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REVIEW

Rapid reviews of medical tests used many similar methods to systematic reviews but key items were rarely reported: a scoping review

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Abstract

Background and Objectives: Rapid reviews provide an efficient alternative to standard systematic reviews in response to a high priority or urgent need. Although rapid reviews of interventions have been extensively evaluated, little is known about the characteristics of rapid reviews of diagnostic evidence.

Study Design and Setting: We performed a scoping review for rapid reviews of medical tests published from 2013 to 2018. We extracted information on review characteristics and methods used to assess the evidence.

Results: We identified 191 rapid reviews. All reviews were developed within a short time (less than 12 months) and were relatively concise (less than 10 pages). The reviews involved multiple index tests (44%), multiple outcomes (88%), and several test applications (29%). Well-known methodological tailoring strategies were infrequently used. Although reporting of several key features was limited, we found that, in general, rapid reviews have similar characteristics to broader knowledge syntheses.

Conclusion: Our scoping review is the first to describe the characteristics and methods of rapid reviews of diagnostic evidence. Future research should identify the most appropriate methods for performing rapid reviews of medical tests. Standards for reporting of rapid reviews are needed.

Keywords: Rapid reviews; Medical tests; Review methods; Scoping review; Health-technology assessment; Knowledge synthesis

1. Introduction

The accurate and unbiased assessment of the value of health care−related tests and diagnostic strategies (i.e., medical tests) in existing clinical pathways has emerged as a critical issue for health care decision-making, mostly driven by the pace of technological advancement in recent years [1,2]. Standard systematic reviews (SRs) have been the leading approach for the formal evaluation of the

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What is new?

Key findings

- Our scoping review identified 191 rapid reviews of medical tests from 15 countries published between 2013 and 2018.
- Most rapid reviews were broad in scope and assessed multiple index tests, outcomes, and test applications. In general, well-known methodological tailoring strategies, such as setting limits for literature searching by date or language or searching a single database, were rarely used.
- Information about parallelization of tasks and the use of automated approaches was infrequently reported.

What this adds to what was known?

- Rapid reviews of medical tests have many of the same characteristics and use similar methods as those of standard systematic reviews. However, we found that several critical items for rapid reviews were infrequently reported.

What is the implication and what should change now?

- Standards for reporting of rapid reviews are needed. Those standards would cover the essential items that should be included in every rapid review.
- Further research should inform the most appropriate methods for performing rapid reviews of medical tests.

quality, extent, and effects of health care evidence [3–5], and evidence regarding the use of medical tests is no exception [6–8]. The process of performing and maintaining SRs on diagnostic tests has been developed and standardized in past years, including methods for searching for studies, study selection, quality assessment, and data synthesis [2,9–11].

The conduction of SRs involves considerable time and resources that might not be available in sensitive clinical scenarios, such as emergencies or disease outbreaks [12]. Recently, Beese et al. estimated that the probability of completing an SR of diagnostic test accuracy in 24 months was less than 10%, increasing to 33% if reviewers invested twice the time in its development [13]. In such situations, rapid reviews (RRs) have emerged as a pragmatic and efficient alternative to speed up the evidence synthesis process. In comparison to SRs, RRs take less time to perform by increasing the intensity of work using methodological tailoring (review shortcuts) and by automating review tasks to streamline the process [6,14–16]. Two examples of RRs developed within time constraints are the RRs performed by Ismail et al. on the challenges to disease surveillance in the context of the crisis in Syria and the RR developed by Banbury et al. on the impact of e-health for rural residents developed in Australia, both developed in less than 7 weeks [17,18].

At present, there is no commonly accepted definition for RRs [14,19,20]. In their analysis of rapid assessment products, Hartling et al. concluded that an RR is "true" when evidence synthesis is carried out to provide an answer about the direction of the evidence collected, and, if possible, the strength of these findings, while meeting important time constraints [14,19,21]. Methods to enhance the timeliness of these knowledge syntheses can be classified into four categories: (1) those limiting the range of populations, interventions, and outcomes assessed (narrow the scope); (2) those increasing the intensity of the work on review processes (parallelization of tasks); (3) those focusing on methodological tailoring of SR steps according to the needs of decision-makers (review shortcuts); and (4) those using new technologies to fast track SR steps (automated steps) [1,12].

