 2011 (104). All guidelines were reported in English, and over 60% were developed by working groups (104). Of the 63% of reporting guidelines that reported the number of people involved in development, a median of 22 people participated (104). One-quarter of guidelines were published in more than one journal (104), presumably to promote dissemination (126,127). About one-third of reporting guidelines were extensions of previously published guidelines (104). Nearly all guidelines (94%) structured their guidance in the form of a checklist, whereas relatively fewer (16%) included flow diagrams that track the flow of research inclusions (e.g., people for studies, reports for systematic reviews) (104). Separate documents elaborating on details for using the reporting guidance were developed for 14% of guidelines (104). Over half of guidelines searched for relevant evidence on the quality of reporting to inform its development (104). About one-third of reporting guidelines were developed using formal consensus processes, and less than 15% of checklists were pilot-tested before publication (104). After the guideline was drafted, about one-third of developers describe handling feedback via email or Web site. Over 60% encouraged endorsement of their guidelines, such as through journals' instructions to authors (104). Despite this evidence of development characteristics, the key aspects of reporting guideline development were generally poorly reported: what pre-meeting preparations took place, presentation of relevant evidence of reporting, discussing the rationale for including items in the checklist, discussing approach for developing the guideline document and authorship, developing an explanatory document, determining strategy for handling feedback and criticism, and encouraging guideline endorsement (104). Moher and colleagues have developed guidance for those wishing to develop a reporting guideline for health research (103).

In that systematic review, relatively few (17%) reporting guidelines indicated the intention to evaluate the guideline (104). The CONSORT statement is a well known reporting guideline

that has been extensively evaluated (126,128–131). A 2012 systematic review indicated that, for some items of the CONSORT checklist, trials published in journals that endorse CONSORT were more completely reported than were trials published before the time of endorsement or in non-endorsing journals (132,133). However, an evaluation of other reporting guidelines may provide editors and other end users with the information needed to help them decide which other guidelines to use or endorse. Since an important role for editors is to ensure that research articles published in their journals are clear, complete, transparent, and as free as possible from bias (134), they may feel the need to endorse multiple reporting guidelines without knowledge of their rigor or ability to improve reporting, in an effort to uphold high standards.

Box 1 provides definitions of terms used in the thesis in relation to reporting and evaluating reporting guidelines.

Box 1. Definitions related to evaluating reporting guidelines.

Endorsement—Action taken by a journal to indicate its support for the use of one or more reporting guideline(s) by authors submitting research reports for consideration; typically achieved in a statement in a journal's "Instructions to authors"
Adherence—Action taken by an author to ensure that a manuscript is compliant with items (that is, reports all suggested items) recommended by the appropriate/relevant reporting guideline
Implementation—Action taken by journals to ensure that authors adhere to an endorsed reporting guideline and that published manuscripts are completely reported
Complete reporting—Pertains to the state of reporting of a study report and whether it is compliant with an appropriate reporting guideline

1.2.2 Reporting and rapid reviews

In several methodological studies, authors indicated reporting issues of rapid reviews or that rapid reviews must be completely and transparently reported (8–11,33,34). The implications are no different than with other healthcare research but with the added risk that a lack in distinction between a systematic and rapid review may make a rapid review seem more valid than it potentially is, thereby providing a misleading sense of confidence of the evidence. Over time, this may lead to a confusion over the two products and potential preferential commissioning of rapid reviews (33) if deemed cheaper and faster to produce.

To date one known empirical study exists that has evaluated the completeness of reporting of rapid reviews. Kelly and colleagues evaluated a cross-section of rapid reviews from the 2013 and 2014 publication years against the PRISMA reporting guideline (12). Authors found that rapid reviews were poorly reported (12). An exploratory analysis by journal publication status found that reporting was better than those not published in academic journals (12).

We have elected to expand on that work to evaluate the completeness of reporting according to journal publication status on a more recent sample, to evaluate partial reporting of items (where applicable), to collect information on additional reporting items, and to include an evaluation of PRISMA for Abstracts. The totality of this work is intended to serve as the empirical basis for the development of a reporting guideline for rapid reviews of primary studies.

1.2.3 Thesis qualifying papers

This thesis contains text from two published qualifying manuscripts submitted as per the TRIBE PhD requirements:

(1) Stevens A, Shamseer L, Weinstein E, Yazdi F, Turner L, Theilman J, Altman DG, Hirst A, Hoey J, Palepu A, Schulz K, Moher D. Relation of completeness of reporting of health research to journals' endorsement of reporting guidelines: systematic review. BMJ. 2014;348:g3804. doi: 10.1136/bmj.g3804. This is an Open Access article distributed in accordance with the Creative Commons Attribution Non Commercial (CC BY-NC 3.0; https://creativecommons.org/licenses/by-nc/3.0/) license, which permits others to distribute, remix, adapt, build upon this work non-commercially, and license their derivative works on different terms, provided the original work is properly cited and the use is non-commercial.

(2) Hersi M*, Stevens A*, Quach P, Hamel C, Thavorn K, Garritty C, Skidmore B, Vallenas C, Norris SL, Egger M, Eremin S, Ferri M, Shindo N, Moher D. Effectiveness of personal protective equipment for healthcare workers caring for patients with filovirus disease: a rapid review. PLoS ONE 2015;10(10): e0140290. doi: 10.1371/journal.pone.014290. *These authors contributed equally to this work. Copyright: © 2015 Hersi et al. This is an open access article distributed under the terms of the Creative Commons Attribution License (https://creativecommons.org/licenses/by/4.0/), which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

The third paper that forms this thesis is unpublished at the time of thesis completion and is outlined in Section 2, Objective 3.

2 AIMS OF RESEARCH AND HYPOTHESES

Rapid reviews have emerged to facilitate the timely compilation of evidence for urgent decision-making circumstances. They are generally conducted with 'shortcuts' or concessions in their approach relative to systematic review methodology. It is important for users of rapid reviews to know not only what the evidence is but also how the rapid review was conducted to then judge the validity of the work and potential limitations. For this to take place, rapid reviews need to be completely and transparently reported. However, there is widespread agreement that rapid reviews suffer from reporting inadequacy. The work described within this thesis provides the empirical basis to develop a reporting guideline for rapid reviews to address that reporting inadequacy.

Objectives

1. To determine which health research reporting guidelines exist and whether one of them is suitable for rapid reviews. Subsequently, to conduct a systematic review to determine whether journals' endorsement of reporting guidelines influences the completeness of reporting of health research. (Qualifying paper 1, BMJ 2014;348:g3804)
2. To assess the effectiveness of personal protective equipment in the context of healthcare workers caring for patients with filovirus disease, using rapid review methodology, the PRISMA reporting guideline, and detailing additional items deemed important, such as any iterative aspects of conducting the rapid review and the involvement of those commissioning the rapid reviews, to describe the rapid review methods and process. (Qualifying paper 2, PLoS ONE 2015;10(10): e0140290)
3. To conduct a comparative, cross-sectional primary methodological study to compare the completeness of reporting of journal-published rapid reviews with rapid reviews not published in academic journals.

Hypotheses

1. The completeness of reporting of health research reports is better with journals that endorse reporting guidelines when compared with other journals that do not endorse reporting guidelines or within journals before the period of endorsement.
2. Personal protective equipment such as double gloves, full face protection, head cover, impermeable gowns, particulate respirators, and rubber boots are better than alternative and potentially less robust personal protective equipment for reducing transmission of filovirus, but potentially with unwanted adverse effects such as reduced dexterity and visibility and increased discomfort and body temperature. We expect that in reporting the rapid review there will be items in addition to that of the PRISMA checklist that will be important to report to readers.
3. Rapid reviews published in academic journals are more completely reported than when not published in academic journals.

3 METHODS

3.1 Methods for systematic review – Relation of completeness of reporting of health research to journals' endorsement of reporting guidelines: systematic review

Our methods were published in a protocol (135). This systematic review is reported according to the PRISMA statement (Appendix 1) (114).

Identifying reporting guidelines

We first searched for and selected reporting guidelines.

Search approach. We included reporting guidelines from the 2011 systematic review published by Moher and colleagues (104), and we screened guidelines identified through the EQUATOR Network (October 2011; reflects content from PubMed searches to June 2011).

Eligibility criteria.

- Reporting guidelines for health research that:
    - Provided explicit text to guide authors in reporting;
    - Described how the guidance was developed; and
    - Used a consensus process to develop the guideline.
- Written in English

Selection process. After removing any duplicate results from the search yield, we uploaded records and full text reports to Distiller Systematic Review© (DistillerSR©). Two reviewers independently screened reporting guidelines. Disagreements were resolved by consensus or a third reviewer.

Identifying evaluations of reporting guidelines

Many developers of reporting guidelines have devised acronyms for their guidelines for simplicity of naming (for example, CONSORT, PRISMA, STARD). Some acronyms, however, refer to words with other meanings (for example, STROBE). For this reason, we used a dual approach when searching for evaluations of relevant reporting guidelines.

We searched for reporting guidelines with unique acronyms cited in bibliographic records in Ovid MEDLINE (1990 to October 2011), Embase (1990 to 2011 week 41), and the Cochrane Methodology Register (2011, issue 4); we searched Scopus (October 2011) for evaluations of all other guidelines (that is, ones with alternate meanings or without an acronym). We did addendum searches in January 2012. Details are provided in Appendix 2. In addition, we contacted the corresponding authors of reporting guidelines, scanned bibliographies of related systematic reviews, and consulted with members of our research team for other potential evaluations.

We included English or French language evaluations if they assessed the completeness of reporting as a primary intent and included studies enabling the comparisons of interest (after versus before journal endorsement and/or endorsing versus non-endorsing journals). Choice of language for inclusion was based on expertise within our research team; owing to budget constraints, we could not seek translations of potential evaluations in other languages.

After removing any duplicate results from the search yield, we uploaded records to DistillerSR©. We first screened records by title and abstract (one reviewer to include, two reviewers to exclude a record) and then in two rounds for the full reports (two reviewers, independently) owing to the complexity of assessing screening criteria and using a team of reviewers. Disagreements were resolved by consensus or a third reviewer. Where needed, we contacted authors of evaluations (n=66) or journal editors (n=48) for additional information. One reviewer (from among a smaller working group of the team) processed evaluations with responses to queries to authors and journal editors and collated multiple reports for evaluations.

We first assessed each published study from within an included evaluation according to the journal in which it was published (Figure 2). We collected information on endorsement from evaluations or journal websites. If the journal's "Instruction to authors" section (or similar) specifically listed the guideline, we considered the journal to be an "endorser."

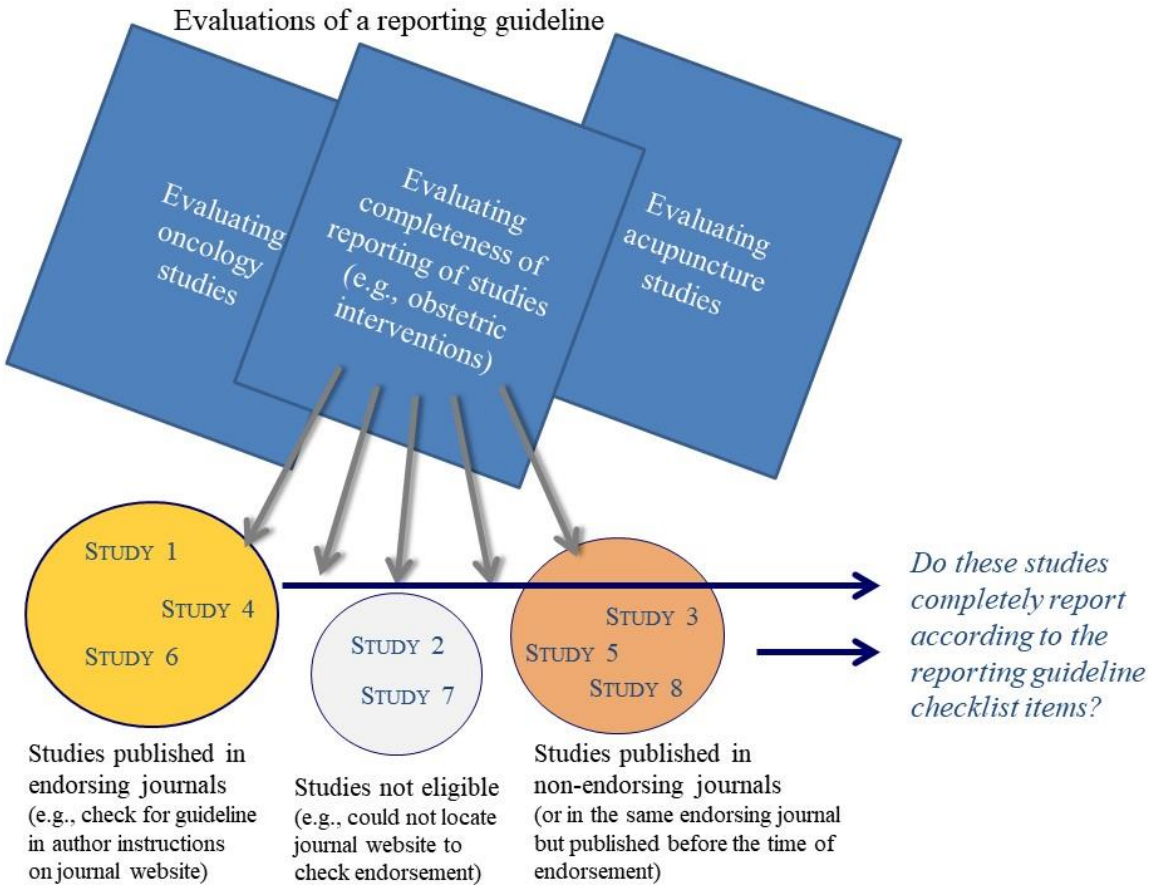

Figure 2. Schematic depicting the relationship among evaluations of a reporting guideline, the studies contained within them, and the determination of comparison groups according to journal endorsement status.

Data extraction and analysis

For included reporting guidelines, one reviewer extracted guidelines' characteristics. For evaluations of reporting guidelines, one reviewer extracted characteristics of the evaluation and outcomes and did validity assessments; a second reviewer verified 20% of the characteristics of studies and 100% of the remaining information. We contacted authors for completeness of reporting data for evaluations, where needed. Variables collected are reflected in Tables 5-11, Figures 5-15, and Appendices 13-15. As no methods exist for synthesizing validity assessments for methods reviews, we present information in Tables 6 and 7, Appendix 14, and as shown in the text for readers' interpretation.

Our primary outcome was completeness of reporting, defined as complete reporting of all elements within a guidance checklist item. As not all authors evaluated reporting guideline checklist items as stated in the original guideline publications, we excluded any items that were split into two or more separate items or reworded (leading to a change in meaning of the item).

Comparisons of interest were endorsing versus non-endorsing journals and after versus before endorsement by journal. The first comparison functions as a cross sectional analysis, and years in which articles from endorsing journals were published depicted the years of comparison with articles from non-endorsing journals. We used the publication date of the reporting guideline as a proxy if the actual date of endorsement was not known. For the second comparison, we included before and after studies from the same journal only if a specific date of endorsement was known. We also examined the publication years of included studies to ensure that years were close enough within a given arm for reasonable comparison. As a result, not all studies included in the evaluations were included in our analysis.

We analyzed the completeness of reporting in relation to journals' endorsement of guidelines by item (number of studies within an evaluation completely reporting a given reporting item) and by mean summed score (we calculated a sum of completely reported guideline items for each study included in an evaluation and compared the mean of those sums across studies between comparison groups); we used a mean summed score only when evaluations also analyzed in this manner. We used risk ratios, standardized mean differences, and mean differences with associated 99% confidence intervals for analyses, as calculated using Review Manager software (136). In most cases, we reworked authors' data to form our comparison groups of interest for the analysis.

Where possible, we used a random effects model meta-analysis to do a quantitative synthesis across evaluations for a given checklist item or for the mean summed score. We entered evaluations into Review Manager as the "studies," whereas studies included within a given evaluation formed the unit of analysis, just as the number of patients would normally be entered. We entered the pooled effect estimate and confidence interval values from Review Manager for each checklist into Comprehensive Meta-Analysis to create summary plots depicting a "snapshot" view for each reporting guideline (137).

Secondary outcomes were methodological quality and unwanted effects of using a guideline, as reported in evaluations. We present data for these outcomes in narrative form.

Changes from protocol

Given the availability of a systematic review of evaluations of the CONSORT guideline (132,133) during the screening process for this review, we decided to exclude CONSORT evaluations and focus our efforts on other reporting guidelines and refer readers to the published CONSORT assessment. We originally planned to include checklist items in which variations in use could be possible (e.g., various parties 'blinded' for the CONSORT statement), but decided against this as we would not have been consistent with our decision to exclude checklist items that were split into two or more separate items in evaluations.

For assessing validity of the evaluations, we made some changes from the protocol. We clarified the wording of items regarding comprehensive search strategies and balanced numbers of studies across journals (i.e., are studies within a given arm of a comparison close to evenly distributed across journals such that data are presumed not to be influenced by a 'clustering' effect?). We changed the item of whether confounding was accounted for in the evaluation to that of the sampling period because, in general, authors were not assessing according to journal endorsement and we had to rework their data to facilitate our comparisons of interest. Similarly, since authors were not evaluating with respect to journal endorsement, we did not feel it relevant to assess whether the authors' intended set of data was completely reported.

3.2 Methods for rapid review – Effectiveness of personal protective equipment for healthcare workers caring for patients with filovirus disease: a rapid review

We performed a "rapid review", a type of review produced using accelerated and/or modified systematic review methods in order to accommodate an expedited turnaround time (138). The rapid review was conducted over a 7-week period between 28 July and 12 September 2014. This rapid review was guided by a protocol (Appendix 3) that was developed a priori by the authors and then reviewed by the guideline development group – a group of external experts who were invited by WHO to formulate recommendations regarding personal protective equipment (PPE) use. The protocol allowed for modifications of scope and analysis during review conduct once the nature and volume of the evidence was known. We used the PRISMA reporting guideline for systematic reviews for reporting the rapid review (139) and added items that were used to tailor reporting to our rapid review conduct and process (Appendix 4).

The research question for this review was: what are the benefits and harms of double gloves, full face protection, head cover, impermeable gowns, particulate respirators, and rubber boots as PPE when compared with alternative and potentially less robust PPE for healthcare workers (HCWs) directly caring for patients with filovirus disease? Our lens for the review starts with the prevention of transmission to the HCW and subsequent transmission prevention from HCW to other patients.

Eligibility criteria for studies

We included studies of HCWs in health care facilities providing direct patient care to persons who had known or suspected filovirus disease caused by any ebolavirus (EVD) or marburgvirus (MVD). Health care facilities refers to both treatment centers specifically set up for managing filovirus disease (Ebola Treatment Centers), as well as to general health care treatment facilities such as health centers and hospitals.

We defined a list of PPE components and comparisons as a guide to identify relevant studies, but remained open to other comparisons if encountered in the literature (Box 2).

1. Double vs single gloving
2. Full facial protection vs exposed skin
    a. Shield and mask vs goggles and mask
    b. Shield vs mask and shield
3. Highly impermeable vs permeable gowns
4. Highly impermeable gowns vs coverall
5. Immediate gown change vs delayed change
6. Particulate respirators vs other or no respirator
7. Rubber boots vs closed shoes
8. Rubber boots vs closed shoes and shoe covers
9. Head cover vs exposed scalp

Box 2. Comparisons of personal protective equipment to prevent transmission of ebolavirus to health care workers.

Outcomes were specified by the guideline development group and included transmission of EVD to HCWs and from HCWs to patients and adverse effects of using PPE such as perceived inconvenience or discomfort, injuries (e.g. needlestick injury), dexterity, reduced visibility, and heat-related events. Other outcomes in reports were also extracted.

As per our protocol, we first sought high quality systematic reviews, evidence-based clinical practice guidelines, and HTAs. In their absence, primary studies were retrieved using an evidence hierarchy: randomized controlled trials; quasi-experimental designs; comparative cohort, case-control studies, and cross-sectional studies, and in the event of no comparative evidence, we searched for and included data from non-comparative studies.

We considered studies published in either English or French published in 1967 (when filovirus disease first emerged) or later. No geographical restrictions were applied.

Because our initial search identified few publications, we expanded our search (as per our protocol) to include studies reporting on Crimean-Congo hemorrhagic fever or Lassa fever as

they were considered to have a similar mode of human-to-human transmission and infectivity to the filovirus diseases.

Literature search

Electronic search strategies were developed and tested iteratively by an experienced medical information specialist. Between 28 July and 7 August 2014, we searched Ovid MEDLINE and Ovid MEDLINE In-Process & Other Non-Indexed Citations, The Cochrane Database of Systematic Reviews (limited to the Cochrane Infectious Diseases Review Group reviews and specialized register), Embase, and African Index Medicus. Search strategies were not limited by language or year. A combination of controlled vocabulary and text-word terms were used (Appendix 5), where possible. The initial MEDLINE search strategy was adapted to the other databases. Study design filters were applied.

Grey literature sources were searched on 20-22 August 2014 using the ProQuest Dissertation and Theses Databases and the Google Search Engine. We also searched ClinicalTrials.gov and WHO International Clinical Trials Registry Platform search portal to seek ongoing and completed trials. References of included studies were scanned. Acquisition of articles was focused to those available electronically through the research team's institutional subscription; some full-text reports were sought elsewhere where time permitted.

Study selection and data extraction

De-duplicated citations in Reference Manager were uploaded to DistillerSR© software for screening. Single reviewers assessed titles and abstracts with excluded records verified by a second reviewer. Any records with disagreements underwent full-text screening. Full-text reports were reviewed independently by two reviewers, and disagreements between pairwise reviewers were resolved by consensus or a third reviewer. Screening forms were pilot-tested using 15 (title/abstract) and 10 records (full text), respectively.

Single reviewers collected information from studies, and a second reviewer verified 57% of information. The extraction form was pilot-tested on nine included studies. Authors of included studies were not contacted for additional information due to time constraints.

Evidence Synthesis

Study characteristics are described narratively. Due to the nature and heterogeneity of included studies, meta-analysis was not undertaken. Plots summarizing the proportion of HCWs reported to have experienced an outcome were produced where appropriate. The denominator included HCWs at risk for whom we knew the PPE worn.

Risk of bias assessments were not done due to the lack of validated instruments to assess the methodological quality of non-comparative designs (140).

Domains of the GRADE framework were used to inform judgments on the quality of the evidence (141). The five main GRADE domains (study limitations, consistency, directness, precision, and publication bias) are assessed for each outcome across studies. Four levels of quality exist within the GRADE framework: high, moderate, low, and very low. This framework initially considers evidence from observational studies as low quality and randomized controlled trials as high quality. As limitations are identified across domains, the quality is be downgraded. Additionally, observational evidence without important threats to validity can be upgraded in three other domains: when there is a dose-response effect, a large magnitude of effect, or because plausible biases may have decreased the observed effect.

The study limitations domain addresses the risk of bias (internal validity) of studies (141). Consistency addresses the degree to which studies yield similar results, while directness considers the degree to which the evidence aligns with the population, interventions, and outcomes of interest (142,143). Precision judges the extent of random error by taking the sample size, number of observed events, and confidence intervals into consideration (144). The publication bias domain addresses the degree to which published and unpublished studies yield systematically different findings (145).

Protocol modifications

We were able to increase the verification of extracted information from 10% to 57% of included studies.

3.3 Methods for primary study – Relation of journal publication status on the completeness of reporting of rapid reviews using PRISMA and PRISMA for Abstracts: a comparative, cross-sectional methodological study

Protocol and Study Design

This comparative, cross-sectional study was guided by an a priori proposal developed as part of the dissertation proposal (Appendix 6) and a larger planned evaluation protocol (146). The unit of inclusion for this study was the rapid review type of study. In the absence of a reporting guideline for general methodological studies, a reporting guideline for meta-epidemiological methodology research was used as a proxy to guide the writing of this report (Appendix 7) (147).

Search strategy and process

We searched Ovid MEDLINE, Ovid MEDLINE In-Process and Other Non-Indexed Citations, Ovid Embase, Ovid Educational Resources Information Center (ERIC), Ovid PsycINFO, Ebsco CINAHL, and Wiley's The Cochrane Library from 2013 through December 19, 2016. The bibliographic database search strategy was initially developed in MEDLINE and peer-reviewed using the 2015 PRESS checklist (148). The completed PRESS checklist and accompanying feedback are reported in the protocol (146). The final strategy was translated to the remaining databases (Appendix 8). We did not apply language restrictions to the search strategy.

We scoped the literature and sought nominations from within the study team (by email) for 148 potential sources of grey literature reports; organizations or websites known or understood to have produced or listed rapid reviews were selected. After the removal of irrelevant sources, websites with broken links, and sources duplicating content, we searched or contacted the websites of 119 of those sources. We supplemented this with the searching of websites listed in the CADTH's Grey Matters checklist (149) and the PROSPERO register (150). Reports were restricted to those dated from 2013 through December 2016.

For journal-published articles, any online publication dates took precedence over print dates, allowing inclusion of e-publication versions made available in the later calendar months of 2016.

Eligibility

Inclusion criteria

- A priori rapid review definition: reports where the intent is to summarize evidence for use in any form of decision-making or information/decision support, directly or indirectly related to patient or health care, using abbreviated and/or accelerated systematic review methodology to accommodate an expedited turnaround time.
    - Indirectness to healthcare includes topics such as financial arrangements for payment of health care providers and the training of clinicians and health care researchers.
    - If no rapid review definition or citation, information provided within the report was used to determine whether a 'rapid' or accelerated aspect of conduct was undertaken, such as conducting the review to meet a specific timeline or specified modification of standard systematic review methodology. However, where authors stated 'rapid review' without further elaboration, we included those reports.
    - Systematic reviews with an indication of conduct in relation to timing or if they described a modified conduct of systematic reviews were also eligible.
    - Reports without a specified 'methods section' if they otherwise meet the definition.
    - Use for decision-making not explicitly stated but could be reasonably inferred.
    - No maximum timeline of conduct.
- Basic review methodology (aside from 'rapid' aspect):
    - Searched at least one database;
    - Provided text to address the process of conduct; and
    - Provided an indication of the results of studies (exempt if an 'empty' review).
- Written in English or French

- Publication or report date of 2014 or 2016
- Rapid reviews including only primary studies
- May have included a statement of applicability or recommendations for translation of the findings
- Any type of research question (intervention, diagnosis, prognosis, etc)

Exclusion criteria

- Reports that are simply a bibliographic list of relevant papers
- Reports that include only abstracts
- Rapid reviews including secondary evidence (systematic reviews, HTAs, clinical practice guidelines)

For grey literature reports, a 'date stamp' appearing in the report was required. For a given report appearing in the published and grey literature, the published version took precedence for determining timestamp and analyzed version, but all versions were kept for eligibility purposes.

Where needed to ascertain eligibility, we contacted corresponding authors to obtain more information or searched the PROSPERO register (150). For grey literature reports, information was obtained from websites, through personal knowledge of products, or with contact with the organizations (including use of in-house methods guidance or manuals, n=18).

Comparison of Interest

We compared journal-published with non-journal-published rapid reviews in each of the publication years.

Outcomes

We assessed the completeness of reporting according to the PRISMA 2009 (114) and PRISMA for Abstracts 2013 (118) checklists. Completeness of reporting was defined as

completely reporting all elements within a guideline checklist item. These assessments were performed such that the presence of the item's elements within the document (abstract or remainder of document, accordingly), and not what section it appeared in, was sufficient.

Review selection process

Bibliographic results

Citations (and abstracts, where available) were entered into a Reference Manager database for de-duplication and uploaded to DistillerSR© (52), an internet-based systematic review program, to assess eligibility. Titles and abstracts were assessed by one reviewer; a second reviewer assessed all records excluded by the first reviewer. Full text reports of potentially relevant records were reviewed by two independent reviewers, with disagreements resolved by consensus or a third reviewer. A team of four and six reviewers were involved at the title-and-abstract and full text report stages, respectively.

Grey literature reports

Title/abstract screening was bypassed for rapid reviews obtained from organizational websites or requests as the full text reports were directly available. Any available information on organizations' rapid review products in relation to our rapid review definition was collated in Microsoft® Excel® using methods described in the Eligibility section. Based on this information, we determined which organizations' rapid reviews should be organized into clusters for sampling (described in the next section); interpretation was made by one reviewer and reviewed by a second, with ensuing discussion. Once sampling took place, rapid reviews were uploaded to DistillerSR© and passed through for full text screening, using the process described for the bibliographic results. The Excel® information on relevant rapid reviews was also used during full text screening and in consideration of any additional information made available in the reports. If any rapid reviews (or the cluster) were found to be ineligible, as decided by two reviewers, these rapid reviews were quarantined in DistillerSR© and resampling took place. This process was iterative, and changes in eligibility in the journal-published group also triggered resampling in the grey literature clusters.

Pilot testing of screening forms was done using a subset of citations (50 records for title-and-abstract screening, 25 articles for full text screening) to clarify the questions and instructions, where needed, and to facilitate consistency in responding among reviewers.

Sampling and sample size

As outlined in the protocol, we anticipated that many more rapid reviews would be available as grey literature reports than published in journals. We were also cognizant that many of those grey literature reports would be developed by evidence-producing groups within organizations such that reports would be clustered (and hence their data correlated) by organization or rapid review product. Therefore, we proceeded first with the selection process for journal-published reports. For practical reasons, this allowed us to use the sample size of the journal-published group (2014, n=48; 2016, n=52) to gauge that of the non-journal-published group. Sampling of the grey literature was undertaken proportionate to cluster size, separately for each publication year, using simple random sampling (without replacement) within each cluster to create a sample in the non-journal-published group (2014, n=46; 2016, n=52) that would be generalizable to the rapid review literature. Since no empirical intracluster correlation coefficients were available through the known literature, we allowed those to be generated through our analysis. Additional details of the sampling approach are provided in Appendix 9.

Given our sampling strategy, using a power calculation to determine sample size was not applicable. Therefore, we calculated post hoc whether the study sample had adequate power to detect a pre-specified minimally important difference of 20% in relation to the primary outcome.

Data collection

Specifically-designed data abstraction forms were used to characterize the included rapid reviews and collect completeness of reporting information. Eight rapid reviews were used to pilot-test the general and reporting forms by five and two reviewers, respectively. Forms were revised for content and clarity before implementation. Extractions were done by single reviewers, with verification by a second reviewer of a 10% random sample of rapid reviews

for the general characteristics and 100% of rapid reviews for reporting outcomes. Verification involved not only an accuracy check for extracted information, but for the omission of relevant information. Discrepancies were resolved by discussion or involvement of a third reviewer, where needed.

General data extraction items are shown in the tables and figures in Section 4.3. With the known existence of predatory journals, we wished to determine whether the journal titles within our sample would be considered legitimate journals, with the idea that legitimate journals are understood to provide peer review. To do this, journal title entries were checked in the *Directory of Open Access Journals* and, where not listed, were evaluated against 13 evidence-based characteristics published by Shamseer and colleagues (151).

For the PRISMA 2009 and PRISMA for Abstracts 2013 checklists, we developed operationalization criteria for scoring each item (Appendix 10). Since the two reporting guideline checklists were developed for systematic reviews addressing intervention questions, we also gave consideration as to which checklist items were applicable to non-intervention questions, as shown in Appendix 11.

Reporting items were scored as 'completely reported' or 'not reported'. Where applicable and feasible, some items were also scored as 'partially reported' (with specifications). We also identified additional items that were reported in rapid reviews.

Data analysis

General characteristics are presented in tables using frequencies and percentages, means and standard deviations, and medians and interquartile ranges.

Primary analysis

For each reporting guideline and publication year, the primary analysis was a mean summed score between groups, whereby each completely reported item within a rapid review was awarded one point, summed to create a total score for the rapid review, and then a mean calculated from across the sums for each group. Partially reported items were not awarded any points. The absolute mean differences between groups and 95% confidence intervals (CI)

were reported. Two-sample two-sided t-tests were used to assess the differences statistically. Generalized Linear Models were used to report adjusted mean differences and P-values are presented in forest plots.

Prior to the undertaking of these analyses, Q-Q plots were drawn for normality, and normality was tested using the Shapiro-Wilk test. A few analyses were also undertaken to test the independence of data: random effects linear regression models were used for assessing the intra-cluster correlation according to sampled clusters (non-journal-published) and a two-sided t-test for journal endorsement status of reporting guidelines (journal-published). A Generalized Linear Model was used to adjust the primary outcome for funding (whether reported), author academic affiliation, and word count; these results are also presented in forest plots.

To evaluate whether a minimally important difference of 20% was attained with the data, we used the mean summed score data with the total guideline checklist size as the denominator to calculate a risk difference. These statistics used a type I error (alpha) of 0.05.

Secondary analysis

A secondary analysis compared groups by-item for each reporting guideline and year. For each item, we calculated the proportion of rapid reviews in each group that met the reporting criterion. Risk ratios (RR) and 99% CI were used for conservative measures of effect, displaying by-item results in forest plots and radar plots. Owing to a multiplicity of analyses, these results are used for descriptive comparisons.

Additional reporting items not found in the reporting guidance tools are reported as frequencies and percentages.

Subgroup and sensitivity analyses were planned, but due to small sample sizes, these were not undertaken; details of planned analyses are described in Appendix 6, Annex 3.

Statistical software

Microsoft® Excel® 2016 (152) was used to calculate summary statistics for the general characteristics data and additional reporting items. Primary outcome analyses were performed

using SAS® version 9.4 (153). Secondary analyses were performed in Review Manager (136). Forest plots were generated in Comprehensive Meta-Analysis for consistency of presentation for all analyses (137). Post-hoc power calculations were performed using ClinCalc (154).

