Research White Paper

EPC Methods: An Exploration of Methods and Context for the Production of Rapid Reviews

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The information in this report is intended to help health care decisionmakers—patients and clinicians, health system leaders, and policy makers, among others—make well-informed decisions and thereby improve the quality of health care services. This report is not intended to be a substitute for the application of clinical judgment. Anyone who makes decisions concerning the provision of clinical care should consider this report in the same way as any medical reference and in conjunction with all other pertinent information (i.e., in the context of available resources and circumstances presented by individual patients).

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Preface

The Agency for Healthcare Research and Quality (AHRQ), through its Evidence-based Practice Centers (EPCs), sponsors the development of evidence reports and technology assessments to assist public- and private-sector organizations in their efforts to improve the quality of health care in the United States. The reports and assessments provide organizations with comprehensive, science-based information on common, costly medical conditions and new health care technologies and strategies. The EPCs systematically review the relevant scientific literature on topics assigned to them by AHRQ and conduct additional analyses when appropriate prior to developing their reports and assessments.

To improve the scientific rigor of these evidence reports, AHRQ supports empiric research by the EPCs to help understand or improve complex methodologic issues in systematic reviews. These methods research projects are intended to contribute to the research base in and be used to improve the science of systematic reviews. They are not intended to be guidance to the EPC program, although they may be considered by EPCs along with other scientific research when determining EPC program methods guidance.

AHRQ expects that the EPC evidence reports and technology assessments will inform individual health plans, providers, and purchasers and the health care system as a whole by providing important information to help improve health care quality. The reports undergo peer review prior to their release as a final report.

We welcome comments on this Methods Research Project. They may be sent by mail to the Task Order Officer named below at: Agency for Healthcare Research and Quality, 540 Gaither Road, Rockville, MD 20850, or by e-mail to epc@ahrq.hhs.gov.

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Key Informants

In designing the study questions, the EPC consulted several Key Informants who represent the end-users of research. The EPC sought the Key Informant input on the priority areas for research and synthesis. Key Informants are not involved in the analysis of the evidence or the writing of the report. Therefore, in the end, study questions, design, methodological approaches, and/or conclusions do not necessarily represent the views of individual Key Informants.

Key Informants must disclose any financial conflicts of interest greater than $10,000 and any other relevant business or professional conflicts of interest. Because of their role as end-users, individuals with potential conflicts may be retained. The TOO and the EPC work to balance, manage, or mitigate any conflicts of interest.

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EPC Methods: An Exploration of Methods and Context for the Production of Rapid Reviews

Structured Abstract

Objectives. To characterize rapid reviews and similar products, to understand the context in which rapid products are produced (e.g., end-users and purposes for rapid products), to understand methodological guidance and strategies used to make products rapid and describe how these differ from systematic review (SR) procedures, and to identify empiric evidence on the impact of methodological approaches on their reliability and validity.

Methods. We searched the literature to identify rapid review methods, empiric evidence on rapid review methodology, and methodological guidance. We conducted interviews with members of organizations known to produce rapid reviews to characterize the types of rapid products produced and to understand the context and uses for rapid products, identify current practices, and understand the evolution of their programs and products.

Results. We identified 36 examples of rapid products produced by 20 organizations with production time ranging from 5 minutes to 8 months.

We categorized rapid products into four groups based on the extent of synthesis: (1) ”inventories” list what evidence is available, and other contextual information needed to make decisions, but do not synthesize the evidence or present summaries or conclusions; (2) ”rapid responses” present the end-user with an answer based on the best available evidence (usually guidelines or SRs), but do not attempt to formally synthesize the evidence into conclusions; (3) ”rapid reviews” perform a synthesis (qualitative and/or quantitative) to provide an answer about the direction of evidence and possibly the strength of evidence; (4) “automated approaches” use databases of extracted study elements and programming to generate meta-analyses in response to user-defined queries.

Methodological approaches identified for rapid products include: searching fewer databases; limited use of grey literature; restricting the types of studies included (e.g., English only, most recent 5 years); relying on existing SRs; limiting full-text review; limiting dual review for study selection and/or data extraction; limiting data extraction; limiting risk of bias assessment or grading; minimal evidence synthesis; providing nominal conclusions or recommendations; and limiting external peer review. As the timeframes for products lengthened many limitations were lifted; however, there were still restrictions on database searching, inclusion, extent of data extraction, and dual review. With lengthened production time, there was more often risk of bias assessment, evidence grading, and external peer review.