The assessment of diagnostic evidence to inform policy decisions presents some particular challenges in comparison with intervention evidence. Reviews for diagnostic test accuracy should specify the purpose (application) and role of the test and its placement in the clinical pathway. In comparison with intervention reviews, the statistical aspects of diagnostic accuracy reviews are more challenging, often requiring hierarchical models for meta-analysis. To our knowledge, a comprehensive review of RRs for medical tests has not yet been performed.

In this scoping review, we aimed to identify recently published RRs of medical tests and to describe their characteristics and methods. This exploration may also help identify shortcomings of current RRs and needs for future research.

2. Methods

2.1. Protocol and registration

The protocol for this review was published on the Open Science Framework platform for public consultation [22]. Authors of the review drafted, revised, and approved this document for publication.

2.2. Eligibility criteria

We included reports fulfilling all of the following criteria:

- Reports defined by the review authors as a "rapid review" of the evidence. In the case of reports defined only as a rapid product or a rapid assessment, we applied the definitions of Hartling et al. and selected

as eligible those classified as "True Rapid Review" [14,21].
- Reports that evaluated a health care–related test or diagnostic test strategy for any purpose and in any setting.
- Reports published from 2013 to 2018 to reflect methods in current use by RR developers.

We searched for RRs without language restriction. We excluded states of the art, evidence inventories, or rapid responses (following the definition of Hartling et al. [14,21]), original versions of updated RRs, and manuscripts unavailable as full-text articles when requested by our review team.

2.3. Information sources

We searched for eligible RRs as follows:

2.3.1. Searching institutional websites and repositories

We conducted a manual search of public repositories belonging to members of the International Network of Agencies for Health Technology Assessment (INAHTA), World Health Organization (WHO) Collaborating Centres on Health Technology Assessment (HTA), and Health Technology Assessment International Network (HTAi; nonprofit members). In addition, we screened the Regional Database of Health Technology Assessment reports in Americas (RedETSA/BRISA) and the EUnetHTA's Assessment Rapid Relative Effectiveness Assessments (REA) repositories and archives. This manual search was conducted in September 2018.

2.3.2. Searching electronic databases

We searched MEDLINE-OVID 1946 to present, EMBASE (Elsevier), the Cochrane Library, and LILACS in September 2018. An experienced librarian developed the search strategies for each indexed database, including a combination of controlled vocabulary and other related search terms and filters to retrieve RRs (Appendix 1).

2.4. Selection of sources of evidence

One review author examined institutional repositories for RRs and those who were deemed potentially eligible were downloaded for further assessment. When these documents were unavailable because of restrictions, we requested permission to access them from their respective institutions. Four review authors confirmed the final eligibility for each RR. In addition, for the electronic searches, two review authors first screened records based on title and abstract and then confirmed eligibility after reviewing full-text articles. We resolved all disagreements by discussion.

2.5. Data charting process

One review author extracted data in a standardized format for each RR on the following features: general characteristics of the review, the research question, index test(s), target condition(s), application(s) of the test, and preplanned outcome(s). In addition, we extracted information on key RR strategies reported in the literature: narrowing the scope, parallelization of tasks, review shortcuts, and automated approaches [16,20,23]. Four different review authors confirmed data extraction for 10% of the included reviews. We resolved all disagreements by discussion. We used operational definitions of variables to standardize data extraction (Appendix 2). Because no RRs reported the length of time to develop the review, we estimated the duration using either the date of the last search strategy and the publication date for reviews published on public repositories or the date of the last search strategy and the submission date for reviews published in peer-reviewed journals [24].

2.6. Synthesis of results

We analyzed the information descriptively using STATA 15.0.

3. Results

3.1. Selection of sources of evidence

3.1.1. Institutional websites and repositories

We screened 74 institutional repositories and two regional databases/archives. We found no information on RRs of medical tests in 57 institutional repositories. The remaining 19 institutional archives provided 394 rapid evidence syntheses for further classification. After applying the selection criteria, we included 181 RRs of medical tests from 14 institutions (Figure 1).

3.1.2. Electronic databases

We identified 4,323 citations after removing duplicates. After screening by title and abstract, we selected 16 full-text articles for review, of which 10 met the criteria for inclusion. We did not identify any additional duplicates after combining information from all sources. In total, we included 191 unique RRs in the review (Figure 1).