Changes from proposal

We had not specified the use of risk differences for the calculation of the minimally important difference.

4 RESULTS

4.1 Results for systematic review – Relation of completeness of reporting of health research to journals' endorsement of reporting guidelines: systematic review

Literature search results

Reporting guidelines

All 81 reporting guidelines from the 2011 systematic review by Moher and colleagues were eligible (104). In addition, 23 of 98 reporting guidelines identified by the EQUATOR Network met the criteria for inclusion (Figure 3). After removal of the CONSORT guidelines, we included a total of 101 reporting guidelines (109,110,114,115,155–238,238–250).

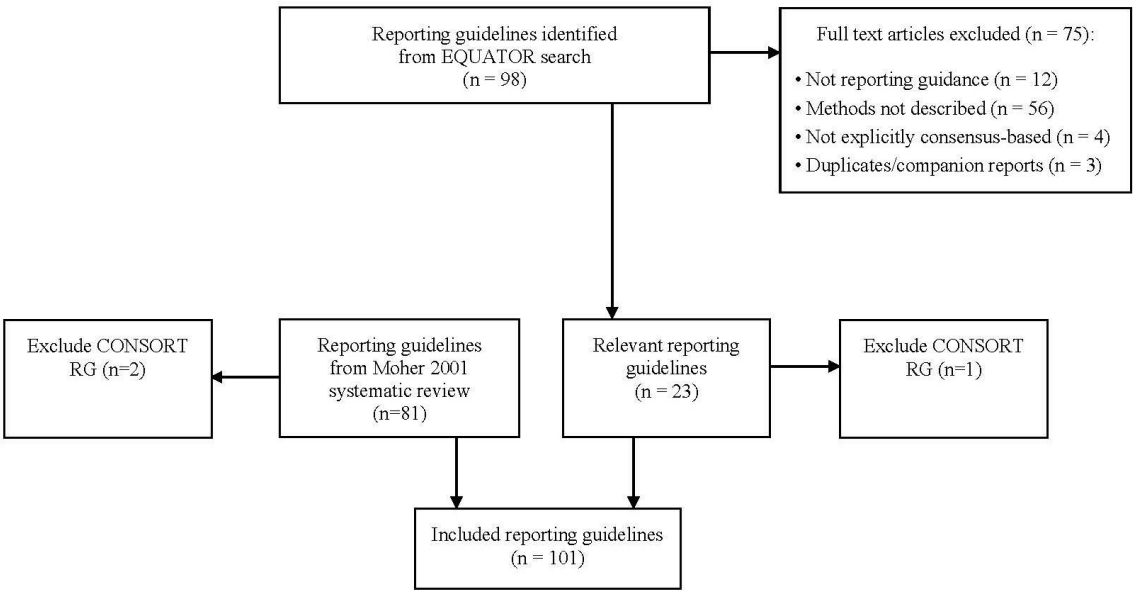

Figure 3. Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flow diagram for selecting reporting guidelines for health research. RG=reporting guideline

Evaluations of reporting guidelines

Our literature search included evaluations of the CONSORT guidelines, but we excluded those during the screening process. We located 17,225 records through bibliographic databases and an additional 49 records from other sources (bibliographies, web search for full text reports of conference abstracts, and articles suggested by authors of reporting guidelines and members of the research team). After removing companion (known multiple publications) and duplicate reports, we screened a total of 15,249 title and abstract records. Of those, 1153 were eligible for full text review. After two rounds of full text screening, contacting authors, and seeking journal endorsement information, we included a total of 26 evaluations (Figure 4) (251–276). A list of potential evaluations written in languages other than English or French is provided in Appendix 12.

Nine reporting guidelines were assessed among the 26 included evaluations:

- STARD 2003 for studies of diagnostic accuracy (n=8) (259–266);
- CONSORT extension for harms 2004 (n=5) (253–255,269,270);
- PRISMA 2009 for systematic reviews and meta-analyses (n=3) (271–273);
- QUOROM 1999 for meta-analyses of randomized trials (n=3) (256–258);
- BMJ economics checklist 1996 (n=2 evaluations) (251,252);
- STROBE 2007 for observational studies in epidemiology (n=2) (268,275);
- CONSORT extension for journal and conference abstracts 2008 (n=1) (274);
- CONSORT extension for herbal interventions 2006 (n=1) (276); and
- STRICTA 2002 for controlled trials of acupuncture (n=1) (267).

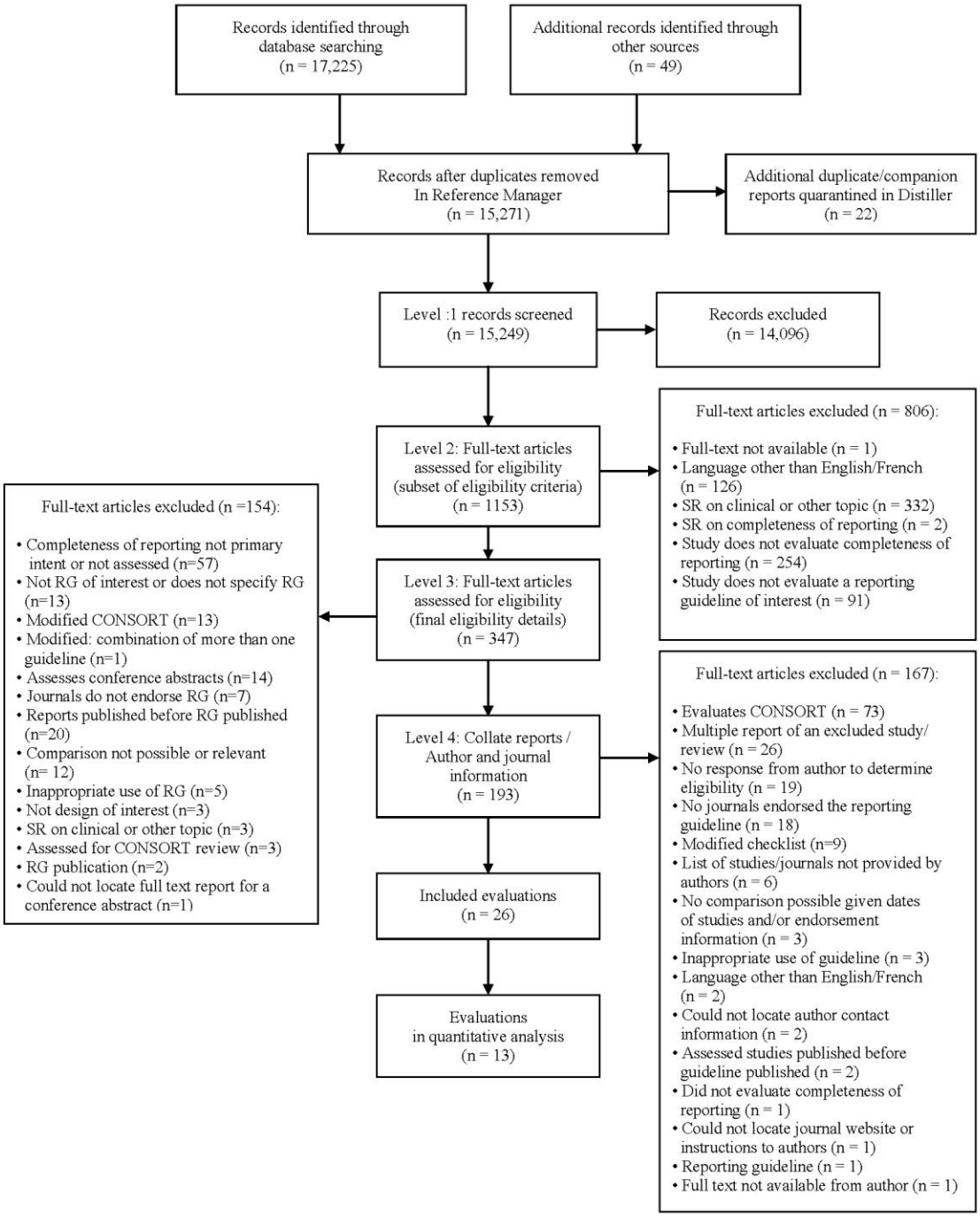

Figure 4. Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flow diagram for selecting evaluations of relevant reporting guidelines. RG=reporting guideline; SR=systematic review

Characteristics of included studies

Reporting guidelines

Appendix 13 descriptively summarizes included reporting guidelines according to the focus of the guideline and the content area the guideline covers. Among included guidelines were those covering general health research reports; animal, pre-clinical, and other basic science reports; a variety of health research designs and types of health research; and a variety of content areas.

Evaluations of reporting guidelines

Table 5 shows the characteristics of the included evaluations. The most frequent content focuses of evaluations were diagnostic studies (7/26; 27%), drug therapies (6/26; 23%), and unspecified (5/26; 19%); evaluations spanned a variety of biomedical areas. Funding was most frequently either not reported (13/26; 50%) or provided by a government agency (7/26; 27%), and the role of the funder in the conduct of the evaluation was not reported in most evaluations (22/26; 85%). Two thirds of the evaluations provided a statement regarding competing interests or declared authors' source(s) of support (17/26; 65%). Corresponding authors of evaluations were located in nine countries; 37% (10/27) of corresponding authors were in the United Kingdom.

For each included evaluation, Tables 6 and 7 show the number of studies relevant to our assessments, their year(s) of publication, the number of journals publishing the relevant studies. Table 8 presents information on the extent of journals' endorsement and whether the date of endorsement was provided by evaluation authors, journal websites, or editors.

Table 5. Characteristics of included evaluations.

Author, Year*	Country of corresponding author	Sources of funding; Role of funder; Authors' source(s) of support	Content focus	Specific medical or scientific specialty	Extent of guideline assessed†
BMJ Economics guideline, 1996					
‡Herman, 2005 (251)	United States	Government agency: Grant from the National Center for Complementary and Alternative Medicine; Not reported; Not reported. The authors declare no competing interests.	Complementary Medicine	Unspecified	All items
Jefferson, 1998 (252)	United Kingdom	Not reported; Not reported; Not reported.	Unspecified	Unspecified	Subset of items§
CONSORT extension for abstracts, 2008‖					
Ghimire, 2014 (274)	South Korea	Not reported; Not reported; Not reported. The authors declare no competing interests.	Unspecified	Oncology	Subset of items§
CONSORT extension for harms, 2004‖					
‡Haidich, 2011 (253)	Greece	Not reported; Not reported; Not reported.	Drug Therapies	Several medical specialties¶	All items
‡Turner, 2011 (254)	Canada	Government agency: National Center for Complementary and Alternative Medicine, National Institutes of Health; Not reported; Authors declare no competing interests.	Complementary Medicine	Unspecified	Subset of items**

Author, Year*	Country of corresponding author	Sources of funding; Role of funder; Authors' source(s) of support	Content focus	Specific medical or scientific specialty	Extent of guideline assessed†
Peron, 2014 (269)	France	Not reported; Not reported; Charitable foundation: Nuovo-Soldati Foundation. Authors declare no competing interests.	Drugs Therapies	Oncology	Subset of items§
Cornelius, 2013 (270)	United Kingdom	Government agency: National Institute for Health Research Biomedical Research Centre at Guy's and St. Thomas' NHS Foundation Trust and King's College London; Not reported; Not reported. Authors declare no competing interests.	Drug Therapies	Neurosciences	Subset of items§
Lee, 2008 (255)	Canada	Government agency: Canadian Institutes of Health Research Chronic Disease New Emerging Team grant (joint sponsorship from the Canadian Diabetes Association, Kidney Foundation of Canada, Heart and Stroke Foundation of Canada, and two other Canadian Institutes of Health Research Institutes); Not reported; Not reported.	Drug Therapies	Clinical Neurology	Subset of items§
CONSORT extension for herbal interventions, 2006‖					
Ernst, 2011 (276)	United Kingdom	Not reported; Not reported; Not reported.	Complementary Medicine	Medicine, General & Internal	Subset of items
PRISMA, 2009					
‡Tunis, 2013 (271)	Canada	No funding; Not applicable; Not reported. Authors state no competing interests. Authors have declared financial activities not related to article.	Unspecified	Radiology, Nuclear Medicine & Medical Imaging	All items

Author, Year*	Country of corresponding author	Sources of funding; Role of funder; Authors' source(s) of support	Content focus	Specific medical or scientific specialty	Extent of guideline assessed†
‡Panic, 2013 (273)	Italy	Not reported; Funder had no role in work; Academic: ERAWEB, Charitable: Fondazione Veronesi. Authors declare no competing interests.	Unspecified	Gastroenterology & Hepatology	All items
‡Fleming, 2013 (272)	United Kingdom	Not reported; Not reported; Not reported.	Unspecified	Dentistry, Oral Surgery & Medicine	All items
QUOROM, 1999					
‡Hind, 2007 (256)	United Kingdom	Not reported; Not reported; Not reported. Authors declare they previously worked for the United Kingdom NHS HTA Programme (source of included reports).	Therapeutic interventions (generic)	Unspecified	Subset of items
Biondi-Zoccai, 2006 (257)	Italy	No funding; Not applicable; Not reported. Authors declare no competing interests.	Drug Therapies	Urology & Nephrology	All items
Poolman, 2007 (258)	Canada, Netherlands	Not reported; Not reported; Academic: Canadian Institutes of Health Research Canada Research Chair Industry: Merck Sharp & Dohme The Netherlands, Biomet Netherlands, Zimmer Netherlands, Other: Stichting Wetenschappelijk Onderzoek Orthopaedische Chirurgie Fellowship, Anna Fonds Foundation, Nederlandse Vereniging voor Orthopedische Traumatologie Fellowship.	Surgery	Orthopedics	All items

Author, Year*	Country of corresponding author	Sources of funding; Role of funder; Authors' source(s) of support	Content focus	Specific medical or scientific specialty	Extent of guideline assessed†
STARD, 2003					
‡Freeman, 2009 (259)	United Kingdom	Government agency: European Commission funds allocated to the Safe Activities For Everyone Network of Excellence under the 6th Framework; Not reported; Not reported.	Biochemical and Laboratory Research Methods	Obstetrics & Gynecology	All items
‡Mahoney, 2007 (260)	United States	Industry: LifeScan Inc; Not reported; Study funder.	Diagnostic (glucose monitoring)	Endocrinology & Metabolism	All items
‡Selman, 2011 (261)	United Kingdom	Not reported; Not reported; Other: Charitable foundation (Wellbeing of Women) and Medical Research Council/Royal College of Obstetricians and Gynaecologists Clinical Research Training Fellowship. The authors declare no competing interests.	Diagnostic studies	Obstetrics & Gynecology	Subset of items§
‡Smidt, 2006 (262)	Netherlands	Government agency: ZonMW; Funder did not play a role in the study nor manuscript††; Authors declare no competing interests.	Diagnostic studies	Medicine, General & Internal	Subset of items§
Coppus, 2006 (263)	Netherlands	Government agency: VIDI-program of ZonMW and Charitable foundation: Scientific foundation of the Maxima Medical Center; Not reported; Not reported.	Diagnostic studies	Reproductive Biology	Subset of items§
Johnson, 2007 (264)	United Kingdom	Not reported; Not reported; Not reported. The authors declare no competing interests.	Diagnostic studies	Ophthalmology	Subset of items
Krzych, 2009 (265)	Poland	Self-financed; Not applicable; Not reported.	Diagnostic studies	Cardiac & Cardiovascular Systems	Subset of items**

Author, Year*	Country of corresponding author	Sources of funding; Role of funder; Authors' source(s) of support	Content focus	Specific medical or scientific specialty	Extent of guideline assessed†
Paranjothy, 2007 (266)	United Kingdom	No funding; Not reported; the authors state no information to disclose.	Diagnostic studies	Ophthalmology	All items
STRICTA, 2002‡‡					
‡Hammerschlag2011 (267)	United States	Not reported; Not reported; Personnel support from the Oregon College of Oriental Medicine research department and the Helfgott Research Institute of the National College of Natural Medicine.	Complementary Medicine	Unspecified	Subset of items§
STROBE, 2007					
‡Parsons, 2011 (275)	United Kingdom	Not reported; Not reported; Not reported.	Surgery	Orthopedics	All items
Delaney, 2010 (268)	United States	Industry : Biomedical Excellence for Safer Transfusion collaborative (industry-sponsored); Not reported; Authors declare no competing interests.	Platelet transfusion	Hematology	Subset of items§

*All included evaluations were published as full reports.

†If authors of evaluations deemed a particular guidance item to be 'not applicable' to the literature they were assessing we excluded those items from our analysis. For evaluations with zero or one studies in one of the comparison arms, we removed those evaluations from the synthesis because that one arm would determine the direction of effect.

‡Included in quantitative analysis.

§As determined by the authors of this review when comparing with the published guidance.

‖Official extension of the CONSORT reporting guideline; 'official' defined as at least one author from the original CONSORT reporting guideline on the authorship of the extension.

¶Cardiac & Cardiovascular Systems; Hematology; Immunology; Infectious Diseases; Obstetrics & Gynecology; Oncology; Psychiatry; Respiratory System; Rheumatology

**Evaluations authors indicated a subset was assessed but the authors of this review determined a smaller subset was analyzed when comparing with the published guidance.

††Specifically, the funding agency did not play a role in the design or conduct of study; the collection, management, analysis, or interpretation of the data; nor the preparation, review, or approval of the manuscript.

‡‡Unofficial extension of the CONSORT reporting guideline.

Validity assessment

Tables 6 and 7 show validity assessments for the comparisons; supports for those judgments are in Appendix 14. Table 6 provides information on evaluations for the endorsing versus non-endorsing journal comparison**;** Table 7 includes information for those evaluations that included studies pertaining to the after versus before endorsement comparison. More than half (15/26; 58%) of the evaluations used at least two people to assess the completeness of reporting. Selective reporting does not seem to be a problem, as most evaluations (20/26; 77%) assessed the number of reporting items as stipulated in the methods section. A comprehensive search strategy for locating relevant studies was reported in relatively few evaluations (5/26; 19%); an evaluation with the intention of evaluating reports from specific journals in a specified time period would have been deemed adequately comprehensive. When comparing endorsing journals with non-endorsing journals, half of the evaluations (14/25; 56%) had a similar number of studies per journal in the comparison groups; when comparing journals after and before endorsement, less than half of the evaluations (4/10; 40%) were balanced for the number of studies per journal in the comparison groups to account for a potential "clustering" problem. When comparing journals after and before endorsement, most evaluations (7/10; 70%) had studies in the "before" arm that were published before the reporting guideline was published, possibly confounding the evaluations.

Table 6. Validity assessment for evaluations with studies enabling the endorsing versus non-endorsing journal comparison.

Author, Year*	Relevant studies for assessment (endorsing versus non-endorsing)	Year of publication of assessed studies	Journals that published the assessed studies	Two or more assessors for completeness of reporting†	Number of items assessed as reported in methods section†	Comprehensive search strategy†	Balance of studies per journal in comparison groups†‡
BMJ economic guidelines, 1996							
Herman, 2005 (251)	2 versus 11	2003-2004	1 versus 10	Unclear	High	Low	High
Jefferson, 1998 (252)	1 versus 5	1997-1998§	1 versus 1	Unclear	Unclear	High	High
CONSORT extension for Abstracts, 2008							
Ghimire, 2014 (274)	74 versus 234	2010-2012	2 versus 4	High	Unclear	Low	Low
CONSORT extension for harms, 2004							
Haidich, 2011 (253)	25 versus 77	2006	2 versus 3	High	High	High	Low
Turner, 2011 (254)	5 versus 189	2009	5 versus 104	Low	High	Low	Low
Peron, 2013 (269)	43 versus 282	2007-2011	2 versus 8	Unclear	High	Low	Low
Cornelius, 2013 (270)	1 versus 6	2009	1 versus 5	High	High	High	High
Lee, 2008 (255)	1 versus 1	2005	1 versus 1	High	High	High	High
CONSORT extension for herbal interventions, 2006							
Ernst, 2011 (276)	1 versus 4	2009	1 versus 3	Unclear	High	Low	High
PRISMA, 2009							
Tunis, 2013 (271)	13 versus 48	2010-2011	1 versus 8	High	High	Low	Low
Panic, 2013 (273)	30 versus 30	Jan-Oct 2012	6 versus 10	High	High	Low	Unclear

Author, Year*	Relevant studies for assessment (endorsing versus non-endorsing)	Year of publication of assessed studies	Journals that published the assessed studies	Two or more assessors for completeness of reporting†	Number of items assessed as reported in methods section†	Comprehensive search strategy†	Balance of studies per journal in comparison groups†‡
Fleming, 2013 (272)	20 versus 2	2009-2011 versus 2010-2011	2 versus 1	**High**	**High**	**Low**	**Low**
QUOROM, 1999							
Biondi-Zoccai, 2006 (257)	1 versus 6	2004	1 versus 6	**High**	**High**	**Low**	**High**
Poolman, 2007 (258)	1 versus 6	2006 versus 2005	1 versus 5	**High**	**Unclear**	**Low**	**High**
STARD, 2003							
Freeman, 2009 (259)	3 versus 9	2004-2005	2 versus 7	**Unclear**	**High**	**High**	**High**
Mahoney, 2007 (260)	6 versus 20	2003-2005	4 versus 13	**High**	**High**	**Low**	**High**
Selman, 2011 (261)	14 versus 36	2003-2006	6 versus 22	**High**	**Low**	**Low**	**Low**
Smidt, 2006 (262)	95 versus 46	2004	7 versus 5	**High**	**High**	**Low**	**Low**
Coppus, 2006 (263)	8 versus 19	2004	1 versus 1	**Low**	**High**	**Unclear**	**High**
Johnson, 2007 (264)	1 versus 10	2005	1 versus 4	**High**	**High**	**Low**	**High**
Krzych, 2009 (265)	4 versus 21	2004-2006	2 versus 16	**Unclear**	**High**	**Low**	**High**
Paranjothy, 2007 (266)	1 versus 8	2005-2006	1 versus 4	**High**	**High**	**Low**	**High**

Author, Year*	Relevant studies for assessment (endorsing versus non-endorsing)	Year of publication of assessed studies	Journals that published the assessed studies	Two or more assessors for completeness of reporting†	Number of items assessed as reported in methods section†	Comprehensive search strategy†	Balance of studies per journal in comparison groups†‡
STRICTA, 2002							
Hammerschlag, 2011 (267)	17 versus 130	2002-2005	3 versus 64	**Low**	**High**	**Low**	**Unclear**
STROBE, 2007							
Parsons, 2011 (275)	9 versus 38	2008-2010	2 versus 6	**Low**	**Unclear**	**Low**	**Low**
Delaney, 2010 (268)	1 versus 4	2008	1 versus 3	**High**	**Unclear**	**Low**	**High**

*Bolded text refers to studies included in the quantitative synthesis.

†High=high validity (green); Low=low validity (red); Unclear=unclear validity (grey).

‡Assessed once authors' data reorganized into comparison groups.

§Estimated based on information provided in article.

Table 7. Validity assessment for evaluations with studies enabling the after versus before journal comparison.

Author, Year*	Relevant studies for assessment (after versus before endorsement)	Year of publication of assessed studies	Journals that published the assessed studies	Two or more assessors for completeness of reporting†	Number of items assessed as reported in methods section†	Comprehensive search strategy†	Balance of studies per journal in comparison groups†‡	Sampling took place in the period following the publication of the reporting guideline†‡
BMJ economic guidelines, 1996								
Jefferson, 1998 (252)	1 versus 8	1997-1998 versus 1994-1995§	1	Unclear	Unclear	High	High	Low
CONSORT extension for abstracts, 2008								
Ghimire, 2014 (274)	74 versus 16	2010-2012 versus 2005-2007	2	High	Unclear	Low	Low	Low
CONSORT extension for harms, 2004								
Lee, 2008 (255)	1 versus 2	2005 versus 1999-2000	1	High	High	High	High	Low
PRISMA, 2009								
Panic, 2013 (273)	27 versus 26	2012 versus 2008-2011	6	High	High	Low	Low	Unclear
Fleming, 2013 (272)	14 versus 12	2009-2011 versus 2006-2009	1	High	High	Low	High	Low
QUOROM, 1999								
Hind, 2007 (256)	13 versus 15	2005 vs 2003	1	Low	High	Low	High	High

Author, Year*	Relevant studies for assessment (after versus before endorsement)	Year of publication of assessed studies	Journals that published the assessed studies	Two or more assessors for completeness of reporting†	Number of items assessed as reported in methods section†	Comprehensive search strategy†	Balance of studies per journal in comparison groups†‡	Sampling took place in the period following the publication of the reporting guideline†‡
STARD, 2003								
Smidt, 2006 (262)	95 versus 78	2004 versus 2000	7	High	High	Low	Unclear	Low
Selman, 2011 (261)	3 versus 1	2005-2006 versus 2003	1	High	Low	Low	Low	High
STRICTA, 2002								
Hammerschlag2011 (267)	11 versus 4	2003-2005 versus 1999-2001	2	Low	High	Low	Unclear	Low
STROBE, 2007								
Parsons, 2011 (275)	9 versus 11	2008-2010 versus 2005-2008	2	Low	Unclear	Low	Low	Low

*Bolded text refers to studies included in the quantitative synthesis.

†High=high validity (green); Low=low validity (red); Unclear=unclear validity (grey).

‡Assessed once authors' data reorganized into comparison groups.

§Estimated based on information provided in article.

Table 8. Journal endorsement information for evaluations.

Author, Year*	Endorsing journals that published the assessed studies	Extent of endorsement	Date of endorsement provided
BMJ economic guidelines, 1996			
Herman, 2005 (251)†	•BMJ	•Submit checklist	•By journal, email
Jefferson, 1998 (252)	•BMJ	•Submit checklist	•By journal, email
CONSORT extension for abstracts, 2008			
Ghimire, 2014 (274)	•Lancet	•Suggests use	•By journal, email
CONSORT extension for harms, 2004			
Haidich, 2011 (253)†	•Annals of Internal Medicine •The Lancet	•Submit checklist •Submit checklist	•By journal, email •By journal, email
Turner, 2011 (254)†	•The American Journal of Gastroenterology •American Journal of Kidney Diseases •Applied Health Economics and Health Policy •JAMA •Phytomedicine	•Submit checklist •Suggests use •Suggests use •Submit checklist •Suggests use	•By journal, email •By journal, email •By journal, email •Not provided •Not provided
Peron, 2014 (269)†	•Lancet •Lancet Oncology	•Submit checklist •Submit checklist	•By journal, email •By journal, email
Cornelius, 2013 (270)†	•Lancet	•Submit checklist	•By journal, email
Lee, 2008 (255)	•BMJ	•Submit checklist	•By journal, email
CONSORT extension for herbal interventions, 2006			
Ernst, 2011 (276)†	•Annals of Internal Medicine	•Suggests use	•Not provided
PRISMA, 2009			
Tunis, 2013 (271)†	•Radiology	•Suggests use	•Unknown based on information given
Panic, 2013 (273)	•Alimentary Pharmacology & Therapeutics •American Journal of Gastroenterology •BMC Gastroenterology •Colorectal Disease •Diseases of the Colon & Rectum	Extent of endorsement at time of author's analysis unknown (all journals).	Provided by author (all journals).

Author, Year*	Endorsing journals that published the assessed studies	Extent of endorsement	Date of endorsement provided
Panic, 2013 (273)	•Gut •Gut Pathogens •Hepatitis Monthly •HPB		
Fleming, 2013 (272)	•American Journal of Orthodontics and Dentofacial Orthopedics •Angle Orthodontist •European Journal of Orthodontics •Journal of Orthodontics	•Submit checklist •Suggests use •Submit checklist •Suggests use	•By journal, email •Not provided •By journal, email •By journal, email
QUOROM, 1999			
Hind, 2007 (256)‡	•UK NHS HTA Programme	•Submit checklist	•By evaluation
Biondi-Zoccai, 2006 (257)†	•Clinical Cardiology	•Unknown based on information given	•Unknown based on information given
Poolman, 2007 (258)†	•BMJ	•Suggests use	•Not provided
STARD, 2003			
Freeman, 2009 (259)†	•American Journal of Obstetrics & Gynecology •Molecular Diagnosis§	•Submit checklist •Suggests use	•Unknown based on information given •Not provided
Mahoney, 2007 (260)†	•Archives of Disease in Childhood (including Fetal & Neonatal Edition) •Clinical Biochemistry •Emergency Medicine Journal •Journal of the Medical Association of Thailand	•Suggests use •Suggests use •Suggests use •Suggests use	•Unknown based on information given •Not provided •Unknown based on information given •Not provided
Selman, 2011 (261)‖	•American Journal of Obstetrics & Gynecology † •Cancer † •Clinical Radiology † •Journal of the Medical Association of Thailand †	•Submit checklist •Suggests use •Suggests use •Suggests use	•Unknown based on information given •Not provided •Not provided

Author, Year*	Endorsing journals that published the assessed studies	Extent of endorsement	Date of endorsement provided
Selman, 2011 (261)‖	•Obstetrics & Gynecology •Radiology †	•Suggests use •Suggests use	•Not provided •By journal, email •By journal website
Smidt, 2006 (262)	•Annals of Internal Medicine •BMJ •Clinical Chemistry •JAMA •The Lancet •Neurology •Radiology	•Suggests use •Suggests use •Submit checklist •Suggests use •Submit checklist •Submit checklist •Suggests use	•Journal website or by evaluation (all journals)
Coppus, 2006 (263)†	•Human Reproduction	Journal no longer endorses guideline	
Johnson, 2007 (264)†	•Ophthalmic and Physiologic Optics	•Submit checklist	•By journal, email
Krzych, 2009 (265)†	•Clinical Chemistry ¶ •Heart	•Submit checklist •Suggests use	•Reported in another evaluation •Not provided
Paranjothy, 2007 (266)†	•British Journal of Ophthalmology	•Suggests use	•Not provided
STRICTA, 2002			
Hammerschlag, 2011 (267)	•Acupuncture in Medicine •Journal of Alternative and Complementary Medicine •Medical Acupuncture †	•Suggests use •Suggests use •Suggests use	•By journal, email •By journal, email •By journal, email
STROBE, 2007			
Parsons, 2011 (275)	•Clinical Orthopaedics and Related Research •The Journal of Bone & Joint Surgery (American)	•Suggests use •Suggests use	•By journal, email •By journal, email
Delaney, 2010 (268)†	•Annals of Surgery	•Suggests use	•Not provided

*Bolded text refers to evaluations included in the quantitative analysis.

†Endorsing versus non-endorsing journals comparison only.

‡After versus before journal endorsement comparison only.

§Now published as Molecular Diagnosis & Therapy.

‖In quantitative analysis for endorsing versus non-endorsing journals only.

¶Reported in another included evaluation.

Relation between journals' endorsement of guidelines and completeness of reporting

Of the 26 included evaluations, we were able to quantitatively analyze 13; we did not have access to the raw data for the remaining evaluations. The CONSORT extensions for herbal interventions and journal/conference abstracts reporting guidelines were covered by one evaluation each, but raw data were not available for our analysis. Because of the few evaluations with available data, we were unable to do pre-planned subgroup and sensitivity analyses and assessments of funnel plot asymmetry to assess publication bias (135). Data described below pertain to overall analyses of checklist items by guideline; individual analyses for each checklist item and mean summed score are provided in Appendix 15.

Endorsing versus non-endorsing journals

Analyzed by checklist item, the CONSORT extension for harms (10 items) (253,254), PRISMA (27 items) (271–273), STARD (25 items) (259–262), and STROBE (34 items) (275) reporting guidelines were evaluated on all items; a subset of items was analyzed for the BMJ economics checklist (19/35 items) (251) and STRICTA (18/20 items) guidelines (267). Most items were assessed by only one evaluation; STARD items were assessed by two to four evaluations and PRISMA by mostly two to three evaluations (Figures 5-10). Relatively few relevant studies were included in the assessments (median 85, interquartile range 47-143, studies). Across guidelines, almost all items were statistically non-significant for completeness of reporting in relation to journal endorsement (Figures 5-10).