Key informant interviews demonstrated that the essence of rapid products differs from that of SRs: key differences include the close relationship with the end-user and focus on helping a specific end-user make a specific decision in an identified timeframe. Because there may not be lead time before the review is needed and the end-user may need the review urgently, maintaining a highly skilled staff is critical to organizational readiness to produce rapid reviews. Having few and/or narrow questions (e.g., emerging technologies, single interventions, specific populations) was also necessary.

There is almost no empiric evidence directly comparing results of rapid products with SRs. One report suggested there may not be any impact; however, it focused on surgical interventions

and may not be generalizable to other clinical specialties or health care fields in which rapid products or SRs are conducted.

Conclusions. Rapid products have tremendous methodological variation. Overall, they vary on two important dimensions that are captured by the term "rapid review": the timeframe for completion and extent of synthesis. The similarity of rapid products lies in their close relationship with the end-user to meet decisionmaking needs in a limited timeframe. The following are considerations for creating rapid products:

- products should be developed in the context of identified end-users and their specific decisionmaking needs and circumstances;
- a close relationship with the end-user and iterative feedback is essential;
- reliance on existing SRs require methods to summarize and interpret evidence;
- a highly skilled and experienced staff and the capacity to mobilize skilled staff quickly are critical;
- restricting scope may be necessary;
- producers and users need to accept modifications to standard SR methods; and
- limitations need to be clearly reported, particularly in terms of potential bias and shortcomings of the conclusions.

Future research evaluating end-user perspectives will complement these findings and provide additional considerations for those interested in establishing a rapid response program or producing rapid products.

Contents

Tables

Appendixes

Introduction

Background

Systematic reviews provide comprehensive and rigorous syntheses of evidence to answer clinical and policy questions; however, they are complex undertakings requiring substantial time and resources to meet currently accepted standards.[1,2] It is not uncommon for standard systematic reviews to take one or even two years to complete. Increasingly, clinicians, policy makers, and other decision makers are requesting evidence in shorter timeframes to support their needs;[3] however they still expect transparent, unbiased, and reliable evidence products.[4] In response, the concept of "rapid reviews" has emerged within the arena of evidence synthesis to describe a review type that can be completed more quickly than a standard systematic review.[4]

Given the considerable time and resource requirements to produce systematic reviews that comply with endorsed standards,[5] it is not surprising that the intuitively appealing concept of rapid reviews has gained considerable attention recently within communities that produce or rely on systematic reviews. For example, sessions on rapid reviews have been offered at the most recent annual symposia of The Cochrane Collaboration and Guidelines International Network (G-I-N). Further, Cochrane Innovations, a trading company owned by The Cochrane Collaboration, has initiated a rapid response program, and a formal methods group is being proposed within the Collaboration with a focus on rapid reviews. A 2012 survey of European Health Technology Assessment (HTA) and public health organizations suggested that rapid reviews are offered by 70 percent of these agencies.[6,7]

This surge in interest poses two challenges to existing systematic review programs. First, should rapid reviews be offered, and what components are needed to build a successful program? Second, can some rapid review methods be adapted to make standard systematic reviews more timely? Answering these questions depends on understanding what methods rapid reviews use to achieve their more timely results, and to what extent those methods increase the risk of bias and error. Systematic reviews take time because they employ multiple methodologies to ensure that all relevant data have been identified and accurately analyzed. These time-consuming methodologies have been developed to minimize bias in the final conclusions, and therefore eliminating some or all of them may result in biased conclusions.

Answering these questions is more complicated than it appears. In order to consider offering rapid reviews, one first has to be able to define what they are. Previous reviews on the topic of rapid reviews describe them as "ill-defined,"[8] "not well-defined,"[9] lacking a single definition,[10] or "varying widely in terms of the language used to describe them."[11] HTAs may also be rapid, and so HTA may be part of the title of such reviews. Given the wide range of terms used to capture these short, focused reviews (rapid review, evidence advisory, evidence inventory, hotline response, etc.), we use the term "rapid products" in this report to capture the range of types of rapid reports.