3.2. Synthesis of results

3.2.1. Characteristics of included rapid reviews

RRs were developed by teams in 15 countries on four continents (three countries in America, 10 in Europe, one in Asia, and one in Australia). In three countries (Argentina, Australia, and Canada), more than two teams/institutions were involved in developing RRs. Forty-seven RRs (24.6%) were published in 2014. Review authors used different terms to describe the RRs including "Rapid review," "Rapid assessment," "Rapid systematic review," "Rapid report," "Valutazione rapida" (Italian), "Rapid HTA report," "Brief report," "Revisión sistemática rápida" (Spanish), "Informe de respuesta rápida"

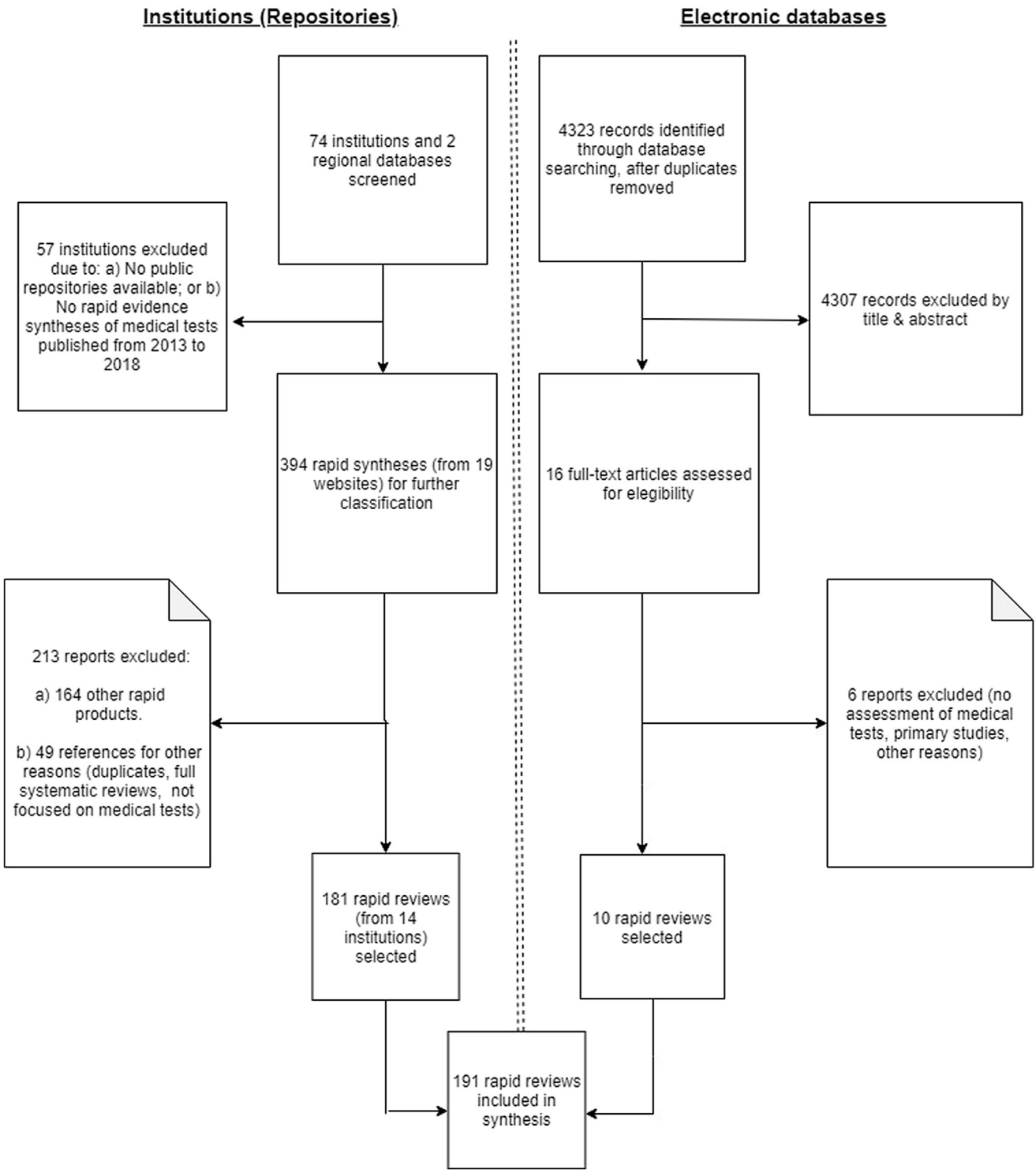

Fig. 1. Study flow diagram: manual search of institutional repositories + electronic databases search.