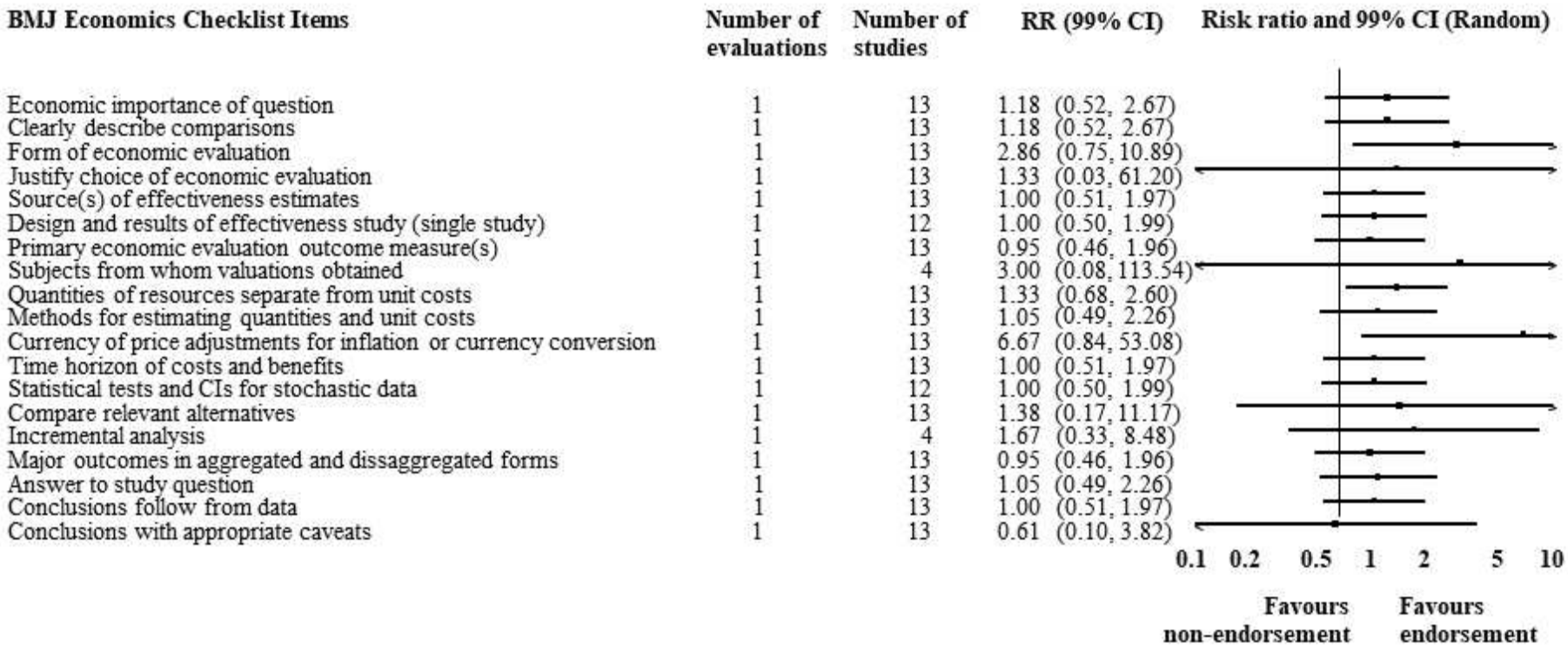

Figure 5. Completeness of reporting summary plot for British Medical Journal (BMJ) economics checklist, endorsing versus non-endorsing journals. In brief, each checklist item was analyzed (Appendix 15), and the summary effect estimates by item are presented here in a summary plot to view the results for all items in entirety. For each item, the number of evaluations and total number of analyzable studies are shown. For example, the checklist item "economic importance of question" was assessed in one evaluation, which had 13 studies with available and relevant data (2 studies from an endorsing journal and 11 studies from non-endorsing journals; Appendix 15).

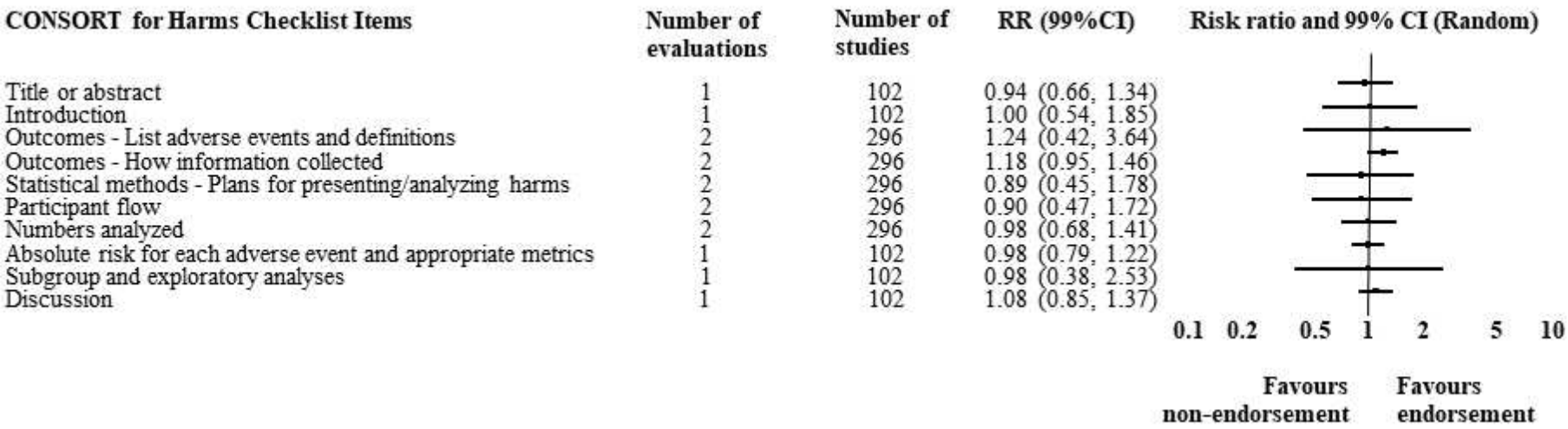

Figure 6. Completeness of reporting summary plot for Consolidated Standards of Reporting Trials (CONSORT) extension for harms checklist, endorsing versus non-endorsing journals.

PRISMA Checklist Items	Number of evaluations	Number of studies	RR (99% CI)
Title	3	143	1.16 (0.95, 1.41)
Structured summary	3	143	1.20 (0.66, 2.19)
Rationale	3	143	1.00 (0.95, 1.05)
Objectives	3	143	1.00 (0.95, 1.05)
Methods - Protocol and registration	3	143	1.45 (0.10, 21.44)
Methods - Eligibility criteria	3	143	1.07 (0.98, 1.17)
Methods - Information sources	3	143	1.05 (0.97, 1.14)
Methods - Search	3	143	1.01 (0.81, 1.26)
Methods - Study selection	3	142	1.04 (0.94, 1.15)
Methods - Data collection process	3	142	1.05 (0.91, 1.21)
Methods - Data items	3	142	1.05 (0.93, 1.19)
Methods - Risk of bias in individual studies	3	120	1.09 (0.91, 1.30)
Methods - Summary measures	3	128	1.02 (0.95, 1.09)
Methods - Synthesis of results	3	115	1.02 (0.87, 1.20)
Methods - Risk of bias across studies	3	113	1.17 (0.63, 2.16)
Methods - Additional analyses	3	113	1.02 (0.94, 1.11)
Results - Study selection	3	143	1.13 (1.01, 1.26)
Results - Study characteristics	3	143	0.98 (0.87, 1.10)
Results - Risk of bias within studies	3	121	1.11 (0.85, 1.45)
Results - Results of individual studies	3	130	1.03 (0.91, 1.17)
Results - Synthesis of results	2	93	1.00 (0.92, 1.08)
Results - Risk of bias across studies	3	113	1.09 (0.65, 1.84)
Results - Additional analysis	2	93	1.01 (0.93, 1.09)
Discussion - Summary of evidence	3	143	1.00 (0.95, 1.05)
Discussion - Limitations	3	143	1.00 (0.93, 1.07)
Discussion - Conclusions	3	143	1.00 (0.95, 1.05)
Funding	3	99	1.25 (0.77, 2.02)

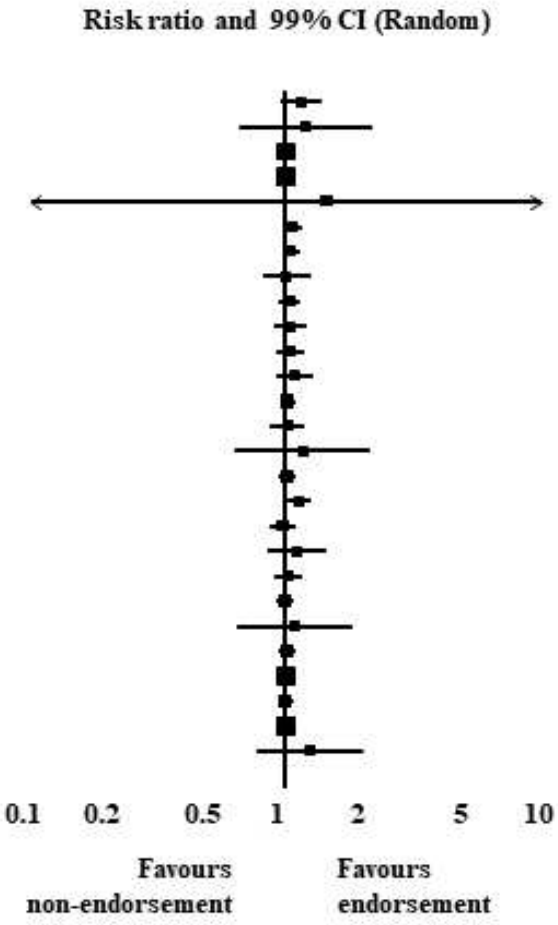

Figure 7. Completeness of reporting summary plot for Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) checklist, endorsing versus non-endorsing journals. Although all evaluations assessed all items, one evaluation was excluded from analysis of two checklist items because of zero or one studies for analysis.

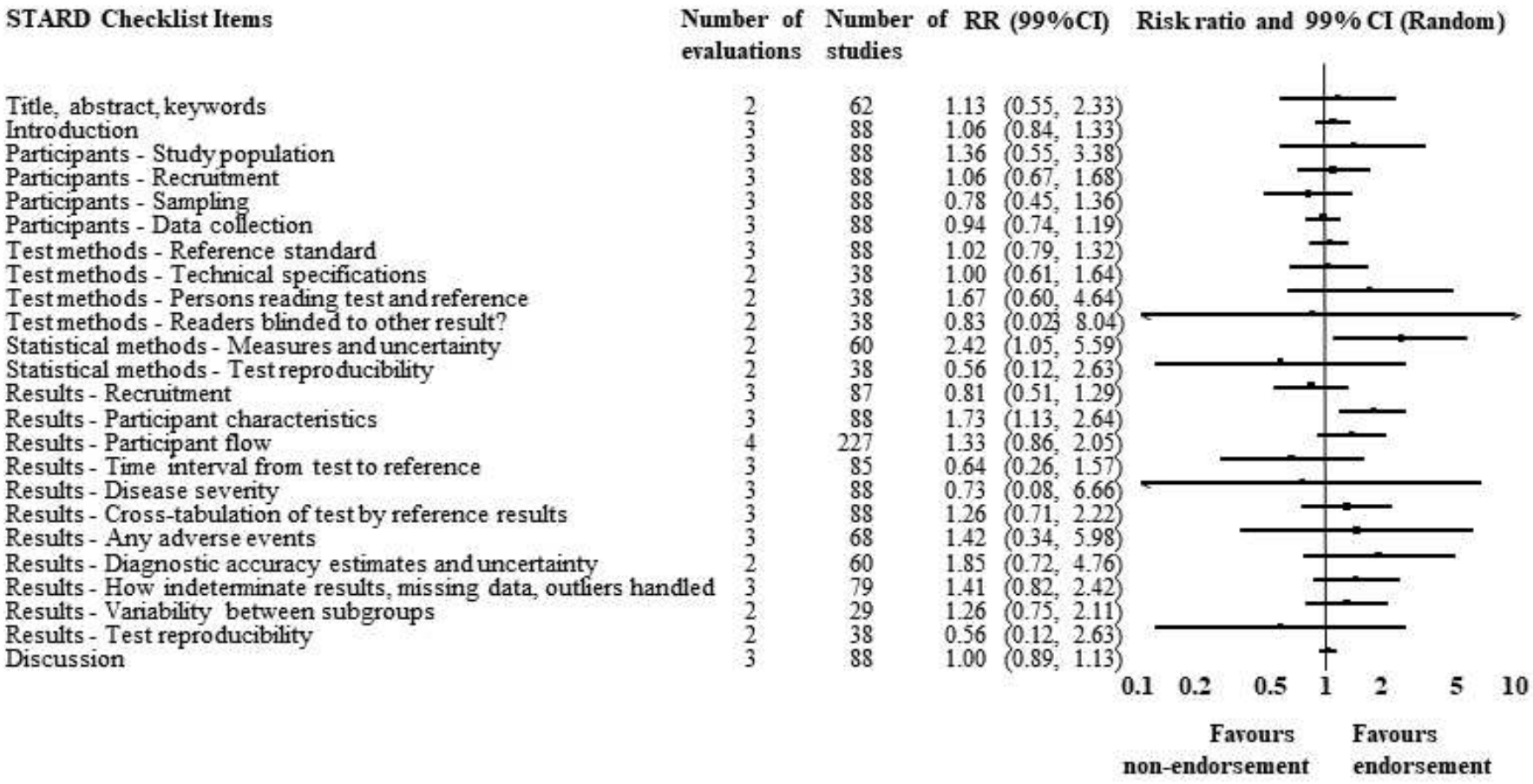

Figure 8. Completeness of reporting summary plot for Standards for Reporting Diagnostic Accuracy (STARD) checklist, endorsing versus non-endorsing journals. Effect estimate for checklist item "Test methods: definition of cut-offs of index test and reference standard" was not estimable during quantitative analysis because of zero events in each arm (one evaluation in analysis).

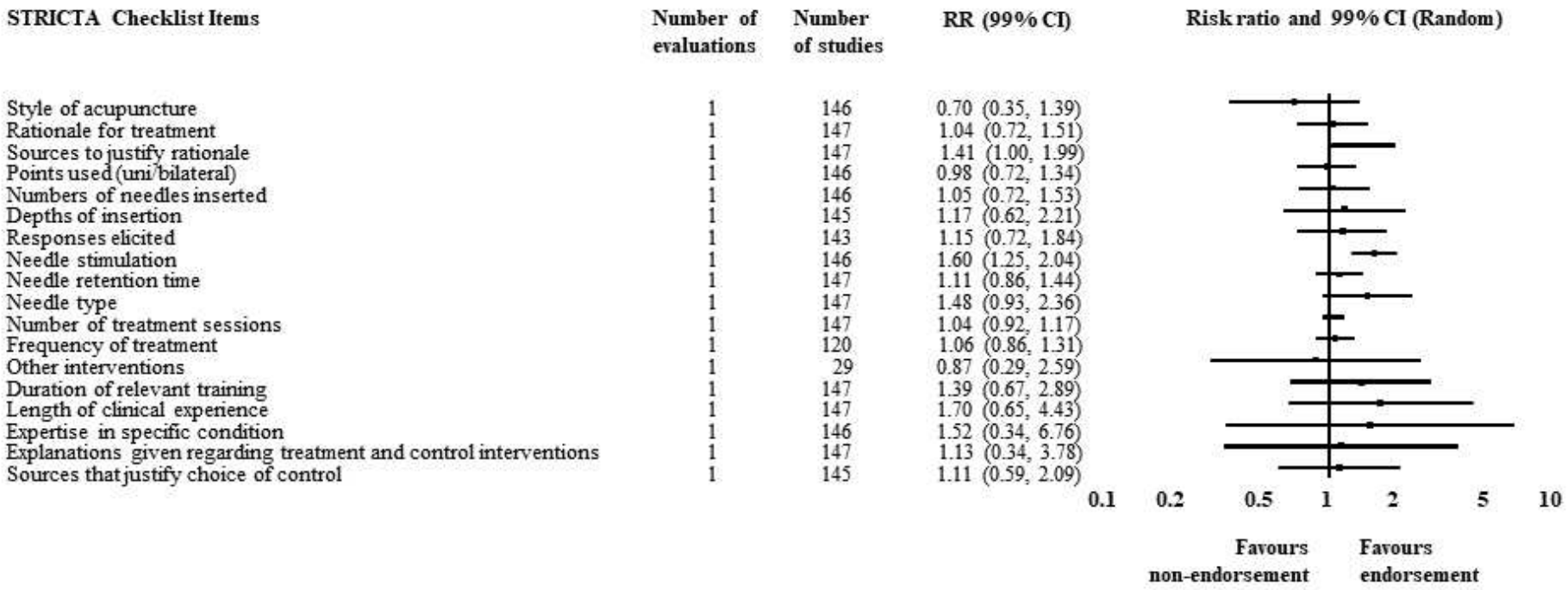

Figure 9. Completeness of reporting summary plot for Standards for Reporting Interventions in Clinical Trials of Acupuncture (STRICTA) checklist, endorsing versus non-endorsing journals

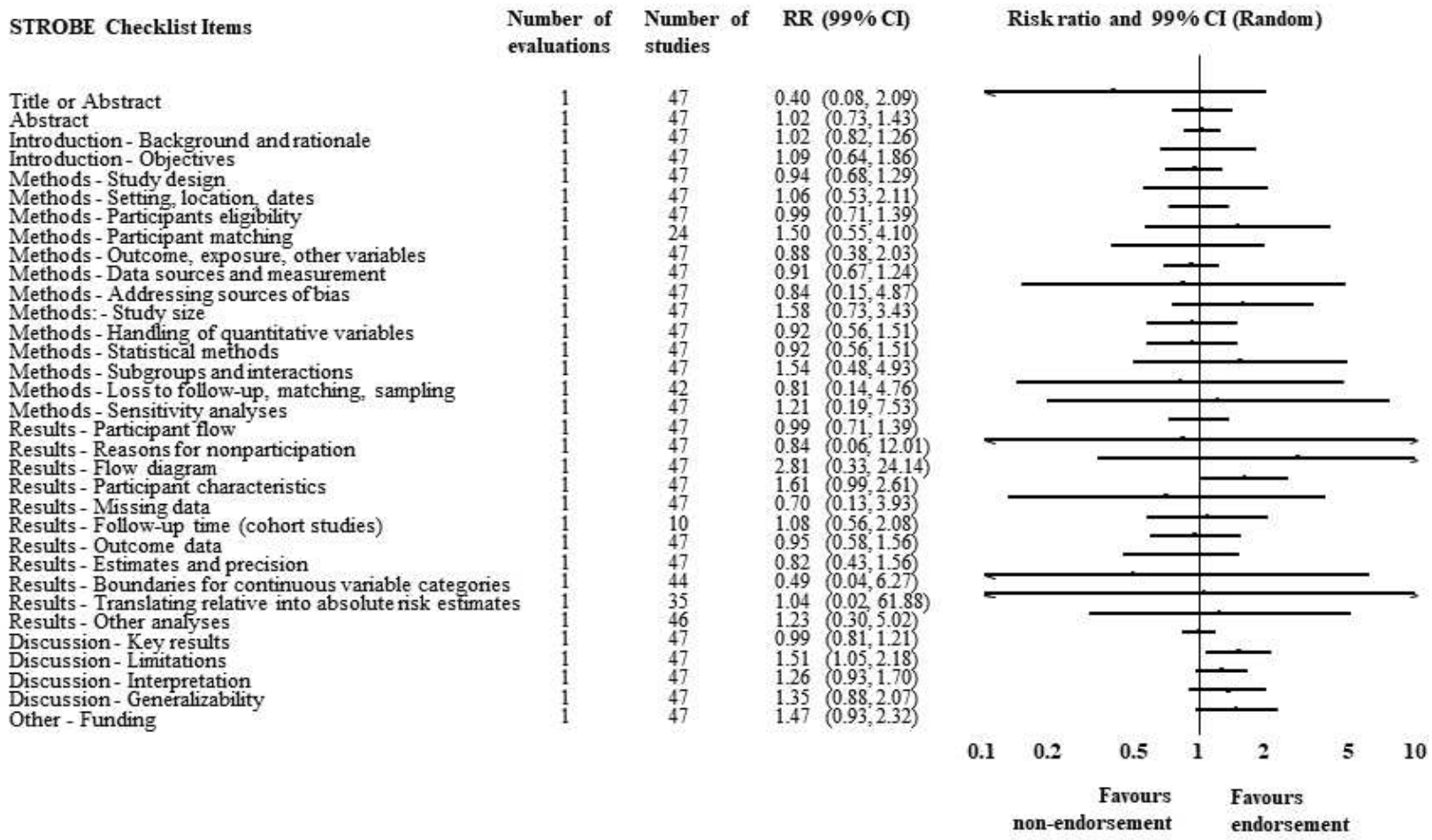

Figure 10. Completeness of reporting summary plot for Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) checklist, endorsing versus non-endorsing journals. Effect estimate for checklist item "Methods: missing data" was not estimable during quantitative analysis because of zero events in each arm.

The CONSORT extension for harms (253), PRISMA (271–273), STARD (259–261), STRICTA (267), and STROBE (275) were each analyzed by mean summed score, for which some evaluations used all items and others used a subset of items (Table 9). Guidelines were assessed by a range of one to three evaluations. Relatively few relevant studies were included in the assessments (median 102, interquartile range 88-143, studies). Analyses for completeness of reporting in relation to journal endorsement for mean summed scores were statistically non-significant for all except PRISMA (Table 9).

Table 9. Analysis by mean summed score of items for reporting guideline checklists, endorsing versus non-endorsing journals*.

Reporting guideline†	**Number of evaluations‡**	**Number of studies (Total): endorsing versus non-endorsing journals**	**Effect estimate (99% Confidence Interval)**
CONSORT extension for harms, 2004	1§	25 versus 77 (102)	Mean Difference 0.04 (-1.50 to 1.58)
PRISMA, 2009	3‖	63 versus 80 (143)	Standardized Mean Difference 0.53 (0.02 to 1.03)
STARD, 2003	3¶	23 versus 65 (88)	Standardized Mean Difference 0.52 (-0.11 to 1.16)
STRICTA, 2002	1**	17 versus 130 (147)	Mean Difference 1.42 (-0.04 to 2.88)
STROBE, 2007	1§	9 versus 38 (47)	Mean Difference 1.55 (-3.19 to 6.29)

*Individual forest plots depicting these summary data are shown in Appendix 15.

†QUOROM (two evaluations) was not estimable because of one study in one comparison arm per assessed evaluation.

‡Only evaluations calculating a summed score for the report were included.

§All checklist items summed.

‖A subset of items was summed for one evaluation.

¶A subset of items was summed for two of three evaluations.

**A subset of items was summed.

After versus before journal endorsement

Analyzed by checklist item, STROBE (34 items) (275) and PRISMA (27 items) (272,273) were the only reporting guidelines with all items evaluated; the QUOROM (1/17 items) (256), STARD (1/25 items) (262), and STRICTA (17/20 items) (267) guidelines were evaluated for a subset of items. All were assessed by one evaluation each with the exception of PRISMA. Relatively few relevant studies were included in the assessments (median 20, interquartile range 19-64, studies; Figures 11-15). Analyses for completeness of reporting in relation to endorsement were statistically non-significant for each checklist item.

PRISMA (all checklist items) (272,273), STRICTA (item subset) (267), and STROBE (all checklist items) (275) reporting guidelines were analyzed by a mean summed score and by one or two evaluations each. Relatively few relevant studies were included in the assessments (median 20, interquartile range 18-50, studies), and analyses for completeness of reporting in relation to endorsement for mean summed scores were statistically non-significant (Table 10).

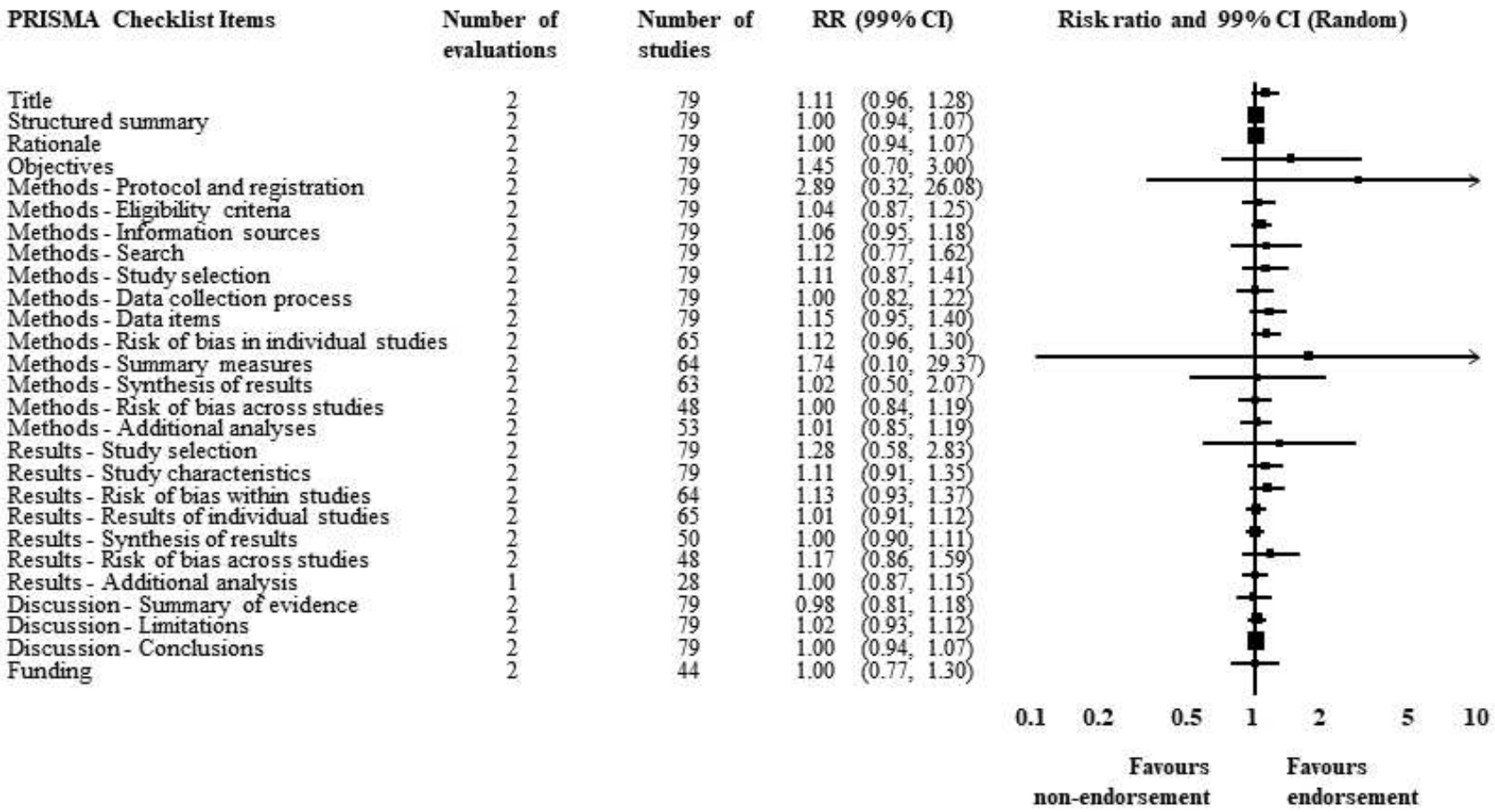

Figure 11. Completeness of reporting summary plot for Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) checklist, after versus before journal endorsement. Although all evaluations assessed all items, one evaluation was excluded from analysis of one checklist item because of zero and one studies for comparison arms.

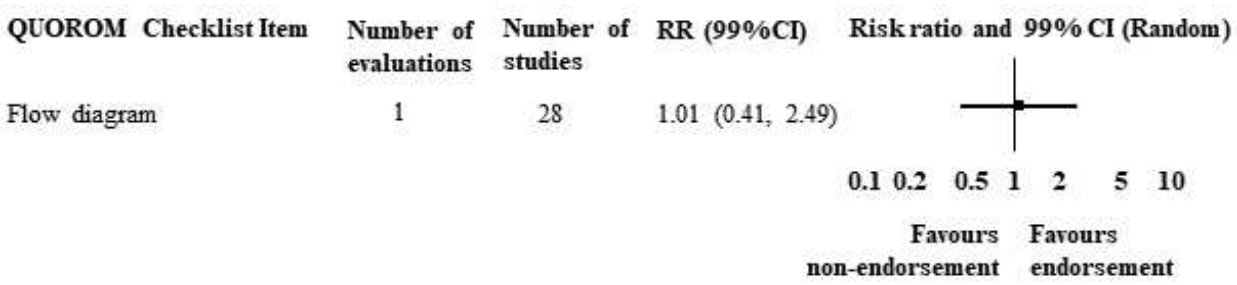

Figure 12. Completeness of reporting summary plot for Quality of Reporting of Meta-Analyses (QUOROM) checklist, after versus before journal endorsement

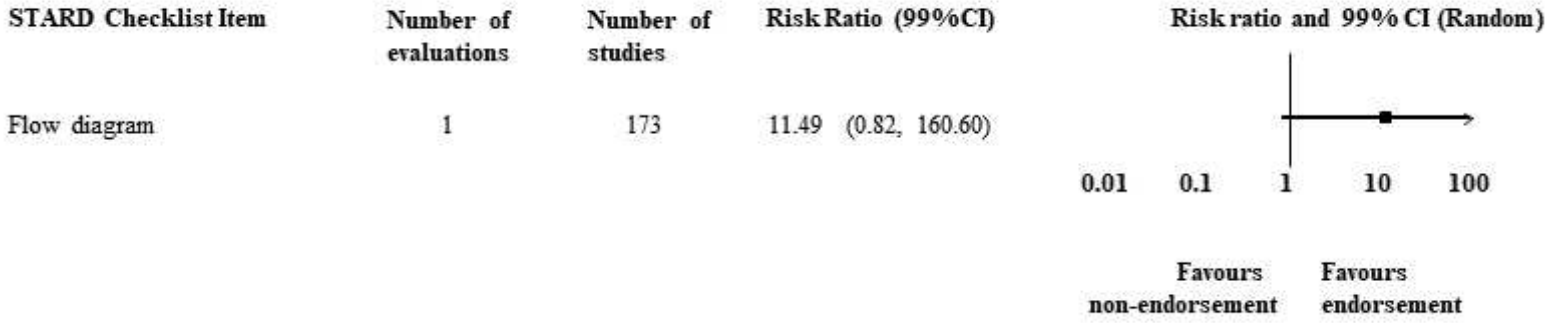

Figure 13. Completeness of reporting summary plot for Standards for Reporting Diagnostic Accuracy (STARD) checklist, after versus before journal endorsement

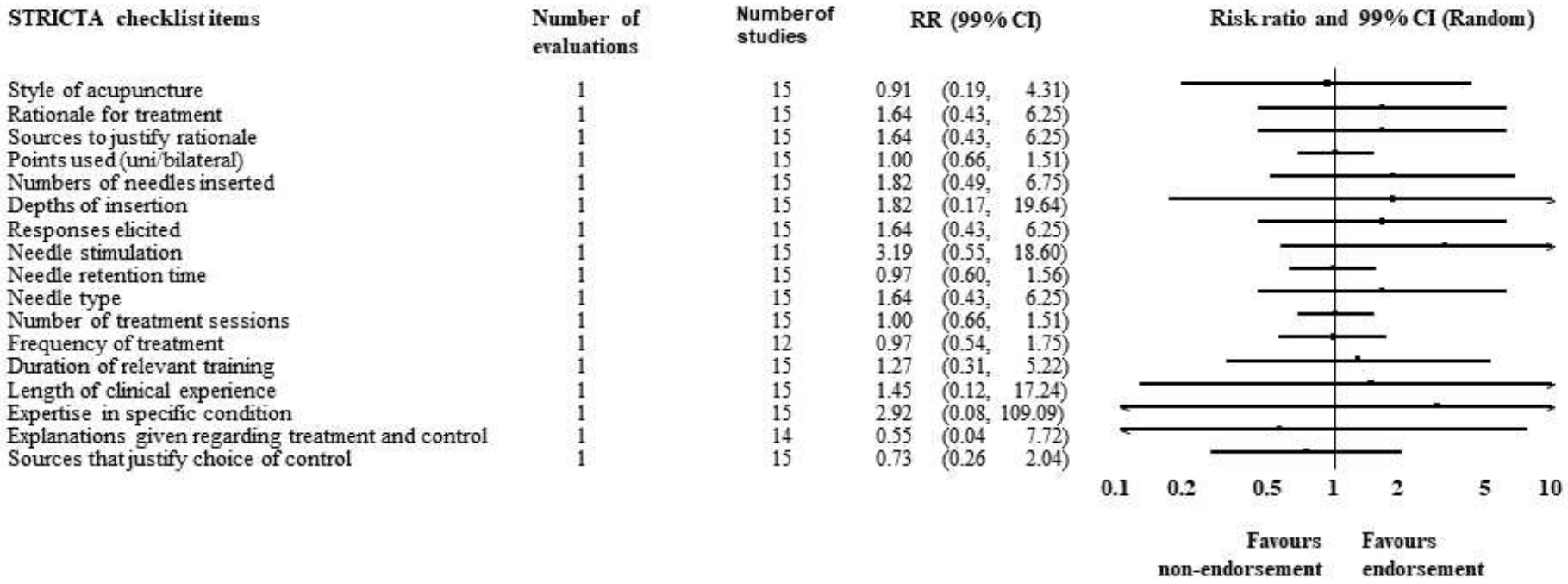

Figure 14. Completeness of reporting summary plot for Standards for Reporting Interventions in Clinical Trials of Acupuncture (STRICTA) checklist, after versus before journal endorsement.