Not only the names, but also the timelines vary considerably. Andradas et al. described rapid reviews as brief, readable, and usable responses to guide decision making that are typically completed within 6 months, which we have also chosen to use as part of our working definition of a rapid product.[12,13] Previous reviews have focused specifically on rapid HTAs and while multiple reviews describe these as taking between 1 and 6 months,[9,10,14] others described products taking as little as 1 week.[15] Automated approaches that generate meta-analyses in response to user-defined queries, sometimes called an "ultra-rapid review," are an outlier product that takes mere minutes to complete.

Finally, rapid products employ a wide range of strategies to reduce the time required to produce the final report, and an even wider range of combinations of strategies. This includes different methods used to identify relevant literature,[10,14,15] different approaches to assessing quality,[10,14] and variation in the types of syntheses conducted.[8,14,10,16] Authors of one review even argued that rapid products "defy definitive categorization because of their heterogeneous timelines, components, search strategies, and methodologies."[17] However, given the growing interest in these rapid products and the ever-present pressure to produce reliable evidence on more topics more quickly, it is imperative that a better understanding be developed.

Purpose of This Report

Since 1997, the Agency for Healthcare Research and Quality's (AHRQ) Evidence-based Practice Centers (EPCs) have been recognized as leaders in conducting comprehensive systematic reviews that shape health policy, inform national scientific conferences, and assist stakeholders in health care decision making. Topics for EPC reviews may be nominated by individuals or specific organizations; however, the reports are prepared with the intent of being applicable to and usable by a broad audience. Currently, the typical process for the production of a systematic review within the EPC Program follows a number of steps including topic nomination, topic triage, topic refinement, and completion of the full review, and can take as long as 2 years. While these reviews are recognized for their breadth and methodological rigor, they cannot be commissioned by stakeholders to provide evidence to support decisions that need to be made urgently.

Given the critical importance of having valid evidence syntheses available in a timely manner for use by a myriad of health and health care decision makers, the AHRQ EPC Program commissioned a white paper on rapid reviews. The goal of this white paper is to understand the range of products that are considered rapid, their intended purposes and the contexts in which they are commissioned, and how methods and required resources differ (e.g., how they gain efficiency) between products and from standard systematic reviews. Ideally, this white paper will also identify available empiric data to judge the impact of specific methodological shortcuts on the reliability, validity, and usability of these rapid products. Further, the perceived value of these rapid products by end-users, particularly in light of different methodological trade-offs, needs to be understood.

We sought to build on previous work by not simply describing how methods vary between rapid products and standard systematic reviews, but by identifying which variations are important and how the context in which they are produced influences variations in methods used. We also sought to understand the approach to rapid products that different organizations have taken particularly in the context of the purpose of the reports, those requesting the reports, the types of decisions being informed, the setting and structure of the rapid product developer, and the relationship between the developers and users of the reports. The following probing questions guided this work: What are the characteristics of rapid products produced by key organizations and described in the literature (e.g., purpose, audience, timelines, and personnel)? What methodological guidance exists for the conduct of rapid products? What empiric evidence exists comparing the results of rapid products with systematic reviews?

Methods

General Approach

We took a two-pronged approach to meet our objectives, combining a review of the literature with Key Informant (KI) interviews of key producers of rapid products to develop a broad picture of what is considered a rapid review/product, the strategies used to make the products rapid, and the context in which such products are produced. A workgroup of members from EPCs, the Scientific Resource Center (SRC), and AHRQ participated in twice monthly workgroup teleconference calls over the course of 10 months to discuss project direction and scope, assign and coordinate tasks, collect and analyze data, and discuss and edit draft documents.

Literature Search

In October and November 2013, we searched Ovid Medline, Ovid EBM Reviews, Cochrane Methodology Register, and SRC Methods Library, and performed a Scopus citation reference search and a grey literature search to identify papers about rapid reviews or similar products. High value keywords were identified by workgroup members. The final search strategy appears in Appendix A.

We sought to identify literature that: (1) discussed rapid review methods; (2) discussed initiatives or programs producing rapid reviews; or (3) provided empiric evidence on rapid review methodology. We also identified examples of published rapid reviews. We limited inclusion to articles describing rapid products within the health care field.