(Spanish), ''Scoping report,'' and ''revisões rápidas de avaliação tecnológica em saúde'' (Portuguese).

The number of review authors involved in the development of RRs ranged from 1 to 17. For RRs published in institutional repositories, the median number of authors was seven (interquartile range [IQR] 3 to 9 authors), similarly for those published in journals (median of authors, 7; IQR, 3 to 8). Forty-three RRs (22.5%) were developed by nine authors, whereas 30 (15.7%) were produced by seven authors. For RRs published in a public repository, the estimated median production time was 2 months (IQR, 1 to 6.8 months), and for 41 RRs (21.4%) was

1 month. For RRs published in journals, the estimated median production time was 8 months (IQR, 2.8 to 12.5 months). We were unable to estimate the production time for 96 RRs.

The structure of the review team was generally poorly reported. Twelve reviews (6.2%) reported a review coordinator or head of the team and 26 reviews (13.6%) reported the involvement of one or two information specialists. No review explicitly reported the participation of methodologists specialized in diagnostic evidence, statisticians, or patients. Nineteen RRs (9%) reported that the intended audience was decision-makers belonging to their local health care system. The person commissioning the review was mentioned in 46 reviews (24%). However, no review explicitly reported involving the person commissioning the RRs in its development.

RRs ranged in length from 2 to 120 pages (median length, 8 pages; IQR, 6 to 12 pages). The main findings (excluding the cover page, references, and appendices) were reported in 10 pages or less for 122 reviews (63.8%). In addition, 48 RRs (25.1%) reported an external peer-review process involving two or more experts, whereas 37 reviews (19.3%) explicitly reported asking for comments and suggestions from the public to incorporate in the final report.

3.2.2. Issues regarding the scope of the RRs

Only 81 RRs (42%) provided explicit information about the population, index test, comparisons, and outcomes in a structured format (i.e., a PICO question) (Table 1). Most reports concerned information about patients with a specific target condition or disease. The target conditions most commonly reported were cancer and blood disorders ($n = 25$), neurological disorders ($n = 21$), and gastrointestinal diseases ($n = 20$).

Thirty-five reviews (18.3%) assessed the evidence for two or more index tests and 50 reviews (26.1%) for an unclear number of tests, described as a set of tests or tools (e.g., genetic panels, biomarkers, screening tools). The most commonly intended outcome was resource requirements ($n = 139$; 72.7%), followed by effectiveness and safety ($n = 134$; 70.1%), accuracy ($n = 124$; 64.9%), and guideline recommendations ($n = 124$; 64%). Sixty-eight reviews (35.6%) assessed more than three outcomes. Forty-nine RRs (25.6%) appraised evidence on accuracy, effectiveness and safety, resource requirements, and recommendations in the same report (Table 1).

None of the included RRs described the clinical pathway, in particular, the role of the test, reference standard, or prior tests. Fifty-six RRs (29.3%) evaluated more than one application for the index tests; the most frequently reported were diagnosis (ruling in), followed by treatment monitoring and screening or surveillance (Table 1).

3.2.3. Issues regarding parallelization of tasks

A considerable number of reviews did not provide information about the methods or researchers performing study selection or data extraction (Table 2). Of those reviews reporting information ($n = 68$), 57 RRs involved a single review author for citation screening and study selection. Only 10 reviews reported the number of authors involved in data extraction (Table 2).