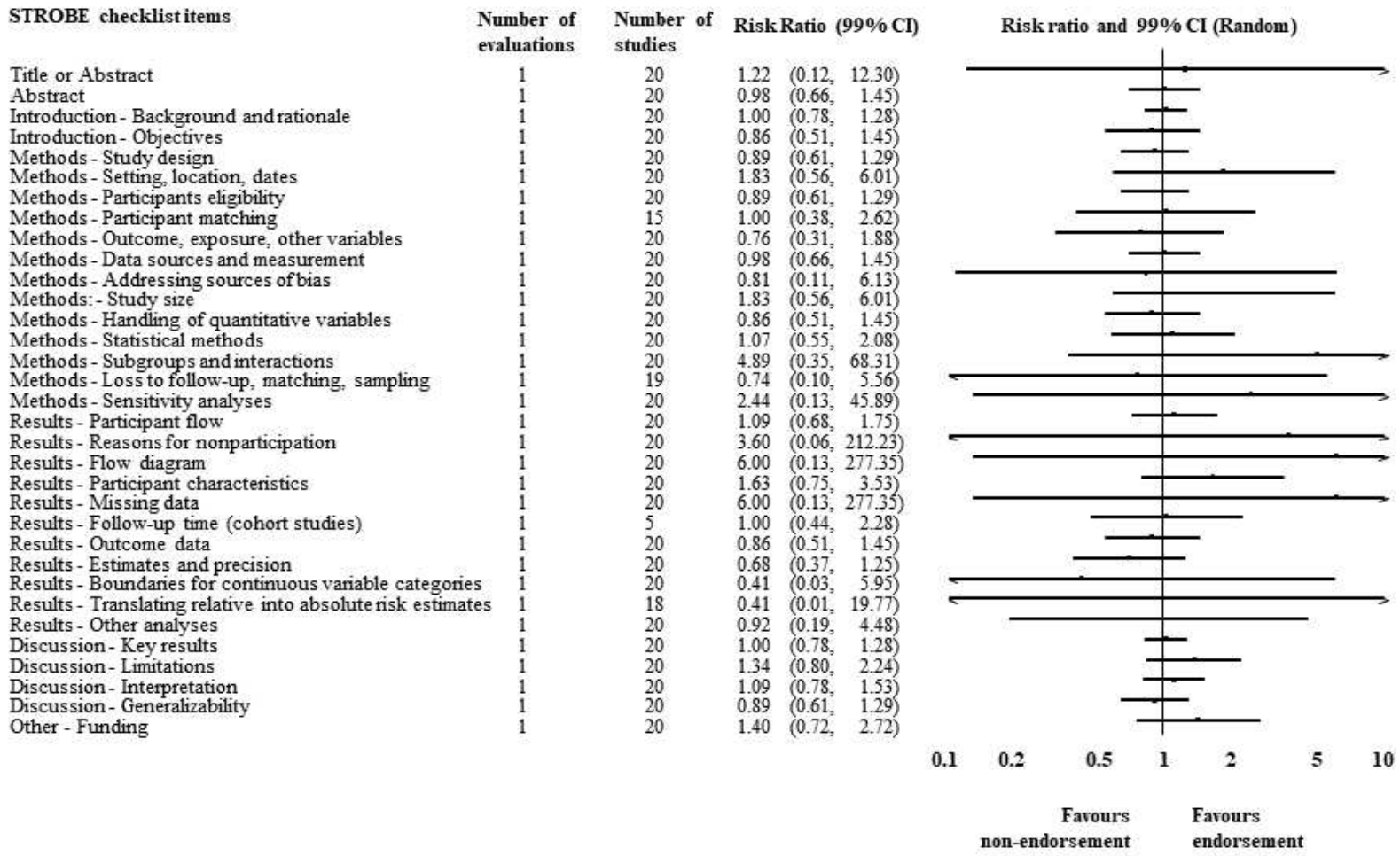

Figure 15. Completeness of reporting summary plot for Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) checklist, after versus before journal endorsement. Effect estimate for checklist item "Methods: missing data" was not estimable during quantitative analysis because of zero events in each arm.

Table 10. Analysis by mean summed score for reporting guideline checklists, after versus before journal endorsement*.

Reporting guideline	Number of evaluations†	Number of studies (Total): after versus before journal endorsement	Effect estimate (99% Confidence Interval)
PRISMA, 2009	2‡	41 versus 38 (79)	Standardized Mean Difference 0.49 (-0.10 to 1.08)
STRICTA, 2002	1§	11 versus 4 (15)	Mean Difference 1.82 (-2.49 to 6.13)
STROBE, 2007	1‡	9 versus 11 (20)	Mean Difference 1.16 (-3.97 to 6.29)

*Individual forest plots depicting these summary data are shown in Appendix 15.

†Only evaluations calculating a summed score for the report were included.

‡All checklist items were summed.

§A subset of items was summed.

Assessment of study methodological quality within evaluations

Nine of 26 evaluations assessed the methodological quality of included studies (Table 11): one economics evaluation (251), one evaluation assessing randomized trials of herbal medicines (276), five systematic review evaluations (257,258,271–273), and two evaluations assessing diagnostic studies (259,265). Relatively few studies per evaluation were included in the assessments. The three more recently published systematic review evaluations used AMSTAR, whereas the older two evaluations used the Oxman and Guyatt index. The two diagnostic evaluations used separate, non-overlapping criteria. Given the different methodological areas and tools represented by the evaluations, a meaningful synthesis statement was not possible.

Unwanted effects of reporting guideline use

None of the included evaluations reported on unwanted effects of reporting guideline use.

Table 11. Methodological quality of included studies, as assessed by evaluations.

Author, Year	Methodological quality assessment
BMJ economic guidelines, 1996	
Herman, 2005 (251)	Evaluated economic evaluations on four criteria: randomization; prospective economic data collection; comparison group was usual care; and the study was not blinded nor mandatory regarding participation. Both studies in the endorsing arm met all four criteria compared with 5/11 studies in the non-endorsing arm.
CONSORT extension for herbal interventions, 2006	
Ernst, 2011 (276)	Assessed studies using the Cochrane risk of bias tool. The one study from an endorsing journal was assessed as at a moderate risk of bias. Studies from non-endorsing journals were assessed at a high (n=2) or moderate (n=2) risk of bias.
PRISMA, 2009	
Tunis, 2013 (271)	Assessed reviews using AMSTAR. Using data provided by the author, studies (n=13) from the one endorsing journal scored a mean of 9.2 of 11 points, and studies (n=48) from non-endorsing journals scored 7.6 of 11 points.
Panic, 2013 (273)	Assessed reviews using AMSTAR. Data by item are not presented. Endorsing versus non-endorsing journals. Using data provided by the author, the mean summed score from studies (n=30) of endorsing journals was 7.2 (range 2 to 9), while those (n=30) from non-endorsing journals was 6.4 (range 1 to 9). After versus before journal endorsement. Using data provided by the author, the mean summed score after journal endorsement (n=27 articles) was 7.3 (range 3 to 9) and 6.0 (range 0 to 9, n=26 articles) before endorsement.
Fleming, 2013 (272)	Authors assessed reviews using the AMSTAR tool but analyzed across all included studies [162].
QUOROM, 1999	
Biondi-Zoccai, 2006 (257)	Assessed studies using the Oxman and Guyatt index (range of 1 [minimal flaws] to 7 [extensive flaws]). The one study from an endorsing journal scored 2 on the index while studies (n=6) from non-endorsing journals scored a range of 1-6 points.
Poolman, 2007 (258)	Used the Oxman and Guyatt index (maximum score, 7 points). The one study from an endorsing journal scored 7 points. Studies from non-endorsing journals (n=6) scored a range of 1-6 points; the 4 studies scoring 1 or 2 points are considered to have 'major flaws' according to the index.
STARD, 2003	
Freeman, 2009 (259)	Assessed eight aspects authors state address internal and external validity of included studies: selective participant sampling; lack of reporting ethnicity and/or sensitization status of participants; lack of reporting the number of

Author, Year	Methodological quality assessment
	replicates, if done, that were used for the overall study outcome; lack of reporting the failure rate; lack of including the reported failure rate into the analysis; difference in reported and adjusted accuracy; lack of controlling for the presence of fetal DNA; and lack of known genotypes in study as the control. Raw data provided in tabular form without summarizing in the text. Studies (n=3) from endorsing journals ranged 2-4 of 8 flaws. Studies (n=8) from non-endorsing journals ranged from 2-6 flaws, and the information from one study was not interpretable.
Krzych, 2009 (265)	Authors assessed studies using the QUADAS tool but analyzed across all included studies.

4.2 Results for rapid review – Effectiveness of personal protective equipment for healthcare workers caring for patients with filovirus disease: a rapid review

Identification of relevant studies

A total of 1,215 unique records were retrieved. No systematic reviews, evidence-based clinical practive guidelines or HTA reports were identified. Furthermore, no comparative primary studies or ongoing trials were identified. However, 30 non-comparative studies fulfilled the eligibility criteria (Figure 16) (277–306). Ten of the 30 studies were identified through a scan of reference lists of included studies. A list of studies excluded following full-text review and reasons for exclusion are provided in Appendix 16.

Characteristics of studies and study populations

The characteristics of studies reporting on gloves, masks, gowns, and glasses/googles are provided in Figure 17. Studies reporting on other PPE combinations are summarized in Appendix 17. Studies were published between 1969 and 2013 and conducted in Africa (277,278,283,284,287,289,290,300–304,306), Europe (including Turkey) (281,282,285,286,288,293,294,298,299,305), South Asia and Western Asia (279,280,297), North America (291,292,296), and one study included HCWs in Africa and HCWs in Europe because of a patient repatriated to Europe (295).

Eleven studies (277,278,283,284,286,287,290,300,301,305,306) reported on filoviruses, two on unspecified viral hemorrhagic fevers (VHF) (288,296), 11 on Crimean-Congo hemorrhagic fever (279–282,285,293–295,297,299,304), and six on Lassa fever (289,291,292,298,302,303). Of the eight studies reporting on ebolavirus, three reported outbreaks of Sudan virus (283,284,306), four of Ebola virus (277,278,287,299), and one of Taï Forest virus (286).

While three studies were case reports of HCWs (285,297,305), a majority of studies involved contact tracing of HCWs providing care to index patients. Seven studies monitored HCWs for at least three weeks for outcomes, while others used a shorter follow-up, did not report this information, or did not actively follow participants.

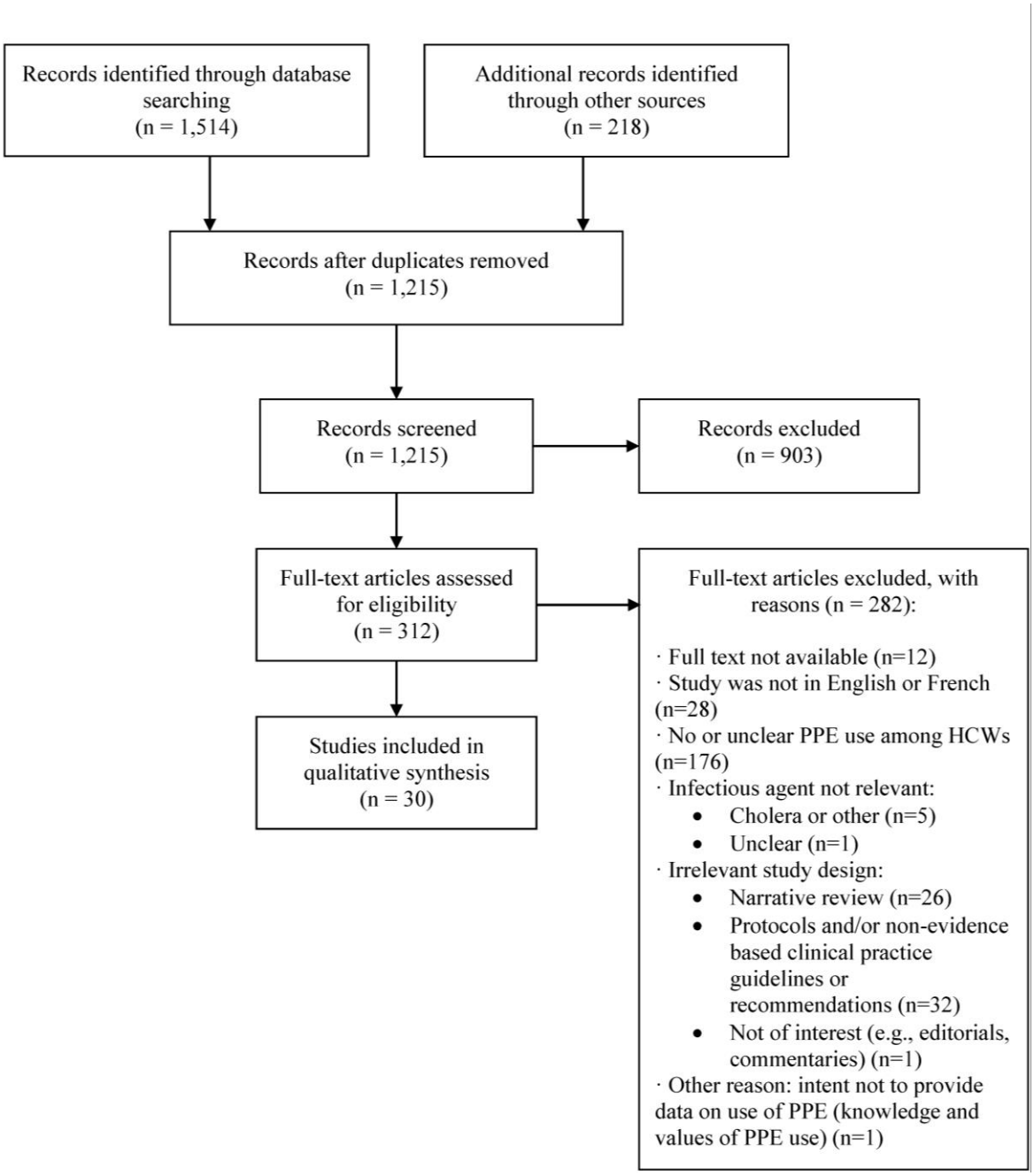

Figure 16. Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flow diagram of the study selection process.

Study (year of publication) **Setting** **Sources of support**	**Year of outbreak**	**Surveillance details** **Number of participants** **Type of HCWs**	**PPE protocol** **Protocol violations (if reported)**	**Outcomes and results**
Crimean-Congo Hemorrhagic Fever				
Tutuncu, EE. (2009) (285) Turkey Hospital NR	NR	NA (CR) 2 (PPE described for 2 HCW) Physicians	One HCW wore gloves, mask, gown and glasses. [The second HCW did not wear gloves (other PPE not described)]	**Virus transmission -** HCW developed no symptoms and tested positive for PCR but negative for IgM at week two. Mode of transmission was likely a needle-stick injury while recapping **Needle-stick injury –** HCW experienced needle-stick injury while recapping
Maltezou, HC. (2009) (294) Alexandroupolis, Greece University hospital, 671-bed tertiary care hospital; Supported by the Hellenic Centre for Disease Control and Prevention	2008	Followed daily for 14 days after last contact and serologically tested 20 Nurses (90.5%), physicians (9.5%)	Gloves, masks, gowns, goggles; 70% of HCWs with direct contact with patient used PPE	**Virus transmission -** No HCW developed symptoms and none were positive for IgG and IgM antibodies (ELISA) **Needle-stick injury –** No needle-stick injury reported

Figure 17. Non-comparative studies of healthcare workers wearing gloves, masks, gowns, and glasses/goggles.

Abbreviations: ELISA=enzyme-linked immunosorbent assay; HCW=healthcare worker; IgG=immunoglobulin G; IgM=immunoglobulin M; NA=not applicable; NR=not reported; PPE=personal protective equipment

Most studies examined nurses and physicians with or without other personnel providing patient care, including medical students, assistants, and other auxiliary staff members. Data from some studies included other personnel not providing direct patient care (e.g., laboratory workers, housekeeping staff, and administrative staff). Sample sizes were not consistently reported, and some studies reported the total number of contacts but did not specify the proportion of HCWs.

Personal Protective Equipment

Only one study was designed with the intent to evaluate PPE use (281). The PPE protocols varied across and within studies, i.e., over the duration of the care period or among HCWs. Several reports (278,287,288,288,289,289,290,292,300,301,306) described changes to the protocol, including delayed implementation of PPE or sequential introduction of PPE components during an outbreak. Three reports (280,289,295) traced HCW contacts from multiple health care facilities and described varying PPE protocols across the settings. A few studies reported varied adherence to the PPE protocol among HCWs within a given study (281,282,294) or only described the PPE used by a subset of HCW contacts (e.g., those who subsequently developed the disease) (278,279,285,297). Three studies (284,293,301) reported adoption of established PPE guidelines for the management of patients with VHFs including those developed by WHO and the Advisory Committee on Dangerous Pathogens.

Although we did not perform a formal assessment of the completeness of reporting across studies, our impression is that the reporting of PPE protocols was poor. In most reports, only a general description was provided of the components of PPE used without indication of the quality or specific characteristics (e.g., disposability, permeability, and other specifications). Further, important details including the quantity of each component used simultaneously by a single HCW (i.e., single or double gloves or gowns) was not reported. Some studies only partially reported the PPE protocol. For example, several studies specified one element of PPE (e.g., gloves, respirators, masks) but the remaining components were not described in detail (e.g., ‘protective clothing’, ‘barrier techniques’) (277,279,292,298,305).

Outcomes

Nearly all studies (90%; 27/30) reported on virus transmission from infected patients to HCWs. One study (296) reported no outcomes of interest as VHF was ruled out. Half of the studies measured virus transmission based on symptoms, serology and/or polymerase chain reaction (PCR) for at least a subset of HCWs (279–281,284,285,287,289–291,294,297,298,300–302,304,306). The remaining studies used only symptoms (278,292,295,299,305), serologic or PCR/reverse transcription-PCR testing (281,286,303), or the method of ascertainment was not reported (278,283,288,293). Three studies (281,282,303) reported on antibody prevalence among HCWs exposed to Crimean-Congo and Lassa fever virus.

The proportion of HCWs who experienced an event are presented (Figures 17-20; Appendix 17 Tables S1-S16), grouped by the combination of PPE elements worn. For filovirus disease, five of 11 studies reported virus transmission to HCWs having worn a variety of PPE combinations (Figure 18). One of those studies was unclear regarding timing of transmission (i.e., at what point during PPE protocol). Eight of 16 studies examining other types of VHFs reported viral transmission to HCWs having worn a various PPE combinations.

No studies reported on dexterity with the use of gloves or on adverse effects such as discomfort, reduced visibility, high temperatures, or humidity. Eight studies reported on needle stick injuries (280–282,285,288,294,304,305), one study on inadvertent touching of face with contaminated gloves (278), and one on glove perforation (280). The proportion of HCWs with other outcomes (needle stick injury, glove perforation, antibody prevalence, and touching of face) are shown in Figures 19 and 20.

Sources of Support

One study clearly indicated their sources of financial support (298). Four studies indicated sources of support but did not provide the nature of the support (281,283,290,294). Four studies listed the participation of organizations in providing or inferring outbreak support (278,284,300,306). No companies manufacturing PPE components were listed among the involved organizations.

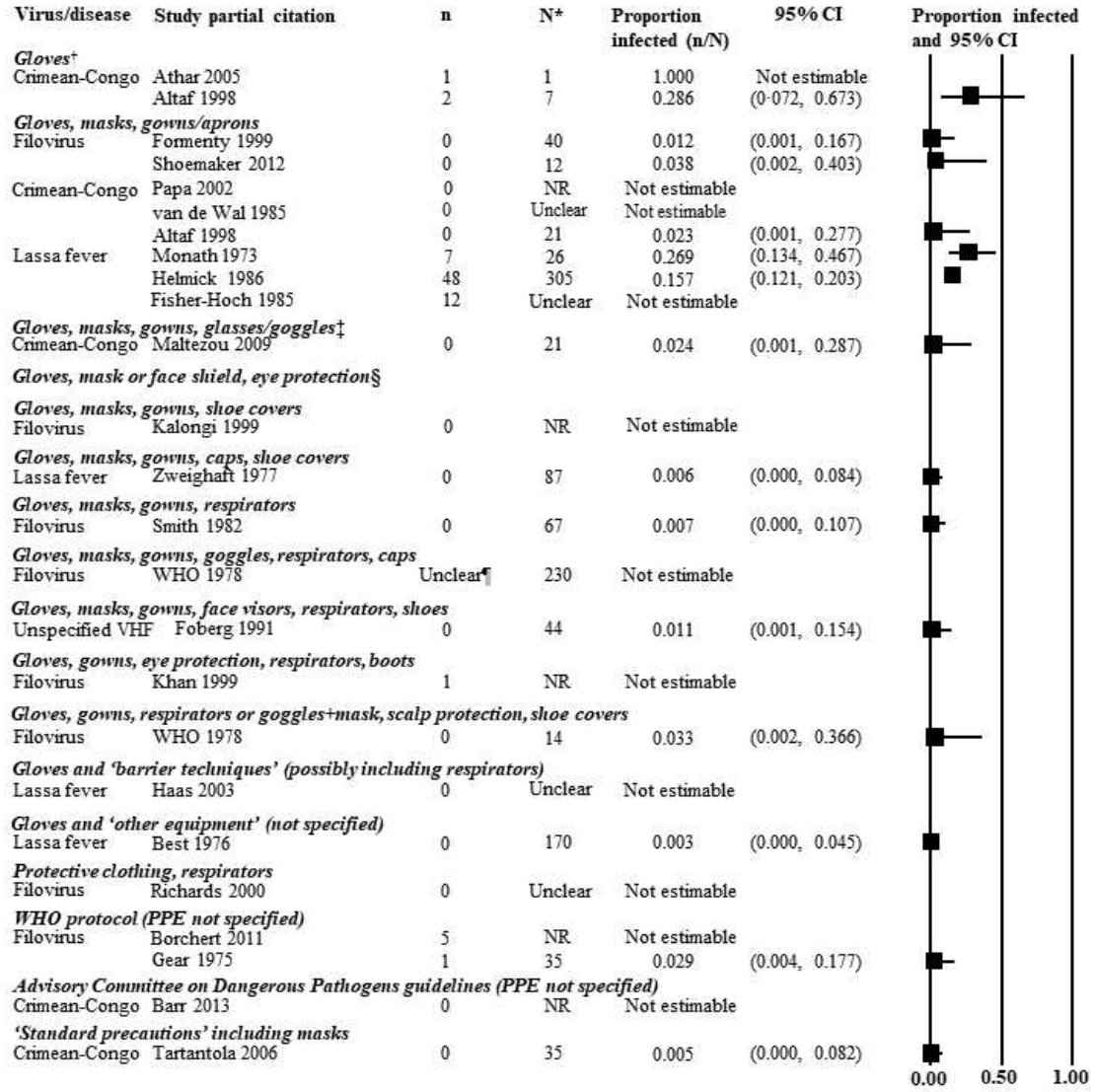

Figure 18. Virus transmission in non-comparative studies of healthcare workers wearing personal protective equipment

Abbreviations: CI=confidence interval; n=number of events; N= number of HCWs at risk for whom we knew the PPE worn; NR=not reported; WHO=World Health Organization. *Most studies did not provide data on all healthcare workers; only workers with available data were included. †Case reports: One report on filovirus (Martini 1969 (305)) and one on Crimean-Congo hemorrhagic fever (Naderi 2011 (297)) were identified. ‡One case report on Crimean-Congo hemorrhagic fever (Tutuncu 2009 (285)) was identified. §One case report on Crimean-Congo hemorrhagic fever (Naderi 2011 (297)) was identified. ¶PPE protocol was altered during process of care; unclear whether events occurred before or after the enhanced PPE protocol was implemented.

Virus/disease	Study partial citation	n	N*	Proportion injured (n/N)	95% CI	Proportion injured and 95% CI
Gloves†						
Crimean-Congo	Altaf 1998	1	7	0.143	(0.020, 0.581)	
Gloves, masks, gowns/aprons						
Crimean-Congo	Gozel 2013	2	104	0.019	(0.005, 0.074)	
	Ergonul 2007	0	41	0.012	(0.001, 0.164)	
	van de Wal 1985	9	Unclear	Not estimable		
Gloves, masks, gowns, glasses/goggles‡						
Crimean-Congo	Maltezou 2009	0	20	0.024	(0.001, 0.287)	
Gloves, masks, gowns, face visors, shoes, respirators						
Crimean-Congo	Foberg 1991	3	44	0.068	(0.022, 0.191)	

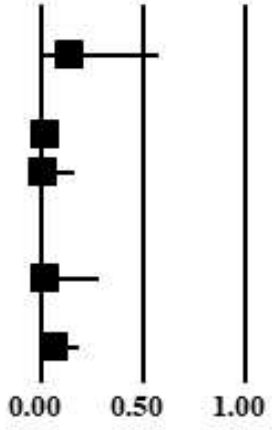

Figure 19. Needle stick injury in non-comparative studies of healthcare workers wearing personal protective equipment

Abbreviations: CI=confidence interval; n=number of events; N= number of HCWs at risk for whom we knew the PPE worn. *Most studies did not provide data on all healthcare workers; only workers with available data were included. †One case report on filovirus (Martini 1969) was also identified. ‡One case report on Crimean-Congo hemorrhagic fever (Tutuncu 2009) was also identified.

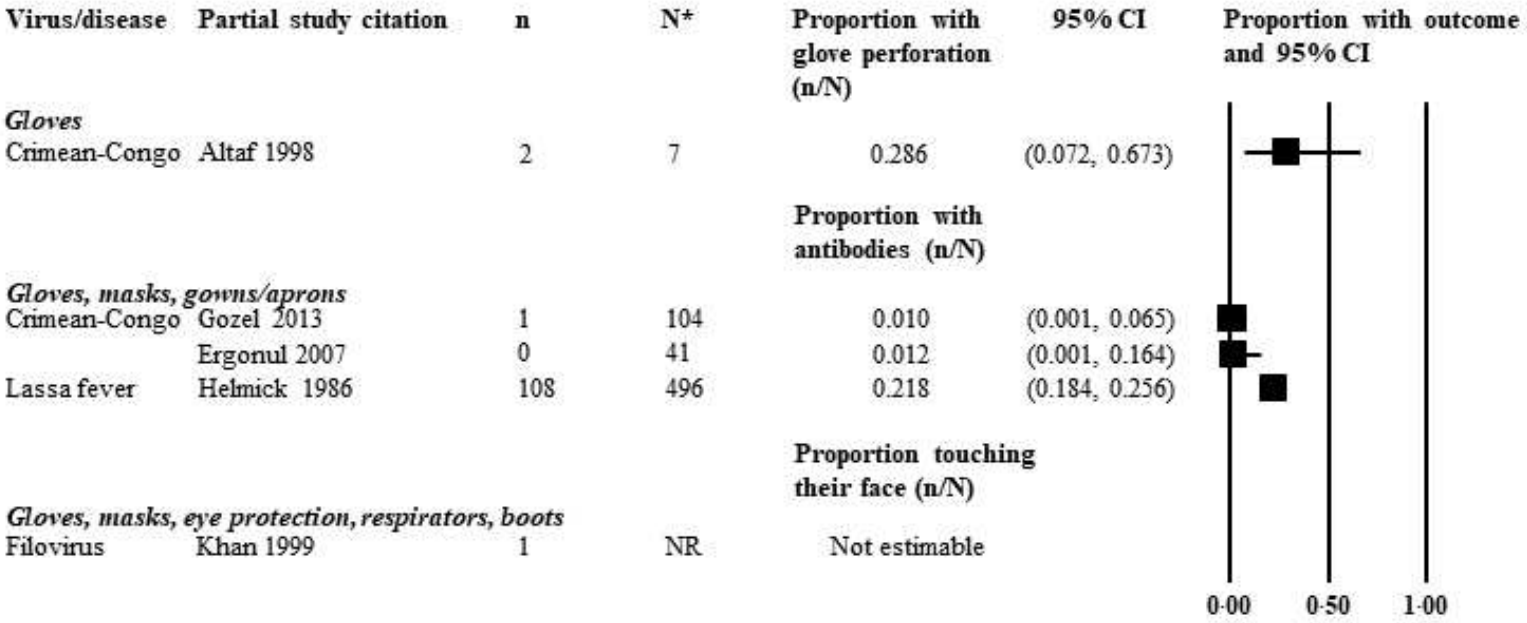

Figure 20. Other adverse events in non-comparative studies of healthcare workers wearing personal protective equipment

Abbreviations: CI=confidence interval; n=number of events; N= number of HCWs at risk for whom we knew the PPE worn; NR=not reported; WHO=World Health Organization. *Most studies did not provide data on all healthcare workers; only workers with available data were included.

4.3 Results for primary study – Relation of journal publication status on the completeness of reporting of rapid reviews using PRISMA and PRISMA for Abstracts: a comparative, cross-sectional methodological study

Study selection results

The process of study selection is summarized in Figure 21. A total of 2481 records were identified through database searching and 27 through other sources; once duplicates were removed, 1990 records were reviewed. After the removal of 1034 ineligible title and abstract records, 956 full-text articles were assessed for eligibility. Of those, 856 reports were removed, including exclusions for year eligibility, leaving 100 journal-published rapid review reports eligible for assessment for the suite of three rapid review methodological studies that are planned, of which one is reporting.

Those 100 rapid review reports were used to gauge the sampling of the non-journal-published rapid reviews. A total of 913 non-journal-published rapid reviews were located from 49 sources, of which 516 were eligible for consideration. Ninety-seven non-journal-published rapid review reports were selected through random sampling. Once post hoc exclusions were processed, a total of 91 unique rapid reviews were included for reporting assessment.

Of the 91 rapid reviews, 47 were published or date stamped in 2014, with 29 in the journal-published group (307–335) and 18 in the non-journal-published group (336–353). Of the 44 rapid reviews published or date stamped in 2016, 24 and 20 were in the journal (23,354–376) and non-journal (377–396) groups, respectively. One article (397) is a companion report to a series of articles (315–317,332–335) and is not included in the unique article counts.

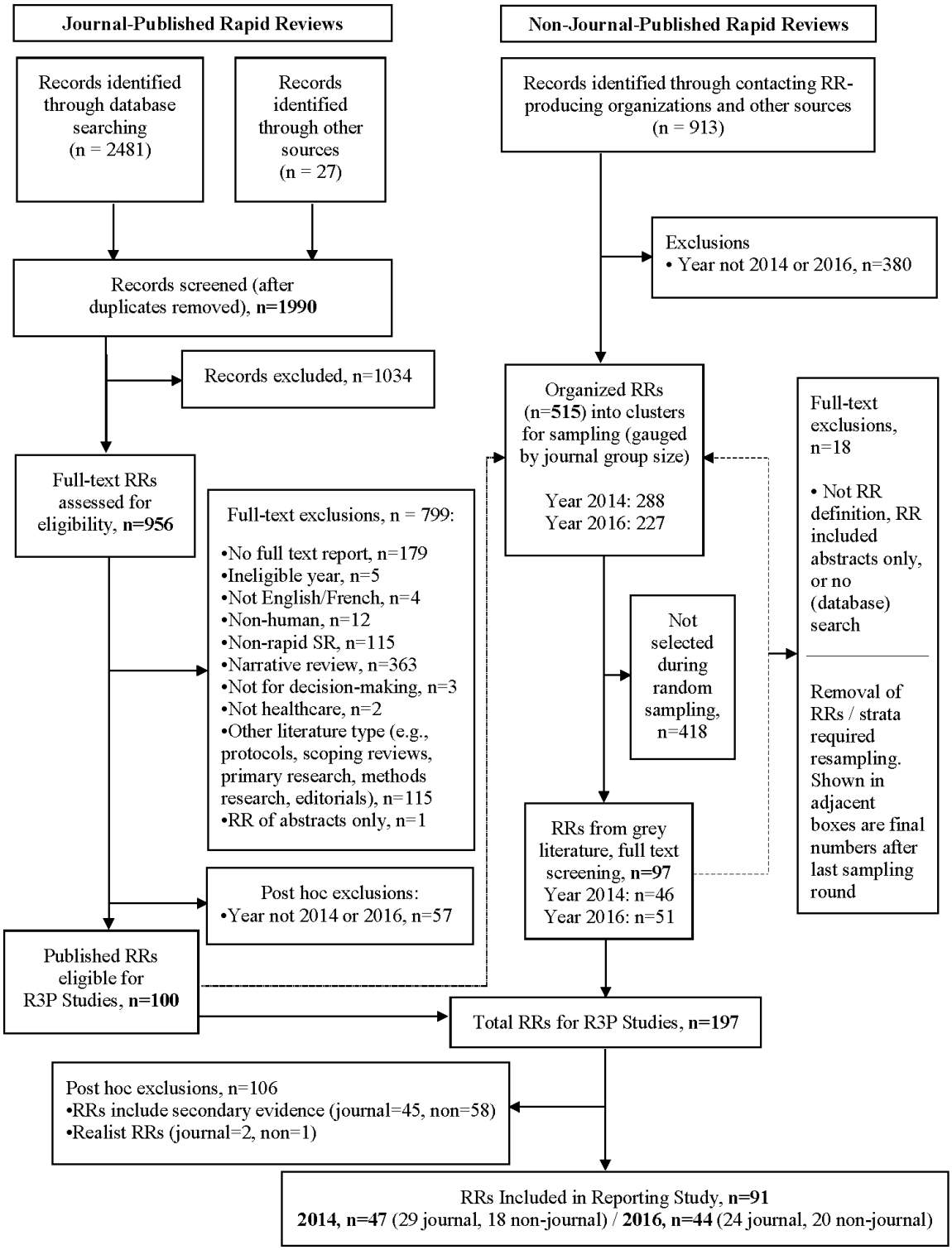

Figure 21. Preferred Reporting of Items of Systematic Reviews and Meta-Analyses (PRISMA) flow diagram for selecting rapid reviews for inclusion. R3P= suite of three rapid review methodological studies that are planned, stemming from the same search approach and of which one is this study on reporting; RR=rapid review.

General characteristics

Several characteristics were collected from the study sample (Tables 12 and 13). 'Rapid review', 'rapid systematic review' and 'rapid evidence assessment' were the most commonly used terms in the report title; journal-published rapid reviews reported this more frequently than those not published in journals.

Around one-third of non-journal-published rapid reviews did not provide an authorship list. Of those that did, the mean number of authors ranged from three to six between journal and non-journal reviews. Almost all journal-published rapid reviews listed a corresponding author compared with only two rapid reviews in the non-journal-published group. Of the journal-published rapid reviews, at least 80% reported an academic institution affiliation of one or more of the key authorship roles (first, second, corresponding, or senior), compared with less than 20% of rapid reviews in the non-journal-published group.