Early on we realized that the terminology used to describe rapid products is extremely varied. As we were interested in understanding broadly how these products are defined and conducted, we sought to be inclusive. During our screening we encountered the concept of mini-HTAs. Mini-HTAs are described as a "management and decision support tool"[18] and typically consist of a form or checklist containing several questions corresponding to the domains of a standard HTA report which may be answered based on the literature, a survey, and expert opinion. We excluded mini-HTAs from this report because they are a checklist that serves to guide decision making and not a method to evaluate evidence.

Abstracts were dual reviewed by investigators using ABSTRACKR software (available at http://abstrackr.cebm.brown.edu). Discrepancies were resolved by a third investigator. Full-text articles were independently reviewed by two investigators for inclusion. Articles suggested by workgroup members or Key Informants were also reviewed for relevance using the same methods. Different groupings of articles emerged during full-text review including: (1) background papers on rapid product methods, programs, or contextual factors; (2) previous articles of rapid product types; (3) descriptions of rapid products, including the methods used to produce them; and (4) empiric data exploring differences resulting from rapid products and standard systematic review methods. Groupings are not mutually exclusive. Articles in groups 1 and 2 provided context and contributed to the introduction and discussion sections of this report. Data from articles in groups 3 and 4 were extracted, synthesized and informed the results.

We reviewed papers that gave an overview or theoretical description of rapid products and used these to develop items for a table of products. First, we developed a set of questions to describe the products and a framework of dimensions of the process that can be altered to make a review more rapid (Table 1). The purpose of this table was to identify which aspects of the

standard systematic review process are most and least often altered to accelerate the review process, whether specific shortcuts are associated with specific features of a review, and what the implications are for the utility of the final product. We also identified a set of questions to allow us to describe the context in which the reviews are created, such as how long the producer has been preparing rapid products, the relationship with the nominator, and the number and knowledge-level of the staff.

Details about reports and programs from articles that described actual rapid reports or programs were extracted into the table of examples, and samples of those rapid reports were used to crosscheck the information from the articles whenever possible. Studies that empirically compared the results of rapid products with standard systematic reviews were extracted and analyzed separately.

Table 1. Dimensions of standard systematic reviews that may be altered in rapid products

Dimension	
Scope	Limit the type of questions (e.g., efficacy only, new technology only, single technology only)
	Limit number of questions
	Limit number of studies that can be included
Comprehensiveness	Limit search strategy (e.g., number of databases, grey literature, date, setting, language)
	Limit study types included (e.g., existing systematic reviews only, RCTs only)
	Limit textual analysis (e.g., no full-text review, limit number of extraction items)
Rigor/Quality control	Eliminate dual study selection
	Eliminate dual data extraction
	Limit or eliminate internal or external review of final product (e.g., peer review)
Synthesis	Limit or eliminate risk of bias/ quality assessment of individual studies
	Limit or eliminate either quantitative or qualitative analysis
	Limit or eliminate strength/quality of evidence assessments (e.g., using GRADE)
Conclusions	Simplify or eliminate any conclusive statements about the direction of the evidence

Key Informant Interviews

In parallel with the literature search, we conducted interviews with producers of rapid products, in both the public and private sector. We invited 19 Key Informants (KIs) to participate in a 60-minute individual telephone interview between January and March of 2014. Seventeen interviews were conducted with 18 KIs. The KIs were selected from organizations known by members of the workgroup to produce rapid products or offer rapid response services. No restrictions were placed with respect to geographic location; however, we were only able to conduct interviews with KIs who could communicate in English. We sought KIs from organizations around the world that are recognized for work in this area. Based on a comparison of KI interviews with the literature review, we are confident that we spoke with most of the prominent producers of rapid products in the English language.

Each KI completed an "EPC Conflict of Interest Disclosure Form" prior to being interviewed and no disclosed conflicts precluded participation of any of the invited organizations. KIs were interviewed about their methods for and experiences in developing rapid products following an interview guide developed by the workgroup (Appendix B). All interviews were digitally recorded, transcribed, and reviewed to identify and code themes using NVivo software (QSR International). Relevant information on rapid products was compiled in an extraction table.