In addition, 182 RRs (95%) did not provide information about the process used to assess the methodological quality of included studies, although 77 reviews (40%) reported that they used a risk of bias checklist (Table 2). The quality

Table 1. Characteristics of the scope of included rapid reviews

Rapid reviews' scope	Count (%)
PICO question	81 (42.0)
Target conditions	
Cancer and blood	25 (13.0)
Neurology	21 (10.9)
Digestive disorders and gastrointestinal diseases	20 (10.4)
Index test	
Single test	106 (55.5)
Two tests or more	35 (18.3)
Unclear (set of tests)	50 (26.2)
Preplanned outcomes	
Resource requirements	139 (72.7)
Effectiveness/safety	134 (70.1)
Accuracy	124 (64.9)
Recommendations	124 (64.9)
Prediction/prognosis	31 (16.2)
Values and preferences	9 (4.7)
Number of outcomes to be assessed	
1	21 (11.0)
2	38 (19.9)
3	63 (33.0)
More than 3	68 (35.6)
Combination of outcomes	
Accuracy + effectiveness/safety + resource requirements + recommendations	49 (25.6)
Accuracy + resource requirements + recommendations	17 (8.9)
Effectiveness/safety + resource requirements + recommendations	16 (8.3)
Accuracy + effectiveness/safety + resource requirements	10 (5.2)
Effectiveness/safety + resource requirements	10 (5.2)
Application of the test	
Diagnosis (ruling in)	120 (62.8)
Treatment monitoring	33 (17.2)
Screening or surveillance	28 (14.6)
Grading and staging	23 (12.0)
Risk assessment and classification	20 (10.4)
Determining prognosis	18 (9.4)
Treatment triage	13 (6.8)
Ruling out disease/condition	1 (0.5)

Rapid reviews could have more than one preplanned outcome or application.

Table 2. Rapid review methods identified from data sources

Rapid review method	Count (%)
Nature of the evidence included under findings	
Systematic reviews	139 (72.7)
Clinical practice guidelines	118 (61.7)
Observational studies (other than accuracy studies)	93 (48.6)
Health Technology Assessment (HTA) reports	73 (38.2)
Primary accuracy studies	68 (35.6)
Randomized controlled trials	63 (32.9)
Economic studies	49 (25.6)
Qualitative studies	5 (2.6)
Unclear	3 (1.5)
Limits on the search	
Limit by language (English-only)	84 (43.9)
Limit by date	72 (37.6)
Limit by database (Medline or PubMed)	45 (23.5)
Limit by using filters	27 (14.1)
Update of an existing full systematic review	10 (5.2)
Limit by outcome	5 (2.6)
Limit by country	2 (1.0)
No supplementary searches	10 (5.2)
Selection of studies	
One reviewer	57 (29.8)
Two reviewers, nonindependent	2 (1.0)
Two reviewers, independent	9 (4.7)
Not reported	123 (64.3)
Data extraction	
One reviewer	4 (2.0)
Two reviewers, nonindependent	2 (1.0)
Two reviewers, independent	4 (2.0)
Not reported/not applicable	181 (94.7)
Quality appraisal	
One reviewer	2 (1.0)
Two reviewers, independent	3 (1.5)
Not reported/NA	182 (95)
Type of synthesis	
Narrative summary	184 (96.3)
Meta-analysis	7 (3.6)
GRADE approach	33 (17.2)

Abbreviation: GRADE, Grading of Recommendations, Assessment, Development and Evaluation.

appraisal tool most frequently reported was the Assessing the Methodological Quality of Systematic Reviews (AMSTAR-I) checklist [25,26] (n = 31), followed by the Appraisal of Guidelines Research and Evaluation (AGREE) checklist [27] (n = 22), and the Quality Assessment of Diagnostic Accuracy Studies (QUADAS I/II) tool [28,29] (n = 19). Fifty-four RRs also used other alternative quality assessment tools, including the Scottish Intercollegiate Guidelines Network (SIGN) checklists, the tools developed by the Critical Appraisal Skills Programme (CASP), and the Drummond's checklist for assessing economic evaluations.

3.2.4. Issues regarding rapid review shortcuts

Seventy-two percent of the reviews included evidence from an existing SR to answer the review question. Other common sources of evidence were clinical practice guidelines and observational studies (e.g., case series, concordance studies, or cohorts estimating risk) (Table 2). Thirty-four RRs (17.8%) based their conclusions only on a previous evidence synthesis (i.e., SRs, clinical practice guidelines, economic studies, or health technology assessment reports).

Regarding the literature search, 76 reviews (39.7%) did not limit their searches. For the remaining RRs, the most frequently applied limit was language, English-only (Table 2). For those reviews limiting by date (n = 72), thirty-two (50%) limited the search to the last 5 years, whereas 22 (32%) limited it to the previous 10 years. Focused internet searches and checking of reference lists were additional resources frequently used by review authors (n = 145; 75.9%). In addition, 133 RRs (69.6%) used specialized search engines, such as the Centre for Reviews and Dissemination database and the Cochrane Library or Trip Database.