Across groups and years, using corresponding author or rapid review producer (e.g., organization) information, rapid reviews were produced in 11 countries, of which the highest-producing countries were Canada (n=25), the United States (n=23), and the United Kingdom (n=15). Relatively fewer journal-published rapid reviews were identifiable as being produced by a specific organization, institute, or rapid review-producing team.

Specification as to whether rapid reviews were commissioned or specifically requested was reported in over 20% in journal-published rapid reviews and around 50% of non-journal-published rapid reviews. At least 70% of rapid reviews reported information on funding, of which most were funded through non-commercial sources not part of a granting scheme, such as charities and governmental and non-governmental agencies. Only two rapid reviews reported being supported financially by a commercial organization.

The majority of journal-published rapid reviews were located in specialty journals. Journals used peer-review processes (Appendix 18), with the exception of one journal, the Ontario Health Technology Assessment Series, in the 2016 data set that did not state the use of a peer-reviewed process; however, we do not believe this journal to be a presumed predatory journal. In contrast, very few non-journal-published rapid reviews state using a peer-review process in their development (Table 12).

Table 12. General characteristics of included rapid reviews.

Characteristic	2014		2016	
	Journal, n=29	Non-journal, n=18	Journal, n=24	Non-journal, n=20
Nomenclature in title				
Rapid review	4 (14)	0	8 (33)	0
Rapid systematic review	6 (21)	0	5 (21)	0
Rapid evidence assessment	3 (10)	0	5 (21)	0
Rapid response	0	2 (11)	0	1 (5)
Rapid HTA	2 (7)	0	0	0
Evidence summary	0	1 (6)	0	2 (10)
Mini systematic review	0	0	1 (4)	0
Evidence brief	0	0	0	1 (5)
List of authors provided, n (%)	29 (100)	13 (72)	24 (100)	12 (60)
Authors listed, median (IQR)	5 (3 to 6)	2 (1 to 3)	5 (3 to 7)	5 (2 to 6)
Corresponding authors listed, n (%)	28 (97)	0	22 (92)	2 (10)
Academic affiliation*, n (%)	23 (79)	3 (17)	23 (96)	3 (15)
Country of corresponding author or producer, n (%)				
United States	14 (48)	2 (11)	3 (13)	4 (20)
Netherlands	7 (24)	0	0	0
Australia	0	6 (33)	2 (8)	4 (20)
United Kingdom	5 (17)	0	10 (42)	0
Canada	1 (3)	9 (50)	3 (13)	12 (60)
Ireland	1 (3)	0	0	0
Italy	1 (3)	0	2 (8)	0
Malaysia	0	1 (6)	0	0
Germany	0	0	1 (4)	0
Belgium	0	0	2 (8)	0
Saudi Arabia	0	0	1 (4)	0
Rapid reviews produced by a specific organization/institute/team, n (%)	12 (41)	17 (94)	2 (8)	20 (100)
Rapid review commissioned or requested, n (%)	7 (24)	9 (50)	5 (21)	9 (45)
Country, n				
Australia	0	6	1	4
United States	3	2	0	2
United Kingdom	3	0	2	0
Canada	0	0	0	2
Italy	1	0	0	0
Malaysia	0	1	0	0
Belgium	0	0	1	0
Not reported/Unclear	0	0	1	1

Characteristic	2014		2016	
	Journal, n=29	Non-journal, n=18	Journal, n=24	Non-journal, n=20
Reported funding, n (%)	26 (90)	13 (72)	18 (75)	14 (70)
Funding source, n				
External, peer reviewed grant	8	0	0	1
External, non-commercial	10	11	12	13
External, commercial	0	0	2	0
Internal	1	2	0	0
Specified no funding obtained	7	0	2	0
Type of publishing journal, n (%)				
General	2 (7)	N/A	5 (21)	N/A
Specialty	27 (93)		19 (79)	
Peer-reviewed, n (%)	29 (100)	2 (11)	23 (95)	1 (5)
Rapid review terminology consistently used to describe the report†	13 (45)	12 (67)	13 (54)	10 (50)
Purpose or rationale for rapid review reported	14 (48)	9 (50)	12 (50)	11 (55)
Wordcount – Abstract Median, IQR	255 (219 to 258)	1698 (1376 to 2922)	248 (240 to 294)	1455 (673 to 2719)
Wordcount – Full report Median, IQR	3240 (2622 to 5742)	4350 (2988 to 11851)	4394 (3448 to 4713)	9813 (3745 to 13669)

*First, second, corresponding, or senior author.

†Reports using inconsistent terminology include use of term 'systematic review'.

The use of consistent, self-identifying rapid review terminology within all reports ranged from 45% to almost 70% across groups and years (Table 12). A self-declaring purpose or rationale for the conduct of the rapid reviews was around 50%.

Most of the rapid reviews (60-79%) addressed one research question (Table 13). For our analyses, intervention-type questions were the most predominant across groups (78-90%), except for the journal-published rapid reviews in 2016 where 50% addressed an intervention question and 25% addressed a qualitative one. Many types of interventions were assessed, and the most frequent across groups included conventional (medications, devices, physical modalities), complementary and alternative medicine, professional behaviour & organization of care, and new device/technology interventions. Proportionately fewer rapid reviews

Table 13. Content and process-specific details of included rapid reviews.

Characteristic	2014		2016	
	Journal, n=29	Non-journal, n=18	Journal, n=24	Non-journal, n=20
Key questions, n (%)				
One	23 (79)	13 (72)	17 (71)	12 (60)
Two	3 (10)	1 (6)	5 (21)	2 (10)
Three	1 (3)	1 (6)	1 (4)	2 (10)
Four or more	1 (3)	1 (6)	1 (4)	2 (10)
NR	1 (3)	2 (11)	0	2 (10)
Research question analyzed, n (%)				
Intervention (+/- safety)	24 (83)	14* (78)	12 (50)	18 (90)
Etiology	1 (3)	0	1 (4)	1 (5)
Prevalence	0	0	1 (4)	0
Diagnostic test accuracy	2 (7)	3* (16)	1 (4)	1 (5)
Prognostic	0	1* (6)	0	0
Qualitative	1 (3)	0	6 (25)	0
Scoping/Descriptive	1 (3)	0	2 (8)	0
Other	0	0	1 (4)	0
Content focus, n (%)				
Coverage of 21 ICD-10 categories	17 (81)	14 (67)	13 (62)	11 (52)
Other	4	1	8	1
Intervention/etiology type, n (%)				
Unifocal				
Conventional	4 (16)	10 (56)	3 (13)	9 (45)
CAM	6 (24)	1 (6)	1 (4)	0
Professional behavior & organization of care (EPOC)	1 (4)	0	2 (8)	2 (10)
Screening test/program	0	1 (6)	0	0
Behavioural	0	1 (6)	0	0
Lifestyle	0	0	1 (4)	1 (5)
New device or technology	0	0	0	5 (25)
Other	0	0	1 (4)	0
Multifocal				
Conventional, CAM	2 (8)	0	0	0
Conventional, new device	1 (4)	0	0	1 (5)
CAM, new device	1 (4)	0	1 (4)	0
Behavioural, lifestyle	3 (12)	0	0	0
Conventional, EPOC	2 (8)	0	0	0
CAM, lifestyle	2 (8)	0	1 (4)	0
Conventional, lifestyle	0	0	2 (8)	0
Public health, EPOC	0	1 (6)	0	0
CAM, behavioural, lifestyle	1 (4)	0	1 (4)	0
CAM, behavioural, EPOC	0	0	0	0
Behavioural, lifestyle, EPOC	0	0	1 (4)	0

Characteristic	2014		2016	
CAM, behavioural, lifestyle, EPOC	2 (8)	0	0	0
Behavioural, other	0	0	1 (4)	0
Citations screened, median (IQR)	1132 (347 to 2771)	327 (39 to 433)	410 (190 to 1391)	340 (52 to 1521)
Included studies, median (IQR)	18 (7 to 32)	5 (3 to 16)	20 (10 to 34)	5 (1 to 13)
Study designs				
RCT	13 (45)	3 (17)	2 (8)	8 (40)
RCT + other designs	11 (38)	7 (39)	6 (25)	5 (25)
Designs other than RCT	5 (17)	6 (33)	12 (50)	7 (35)
Unclear	0	1 (6)	4 (17)	0
No included studies	0	1 (6)	0	0
Outcomes specified	16 (55)	10 (56)	14 (58)	15 (75)
Median, IQR	2 (1 to 3)	9 (4 to 11)	3 (1 to 6)	10 (7 to 12)
Synthesis approach				
Narrative synthesis	22 (76)	4 (22)	13 (54)	11 (55)
Meta-analysis	1 (3)	0	0	0
Mixed (across outcomes)				
Meta-analysis and narrative	1 (3)	0	0	0
Vote counting and narrative	1 (3)	0	0	0
NMA and narrative	0	0	0	1 (5)
Meta-analysis and NMA	0	1 (6)	0	1 (5)†
By-study reporting (no synthesis)	0	9 (50)	2 (8)	5 (40)
Poorly reported	0	0	0	1 (5)
Not applicable (type of question)	4 (14)	4 (22)	9 (38)	1 (5)

Abbreviations: CAM = complementary and alternative medicine; Conventional = medications, physical modalities, devices and technology; EPOC = effective practice and organization of care; lifestyle = physical activity, diet; NMA=network meta-analysis; NR=not reported; MA=meta-analysis.

*Subset included economics questions.

†Methods reported, but quantitative results not provided in report. Narrative reporting in text.

addressed multifocal interventions (for example, behavioural and lifestyle) across groups except that of the journal-published rapid reviews in 2014.

The rapid reviews addressed a range of health topics within and across groups, with 50% to 80% coverage of the ICD-10 categories (Table 13). Relatively few rapid reviews addressed content not covered by the ICD-10 categorization, such as advanced care planning, quality improvement, education, and social determinants of health (Appendix 19). Rapid reviews

were relatively small-volume reports, ranging from a median of over 300 to over 1100 citations (at the outset of study selection) and a median of 5 to 20 included studies across groups.

At least 50% of rapid reviews contained randomized controlled trials (RCTs), with or without other study designs, as the primary study of inclusion (Table 13). The proportion of rapid reviews not containing RCTs was 35% or less across groups; the exception is the journal-published group in 2016, which coincides with proportionately more qualitative and other question types that would use non-RCT evidence. A few rapid reviews did not clearly state the design types of their included studies. One rapid review in 2014 was an empty review.

Outcomes were specified in 55% to 75% of rapid reviews (Table 13). The median number of outcomes between the journal and non-journals rapid reviews ranged from 2 to 10. Narrative synthesis of outcomes was a commonly used synthesis approach between the review types. Relatively few employed a formal quantitative approach, such as pair-wise or network meta-analysis. A few reviews included a mix of approaches, depending on the type of outcome. In the non-journal-published groups, 40-50% of rapid reviews did not formally synthesize studies but reported information by-study. Rapid reviews for which an evaluation of narrative versus formal quantitative analysis was not warranted, as per the type of question (e.g., qualitative), ranged from 5% to 38% across groups.

Effect of Journal Publication Status

Primary analysis

The subset of rapid reviews included in these analyses were those that could be evaluated on all items, comprising mainly intervention but also etiology questions. Sample sizes are shown in Figure 22. Summary data are provided in Appendix 20. Post hoc power calculations are in Appendix 21.

Data distribution and correlation analyses

Assumptions of a normal data distribution were adequate for the PRISMA 2014 and 2016 data with no skewness detected statistically, nor with data plotting (Shapiro-Wilk values 0.95

Analysis	Journal Mean (SD), n	Non-Journal Mean (SD), n	Absolute Mean difference (95% CI)	p-value	Absolute Mean difference 95% CI
PRISMA 2014	9.76 (2.68), 25	5.43 (3.00), 14	4.33 (2.44, 6.22)	<0.001	
PRISMA 2016	9.23 (3.24), 13	8.26 (3.38), 19	0.97 (-1.48, 3.41)	0.425	
PRISMA-Abs 2014	2.72 (2.25), 25	3.67 (0.82), 6	-0.95 (-2.10, 0.21)	0.104	
PRISMA-Abs 2016	3.46 (1.51), 13	3.38 (0.96), 16	0.09 (-0.86, 1.03)	0.852	

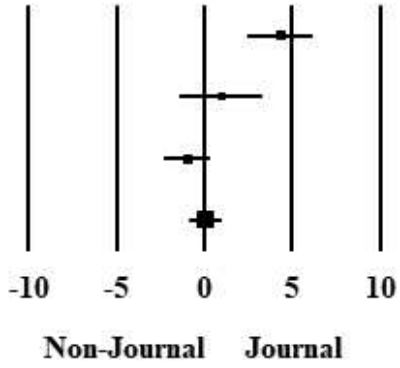

Figure 22. Journal-published versus non-journal-published for absolute (unadjusted) mean differences for completeness of reporting.

[both], p-values 0.10 and 0.13, respectively) (Appendix 20). Slight skewness was detected statistically with both PRISMA for Abstracts data sets (Shapiro-Wilk values 0.92 [both], p values 0.02-0.03), but not observed with data plotting (Appendix 20); the skewness was not deemed substantive enough to preclude use of parametric testing.

Evaluation of cluster sampling (non-journal-published) and journal endorsement of reporting guidelines for systematic reviews (journal-published) was performed separately as those variables only pertained to one of the two comparison groups and could, therefore, not be included in a regression analysis with other covariates (funding, academic affiliation, wordcount). The non-journal-published PRISMA datasets were highly correlated according to the sampled clusters, with ICCs of 0.80 (2014) and 0.98 (2016). Similarly, PRISMA for Abstracts data were considerably correlated (ICC 0.29 [2014] and 0.36 [2016]). No data correlation was observed in the PRISMA 2014 and 2016 journal-published datasets when evaluating endorsement (absolute mean difference 0.07 [95% CI -2.25 to 2.38] and 0.43 [95% CI -3.71 to 4.57], respectively). We did not undertake an endorsement evaluation for PRISMA for Abstracts as no journals reported endorsing the use of reporting guidelines for abstracts.

PRISMA

The unadjusted comparison between groups for the mean summed score of PRISMA items is shown in Figure 22 and Appendix 20. For the 2014 data, journal-published rapid reviews completely reported, on average, four more items than those not journal-published, shown with statistical significance (absolute mean difference 4.33, 95% CI 2.44 to 6.22; post hoc power 99.4%). There was little to no statistical difference and low power observed between groups in the 2016 data (Figures 22; Appendix 21). The difference in results between years appears to be from poorer reporting in the 2014 non-journal-published group (mean 5.43 items) than in 2016 (mean 8.26 items). Journal-published rapid reviews completely reported about one-third of PRISMA items (mean 9.76 [2014] and 9.23 [2016] of 27 items, respectively).

After multivariable adjustment for funding, academic affiliation, and report wordcount, greater differences were observed between groups. The PRISMA 2014 data remained statistically significant, with an adjusted average of six more completely reported items in the

Analysis	Journal n	Non-Journal n	Adjusted Mean Difference (95% CI)	p-value	Adjusted Mean Difference 95% CI
PRISMA 2014	25	14	5.92 (3.41, 8.44)	<0.001	
PRISMA 2016	13	19	3.19 (-0.57, 6.95)	0.096	
PRISMA-Abs 2014	25	6	-1.08 (-.3.40, 1.25)	0.365	
PRISMA-Abs 2016	13	16	0.51 (-1.33, 2.35)	0.584	

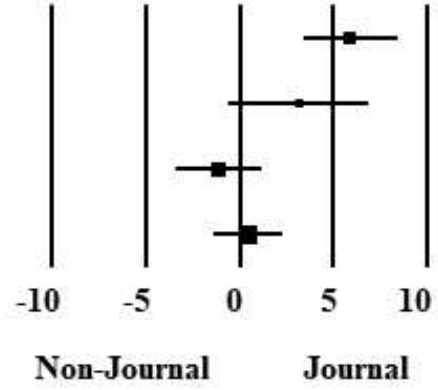

Figure 23. Journal-published versus non-journal-published for mean difference for completeness of reporting, adjusted for funding, author academic affiliation, and wordcount.

journal-published group (adjusted mean difference 5.92, 95% CI 3.41 to 8.44, Figure 23**).** Exploratory post hoc univariable analyses revealed statistical significance with each variable (Appendix 20). Little to no difference was observed between groups after multivariable adjustment in the 2016 data, and only wordcount was significant in exploratory post hoc univariable analyses (Appendix 20; Figure 23).

PRISMA for Abstracts

Few 2014 non-journal-published rapid review reports included abstracts for analysis (n=6). Very little to no difference in reporting and lower power were observed for the unadjusted comparisons for mean summed score 2014 and 2016 PRISMA for Abstracts data (Figure 22; Appendix 20). Data were consistent between groups and across years, with about one-quarter of completely reported items (mean 2.72 to 3.67 of 12 items; Figure 22). Minimal shifts in the data were observed after multivariable adjustment, which were also not statistically significant after post hoc univariable analyses (Figure 23).

Exploring a minimally important difference threshold for reporting

One aspect of our a priori research plan was to determine whether any differences observed would reach a threshold for what might be considered a minimally important difference in reporting. A 20% difference in reporting with PRISMA would translate to a difference of five-to-six items, on average, between groups; for PRISMA for Abstracts, it would be a difference of two-to-three items on average. As shown in Figure 24, none of these meet the threshold.

Reporting Guideline & Data Year	Journal Mean	Journal Total	Non-journal Mean	Non-journal Total	Risk difference (95% CI)
PRISMA 2014	10	27	6	27	0.15 (-0.9, 0.39)
PRISMA 2016	9	27	8	27	0.04 (-0.21, 0.28)
PRISMA Abstracts 2014	3	12	4	12	-0.08 (-0.45, 0.28)
PRISMA Abstracts 2016	3	12	3	12	0.00 (-0.35, 0.35)

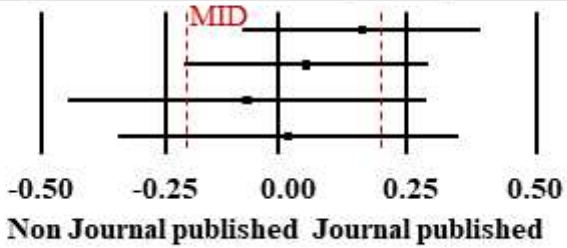

Figure 24. Journal-published versus non-journal-published for the absolute risk difference and minimally important difference in the completeness of reporting. MID=minimally important difference.

Secondary analysis

The subset of rapid reviews included in these analyses were those for which each item was applicable to the question type. Sample sizes are shown in Figures 25, 26, 30, and 31. Summary data are provided in Tables 14-19**.**

PRISMA

By-item PRISMA checklist assessments are shown are shown in Figures 25 and 26. Few events lent to wide confidence intervals for many items. Directionality of point estimates varied according to item. Certain items were not estimable because no rapid reviews completely reported them.

Radar plots were constructed to show the percentage frequency of reporting by item (Figures 27-28). Overall, many items were infrequently reported or not reported at all. A combined overlay of the radar plots shows, despite some differences, a strikingly similar pattern across groups and years (Figure 29**).**

Items such as 'Rationale', 'Study characteristics' and 'Synthesis' were among the few that were reported by 70% or more of rapid reviews across groups (Table 14). Around 30-40% of PRISMA items were reported by at least 50% of rapid reviews for most groups, the exception of which was 15% of PRISMA items in the 2014 non-journal-published reports.

PRISMA Checklist Item	Journal		Non-journal		
	Events	Total	Events	Total	Risk ratio (99% CI)
1 Title	14	29	3	18	2.90 (0.68, 12.29)
2 Abstract	22	29	6	18	2.28 (0.93, 5.60)
3 Rationale	29	29	15	18	1.21 (0.90, 1.61)
4 Objectives	21	29	3	18	4.34 (1.08, 17.43)
5 Protocol and registration	4	25	4	18	0.72 (0.14, 3.70)
6 Methods: Eligibility	8	29	9	18	0.55 (0.21, 1.48)
7 Methods: Information sources	14	29	7	18	1.24 (0.50, 3.08)
8 Methods: Search	18	29	9	18	1.24 (0.61, 2.53)
9 Methods: Study selection	3	29	3	18	0.62 (0.09, 4.39)
10 Methods: Data collection process	1	29	0	18	1.90 (0.03, 119.08)
11 Methods: Data items	9	29	2	18	2.79 (0.44, 17.93)
12 Methods: Risk of bias	1	26	0	15	1.78 (0.03, 110.21)
13 Methods: Summary measures	5	27	0	18	7.46 (0.18, 310.15)
14 Methods: Synthesis of results	1	25	0	14	1.73 (0.03, 106.82)
15 Methods: Risk of bias across studies	1	25	0	15	1.85 (0.03, 114.32)
16 Methods: Additional analyses	0	27	0	18	Not estimable
17 Results: Study selection	10	29	7	18	0.89 (0.32, 2.43)
18 Results: Study characteristics	21	29	15	17	0.82 (0.57, 1.19)
19 Results: Risk of bias within studies	10	26	1	15	5.77 (0.44, 75.32)
20 Results: Results of individual studies	1	27	2	17	0.31 (0.01, 6.66)
21 Results: Synthesis of results	22	25	2	14	6.16 (1.13, 33.62)
22 Results: Risk of bias across studies	2	25	1	15	1.20 (0.06, 25.10)
23 Results: Additional analyses	0	28	0	17	Not estimable
24 Discussion: Summary of evidence	15	27	4	17	2.36 (0.70, 7.92)
25 Discussions: Limitations	12	28	0	18	16.38 (0.43, 621.61)
26 Discussion: Conclusions	16	28	1	18	10.29 (0.81, 130.22)
27 Funding	9	29	1	18	5.59 (0.41, 75.42)

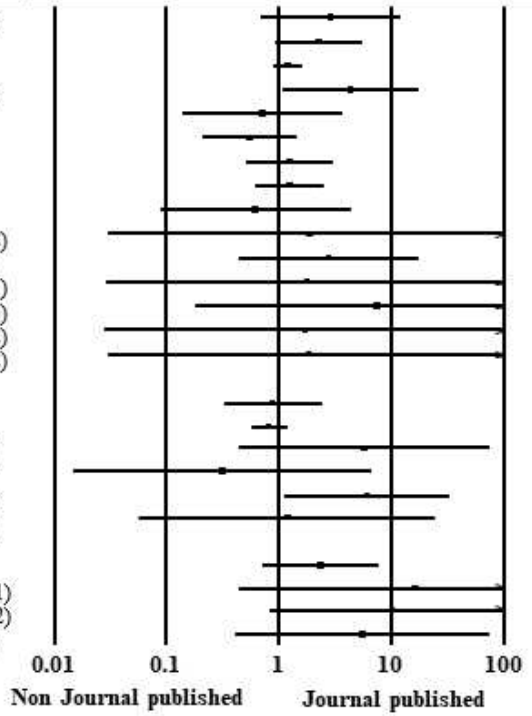

Figure 25. Journal-published versus non-published rapid reviews in 2014 for completeness of reporting according to each Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) checklist item.

PRISMA Checklist Item	Journal		Non-journal		Risk ratio (99% CI)
	Events	Total	Events	Total	
1 Title	19	24	5	20	3.17 (1.13, 8.90)
2 Abstract	15	24	10	20	1.25 (0.62, 2.53)
3 Rationale	24	24	19	20	1.06 (0.89, 1.25)
4 Objectives	17	24	5	20	2.83 (0.99, 8.12)
5 Protocol and registration	5	24	9	20	0.46 (0.14, 1.55)
6 Methods: Eligibility	12	24	15	20	0.67 (0.36, 1.24)
7 Methods: Information sources	16	24	13	20	1.03 (0.58, 1.80)
8 Methods: Search	12	24	15	20	0.67 (0.36, 1.24)
9 Methods: Study selection	4	24	8	20	0.42 (0.11, 1.64)
10 Methods: Data collection process	5	24	2	20	2.08 (0.28, 15.53)
11 Methods: Data items	3	24	0	20	5.88 (0.13, 267.86)
12 Methods: Risk of bias	1	22	0	19	2.61 (0.04, 162.52)
13 Methods: Summary measures	3	16	1	20	3.75 (0.22, 64.57)
14 Methods: Synthesis of results	0	15	1	19	0.42 (0.01, 25.56)
15 Methods: Risk of bias across studies	1	15	2	19	0.63 (0.03, 13.06)
16 Methods: Additional analyses	0	16	0	20	Not estimable
17 Results: Study selection	8	24	16	20	0.42 (0.19, 0.92)
18 Results: Study characteristics	15	24	19	20	0.66 (0.43, 1.01)
19 Results: Risk of bias within studies	5	21	6	19	0.75 (0.20, 2.85)
20 Results: Results of individual studies	0	15	0	20	Not estimable
21 Results: Synthesis of results	12	15	13	19	1.17 (0.69, 1.97)
22 Results: Risk of bias across studies	1	15	2	19	0.63 (0.03, 13.06)
23 Results: Additional analyses	0	16	0	20	Not estimable
24 Discussion: Summary of evidence	5	16	4	20	1.56 (0.35, 6.98)
25 Discussions: Limitations	4	22	1	20	3.64 (0.23, 57.90)
26 Discussion: Conclusions	7	22	0	20	13.70 (0.35, 543.55)
27 Funding	9	24	0	20	15.96 (0.41, 619.49)

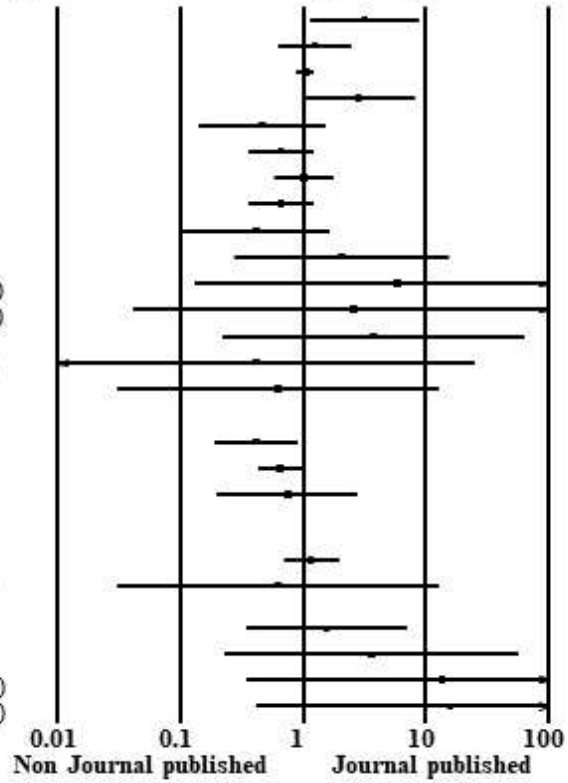

Figure 26. Journal-published versus non-published rapid reviews in 2016 for completeness of reporting according to each Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) checklist item.

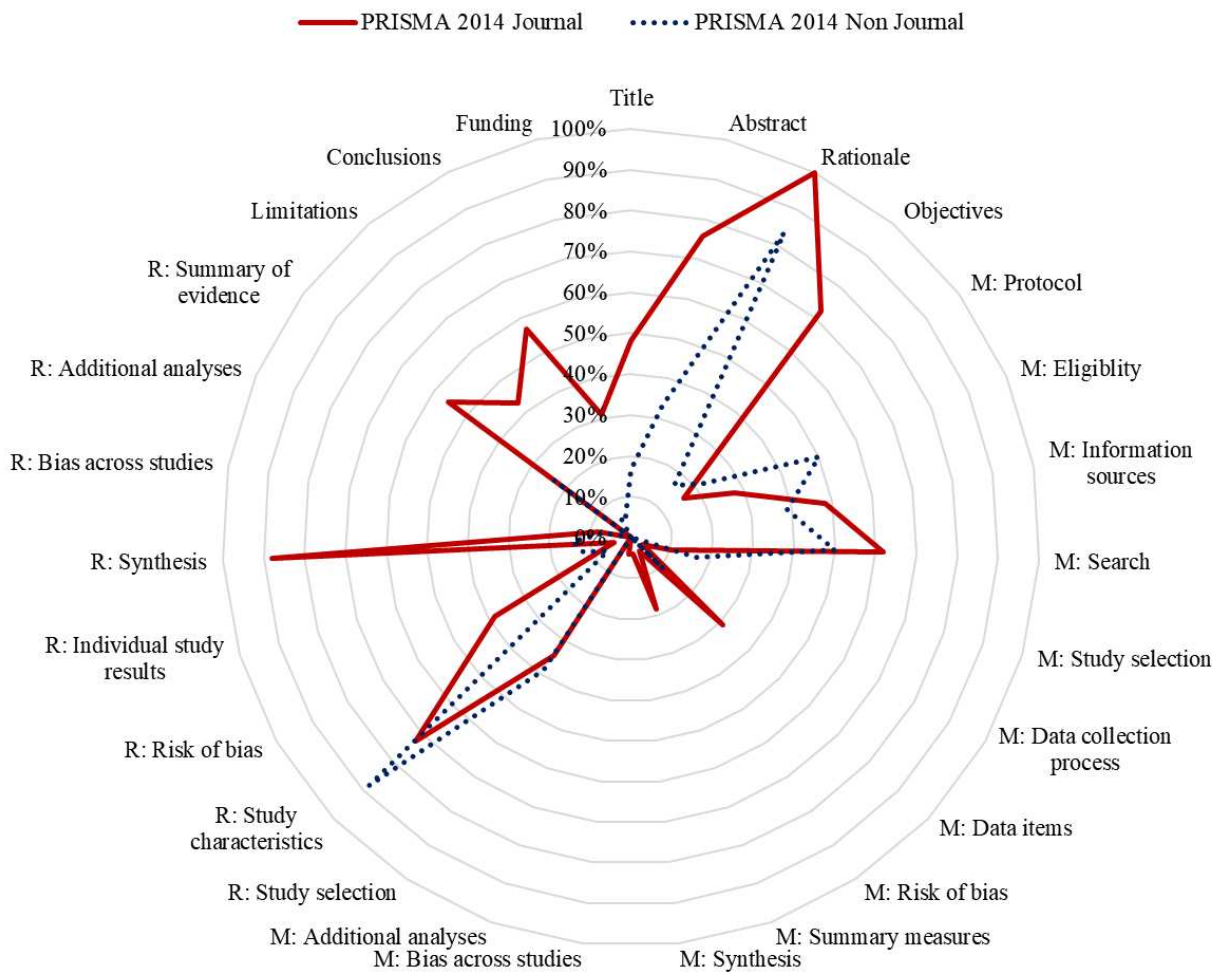

Figure 27. Radar plot of 2014 journal-published and non-journal-published rapid reviews for completeness of reporting according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) checklist. M=Methods; R=Results.

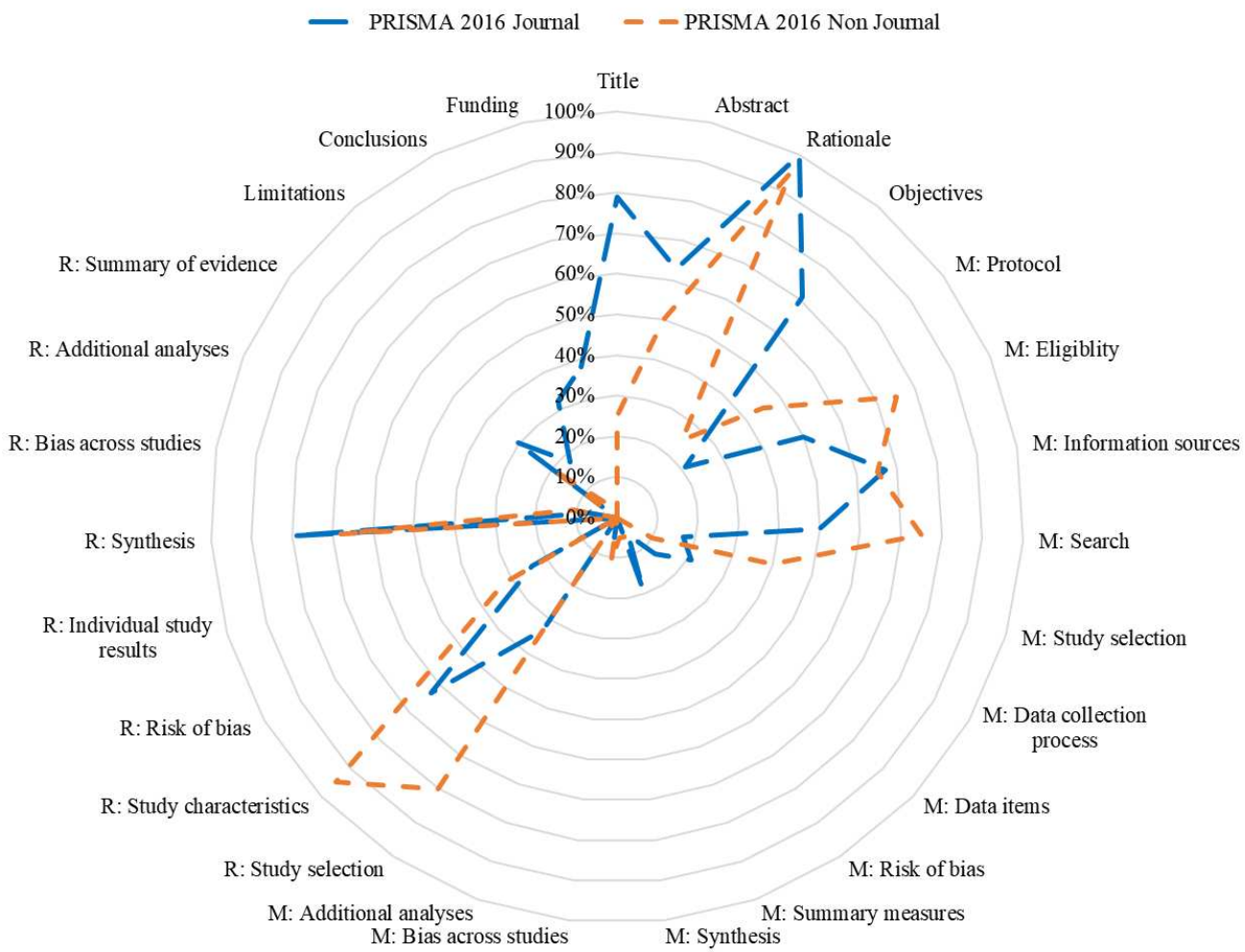

Figure 28. Radar plot of 2016 journal-published and non-journal-published rapid reviews for completeness of reporting according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) checklist. M=Methods; R=Results.

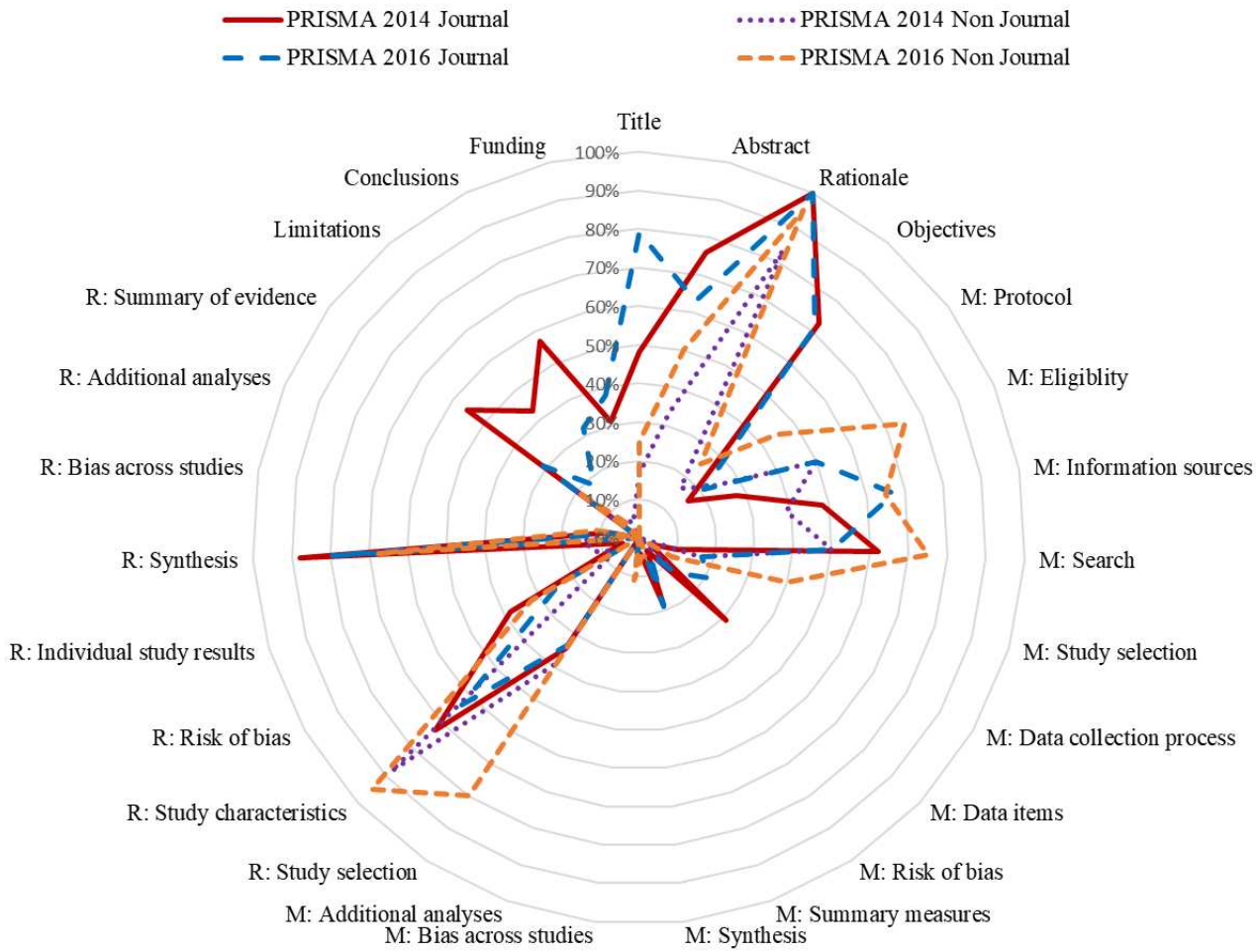

Figure 29. Radar plot of data overlay of 2014 and 2016 journal-published and non-journal-published rapid reviews for completeness of reporting according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) checklist. M=Methods; R=Results.

Table 14. Higher Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) by-item reporting yields

Reporting	**2014**		**2016**	
	Journal	**Non-Journal**	**Journal**	**Non-Journal**
Around 70% or more of rapid reviews	• Abstract • Rationale • Objectives • Results: Study characteristics • Results: Synthesis	• Rationale • Results: Study characteristics	• Title • Rationale • Objectives • Results: Synthesis	• Rationale • Eligibility • Search • Study selection • Results: Study characteristics • Results: Synthesis
Around 50-70% of rapid reviews	• Title • Information Sources • Search • Results: Summary of evidence • Conclusions	• Eligibility • Search	• Abstract • Eligibility • Search • Information sources • Results: Study characteristics	• Abstract • Information sources
Total items (%)	10/27 (37)	4/27 (15)	9/27 (33)	8/27 (30)

A visual examination of the percentage frequencies of both the complete and partial reporting categories together, across items, suggests that better reporting was observed in the journal-published groups for both years (Tables 15 and 16). Examples of partial reporting include specifying the bibliographic databases that were searched but without reporting dates of time coverage; not fully or clearly reporting on the number of people involved nor how disagreements were handled during the study selection phases; providing some detail on individual study results, but not reporting all elements for a given data type; and, when providing a summary of the evidence, not stating what the strength of that evidence was. A detailed presentation of all partial reporting findings and their mapping is provided in Appendix 22.

Table 15. Reporting yields for 2014 journal-published versus non-journal-published according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) checklist.

	Journal				Non-Journal			
Item	n	Yes (%)	Partial/ Other (%)	No (%)	n	Yes (%)	Partial/ Other (%)	No (%)
Title	29	48	n/a	52	18	17	n/a	83
Abstract	29	76	24*	0	18	33	0	67
Rationale	29	100	n/a	0	18	83	n/a	17
Objectives	29	72	28†	0	18	17	50†	33
M: Protocol	25	16	n/a	84	18	22	n/a	78
M: Eligibility	29	28	72	0	18	50	22	28
M: Information sources	29	48	52	0	18	39	28	33
M: Search	29	62	21‡	17	18	50	22	28
M: Study selection	29	10	79	10	18	17	22	61
M: Data collection process	29	3	31	66	18	0	6	94
M: Data items	29	31	48	21	18	11	0	89
M: Risk of bias	26	4	81	15	15	0	40	60
M: Summary measures	27	19	0	81	18	0	6	94
M: Synthesis	25	4	36	60	14	0	21	79
M: Bias across studies	25	4	0	96	16	0	0	0
M: Additional analyses	27	0	4	96	18	0	0	0
R: Study selection	29	34	62	3	18	39	56	6
R: Study characteristics	29	72	24	3	17	88	6	6
R: Risk of bias	26	38	46§	15	15	7	27§	67
R: Individual study results	27	4	93**	4	17	12	88**	0
R: Synthesis	25	88	12	0	14	14	21	64
R: Bias across studies	25	8††	0	92	15	7	0	93
R: Additional analyses	28	0	4	96	17	0	6	94
R: Summary of evidence	27	56	44	0	17	24	65	12
Limitations	28	43	43	14	18	0	56	44
Conclusions	28	57	43	0	18	6	56	39
Funding	29	31	59	10	18	6	72	22

Abbreviations: M=Methods; R=Results.

*Abstract not structured.

†Partial/vague.

‡Not replicable/essential information missing.

§Summary data by item or all items for one study or across studies data on some items only

**Mix of presentation of results.

††One of two rapid reviews reported that explicitly not undertaken.

Table 16. Reporting yields for 2016 journal-published versus non-journal-published according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) checklist.

Item	Journal				Non-Journal			
	n	Yes (%)	Partial/ Other (%)	No (%)	n	Yes (%)	Partial/ Other (%)	No (%)
Title	24	79	n/a	21	20	25	n/a	75
Abstract	24	63	38*	0	20	50	35*	15
Rationale	24	100	n/a	0	20	95	n/a	5
Objectives	24	71	29†	0	20	25	65†	10
M: Protocol	24	21	n/a	79	20	45	n/a	55
M: Eligibility	24	50	50	0	20	75	5	20
M: Information sources	24	67	33	0	20	65	15	20
M: Search	24	50	50‡	0	20	75	20‡	5
M: Study selection	24	17	63	21	20	40	40	20
M: Data collection process	24	21	29	50	20	10	15	75
M: Data items	24	13	33	54	20	0	25	75
M: Risk of bias	22	5	64	32	19	0	79	21
M: Summary measures	19	19	0	82	20	5	10	85
M: Synthesis	15	0	53	47	19	5	21	74
M: Bias across studies	15	7	0	93	19	11	0	89
M: Additional analyses	16	0	6§	94	20	0	10**	90
R: Study selection	24	33	67	0	20	80	20	0
R: Study characteristics	24	63	33	4	20	95	5	0
R: Risk of bias	21	24††	38	38	19	32	47	21
R: Individual study results	15	0	87	13	20	0	100	0
R: Synthesis	15	80	7	13	19	68	0	32
R: Bias across studies	15	7	0	93	19	11	0	89
R: Additional analyses	16	0	7	93	20	0	20	80
R: Summary of evidence	16	31	69	0	20	20	30	50
Limitations	22	18	59	23	20	5	65	30
Conclusions	22	32	68	0	20	0	55	45
Funding	24	38	38	25	20	0	85	15

Abbreviations: M=Methods; R=Results.

*Abstract not structured.

†Partial/vague.

‡Not replicable/essential information missing.

§Unclear specification of subgroup.

**Unclear whether subgroup prespecified.

††*One of five rapid reviews explicitly stated that risk of bias not done.

PRISMA for Abstracts

Very few non-journal-published rapid review reports in 2014 included an abstract (n=6). By-item PRISMA for Abstracts assessments are shown in Figures 30 and 31. As with the above, few events lent to wide confidence intervals for several items. The directionality of point estimates varied according to item.

Consistent with the PRISMA data, many items were poorly reported. 'Objectives' was the only item to be reported by around 70% or more of rapid reviews across groups (Table 17). One-quarter to one-third of items were reported by around 50% or more of rapid reviews (Table 17; Figures 32-33). The pattern across groups and years is also similar (Figure 34).

PRISMA for Abstracts Checklist Item	Journal Events	Total	Non-journal Events	Total	Risk ratio (99% CI)
1 Title	14	29	0	6	6.77 (0.20, 234.11)
2 Objectives	22	29	6	6	0.81 (0.55, 1.18)
3 Methods: Eligibility criteria	3	29	0	6	1.63 (0.04, 68.84)
4 Methods: Information sources	3	29	0	6	1.63 (0.04, 68.84)
5 Methods: Risk of bais	3	26	2	6	0.35 (0.04, 2.67)
6 Results: Included studies	4	29	3	6	0.28 (0.06, 1.36)
7 Results: Synthesis of results	13	27	4	6	0.72 (0.29, 1.78)
8 Results: Description of the effect	1	24	1	6	0.25 (0.01, 7.86)
9 Strengths/limitations of the evidence	0	28	0	6	Not estimable
10 Interpretation	10	28	6	6	0.39 (0.02, 0.78)
11 Funding	1	29	0	6	0.70 (0.01, 40.78)
12 Registration	1	29	0	6	0.70 (0.01, 40.78)

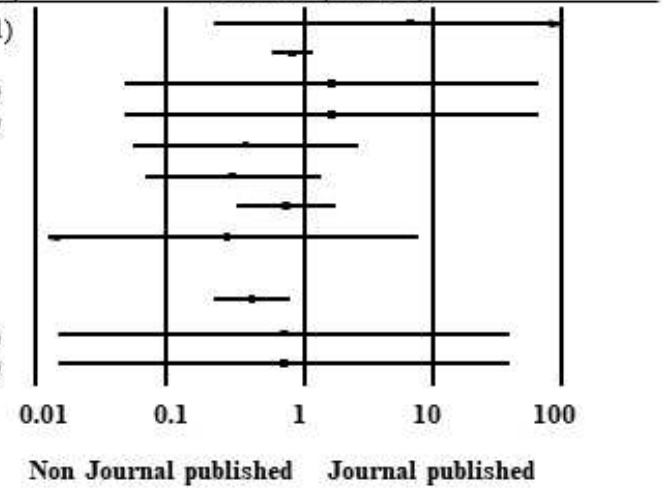

Figure 30. Journal-published versus non-published rapid reviews in 2014 for completeness of reporting according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) for Abstracts checklist. CI=confidence interval.

PRISMA for Abstracts Checklist Item	Journal Events	Journal Total	Non-journal Events	Non-journal Total	Risk ratio (99% CI)
1 Title	19	24	2	17	6.73 (1.19, 38.03)
2 Objectives	22	24	12	17	1.30 (0.84, 2.00)
3 Methods: Eligibility criteria	4	24	0	17	6.48 (0.15, 277.29)
4 Methods: Information sources	6	24	1	17	4.25 (0.30, 60.74)
5 Methods: Risk of bias	3	21	0	17	5.73 (0.13, 257.88)
6 Results: Included studies	0	14	9	17	0.06 (0.00, 2.38)
7 Results: Synthesis of results	6	16	12	17	0.53 (0.21, 1.34)
8 Results: Description of the effect	0	13	2	12	0.19 (0.00, 8.86)
9 Strengths and Limitations of evidence	0	22	1	17	0.26 (0.00, 16.18)
10 Interpretation	12	22	12	17	0.77 (0.41, 1.47)
11 Funding	0	24	0	17	Not estimable
12 Registration	1	24	0	17	2.16 (0.03, 134.34)

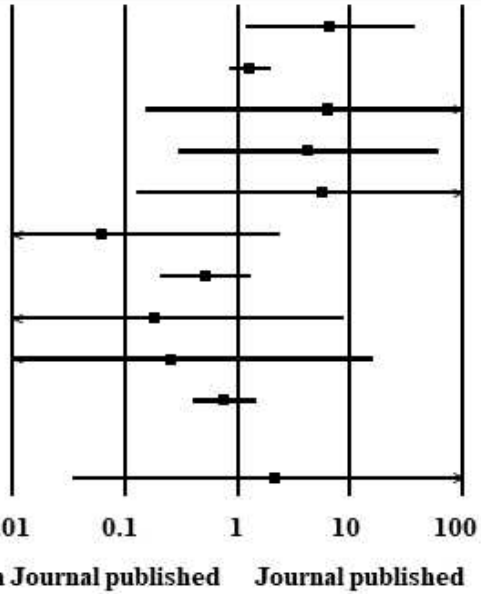

Figure 31. Journal-published versus non-published rapid reviews in 2016 for completeness of reporting according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) for Abstracts checklist. CI=confidence interval.

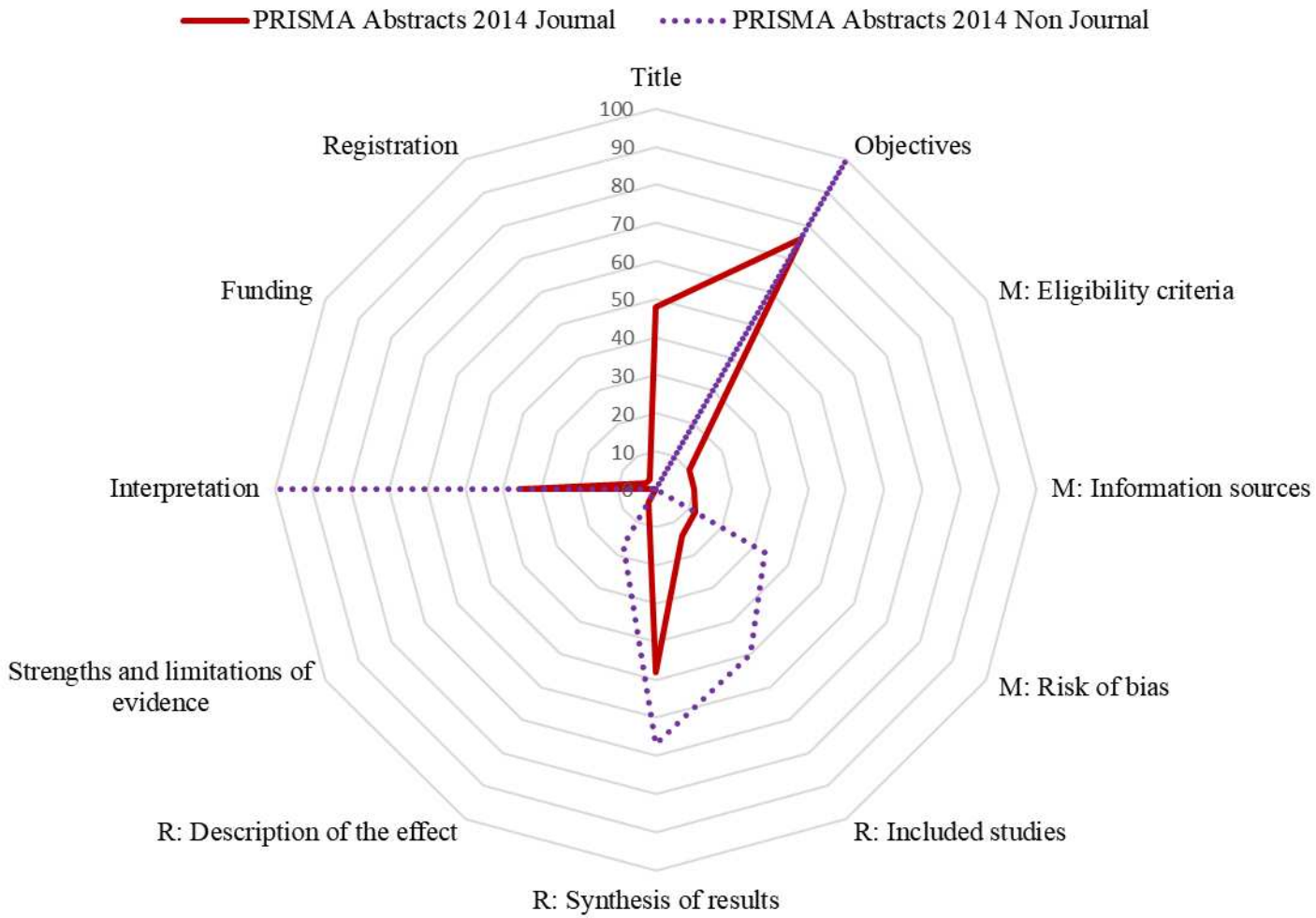

Figure 32. Radar plot of 2014 journal-published and non-journal-published rapid reviews for completeness of reporting according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) for Abstracts checklist. M=Methods; R=Results.

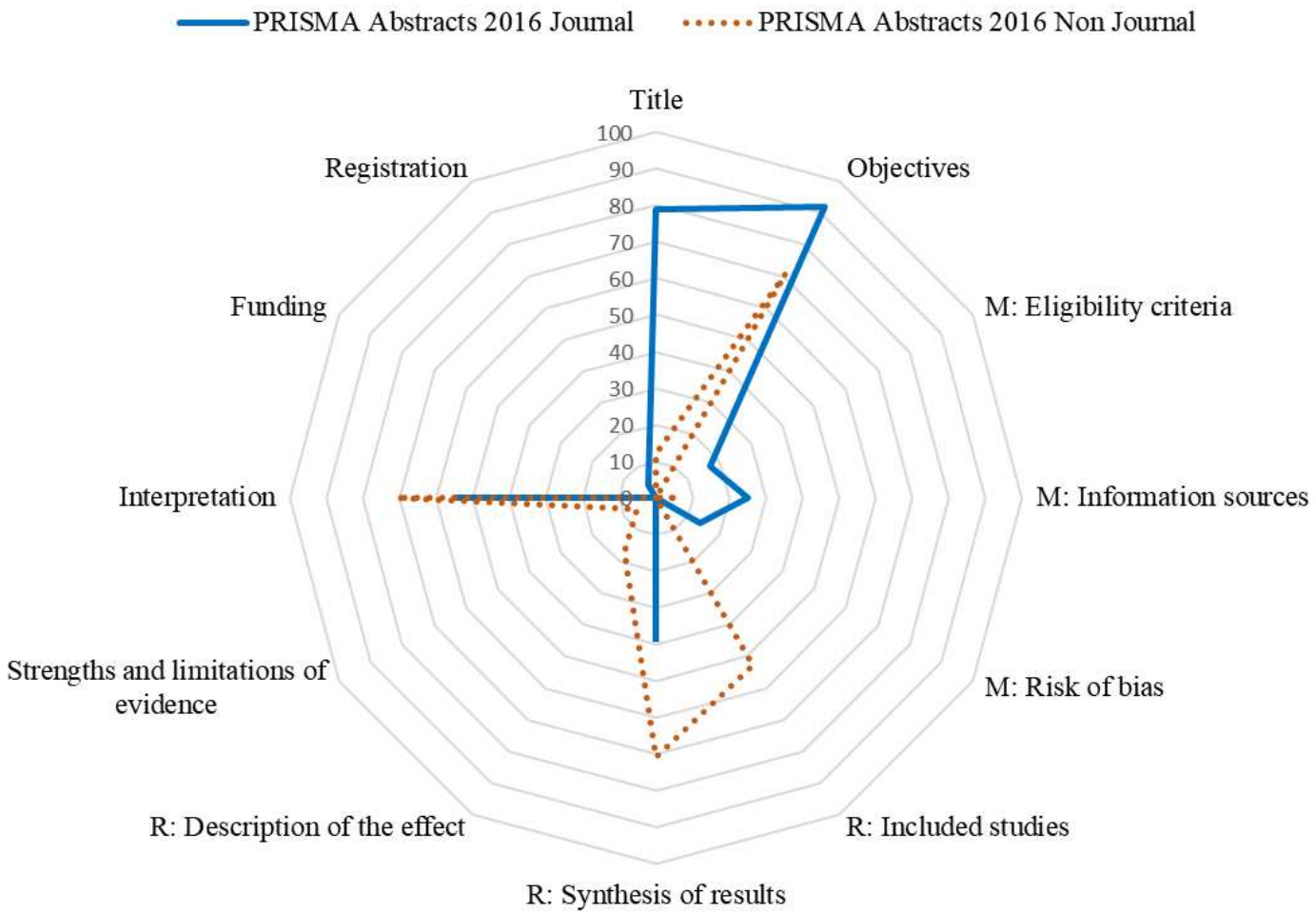

Figure 33. Radar plot of 2016 journal-published and non-journal-published rapid reviews for completeness of reporting according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) for Abstracts checklist. M=Methods; R=Results.

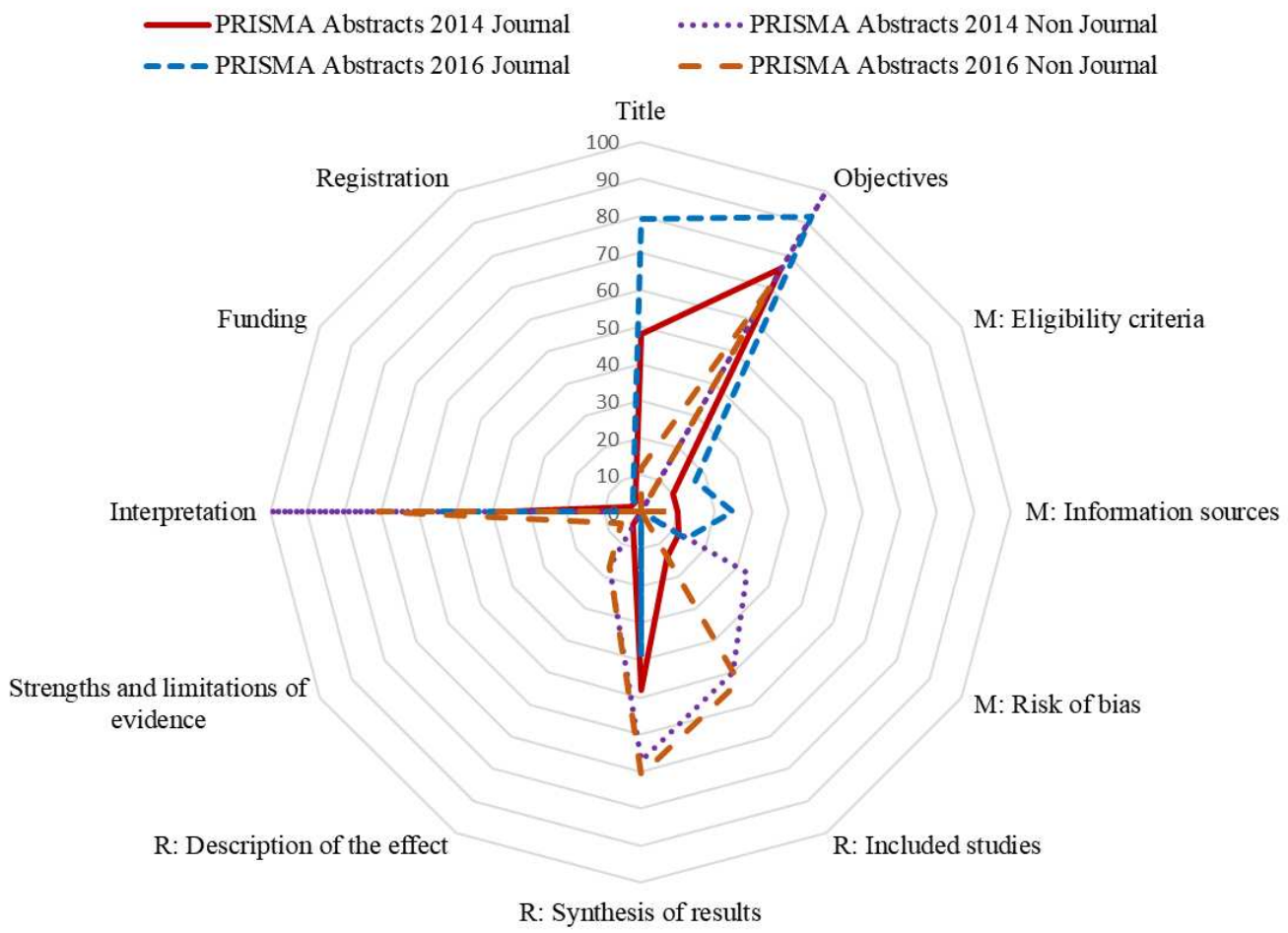

Figure 34. Radar plot of data overlay of 2014 and 2016 journal-published and non-journal-published rapid reviews for completeness of reporting according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) for Abstracts checklist.

M=Methods; R=Results.

Table 17. Higher Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) for Abstracts by-item reporting yields

Reporting	**2014**		**2016**	
	Journal	**Non Journal**	**Journal**	**Non Journal**
Around 70% or more of rapid reviews	• Objectives	• Objectives • Interpretation	• Title • Objectives	• Objectives • Results: Synthesis of results • Interpretation
Around 50-70% of rapid reviews	• Title • Results: Synthesis of results	• Results: Included studies • Results: Synthesis of results	• Interpretation	• Results: Included studies
Total (%)	3/12 (25)	4/12 (33)	3/12 (25)	4/12 (33)

A visual examination of the completely and partially reported percentage frequency data together for the 2016 sample, suggests that the earlier listed items were reported more by journal-published rapid reviews, and the later listed items by the non-journal-published ones (Table 18). Examples of partial reporting include simply stating that risk of bias methods were undertaken without stated the methods used; reporting the number (and possibly, the type) of studies, but less frequently the number of participants and relevant characteristic information; reporting the general interpretation of the data without implications, although some reported on implications only. A detailed presentation of all partial reporting findings and their mapping is provided in Appendix 22.

Table 18. Reporting yields for 2014 journal-published versus non-journal-published according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) for Abstracts checklist.

Item	Journal				Non Journal			
	n	Yes (%)	Partial/ Other (%)	No (%)	n	Yes (%)	Partial / Other (%)	No (%)
1 Title	29	48	n/a	52	6	0	n/a	100
2 Objectives	29	76	n/a	24	6	100	n/a	0
3 Methods: Eligibility	29	10	59	31	6	0	33	67
4 Methods: Information sources	29	10	38	52	6	0	17	83
5 Methods: Risk of bias	26	12	54	35	6	33	0	67
6 Results: Included studies	29	14	79	7	6	50	33	17
7 Synthesis of results	27	48	19	33	6	67	0	33
8 Description of the effect	24	4	38	58	6	17	67	17
9 Evidence strengths, limitations	28	0	14	86	6	0	17	83
10 Interpretation	28	36	39	25	6	100	0	0
11 Funding	29	3	n/a	97	6	0	0	100
12 Registration	29	3	0	97	6	0	0	100

Table 19. Reporting yields for 2016 journal-published versus non-journal-published according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) for Abstracts checklist.

Item	Journal				Non Journal			
	n	Yes (%)	Partial/ Other (%)	No (%)	n	Yes (%)	Partial/ Other (%)	No (%)
1 Title	24	79	n/a	21	17	12	n/a	88
2 Objectives	24	92	n/a	8	17	71	n/a	29
3 Methods: Eligibility	24	17	21	63	17	0	12	88
4 Methods: Information sources	24	25	25	50	17	6	0	94
5 Methods: Risk of bias	21	14	24	62	17	0	24	76
6 Results: Included studies	24	0	87	13	17	53	35	12
7 Synthesis of results	16	38	38	25	17	70	18	12
8 Description of the effect	13	0	46	54	12	17	83	0
9 Evidence strengths, limitations	22	0	5	95	17	6	24	70
10 Interpretation	22	55	32	14	17	70	18	12
11 Funding	24	0	n/a	100	17	0	n/a	100
12 Registration	24	4	0	96	17	0	6	94

Additional items

We recorded the frequency of additional items that were not included in either checklist (Tables 20 and 21). Some of these items were identified a priori, for example, whether authors used the term 'rapid review' (or analogous) in the abstract, the timeframe of conduct was specified, methods used for interpretation of the evidence were reported, a priori indication of the use of iteration during the process of developing the rapid review, and whether a full assessment (i.e., systematic review) should be conducted.

No abstract item was reported by most of the rapid reviews in each group (Table 20). Identifying paper type and specifically use of the 'rapid review' term or use of rapid review methodology were more frequently reported. Several items were not reported by non-journal-published reviews. Only one rapid review noted limitations.

The more commonly reported items, although variable across groups, were a rapid review definition, indication that conducted to meet a certain timeframe (although few provided that timeframe), citing a specific rapid review methodology used, providing methods for the quality or interpretation of the evidence, end user involvement during development, implications of the findings to at least one end user context, linking out to supplementary information in relation to the rapid review, conflicting/competing interests, copyright information, and disclaimers in relation to the evidence or for other reasons (e.g., releasing intellectual or other liability from funders) (Table 21).

Table 20. Additional abstract items for journal-published and non-journal-published rapid reviews.

Item	2014 n (%)		2016 n (%)	
	Journal, n=29	Non-journal, n=6	Journal, n=24	Non-journal, n=17
Identification/Declarations				
Paper type*	21 (76)	4 (67)	19 (79)	9 (53)
States rapid review term or use of rapid review (or analogous) methodology†	20 (69)	1 (17)	17 (71)	4 (24)‡
Originality/value of the paper§	1 (3)	0	1 (4)	0
Keywords	24 (83)	0	18 (75)	0
Conduct				
Cited a specific rapid review methodology	8 (28)	0	4 (24)	0
Results				
Risk of bias/critical appraisal results	12 (41)	1 (17)	1 (5)‡	4 (24)
Ease-of-access information				
Key findings/implications (set apart from text or in a box)	1 (3)	0	3 (13)	2 (12)
Applicability				
Limitations attributed to use of rapid review methodology	1 (3)	0	0	0
Recommendations for policy, practice, guidelines†	2 (7)‡	1 (17)	0‡	10 (59)

*Mention of any paper type, such as rapid review, evidence brief, systematic review.

†Item specified a priori (prior to data extraction).

‡Item not applicable to all rapid reviews.

§Specified as such in the article.

Table 21. Additional items in the main reports for journal-published and non-journal-published rapid reviews.