Most RRs (n = 184; 96.3%) reported their findings in a narrative summary. Thirty-three reviews (17.2%) explicitly mentioned the use of the Grading of Recommendations, Assessment, Development and Evaluation (GRADE) approach to assess the certainty of the evidence.

3.2.5. Issues regarding automated approaches

No reviews reported the use of new technologies, such as machine learning or algorithms, for any of the steps involved in the development of the RRs.

4. Discussion

To our knowledge, this is the first review that attempts to explore the characteristics and methods used in the production of RRs of medical tests. We aimed to analyze whether well-known mechanisms to enhance the timeliness of RRs (i.e., narrowing the scope, parallelization of tasks, using review shortcuts, and automating review steps) are being used in the development of RRs of medical tests. We identified a considerable number of RRs (n = 191), mostly published on institutional websites and developed by different teams globally. Previous reviews of RRs identified a small proportion of reviews on diagnostic evidence, of which most included only accuracy outcomes [16,24].

We found that RRs were typically developed by large teams (median 7 authors), produced relatively quickly (in less than 12 months), and concisely written (less than ten pages). These findings are consistent with the requirement

of timeliness and feasibility of a rapid product [1,5]. However, due to poor reporting, we were unable to assess whether the team structure and its dynamics affected the development of these RRs, specifically whether the project involved highly trained staff, a feature for developing RRs that has been previously suggested [19].

Beyond the description of the main characteristics of RRs, our scoping review aimed to assess the use of mechanisms and strategies recommended for the development of RRs [12]. One of these strategies is limiting the extent of the review scope because a broader scope requires comprehensive and consistent review methods (i.e., a standard full systematic review) [21]. However, we observed that RRs addressed multiple elements in their scope, such as several index tests and different scenarios for test application. Moreover, we expected that the authors of RRs would consider only a limited number of outcomes (e.g., accuracy) [30], but instead, we found that they commonly included multiple outcomes. We also found that narrowing the scope of the review was infrequently used in the development of RRs of medical tests.

Using review shortcuts to abbreviate steps in the review process is another suggested method for streamlining development of RRs, including the use of a single database, limiting electronic searches, and omitting a search of the gray literature [16,20,23]. However, we found that these review shortcuts were not generally applied in our set of RRs, including setting limits by date and language [16,20,23]. The narrative report of findings (i.e., the omission of a meta-analysis) was the only shortcut widely used, which is in agreement with previous assessments of rapid synthesis products [16,20,23].

Unfortunately, we found a lack of reporting of key methods, including study selection, data collection, and quality appraisal. Thus, we were unable to assess whether mechanisms such as parallelization of tasks or automated approaches were put into practice to speed up preparation of these reviews.

Despite shortfalls in reporting, we observed that RRs of medical tests have characteristics similar to those in SRs, such as searching multiple electronic databases, the inclusion of evidence from primary studies, and the use of additional sources of evidence. Despite this, most RRs included in our scoping review explicitly alerted the reader to the limitations of their review owing to the rapid approach used.

Strengths of our review include the large number of RRs of medical tests identified and published in different countries and continents. We also used a strict definition of RRs (i.e., True Rapid Review), which excludes other rapid products of knowledge synthesis but is the most comparable synthesis to an SR [21]. Our methodological approach has been previously used in other reviews assessing methods for the development of RRs [16,20]. However, our review has several limitations. Selection of RRs was limited to reports available in the public domain, and we cannot guarantee that we found all RRs of medical tests. We also did not attempt to contact institutions without public repositories to collect additional information. Moreover, most of our findings came from five institutions that published 87% of the RRs assessed in our study. It is also important to note that most RRs were developed for Health Technology Assessment agencies. This might explain the broad scope previously described, which frequently included an extensive assessment of resource requirements.