Item	2014, n (%)		2016, n (%)	
	Journal, n=29	Non-journal, n=18	Journal, n=24	Non-journal, n=20
Methods/Process				
Rapid review definition provided*	19 (66)	4 (22)	11 (46)	2 (10)
Analytical framework	1 (3)	2 (11)	3 (13)	4 (20)
Ethics statement (i.e., not required)	1 (3)	0	1 (4)	0
Conducted to meet a timeline*				
Timeframe reported	3 (17)	0	0	1 (5)
Indication, but timing NR	14 (48)	5 (28)	12 (50)	2 (10)
Citing specific rapid review methodology	15 (52)	2 (11)	13 (54)	2 (10)
Iterative process specified a priori*	0	0	1 (4)†	0†
Used reporting guideline*				
Named guidance	1 (3)	1 (6)	2 (8)	3 (15)
Only in relation to flow diagram	2 (7)	4 (22)	8 (33)	9 (45)
Interpretation/quality of evidence*	12 (44)‡	8 (47)	1 (5)	8 (40)
Change in methods from protocol*	3 (10)	3 (17)	0	0
End users				
End user involvement*	13 (45)	4 (22)	3 (13)	12 (60)
Consultation only	2	1	0	5
Conduct, decision-making	2	0	1	0
Both	9	3	2	7
Patient input	2 (7)	4 (22)	1 (4)	9 (45)
Intended users	1 (3)	5 (28)	1 (4)	10 (50)
Ease-of-access information				
Key findings (set apart from text)	2 (7)	3 (17)	7 (29)	0
Applicability				
Contextual implications: policy, practice, guideline perspective*	23 (82)‡	8 (44)	17 (77)	8 (40)
Recommendations provided*	9 (32)‡	2 (11)	5 (23)	3 (16)
Validity				
Whether SR should be conducted*				
Whether SR warranted				
Comparison with SR	0	0	3 (13)	1 (5)
suggested	0	0	1 (4)	0
Structured declarations, publication science				
Acknowledgements (non-author)	20 (69)	3 (17)	9 (38)	6 (30)
Link out to supplemental information or documents	3 (10)	10 (56)	10 (42)	14 (70)
Additional information on request	0	1 (6)	0	0
Conflicting/competing interests	25 (86)	2 (11)	18 (75)	6 (30)
Contributions of contributors	14 (48)	5 (28)	9 (38)	3 (15)
Ownership/disclaimer				
Copyright mark or information	21 (72)	14 (78)	21 (88)	16 (80)

Item	2014, n (%)		2016, n (%)	
	Journal, n=29	Non-journal, n=18	Journal, n=24	Non-journal, n=20
Disclaimer statement (evidence) *	0	9 (50)	1 (4)	14 (70)
Other disclaimer type (e.g., not representing views of the funder)	15 (52)	9 (50)	3 (13)	9 (45)
Other				
Guidance in relation to reporting	7 (24)	0	2 (8)	0

*Item specified a priori (prior to data extraction).

†One (journal-published) and two rapid reviews (non-journal-published) unclear on this item; not marked as reported.

‡Item not applicable to all rapid reviews.

Of interest was to collect information from within reports that would identify or distinguish it as a rapid review. Information may have come from various sources, such as a reported definition, statements of the methods used, reported limitations, or a disclaimer. We also collected whether a definition itself was reported. Frequency counts in Figure 35 are not mutually exclusive as a rapid review could have cited more than one reason.

Most frequently reported were rapid review definitions, providing citations to rapid review methodology, an indication that the report was conducted to meet an expedited timeline, an indication that the review is not comprehensive or exhaustive, specification or limitations in study designs included, used language limitations, a generic statement about limited searching, targeted or restricted search strategies, and used no or limited grey literature searching. In contrast, not self-identifying as rapid review was observed among non-journal-published rapid reviews. The journal-published reports in 2014 provided the most information.

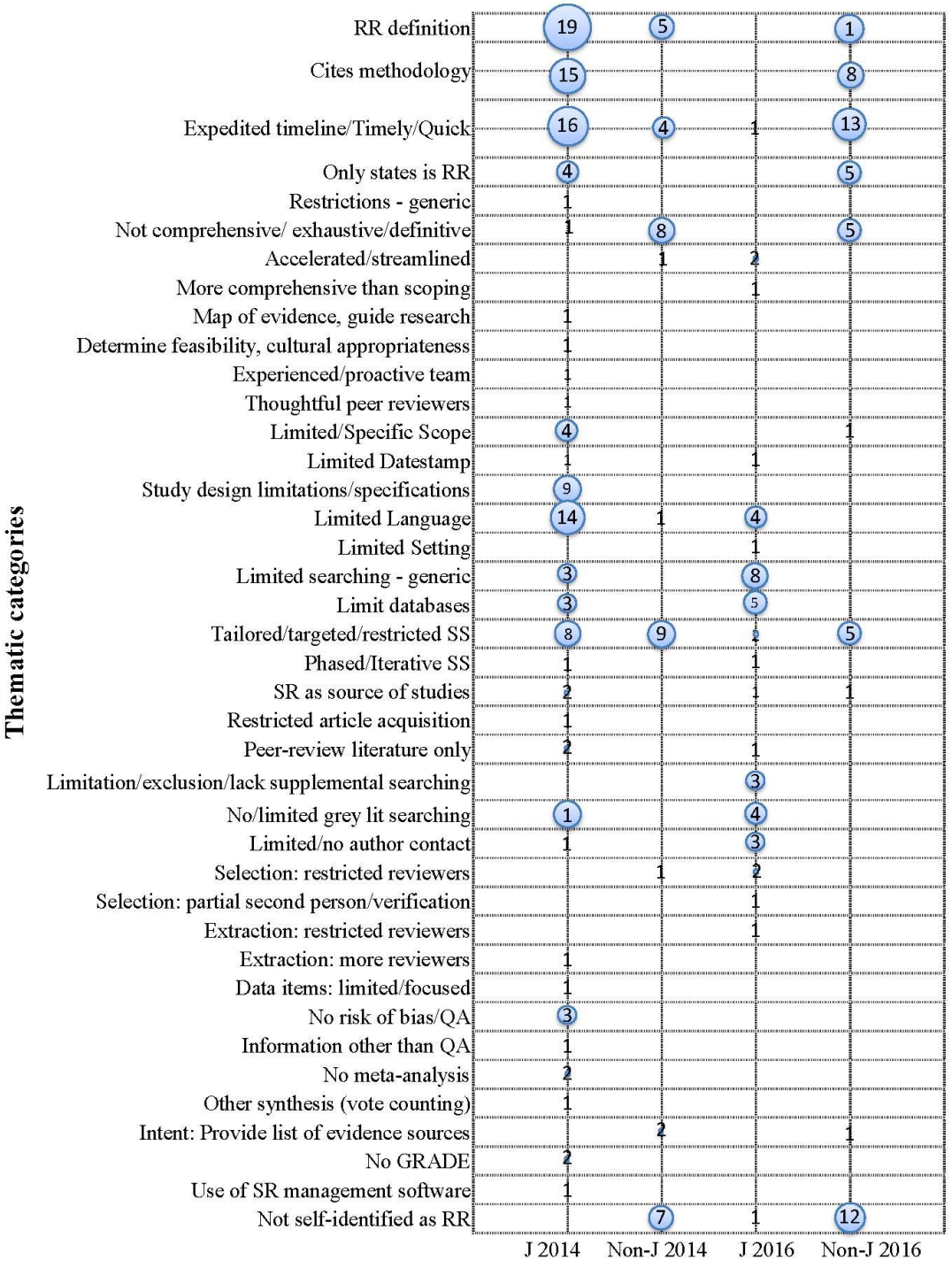

Figure 35. Bubble plot of report information that would identify or distinguish as a rapid review. J=journal; Non-J=non-journal; QA=quality assessment; RR=rapid review; SS=search strategy.

5 DISCUSSION

5.1 Overview

Reporting of the healthcare literature is a fundamental aspect of the research process. Complete and transparent reports help facilitate the use of the findings and adjudication of the validity of that work can be realized by various stakeholders, such as clinicians, patients, policy decision-makers, administrators, researchers, editors, and funders. Widely noted in the rapid review literature are issues of reporting and calls to make reporting transparent, especially given the varied approaches that exist to conduct rapid reviews. Reporting guidelines have emerged to remedy poor reporting of the scientific literature, and exploration of this in relation to rapid reviews was needed.

This thesis has demonstrated that no reporting guidelines exist for rapid reviews; has provided a case study example of a completely and transparently reported rapid review that required additional reporting considerations in context of its conduct; and has contributed empirical evidence that the poor reporting of rapid review reports, using PRISMA as a benchmark, is highly prevalent in the literature. Finally, a systematic review on the evaluations of reporting guidelines provides an important evidence base that can inform future work.

5.2 Reporting of rapid reviews

Like other research before it (12), the primary study investigation in this thesis showed that the reporting of rapid reviews is meager. Important aspects such as the process of study selection and data extraction, risk of bias assessments and methods, methods for synthesis, and biases across the body of evidence are infrequently reported. Complete reporting of individual study results was absent, and declarations of the limitations of the rapid review process were rare. In keeping with our research plan, we conducted statistical analyses on the pre-planned comparisons of interest. As shown with the study results, differences were not observed with most comparisons. For the one data set (PRISMA, 2014 publication year) with statistical significance, results may be spurious due to small sample size; the generalizability of this would need to be tested with a larger sample. The difference in the PRISMA 2014

analysis is due to a lower reporting in the non-journal-published group relative to the 2016 data; different in organizational representation and proportional contribution thereof is likely not the explanatory factor but difficult to assess given the small sample size. In this study we also explored use of a minimally important difference threshold; the poor reporting observed across the board did not lend to meeting the threshold. The threshold was not empirically derived but serves as starting place for future consideration as to what improvements, when observed, might be meaningful.

Patterns of reporting are similar to those reported by Kelly and colleagues (12), but the extent of poor reporting has been shown to be more serious in some domains with our analysis (Figure 36). To explore the difference in findings, we compared the citation representation between samples, focusing on the journal-published reports (Figure 37). About one-third of rapid reviews overlap between the analyses. Additional studies in the Kelly analysis (12) were rapid reviews of secondary evidence, rapid reviews published in the previous calendar year, and the inclusion of articles without eligible data. Some of the additional studies in our analysis were a series of related articles included by Kelly (12) as one study but analyzed here as separate articles because of differences in reporting. For another, the non-journal-published version was included in the Kelly analysis (12). Otherwise, the remaining ten additional articles in our analysis were either not located or not included in the Kelly analysis (12).

By way of trying to explain the higher frequency of reported items in the Kelly analysis (12), it is possible that reporting may be more complete with rapid reviews of secondary evidence, but, for face validity reasons in applying about one-third of the PRISMA items, we excluded rapid reviews of secondary evidence from our analysis. It is plausible that differences in the operationalization of the PRISMA items occurred between the two studies, especially since the assessments conducted in the Kelly study (12) were performed by one person. In conducting our study, we spent important time at the outset to develop operationalization criteria, based on the PRISMA Explanation and Elaboration guidance (116). We found that a few iterations were needed to refine the instructions; this allowed standardization in assessments to reduce the rate of disagreed ratings between reviewers. However, the overall message between the two studies is the same: poor reporting is widespread, which is wasteful scientifically, fiscally, and ethically.

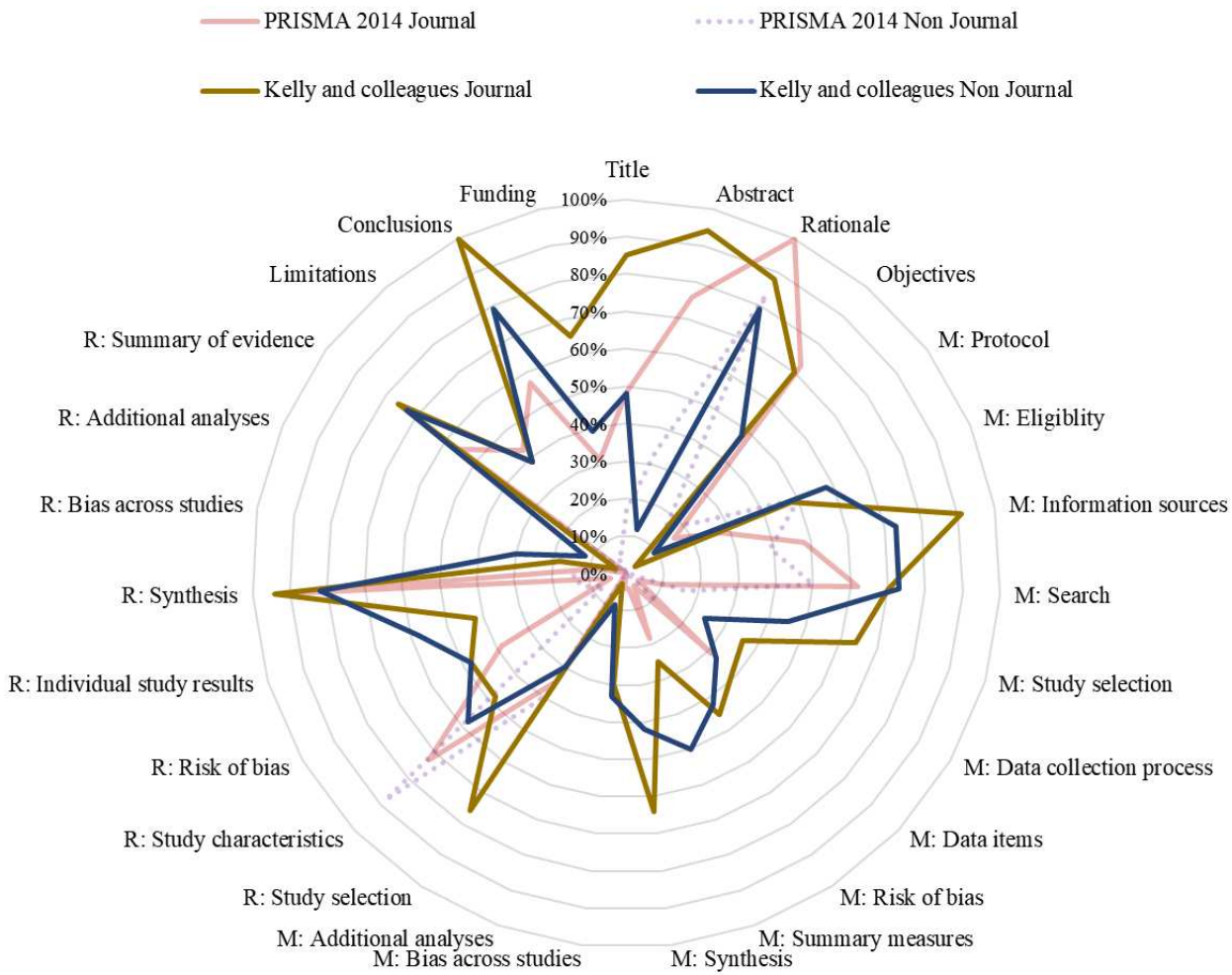

Figure 36. Comparison of by-item Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) assessments between Kelly 2016 (12) (2013-2014 publication year sample) and the present analysis (2014 publication year).

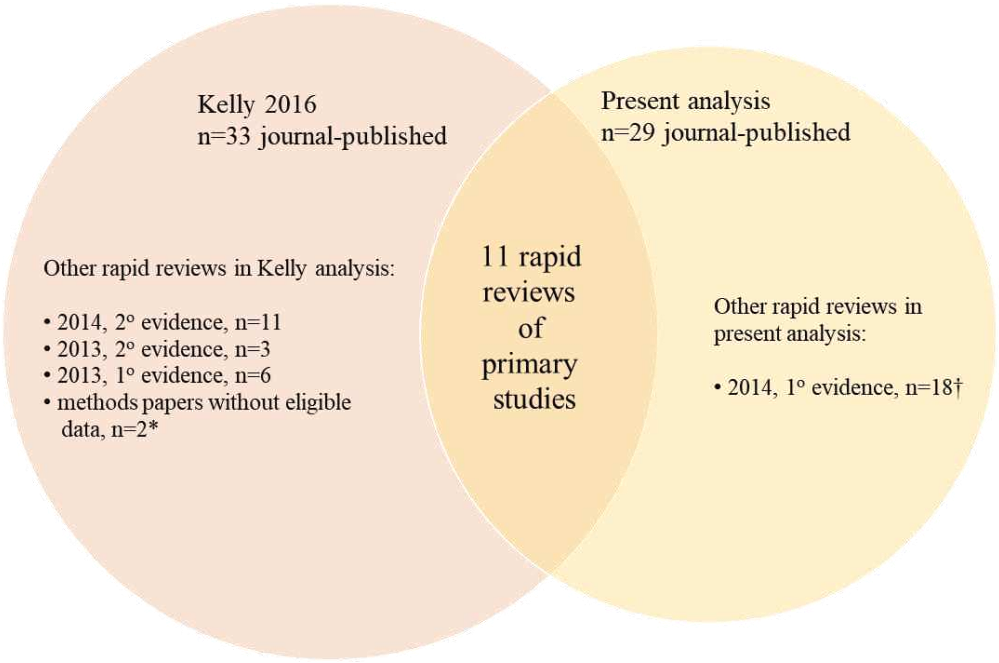

Figure 37. Citation representation of journal-published rapid review samples between the Kelly 2016 (12) (2013-2014 publication year) and the present analysis (2014 publication year).

*one paper included in present analysis but considered as a companion article.
†Includes an article series (n=8) grouped by Kelly (12) as one article, but each considered independently here due to different reporting of items across articles.

5.3 Reporting guideline considerations for rapid reviews

The Lancet published a five-article series on research waste in 2014 (398). The series authors address the pervasive issues of waste in the biomedical realm as a whole, one issue of which is the occurrence of incomplete or unusable reports (399). Among initiatives highlighted to facilitate better reporting was reporting guidelines. Within our analyses, we determined that many consensus-developed reporting guidelines exist, but none for rapid reviews. Although PRISMA may intuitively fill this need for rapid reviews of primary studies, we have shown that additional reporting items may need to be considered.

Providing a rapid review definition was one item we included in our rapid review on personal protective equipment for healthcare workers caring for Ebola patients. As outlined in the Introduction section of this thesis, rapid review conduct and processes varies widely, so we felt this would help to anchor the reader's understanding about the process undertaken. Further, we provided information on how the rapid review differed from a systematic review (e.g., limited extent of literature searching) and any restrictions or deviations in conduct or process relative to a systematic review process (e.g., limited acquisition of articles to institutional subscription and electronic availability) to further provide clarity. Additionally, the time frame to conduct the review helps to understand the context of time constraint that producers face to then made methodological decisions to complete the work.

Describing the nature and extent of involvement of commissioners, funders, patients, and other knowledge users during the conduct of the review provides transparency as to who was involved and at what phases, which may have implications for understanding both applicability as well as the potential for bias; to this, conflicts of interest declarations should be provided. The iterative or flexible nature of conduct, allowing for post hoc changes and decisions, is an important communication aspect for the reader; it can help them understand why and how decisions were made and any associated bias. Transparently declaring the limitations of the work and juxtaposing the work to that of systematic reviews would also be helpful to the reader.

The candidate and her collaborators are developing an extension of PRISMA tailored for rapid reviews of primary studies (PRISMA-RR) that will start consensus-building exercises in the autumn of 2018 (400). In keeping with recommended guidance for developing reporting guidelines, the process will involve Delphi consensus surveys with various informants and a series of web-facilitated discussion meetings among the development team. The examples of additional reporting items we used in the Ebola rapid review will need to be considered for inclusion in the checklist, along with those collected during the primary empirical study, and any other items nominated by informants and the development team. Concurrently, the PRISMA statement is being updated (PRISMA 2019), which will inform the development of PRISMA-RR.

The development of PRISMA-RR may need to consider additional aspects of its development that are potentially unique. One of these factors is consideration of the rapid review report format. Although we would suspect that the 'Introduction-Methods-Results-And-Discussion'

(IMRAD)-style structure of the PRISMA checklist will be preserved in the development of the extension, text accompanying the checklist to reassure readers that the location of reported items will not necessarily need to follow the checklist's structure may be prudent. Where tension exists for producers in meeting end users' needs for conciseness while staying true to complete reporting, PRISMA-RR developers may also need to consider the totality of complete reporting to extend beyond the bounds of one document, such as directly linking to additional documentation that provides a fulsome description of methods, process, and perhaps even findings to strike the right balance in meeting needs. Some rapid reviews are written in a 'graded-entry' format, whereby information is presented in a series of documents that become increasingly more detailed, such as the use of a 1:3:25 format consisting of a brief, one-page document of the main messages, a three-page executive summary, and a maximum 25-page full report and appendices (401); there may even need to be consideration made for such formats when developing PRISMA-RR.

5.4 Knowledge translation of reporting guidelines: what needs to be considered

For reporting guidelines, facilitating behaviour change in reporting is the end goal. To this, knowledge translation needs to be carefully considered. Dissemination, perhaps via journal publication, may seem like a natural and worthy approach. One design used in the literature is the comparison of complete reporting before and after the publication of a reporting guideline. However, as defined by the Canadian Institutes of Health Research, the crux of knowledge translation is that it is a move beyond the simple dissemination of knowledge into the actual use/implementation of knowledge (402). Little effort, though, is dedicated to implementation activities beyond that of the simple publication of a guideline.

In light of this, we evaluated implementation to the extent of considering journal endorsement of guidelines in our systematic review of reporting guideline evaluations. Although we identified a large number of reporting guidelines, very few evaluations of those reporting guidelines were located and provided information to enable an examination with respect to endorsement.

Evidence relating to CONSORT, STARD, MOOSE, QUOROM, and STROBE indicates that no standard way exists in which journals endorse reporting guidelines (403–406). Furthermore, other than including recommendations in their "Instructions to authors," few

journals declare their process for ensuring adherence to reporting guidelines; the American Journal of Orthodontics and Dentofacial Orthopedics is an example whereby journal associate editors, concurrently with peer review, check and provide feedback to authors on the reporting of randomized controlled trials according to the CONSORT checklist (407). This is a question of fidelity; the effect of endorsement is therefore plagued by different, and not well documented, processes as to the "strength" of endorsement. For example, some journals require a completed reporting guideline checklist as part of the manuscript submission, whereas others only suggest the use of reporting guidelines to facilitate writing of manuscripts. In both instances, whether or how journals check that authors adhere to journals' recommendations/requirements is not known. One strategy would be to encourage peer reviewers to check adherence to the relevant reporting guideline. A 2012 survey of journals' instructions to peer reviewers shows that reference to or recommendations to use reporting guidelines during peer review was rare (19 of 116 journals assessed) (408). When mentioned, instructions on how to use reporting guidelines during peer review were almost completely absent (408); most journals pointed to CONSORT but few other reporting guidelines. Specifically, surveys of journals' instructions to authors with respect to endorsement of CONSORT show that guidance is inconsistent and ambiguous and does not provide authors with a strong indication of what is expected of them in terms of using CONSORT during the manuscript submission process (403,404,409). Evidence from our systematic review and a similar CONSORT systematic review suggest much room for improvement in how journals seek to achieve adherence to reporting guidelines (132,133). Developers of reporting guidelines and editors could work together and agree on the optimal way to endorse and implement reporting guidelines across journals, thus bringing some standardization to the implementation process.

Evaluating the completeness of reporting of reporting guidelines in relation to journals' endorsement might seem straightforward. However, in reality, it is complex. One problem in approaching our analysis is that only three evaluations considered endorsement as the "intervention" of interest, of which two could be included in our quantitative analysis. As a result, we had to rework authors' data to facilitate the comparisons of interest and track down journals' endorsement information, requiring considerable time and effort. Evaluators of reporting guidelines, in general, have not considered endorsement as an "intervention" that has the potential to affect the completeness of reporting. Although evaluations in our systematic review do not provide conclusive evidence, the CONSORT review provides some

evidence that simple endorsement of reporting guidelines has the potential to affect the completeness of reporting (132,133). The emergence in recent years of artificial intelligence (AI) may also help to facilitate that process for journals; StatReviewer (http://www.statreviewer.com/) is an example of a software application that is integrated within Editorial Manager, the editorial management system used by about 6000 journals, and provides an automated scan and report for statistical approach and reporting against several reporting guidelines, such as CONSORT, STROBE, and STARD (410). It is conceivable that this software could be expanded to accommodate the forthcoming PRISMA-RR guideline. Penelope is another example of AI software that has emerged for manuscript checking and encourages the use of reporting guideline checklists (411), but does not, itself, provide a report on the completeness of reporting.

For rapid reviews, though, journal publication is uncommon relative to the large volume of grey literature reports, so alternative considerations are needed. Glasziou and colleagues (399) make three recommendations in relation to reducing waste from incomplete or unusable reports: instituting incentives, developing a reporting infrastructure, and building capacity. Within each of the recommendations, the authors provide sample solutions, such tying promotion to reporting activity, a principle also suggested in a publication by an expert panel on the hiring, promotion, and tenure decisions for scientists (412); making the receipt of research funds conditional on research registration to repositories such as PROSPERO; and improving the capability and capacity of researchers in reporting guidelines, publication ethics, and research integrity. Although recommendations may be geared to academic settings, there may be an opportunity, as well, for organizations that are not academically affiliated. Of note, very few of the non-journal-published rapid reviews in our sample had evident academic affiliations. They, too, could consider tying reporting efforts and activities to advancement. Instituting a quality control step, such as use of peer review, even if internal to the organization, would be beneficial. The potential for using applications such as StatReviewer (http://www.statreviewer.com/) might make the addition of this quality control step seem less onerous. Inviting those organizations to a discussion to receive their input on potential mechanisms to fulfill the Glasziou recommendations (399) might be a powerful means to facilitate knowledge exchange. Outreach and continued discussions will help to shape and test future implementation strategies.

5.5 Strengths and limitations of the research

5.5.1 Systematic review of reporting guidelines and evaluations

This is the first systematic review to comprehensively review a broad range of reporting guidelines. We sourced these reporting guidelines from the EQUATOR Network and another systematic review (104) characterizing known, high quality guidelines. Careful consideration was given to the parameters required to enable our comparisons of interest and made a considerable effort to locate evaluations, including the re-analysis of others' data.

As exemplified by the volume of literature we had to screen, searching is complex with methods reviews. No search filters or established bibliographic database-controlled vocabulary terms exist, especially for reporting guidelines. For many methods reviews, the particular studies of interest are often embedded in other studies. The time-consuming task of screening leads to a very low yield. Although systematic reviews are customarily current with the literature on publication, all such evidence pertains to comparative effectiveness reviews and not to methods reviews, such as ours. An updated search would yield more than 6000 records to be screened with a likely low yield of studies to include. We were aware of additional evaluations that have been published since the date of our literature search, and we have added these into our review. These additional studies have not led to a change in our conclusions. Other recently published articles did not meet our criteria (413–415). We do not believe that an updated search would identify sufficient additional studies to change our results.

We limited our inclusion to evaluations written in English or French. This may be a limitation of our work, but we are unclear as to how many evaluations might exist in other languages given that relatively fewer reporting guidelines are translated into other languages (https://www.equator-network.org/library/translations-of-reporting-guidelines/).

We did not include the main CONSORT reporting guideline here, and this decision was made after the initial protocol was written. The volume of evaluations for CONSORT is so large that we felt that detailed analysis would have overwhelmed the evidence from other reporting guidelines; furthermore, a systematic review solely evaluating the effect of CONSORT is available as recently as 2012 (132,133).

5.5.2 Methodological study on journal publication status and the completeness of reporting of rapid reviews using PRISMA and PRISMA for Abstracts

This methodological study contributes to the literature that has had very little empirical investigation. Guided by an a priori protocol, it used a comprehensive search approach and extensive grey literature searching to create a sample of internationally-produced rapid review to increase generalizability; however, we are aware that some rapid reviews are produced under proprietary arrangement (35), and it is unclear how well our results would generalize to those. Particular attention was given to the nature of the literature, employing a cluster sampling approach. This study also explored use of a minimally important difference in the interpretation of the results.

The search strategy was last executed 18 months prior to publication; however, methodological studies do not bear the same implications as that of systematic reviews that are used to inform patient care. Given the relatively few analyzable reports in the journal-published literature and the consistent poor reporting observed, it is unlikely that an updated literature search would change the findings in an appreciable way. Of exclusions, almost 180 citations were available in abstract form only, and so it is unknown whether those rapid reviews are systematically different in their reporting. Our results would not be generalizable to rapid reviews that solely included a reference list without a synthesis of the literature as well as rapid reviews that summarized abstracts. We considered systematic reviews conducted rapidly as meeting our definition but, for pragmatic reasons, could not screen a general search for systematic reviews to find additional ones that may have been conducted rapidly. Some of the rapid reviews may not have been considered as such by their producers but met our definition for inclusion.

5.6 Future research for the reporting of rapid reviews

The next logical step is the development of a reporting guideline for rapid reviews of primary studies, PRISMA-RR, for which plans are underway. Just as was undertaken in the PRISMA extension for diagnostic test accuracy studies (125), the PRISMA for Abstracts data will inform the development of PRISMA-RR. Particularly important will be the development of accompanying guidance as to how to use the checklist, which will also remind producers that

transparent reporting includes explicitly indicating when a checklist item (or aspect thereof) *was not* undertaken.

Subsequently, we plan to evaluate the reporting and develop a reporting guideline for rapid reviews of secondary evidence. To be determined is whether the two guidance sets will eventually be merged into one checklist, much like that of the STROBE checklist that has different considerations for some criteria according to study design (416). When developing guidance for rapid reviews, consideration will need to be paid to how information is packaged and how the complement of the minimum reporting standards will be handled if, for example, a graded entry format is used. This aspect of format is being addressed in a companion study (71), the results of which will be ready to inform the development of PRISMA-RR.

Given the state of science and with the methodological study serving as a form of replication of previous work, we do not recommend replicating empirical work on the reporting of rapid views of primary studies. With the forthcoming PRISMA-RR guideline, research funds would be better spent waiting to evaluate the implementation of the guideline. Time may also lend to a larger sample than what we were able to evaluate here. A recently published article evaluated the statistical power of over 136,000 randomized clinical trials between 1975 and 2014 found that some improvements have been made in conducting larger, better powered trials but found that the effect size remained the same (417). Providing rationale for the issues with small, underpowered trials, the main message from this study was to continue to implore researchers to design and conduct well-powered trials. Without evidence to the contrary, we would suggest the same for the development of methodological studies, to the best extent possible.

For evaluating the reporting guideline, ideal would to design a cluster randomized trial like the randomized trial conducted by Cobo and colleagues (418).

6 CONCLUSION

Reporting has shown to be inadequate in the health research literature, and reporting guidelines have been developed to help overcome those reporting deficiencies. Rapid reviews, a type of literature review conducted to locate evidence using, typically, modified systematic review methods to meet a certain timeline, are no exception.

The first part of thesis found that no reporting guideline exists for rapid reviews and explored what evaluations exist to facilitate a comparison of journal endorsement as a potential implementation strategy for reporting guidelines. Next, in context of an urgent public health decision-making situation, the development of a rapid review was used as a case study for a properly reported rapid review and additional reporting considerations were identified and deemed important to communicate the conduct of the rapid review. Finally, a primary methodological study was conducted to further the empirical evidence of rapid review reporting of PRISMA, with the added evaluation of PRISMA for Abstracts, the latter of which has not been undertaken in the literature to date.

Together these results show that the reporting of rapid reviews is poor, no reporting guideline exists to facilitate better reporting, and that a reporting guideline tailored to rapid reviews would accommodate additional reporting considerations.

Due to insufficient data, we were unable to test our hypothesis about the relation of journal endorsement to the completeness of reporting of health research. When conducting the rapid review, insufficient evidence existed to test the effectiveness of the various forms of personal protective equipment. In the primary study, although statistical significance was observed in one data set (PRISMA, 2014 rapid reviews), sample sizes were small. Reporting guidance needs to be developed and a determination of how best to implement the checklist in non-journal-published settings needs to be explored.

7 SAŽETAK

Naslov disertacije: Poticanje brze diseminacije znanja: razvoj smjernica za izvještavanje o brzim preglednim člancima

Brzi pregledni članci (engl. *rapid reviews*) novi su oblik sažimanja dokaza za odlučivanje u situacijama kad je potrebno brzo donošenje medicinskih odluka. Iako su do sada objavljivana istraživanja o brzim preglednim člancima, primjerice o načinu kako se koriste i o njihovim obilježjima, poznato je da je izvještavanje u takvim istraživanjima loše. U biomedicinskoj literaturi su razvijene brojne smjernice za izvještavanje kako bi se riješio problem lošeg izvještavanja u literaturi.

Cilj ove doktorske disertacije bio je pomoći istraživačkoj zajednici u razumijevanju načina izvještavanja u brzim preglednim člancima. Utvrdili smo da ne postoje smjernice za izvještavanje brzih preglednih članaka. PRISMA smjernice su pogodne kao početna točka za poticanje boljeg izvještavanja u brzim preglednim člancima, ali smo također utvrdili da bi PRISMA smjernice trebalo prilagoditi i proširiti kako bi se zadovoljili jedinstveni pristupi koji se koriste u provedbi brzih preglednih članaka.

Empirijskim istraživanjem, i dosljedno rezultatima ranije objavljenih znanstvenih radova, utvrdili smo da je izvještavanje u brzim preglednim člancima loše, čak možda i više nego što je ranije pokazano.

Kako bi brzi pregledni članci zadovoljili svoju primarnu svrhu – a to je donošenje važnih informacija za donošenje odluka u medicini i zdravstvu – njihovo izvještavanje se mora popraviti. Nužno je osmisliti smjernice za izvještavanje brzih preglednih članaka. Takve smjernice trenutno su u izradi. Vrlo je važno utvrditi kako na najbolji način primijeniti smjernice kako bi bile svrhovite, a za što osim CONSORT smjernica postoji vrlo malo dokaza. Urednike treba poticati na promoviranje smjernica za izvještavanje, primjerice kroz integraciju tih smjernica u uredničkiproces. Međutim, budući se većina brzih preglednih članaka obavlja izvan znanstvenih časopisa, nužno je podignuti svijest o važnosti dobrog izvještavanja takvih radova među organizacijama i autorima koji ih provode. Također će u budućnosti biti važno istražiti kako izgleda implementacija smjernica te kako se mogu prepoznati i riješiti potencijalne prepreke.

8 SUMMARY

Rapid reviews have emerged to collate evidence for decision-making circumstances that need timely access. While information about rapid reviews such as their uses and characteristics have been published, they are known to be poorly reported. Numerous reporting guidelines have been developed in the health care literature as problem-solving endeavours in relation to reporting.

The efforts of this dissertation have been undertaken to help and serve the research community to understand the state-of-science in relation to the reporting of rapid reviews. We have found that no reporting guidelines exist for rapid reviews. PRISMA serves as a good starting place to facilitate the reporting of rapid reviews but, through experience, we have found that PRISMA could be expanded to address unique aspects of rapid review conduct. We undertook an empirical study and, consistent with previously published work, found that rapid reviews are poorly reported, perhaps even more than previously shown.

If rapid reviews are to fulfill the purpose for which they are intended – to inform important healthcare and health systems decision-making – then reporting must improve. To leave otherwise would be unethical.

A reporting guideline needs to be developed to help rapid reviewers. Such work is underway and will be disseminated widely. Of importance is to determine how best to implement the guideline to ensure it serves its purpose, and little evidence, aside from the CONSORT guideline, exists to this regard. Encouraging journals to consider strong actions of endorsement, such as intentional integration during editorial review, will be an important message. However, for the majority of rapid reviews that are conducted outside of a journal-publication environment, outreach will need to take place to explore what implementation looks like and to identify and address any potential barriers.

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383. Diabetes Prevention Programs: Effectiveness and Value. Institute for Clinical & Economic Review (ICER); 2016.

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391. Ibrutinib (Imbruvica) for chronic lymphocytic leukemia/small lymphocytic lymphoma (previously untreated). pan-Canadian Oncology Drug Review (pCODR); 2016.

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10 APPENDICES

Appendices are posted online at:

http://www.mefst.unist.hr/studies/graduate-school/tribe/defended-theses/1812

or

http://www.mefst.unist.hr/studiji/doktorska-skola/tribe-607/tribe-doktorati/1809

11 RESUME

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RESEARCH INTERESTS

Systematic reviews; rapid reviews; scoping reviews; overviews of reviews; guideline development; reporting of healthcare research; bias in research; diagnostic test accuracy.

EDUCATION

In-progress	PhD Candidate, TRIBE Program (Epidemiology), University of Split, Croatia
2000	Master of Science (Biology), McMaster University, Canada
1997	Bachelor of Science, Biology (First Class Honours), Mount Allison University, Canada

EMPLOYMENT HISTORY

Ottawa Hospital Research Institute, Clinical Epidemiology (2011-present)

Scientific Lead, Ottawa Evidence Review Synthesis Centre to support the Canadian Task Force on Preventive Health Care

Clinical Research Manager / Senior Clinical Research Associate

Senior methodologist to provide scientific leadership on various knowledge synthesis products (e.g., systematic reviews, rapid reviews) and methods research projects as standalone publications or to directly support decision-making and guideline development.

Liaise with funding agencies, potential clients, and other internal and external collaborators. Provide consultancy support on methodology and strategic planning. Lead and contribute to grant applications. Develop and deliver training. Oversee staff. Manage project and program budgets.

Cochrane Canada, Institute of Population Health, University of Ottawa (2007-11)

Education Coordinator, Canadian Cochrane Centre. Led Cochrane Canada's multidisciplinary, nationwide author training program and developed the *Cochrane Canada Live!* webinar training series. Developed standard and customized training programs (including train-the-trainer) and delivered training in-person and online. Led Cochrane Canada award panels. Strategic planning.

Cochrane EPOC Review Group, University of Ottawa (2006)

Study Coordinator for *Rx for Change*, a database of overviews on EPOC-related reviews to promote evidence-based prescribing and medicines use.

McMaster University, Department of Clinical Epidemiology and Biostatistics (2002-5)

Research Coordinator, Cancer Care Ontario's Program in Evidence-based Care. Systematic reviews methodologist for hematology oncology clinical practice guidelines.

McMaster University, Department of Clinical Epidemiology and Biostatistics (2000-2)

Research Coordinator, Health Information Research Unit. Methodological appraisal and writing of structured summaries for the secondary journal publications *ACP Journal Club*, *Evidence-based Medicine*, *Evidence-based Nursing*, *Evidence-based Mental Health*.

PROFESSIONAL AND SCIENTIFIC ACTIVITIES

Consultant, Cochrane Public Health and Health Systems Network, 2018

Associate Editor (interim), Cochrane Brain, Nerves, Mind Network, 2018

Lecturer, Wilfred Laurier University, Master of International Public Policy, Canada, 2016-8

Co-Convenor, Cochrane Rapid Reviews Methods Group, 2015 to present

Associate Editor, Systematic Reviews, 2013 to 2016

Consultant, Ottawa Methods Centre, 2011 to present

Member, Cochrane Trainers' Network, 2011 to present

Member, Abstract Review Committee, 24th Cochrane Colloquium, 2016

Member, Cochrane Review of the Year Selection Committee, 12th Canadian Symposium, 2015

Member, Health Technology Assessment International, 2012-3

Member, AHRQ-EPC Reporting Bias Workgroup / Lead, Selective Reporting, 2011–2

Member, 9th Canadian Cochrane Symposium Scientific Committee, 2010

Member, 9th Canadian Cochrane Symposium Planning Committee, 2010

Lead, Cochrane Review of the Year Selection Committee, 9th Canadian Symposium, 2011

Lead, Cochrane Graduate Poster Prize Committee, 9th Canadian Symposium, 2011

Member, Cochrane Training Working Group Executive, 2009-11.

Member, 8th Canadian Cochrane Symposium Steering Committee, 2009-10

Member, Pan-Canadian Cochrane Library Task Force, 2009-10

Lead, Cochrane Review of the Year Selection Committee, 8th Canadian Symposium, 2010

Lead, Cochrane Graduate Poster Prize Committee, 8th Canadian Symposium, 2010

Member, 5th Canadian Cochrane Symposium Program Committee, 2006-7

Member, 5th Canadian Cochrane Symposium Registration Committee, 2006-7

Member, Hematology Cancer Disease Site Group, Cancer Care Ontario, 2002-5

Graduate Student Senator, McMaster University Senate, McMaster University, 1998 – 2000

PEER REVIEWED FUNDING

Granting Agency	Principal Investigator	Involvement	Amount	Funding Period	Project Title
CIHR	Brian Hutton	Co-Applicant	CAD$187,425	2018/4-2020/3	Updating Needs and Network Meta-analyses for the Canadian Guidelines for Chronic Rhinosinusitis
CIHR	Matthew McInnes	Co-Investigator	CAD$100,000	2017/4 – 2019/3	Development and implementation of a reporting guideline for systematic reviews and meta-analyses of diagnostic accuracy studies: The PRISMA-DTA Initiative
CIHR	Andrea Tricco	Co-Investigator	CAD$279,281	2016/7-2019/12	Systematic Prospective Assessment of Rapid Knowledge Synthesis – SPARKS Study
CIHR	David Moher	Co-Applicant	CAD$231,146	2015/7-2017/6	Getting knowledge now: are rapid reviews the way to go?

PUBLICATIONS

Journals, peer-reviewed

1. McInnes MDF, Moher D, Thombs BT, McGrath TA, Bossuyt PM; the PRISMA-DTA Group, Clifford T, Cohen JF, Deeks JJ, Gatsonis C, Hooft L, Hunt HA, Hyde CJ, Korevaar DA, Leeflang MM, Macaskill P, Reitsma JB, Rodin R, Rutjes AWS, Salameh JP, **Stevens A**, Takwoingi Y, Tonelli M, Weeks L, Whiting P, Willis BH. Preferred

Reporting Items for a Systematic Review and Meta-analysis of Diagnostic Test Accuracy Studies: The PRISMA-DTA Statement. JAMA 2018;319(4):388-96.

2. Moher D, Shamseer L, Cobey KD, Lalu MM, Galipeau J, Avey MT, Ahmadzai N, Alabousi M, Barbeau P, Beck A, Daniel R, Frank R, Ghannad M, Hamel C, Hersi M, Hutton B, Isupov I, McGrath TA, McInnes MDF, Page MJ, Pratt M, Pussegoda K, Shea B, Srivastava A, **Stevens A**, Thavorn K, van Katwyk S, Ward R, Wolfe D, Yazdi F, Yu AM, Ziai H. Stop this waste of people, animals and money. Nature 2017;549 (7670): 23-25.

3. Pussegoda K, Turner L, Garritty C, Mayhew A, Skidmore B, **Stevens A**, Boutron I, Sarkis-Onofre R, Bjerre LM, Hróbjartsson A, Altman DG, Moher D. Systematic review adherence to methodological or reporting quality. Systematic Reviews 2017;6:131.

4. Pussegoda K, Turner L, Garritty C, Mayhew A, Skidmore B, **Stevens A**, Boutron I, Sarkis-Onofre R, Bjerre LM, Hróbjartsson A, Altman DG, Moher D. Identifying approaches for assessing methodological and reporting quality of systematic reviews: a descriptive study. Systematic Reviews 2017;6:117.

5. Catalá-López F, **Stevens A**, Garritty C, Hutton B. Revisiones rápidas para la síntesis de la evidencia [Rapid reviews for evidence synthesis]. Medicina Clinica 2017;148(9): 424-8.

6. Garritty C, **Stevens A**, Gartlehner G, King V, Kamel C. Cochrane Rapid Reviews Methods Group to play a leading role in guiding the production of informed high-quality, timely research evidence syntheses. Systematic Reviews 2016;5:184.

7. Fitzpatrick EM, Hamel C, **Stevens A**, Pratt M, Moher D, Doucet SP, Neuss D, Bernstein A, Na E. Does sign language facilitate spoken language development for children with hearing loss? A systematic review. Pediatrics 2016;137(1):e20151974.

8. Hong CJ, Tsang AC, Quinn JG, Bonaparte JP, **Stevens A**, Kilty SJ. Anti-IgE monoclonal antibody therapy for the treatment of chronic rhinosinusitis: a systematic review. Systematic Reviews 2015;4(1):166.

9. Hersi M*, **Stevens A***, Quach P, Hamel C, Thavorn K, Garritty C, Skidmore B, Vallenas C, Norris SL, Egger M, Eremin S, Ferri M, Shindo N, Moher D. Effectiveness of personal protective equipment for healthcare workers caring for patients with filovirus disease: a rapid review. PLoS ONE 2015;10(10):e0140290. *contributed equally to this work.

10. Galipeau J, Pussegoda K, **Stevens A**, Brehaut JC, Curran J, Forster AJ, Tierney M, Kwok ESH, Worthington JR, Campbell SG, Moher D. Effectiveness and safety of short stay units in the emergency department: A systematic review. Academic Emergency Medicine 2015;22:893-907.

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21. Cheung MC, Haynes AE, **Stevens A**, Meyer RM, Imrie K, et al. Yttrium 90 ibritumomab tiuxetan in lymphoma. Leukemia Lymphoma 2006;47:967-77.

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23. **Stevens A** and Jacobs JR. Integrins regulate responsiveness to Slit repellent signals. Journal of Neuroscience 2002;22:4448-55.

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Reports

1. **Stevens A**, Garritty C, Hersi M, Moher D. Developing PRISMA-RR, a reporting guideline for rapid reviews of primary studies (protocol). EQUATOR Network. Available from: http://www.equator-network.org/wp-content/uploads/2018/02/PRISMA-RR-protocol.pdf

2. Garritty C, **Stevens A**, Hartling L, Stewart L, Tricco A, Welch V, Thavorn K, Pussegoda K, Hersi M, Monfaredi Z, Hamel C, Hutton B, Moher D. Taking a close look at the layout and content structure of journal published and non-journal published rapid review reports: protocol for a cross-sectional, methodological study. Available from: https://osf.io/29xvk/.

3. Garritty C, **Stevens A**, Hersi M, Monfaredi Z, Hamel C, Ahmadzai N, Nussbaumer-Streit B, Hutton B, Moher D. Assessing rapid reviews as an evidence product for policymakers: a protocol for a cross-sectional study. Available from: https://osf.io/68tj7/.

4. Hutton B, Forster A, **Stevens A**, Davies B, Chan J, Jennings A, McCurdy A, Garritty C. Patient navigation systems for coordination of patients with rare diseases or chronic disease multimorbidity: protocol for a scoping review. Available from: https://osf.io/gxf86/.

5. Hamel C, Groulx S, Doull M, Beck A, **Stevens A**, Skidmore B, Chatterjee A, Ferri L, Maziak D, Klarenbach S, Singh H, Thombs B, Wilson B, Ahmadzai N, Hutton B, Shea B, Belletrutti PJ, Targownik L, Limburg H, Rodin R,Little J, Moher D. Benefits and harms of treatment options for esophageal adenocarcinoma and precancerous conditions: a protocol for an overview of systematic reviews. Available from: https://osf.io/w675h/.

6. Barbeau P, **Stevens A**, Beck A, Skidmore B, Arnaout A, Brackstone B, Ginty A, Hey A, Hutton B, Shea B, Moher D, Little J. Part A: An Evidence report to inform an update of the Canadian Task Force on Preventive Health Care 2011 Guideline (Prepared by the Knowledge Synthesis Group, Ottawa Methods Centre, Ottawa Hospital Research Institute for the Canadian Task Force on Preventive Health Care under contract by the Public Health Agency of Canada). CTFPHC; October 2017.

7. **Stevens A**, Garritty C, Pussegoda K, Hartling L, Stewart L, Thavorn K, Tricco A, Welch VA, Moher D. Relation of the completeness of reporting of rapid reviews to journal publication status: protocol for a comparative, cross-sectional methodological study [Internet]. Open Science Framework; 2017. Available from: https://osf.io/2av37/

8. Barbeau P, Beck A, **Stevens A**, Pillay J, Skidmore B, Featherstone R, MacGregor T, Arnaout A, Brackstone M, Ginty A, Hey A, Kornecki A, Shea B, Hutton B, Hartling L, Moher D, Little J. Benefits and harms of breast cancer screening in women 40 years of age and older: protocol for a modified overview of reviews. PROSPERO 2017:CRD CRD42017051498 Available from http://www.crd.york.ac.uk/PROSPERO/display_record.asp?ID=CRD42017051498

9. Hamel C, Beck A, **Stevens A**, Skidmore B, Chatterjee A, James P, Maziak D, Bjerre LM, Coleman I, Shea B, Thavorn K, Hutton B, Thuku M, Whelan D, Little J, Moher D. Effectiveness of screening for esophageal adenocarcinoma and precancerous conditions (dysplasia and Barrett's esophagus) in patients with chronic gastroesophageal reflux disease with or without other risk factors: protocol for a systematic review. PROSPERO 2017:CRD42017049993 Available from http://www.crd.york.ac.uk/PROSPERO/display_record.asp?ID=CRD42017049993

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11. Quach P, **Stevens A**, Hersi M, Ghannad M, Ahmadzai N, Garritty C, Moher, D. Screening for Hereditary Haemochromatosis: External review against programme appraisal criteria for the UK National Screening Committee (UK NSC). Ottawa Hospital Research Institute, December 18, 2015.

12. Galipeau J, **Stevens A**, Moher D, Hutton B, Pussegoda K, Brehaut J, Curran J, Forster A, Tierney M, Kwok E, Ovens H, Worthington J, Campbell S. Effectiveness and safety of short stay units in the emergency department: a systematic review. PROSPERO 2014: CRD42014007184. Available from:

http://www.crd.york.ac.uk/PROSPERO/display_record.asp?ID=CRD42014007184#.U9Fc8ONdU9U

13. **Stevens A**, Hamel C, Garritty C. Do outcomes vary among different curricula or models of delivery for pre-licensure nursing education? A rapid review. Ottawa Hospital Research Institute, November 7, 2013.

14. Balshem H, **Stevens A**, Ansari M, Norris S, Kansagara D, Shamliyan T, Chou R, Chung M, Moher D, Dickersin K. Finding grey literature evidence and assessing for outcome and analysis reporting biases when comparing medical interventions: AHRQ and the Effective Health Care Program. Methods Guide for Comparative Effectiveness Reviews.(Prepare by the Oregon Health and Science University and the University of Ottawa Evidence-based Practice Centers under Contract Nos. 290-2007-10057-I and 290-2007-10059-I.) AHRQ Publication No. 13(14)-EHC096-EF. Rockville, MD: Agency for Healthcare Research and Quality. November 2013. www.effectivehealthcare.ahrq.gov/reports/final.cfm.

15. Ahmadzai N, Ansari M, Garritty C, Moher D, Selva A, Singh K, **Stevens A**, Yazdi F. Effects of performing complex pediatric intracavitary surgical procedures in specialized versus non-specialized centers in high risk children: Cochrane Response rapid review. Cochrane Response Rapid Review no.1.; April 12, 2013.

16. **Stevens A**, Ahmadzai N, Konnyu K, Moher D. What pre-operative rehabilitation interventions will improve pre- and post-operative outcomes in adult patients with arthritis who will undergo primary total knee arthroplasty? Ottawa Hospital Research Institute, December 2011.

17. Zaretsky Y, Crump M, Haynes AE, **Stevens A**, Imrie K, Meyer RM, and the Hematology Disease Site Group. Evidence based Series #6-14: Section 1. Treatment of acute myeloid leukemia in older patients: guideline recommendations. Report date: December 18, 2008.

18. Zaretsky Y, Crump M, Haynes AE, **Stevens A**, Imrie K, Meyer RM, and the Hematology Disease Site Group. Evidence based Series #6-14: Section 2. Treatment of acute myeloid leukemia in older patients: evidentiary base. Report date: December 18, 2008.

19. Zaretsky Y, Crump M, Haynes AE, **Stevens A**, Imrie K, Meyer RM, and the Hematology Disease Site Group. Evidence based Series #6-14: Section 3. Treatment of acute myeloid leukemia in older patients: EBS development methods and external review Process. Report date: December 18, 2008

20. Imrie K, **Stevens A**, Makarski J, Esmail R, Meharchand J, Meyer R, and the members of the Hematology Disease Site Group. Evidence-based Series #6-4: Section 1. The role of bisphosphonates in the management of skeletal complications for patients with multiple myeloma: a clinical practice guideline. Report date: March 12, 2007.

21. Imrie K, **Stevens A**, Makarski J, Esmail R, Meharchand J, Meyer R, and the members of the Hematology Disease Site Group. Evidence-based Series #6-4: Section 2. The role of bisphosphonates in the management of skeletal complications for patients with multiple myeloma: a systematic review. Report date: March 12, 2007.

22. Imrie K, **Stevens A**, Makarski J, Esmail R, Meharchand J, Meyer R, and the members of the Hematology Disease Site Group. Evidence-based Series #6-4: Section 3. The role of bisphosphonates in the management of skeletal complications for patients with multiple myeloma: guideline development and external review – methods and results. Report date: March 12, 2007.

23. Imrie K, Cheung MC, Haynes AE, **Stevens A**, Meyer R, and the members of the Hematology Disease Site Group. Evidence-based Series #6-8 Version 2.2005: Section 1. Rituximab in lymphoma and chronic lymphocytic leukemia: a clinical practice guideline. Report date: December 1, 2006.

24. Imrie K, Cheung MC, Haynes AE, **Stevens A**, Meyer R, and the members of the Hematology Disease Site Group. Evidence-based Series #6-8 Version 2.2005: Section 2. Rituximab in lymphoma and chronic lymphocytic leukemia: a systematic review. Report date: December 1, 2006.

25. Reece D, Imrie K, Smith CA, **Stevens A**, and the members of the Hematology Disease Site Group. Evidence-based Series #6-18: Section 1. Bortezomib in multiple myeloma and lymphoma: a clinical practice guideline. Report date: April 3, 2006.

26. Reece D, Imrie K, Smith CA, **Stevens A**, and the members of the Hematology Disease Site Group. Evidence-based Series #6-18: Section 2. Bortezomib in multiple myeloma and lymphoma: a systematic review. Report date: April 3, 2006.

27. Reece D, Imrie K, Smith CA, **Stevens A**, and the members of the Hematology Disease Site Group. Evidence-based Series #6-18: Section 3. Bortezomib in multiple myeloma and lymphoma: guideline development and external review – methods and results. Report date: April 3, 2006.

28. Walker I, Makarski J, **Stevens A**, Meyer RM, and the members of the Hematology Disease Site Group. Practice Guideline Report #6-15. Treatment of chronic myeloid leukemia with imatinib. Report date: July 16, 2004.

Manual Chapters

1. King VJ, Garritty C, **Stevens A**, Nussbaumer-Streit B, Hartling L, Harrod CS, Guise J-M, Kamel C. Performing rapid reviews. In: Tricco AC, Langlois EV, Straus SE, editors. Rapid reviews to strengthen health policy and systems: a practical guide. Geneva: World Health Organization; 2017. Licence: CC BY-NC-SA 3.0 IGO. Available from: http://www.who.int/alliance-hpsr/resources/publications/rapid-review-guide/en/.

PRESENTATIONS

Academic courses

1. Wilfred Laurier University. Master of International Public Policy. Lecturer for course IP605: Interdisciplinary Seminar in Global Governance. Critical appraisal primer: Systematic reviews & Cochrane. *Waterloo, 30 January 2018*.

2. Wilfred Laurier University. Master of International Public Policy. Lecturer for course IP605: Interdisciplinary Seminar in Global Governance. Critical appraisal primer: Systematic reviews & Cochrane. *Waterloo, 25 January 2017*.

3. Wilfred Laurier University. Master of International Public Policy. Lecturer for course IP644: Interdisciplinary Seminar in Global Governance. Critical appraisal primer: Systematic reviews & Cochrane. *Waterloo, 2 March 2016*.

Workshops and Webinars

1. Rapid reviews workshop. Université Laval. *Quebec. 24-25 May 2017.*
2. Developing timely evidence summaries for decision makers. *24th Cochrane Colloquium. Seoul, 23 October 2016.*
3. Rapid reviews programs and methods research: description and discussion of the experiences from among Convenors of the Cochrane Methods Rapid Reviews Group. *24th Cochrane Colloquium. Seoul, 24 October 2016.*
4. The Knowledge Synthesis Platform: Rapid reviews workshop. University of Manitoba. *Winnipeg, 25-26 February 2016.*
5. Rapid reviews training stream as part of Putting Evidence Into Practice workshop. *University of Alberta. Edmonton, 23-25 November 2015.*
6. Rapid review workshop: timely evidence synthesis for decision-makers. *23rd Cochrane Colloquium. Vienna, October 2015.*
7. Using the Cochrane RCT "Risk of bias" tool in systematic reviews. *23rd Cochrane Colloquium. Vienna, October 2015.*
8. What are Cochrane Systematic Reviews? Introductory Cochrane Knowledge Translation Workshop for Balsillie School of International Affairs. *Waterloo, February 2015.*
9. Cochrane Standard Author Training Workshop. Teaching session: Review Manager 5. *Ottawa, January 2014.*
10. Introduction to rapid reviews. *Cochrane Canada webinar. 30 January 2014*
11. Introduction to Systematic Reviews and Risk of Bias. *Workshop for the Ottawa Hospital Research Institute Clinical Research Training Course, October 2012.*
12. Introduction to Systematic Reviews and Risk of Bias. *Workshop for the Ottawa Hospital Research Institute Clinical Research Training Course, October 2011.*

13. Primer to Systematic Reviews. *Seminar for Improving Quality and Patient Safety: The Physician Leadership Program. The Ottawa Hospital / University of Ottawa, September 2011.*

14. Cochrane Thursdays in June, an introductory review author training webinar series. Teaching sessions: Introduction to the Cochrane Collaboration and systematic reviews; learn and search *The Cochrane Library*; brief overview of the steps of conducting a Cochrane review. *Four-part webinar series, June 2011.*

15. Applying Evidence in Practice series. Co-led teaching session: Evidence quality is important: a critical appraiser primer. *Webinar for the Canadian Physiotherapy Association, May 2011.*

16. Ontario Chiropractic Association / Cochrane Training Series 2: Your head start to authoring a Cochrane review. Teaching sessions: Introduction to Cochrane Collaboration and defining research questions; systematic literature searching and study selection; and data extraction and planning data analysis. *Three-part webinar series broadcast from Ottawa, April-May 2011.*

17. Cochrane Canada Webinar Orientation for Trainers. A train-the-trainer initiative to build capacity among Cochrane Canada groups, Iberoamerican Cochrane Centre staff, and PAHO/WHO staff to conduct training via an e-learning platform. *Webinar broadcast from Ottawa, April 2011.*

18. Cochrane Standard Author Training Workshop. Teaching sessions: Critical appraisal and the Risk of Bias Tool, Review Manager 5. *Presymposium workshop for the 9th Canadian Cochrane Symposium, Vancouver, February 2011.*

19. Cochrane Canada's Train the trainer workshop for Cochrane author training. Teaching sessions: Research question and protocols, Data extraction, Ongoing trainer support. *Conducted for The Canadian Cochrane Centre, Ottawa, June 2010.*

20. Cochrane Standard Author Training Workshop. Teaching sessions: Overview of Cochrane and systematic reviews, Research question and protocols, Critical appraisal and the Risk of Bias Tool, Data extraction, Review Manager 5. *Presymposium workshop for the 8th Canadian Cochrane Symposium, Ottawa, May 2010.*

21. Review Manager 5 (two-part series). *Canadian Cochrane Network and Centre's Fall 2009 Research Webinar Series, October 2009.*

22. Review Manager 5 (two-part series). *Canadian Cochrane Centre's Review Manager 5 Webinar Training, August 2009.*

23. Review Manager 5 (two-part series). *Canadian Cochrane Centre's Review Manager 5 Webinar Training, July 2009.*

24. Tapping into Cochrane: How can an evidence-based approach support you in your practice? Teaching session: AMSTAR for appraising systematic reviews. *Preconference workshop for the Canadian Association of Occupational Therapists Annual Conference, June 2009.*

25. Cochrane Standard Author Training Workshop. Teaching sessions: Overview of Cochrane and systematic reviews, Study selection, Critical appraisal and the Risk of Bias Tool, Data extraction, Review Manager 5, Question development consultation. *Invited workshop for the Pan American Health Organization / World Health Organization, El Paso, April 2009.*

26. Cochrane Systematic Review Workshop: Introduction to Methodology. *Invited workshop for Vulnerable Populations, Safe Environments Program, Health Canada. April 2009.*

27. Cochrane Standard Author Training Workshop. Teaching sessions: Summary of findings and GRADE, Completing Your Review, Review Manager 5. *Presymposium workshop for the 7th Canadian Cochrane Symposium, Halifax, March 2009.*

28. Cochrane Advanced Training on Review Manager 5. *Presymposium workshop for the 7th Canadian Cochrane Symposium, Halifax, March 2009.*

29. Cochrane Standard Author Training Workshop. *McMaster University, April 2007.*

30. Cochrane Standard Review Author Training Workshop. Teaching sessions: Overview of Cochrane and systematic reviews, research question and protocols, study selection, methodologic appraisal, data extraction, completing your review. *Presymposium workshop for CADTH's Invitational Symposium, April 2007.*

31. Cochrane Standard Author Training Workshop. Teaching session: Review Manager 5. *Presymposium workshop for the 5th Canadian Cochrane Symposium, Ottawa, February 2007.*

Other presentations and co-authored works

1. Rapid reviews: terminology, methodology, and potential utility for Cochrane. Panel presentation. *23rd Cochrane Colloquium. Vienna, 7 October 2015.*

2. Hersi M, **Stevens A**, Quach P, Hamel C, Thavorn K, Garritty C, Skidmore B, Vallenas C, Norris SL, Egger M, Eremin S, Ferri M, Shindo N, Moher D. Rapid review on the effectiveness of personal protective equipment for healthcare workers caring for patients with filovirus disease. Oral presentation. *23rd Cochrane Colloquium. Vienna, 5 October 2015.*

3. Tsang AC, Hong CJ, Quinn J, Bonaparte J, **Stevens A**, Kilty AJ. Anti-IgE monoclonal antibody therapy for the treatment of chronic rhinosinusitis: a systematic review. Poster presentation. *American Academy of Allergy Asthma & Immunology 2015 Annual Meeting. Houston, 20-24 Feb 2015.*

4. **Stevens A**, Hamel C, Garritty C, Brown J, Cruickshank C, Macmillan K, O'Neill ML, Walls C, Collier G. For baccalaureate nursing education, do outcomes vary among different curricula or models of delivery? A rapid review. Poster presentation. *CADTH Rapid Review Summit: Then, Now, and in the Future. Vancouver, 3-4 Feb 2014.*

5. Effectiveness of personal protective equipment for healthcare workers caring for patients with filovirus disease: a rapid review. Oral presentation. *WHO Guidelines Development Group meeting on Personal Protective Equipment in the Context of Filovirus Disease Outbreak Response, Geneva, 6-7 Oct 2014.*

6. Hong CJ, Tsang AC, Quinn J, Bonaparte J, **Stevens A**, Kilty SJ. Anti-IgE monoclonal antibody therapy for the treatment of chronic rhinosinusitis: a systematic review. Poster presentation. *Canadian Society of Allergy and Clinical Immunology Annual Scientific Meeting, Ottawa, October 2014*.

7. Young M, **Stevens A**. Effectiveness of Brief Interventions as Part of the Screening Brief Intervention and Referral to Treatment (SBIRT) Model for Reducing the Non-Medical Use of Psychoactive Substances: a Systematic Review. Oral presentation. *3rd Substance Abuse Prevention & Treatment Initiative Workshop, Ottawa, January 2013.*

8. **Stevens A**, Grimshaw J, Cuervo LG. Cochrane Canada Live: Webinars for Cochrane and beyond. Oral presentation. *Cochrane Canada 9th Annual Symposium, Vancouver, February 2011.*

9. **Stevens A**, Grimshaw J, Cuervo Amore LG. *Cochrane Canada Live*: webinars to benefit the Collaboration and beyond. Oral presentation. *Abstracts of the Joint Cochrane and Campbell Colloquium. October 18-22, 2010, Keystone, USA. Cochrane Database of Systematic Reviews, Supplement 2010: Art No.: CD000002. DOI:10.1002/14651858.CD000002*

10. **Stevens, A**. Cochrane Canada Live: webinars to benefit the Collaboration and beyond. Oral presentation. *Institute of Population Health Research Coordination Meeting, Ottawa, Canada, September 2010.*

11. **Stevens, A**. eLearning and Webinars. Oral presentation. *Cochrane Training Working Group Meeting, Oxford, United Kingdom, April 2010.*

12. **Stevens A**, Pardo Pardo J, Ambriz Irigoyen L, Cumpston M, McDonald S. Integrating collaborative eLearning with Cochrane face-to-face training. Poster presentation. *17th Cochrane Colloquium, Singapore, October 2009.*

13. Grimshaw J, **Stevens A**, Mayhew A, Leslie B. Changing Professional Behaviour: An Updated Overview of Systematic Reviews. Oral presentation. *7th Canadian Cochrane Symposium, Halifax, Canada, March 2009.*

14. Mayhew A, Santesso N, **Stevens A**, Weir M, Leslie B, Grimshaw J. Working Partnerships: Cochrane and CADTH Creating Tools for Decision Makers. Oral presentation. *7th Canadian Cochrane Symposium, Halifax, Canada, March 2009.*

15. Grimshaw J, Mayhew A, **Stevens A**, Leslie B. Changing Professional Behaviour: An Updated Overview of Systematic Reviews. Poster presentation. *Canadian Association of Health Services and Policy Research, Gatineau, Canada, May 2008.*

16. Grimshaw J, Mayhew A, **Stevens A**, Graham S. Changing Professional Behaviour: An Updated Overview of Systematic Reviews. *Canadian Cochrane Symposium, Edmonton, Canada, March 2008.*

17. Grimshaw J, Mayhew A, **Stevens A**, Graham S. Changing professional behaviour: an updated overview of systematic reviews. *XV Cochrane Colloquium Sao Paulo, Brazil, October 2007.*

18. Santesso N, **Stevens A**, Mayhew A, Ryan R, Hill S, Grimshaw J. Cochrane Inside: Working with a national agency to create tools for decision makers. *XV Cochrane Colloquium Sao Paulo, Brazil, October 2007.*

19. Grimshaw J, Mayhew A, **Stevens A**, Graham S. Changing Professional Behaviour: An Updated Overview of Systematic Reviews. *4th Annual G-I-N Conference, Toronto, Canada, August 2007.*

20. **Stevens, A**. Capacity building activities at The Canadian Cochrane Network and Centre. Oral presentation. *5th Canadian Cochrane Symposium, Ottawa, Canada, February 2007.*

21. Grimshaw J, **Stevens A**, Schaafsma M. Le Réseau francophone Cochrane. Oral presentation (in French). *2006 XIV Cochrane Colloquium, Dublin, Ireland, October 2006.*

22. **Stevens AL**, Wilczynski NL, McKibbon KA, Haynes RB. Mapping the medical literature for high quality studies and reviews for age-specific clinical specialties. Poster presentation. *25th American Medical Informatics Association Annual Symposium, Washington, USA, November 2001.*

23. **Stevens A** and Jacobs JR. Functional interaction of slit with integrin. Poster presentation. *41st Annual Drosophila Research Conference, Pittsburgh, USA, March 2000.*

24. Battye R, **Stevens A**, Jacobs JR. Slit contributes to axon guidance at the midline of the *Drosophila* CNS. Poster presentation. *Cold Spring Harbor Symposium, New York, USA, September 1998.*

25. **Moroz A**, Kaczmarska I, Clair T. Effect of UV-B radiation on motile behaviour of a freshwater diatom. Poster presentation. *35th Northeast Algal Symposium. Woods' Hole, USA, April 1996.*