One conclusion of our study is the need for the standardization of RRs reporting to enhance transparency of methods used for these rapid products. In 2016, Kelly et al. found that several key issues were poorly reported in a selection of RRs, including protocol registration, the process of data collection, methods used for assessing the risk of bias, time for completion, and the reporting of individual risk of bias assessment [24]. Standardized guidelines for adequate reporting of RRs would be helpful to determine the adequacy of the methods and the extent of the limitations on the review conclusions. We are aware that some efforts to develop the PRISMA for RRs of interventions are currently underway (https://osf.io/t54fv/).

Our scoping review also shows the need for additional research regarding which methods are appropriate for RRs of medical tests. One example is the suitability of a narrow scope. If a mixture of evidence is needed to fulfill stakeholder needs and narrowing the scope is not an option, the remaining mechanisms suggested to streamline the review process need to be carefully assessed. For a more in-depth investigation, our team will be conducting an international survey to investigate stakeholders' and developers' views on RRs of medical tests. In addition, we will explore potential challenges and discuss the implications for further development of RRs of diagnostic tests with experts in the field [31]. This information will be used in a research program to identify the most appropriate methodological framework for conducting RRs for diagnostic evidence, to be used by developers, stakeholders, and decision-makers in the future.

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Supplementary data

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References

[1] Tricco AC, Langlois EV, Straus SE, editors. Rapid reviews to strengthen health policy and systems: a practical guide. Geneve: World Health Organization; 2017.

[2] Mustafa RA, Wiercioch W, Falavigna M, Zhang Y, Ivanova L, Arevalo-Rodriguez I, et al. Decision making about healthcare-related tests and diagnostic test strategies. Paper 3: a systematic review shows limitations in most tools designed to assess quality and develop recommendations. J Clin Epidemiol 2017;92:29−37.

[3] Murad MH, Asi N, Alsawas M, Alahdab F. New evidence pyramid. Evid Based Med 2016;21(4):125−7.

[4] Schunemann HJ, Mustafa R, Brozek J, Santesso N, Alonso-Coello P, Guyatt G, et al. GRADE Guidelines: 16. GRADE evidence to decision frameworks for tests in clinical practice and public health. J Clin Epidemiol 2016;76:89−98.

[5] Tricco AC, Zarin W, Ghassemi M, Nincic V, Lillie E, Page MJ, et al. Same family, different species: methodological conduct and quality varies according to purpose for five types of knowledge synthesis. J Clin Epidemiol 2018;96:133−42.

[6] Moher D, Stewart L, Shekelle P. All in the family: systematic reviews, rapid reviews, scoping reviews, realist reviews, and more. Syst Rev 2015;4:183.

[7] Deeks J, Bossuyt P, Gatsonis CE. Cochrane handbook for systematic reviews of diagnostic test accuracy. London: The Cochrane Collaboration; 2010.

[8] McInnes MDF, Moher D, Thombs BD, McGrath TA, Bossuyt PM, Clifford T, et al. Preferred reporting items for a systematic review and meta-analysis of diagnostic test accuracy studies: the PRISMA-DTA statement. JAMA 2018;319:338−96.

[9] Mustafa RA, Wiercioch W, Arevalo-Rodriguez I, Cheung A, Prediger B, Ivanova L, et al. Decision making about healthcare-related tests and diagnostic test strategies. Paper 4: international guidelines show variability in their approaches. J Clin Epidemiol 2017;92:38−46.

[10] Schunemann HJ, Mustafa RA, Brozek J, Santesso N, Bossuyt PM, Steingart KR, et al. GRADE Guidelines: 22. The GRADE approach for tests and strategies - from test accuracy to patient important outcomes and recommendations. J Clin Epidemiol 2019;111:69−82.

[11] Schunemann HJ, Mustafa R, Brozek J, Santesso N, Alonso-Coello P, Guyatt G, et al. GRADE Guidelines: 16. GRADE evidence to decision frameworks for tests in clinical practice and public health. J Clin Epidemiol 2016;76:89−98.

[12] Langlois EV, Straus SE, Antony J, King VJ, Tricco AC. Using rapid reviews to strengthen health policy and systems and progress towards universal health coverage. BMJ Glob Health 2019;4(1):e001178.

[13] Beese S, Harris B, Davenport C, Mallet S, Takwoingi Y, Deeks JJ, editors. The first ten years of Cochrane DTA reviews: progress and common methodological challenges. Abstracts of the 25th Cochrane Colloquium. Edinburgh, UK: Cochrane Database of Systematic Reviews; 2018.

[14] Hartling L, Guise JM, Kato E, Anderson J, Aronson N, Belinson S, et al. EPC methods: an exploration of methods and context for the production of rapid reviews. Research white paper. Rockville (MD): Agency for Healthcare Research and Quality; 2015.

[15] Khangura S, Konnyu K, Cushman R, Grimshaw J, Moher D. Evidence summaries: the evolution of a rapid review approach. Syst Rev 2012;1:10.

[16] Polisena J, Garritty C, Kamel C, Stevens A, Abou-Setta AM. Rapid review programs to support health care and policy decision making: a descriptive analysis of processes and methods. Syst Rev 2015;4:26.

[17] Ismail SA, Abbara A, Collin SM, Orcutt M, Coutts AP, Maziak W, et al. Communicable disease surveillance and control in the context of conflict and mass displacement in Syria. Int J Infect Dis 2016;47:15−22.

[18] Banbury A, Roots A, Nancarrow S. Rapid review of applications of e-health and remote monitoring for rural residents. Aust J Rural Health 2014;22(5):211−22.

[19] Hartling L, Guise JM, Hempel S, Featherstone R, Mitchell MD, Motu'apuaka ML, et al. Fit for purpose: perspectives on rapid reviews from end-user interviews. Syst Rev 2017;6(1):32.

[20] Tricco AC, Antony J, Zarin W, Strifler L, Ghassemi M, Ivory J, et al. A scoping review of rapid review methods. BMC Med 2015;13:224.

[21] Hartling L, Guise JM, Kato E, Anderson J, Belinson S, Berliner E, et al. A taxonomy of rapid reviews links report types and methods to specific decision-making contexts. J Clin Epidemiol 2015;68:1451−1462.e3.

[22] Arevalo-Rodriguez I, Moreno-Nunez P, Gonzalez Peña LM, Buitrago-Garcia D, Tricco AC, Zamora J. Rapid reviews addressing diagnostic issues: a scoping review of published reports-OSF Protocol. Available at http://cort.as/-Rd_7. Accessed September 26, 2019.

[23] Abou-Setta AM, Jeyaraman MM, Attia A, Al-Inany HG, Ferri M, Ansari MT, et al. Methods for developing evidence reviews in short periods of time: a scoping review. PloS One 2016;11:e0165903.

[24] Kelly SE, Moher D, Clifford TJ. Quality of conduct and reporting in rapid reviews: an exploration of compliance with PRISMA and AMSTAR guidelines. Syst Rev 2016;5:79.

[25] Shea BJ, Hamel C, Wells GA, Bouter LM, Kristjansson E, Grimshaw J, et al. AMSTAR is a reliable and valid measurement tool to assess the methodological quality of systematic reviews. J Clin Epidemiol 2009;62:1013−20.

[26] Shea BJ, Reeves BC, Wells G, Thuku M, Hamel C, Moran J, et al. Amstar 2: a critical appraisal tool for systematic reviews that include randomised or non-randomised studies of healthcare interventions, or both. BMJ 2017;358:j4008.

[27] Brouwers MC, Kerkvliet K, Spithoff K, Consortium ANS. The AGREE Reporting Checklist: a tool to improve reporting of clinical practice guidelines. BMJ 2016;352:i1152.

[28] Whiting PF, Rutjes AW, Westwood ME, Mallett S, Deeks JJ, Reitsma JB, et al. QUADAS-2: a revised tool for the quality assessment of diagnostic accuracy studies. Ann Intern Med 2011;155:529−36.

[29] Whiting PF, Weswood ME, Rutjes AW, Reitsma JB, Bossuyt PN, Kleijnen J. Evaluation of QUADAS, a tool for the quality assessment of diagnostic accuracy studies. BMC Med Res Methodol 2006;6:9.

[30] Bossuyt PM, Reitsma JB, Linnet K, Moons KG. Beyond diagnostic accuracy: the clinical utility of diagnostic tests. Clin Chem 2012;58:1636−43.

[31] Arevalo-Rodriguez I, Tricco AC, Steingart KR, Nussbaumer-Streit B, Kaunelis D, Alonso-Coello P, et al. Challenges of rapid reviews for diagnostic test accuracy questions: a protocol for an international survey and expert consultation. Diagn Prognostic Res 2019;3(1):7.