The details of specific rapid products described in the interviews were extracted by one researcher and reviewed by at least one other and combined with data extracted from the

literature examples to create a combined table of examples of rapid products. Some of the examples are informed only from the literature, some only by the interview, and others by both. While this approach has some drawbacks—in general we have less detail about rapid products available only through the literature—it allowed us to create a larger and richer set of examples than would have been available though one approach alone. For the examples derived from the interviews, we sent the tabulated information back to the interviewees for review; we received responses from 10 of the organizations.

Results

A total of 468 articles were identified through the literature search. After dual review of abstracts, 116 articles were pulled for full-text review. Additional articles from workgroup members and Key Informants (KIs) were also pulled for full-text review. After full-text review, a total of 53 articles were included and were categorized as: background (n=8), review of rapid review types (n=12), rapid review/product methods (n=30), and empiric studies evaluating rapid review/product methods (n=2). Of the 30 articles initially classified as rapid review/product methods, only those that described methods for a specific program or product (n=10) were included in the final analysis. A flow diagram of the search process is shown in Appendix C. The background articles and reviews of rapid review types were used to provide context for the introduction and background sections of this white paper. The other sets of papers are described in the sections below, including:

1. Characterization of Rapid Products and Their Methods (based on the literature review and KI interviews)
2. Comparing Systematic Review and Rapid Review Approaches (based on KI interviews and the literature review)
3. Empiric Evidence Comparing Rapid Products With Systematic Reviews (based on the literature review)

Characterization of Rapid Products and Their Methods

In this section we integrate information extracted from studies that describe rapid response programs or products with information gathered from the KI interviews and, where possible, by examining actual examples of the products in question. Based on these two methods of data gathering, we identified 36 examples of rapid products produced by 20 organizations. The organizations represented were both public and for-profit and had a range of experience with rapid products, from several months to 25 years. Most organizations also had well-established programs and extensive experience producing standard systematic reviews or HTAs (e.g., 25 years). Only one organization did not conduct standard systematic reviews or HTAs. The volume of reports produced varied by organization and type of product, ranging from 3 to 5 per year to 300 to 400 per year.

Most organizations had a multidisciplinary staff that was involved in producing the rapid products (e.g., librarian or information scientist, statistician, economist, project coordinator, researcher); often these staff also produced the standard systematic reviews or HTAs, or had experience with these more comprehensive products. Moreover, most often staff had extensive experience with reviews and graduate-level or medical training. The number of personnel assigned to a given product varied from zero (a computer algorithm where the user enters query) to nine; however, most common was one to three staff for shorter timeframes and two to four staff for longer timeframes.

The target audience varied and included: hospitals, hospital management, health systems, health systems administrators, ministries of health, health plans, special interest organizations, societies, guideline development organizations, universities, medical manufacturers, industry, public health consultants, patients, clinicians, policy makers, and payers. However, health systems tended to dominate and few programs responded to requests from individuals not associated with a larger organization.

All organizations described a structured topic nomination process that took different forms (e.g., dedicated phone line, email or electronic submission). Most organizations engaged directly with the nominator to refine the topic, adjust the scope as needed, and establish user needs and timelines. In fact, very few did not mention involvement with the nominator to refine the topic and develop the review.

We analyzed this information in two different but complementary ways guided by the two aspects of the term "rapid review." First, we summarize information on the rapid products according to their production time (i.e., how rapidly they are produced). Second, we divide rapid products into four categories based on the extent of synthesis—Evidence Inventories, Rapid Responses, Rapid Reviews, and Automated Approaches—and describe the methods used for each type of product. Appendix D provides four tables describing these products according to: (1) product scope and purpose, (2) comprehensiveness, (3) rigor and quality control, and (4) approach to analysis and conclusions.

Description of Rapid Products by Production Time

Table 2 summarizes the scope, end-users, and purpose of rapid products by production time (more detailed information available in Table E-1). The sections that follow provide a narrative summary of timeframe and methods (detailed information available in Tables E2-4).

Table 2. Scope, end-user and purpose of rapid review products by timeframe

Timeframe (number of products)	Scope	End-Users	Purpose
Within 1 week (5 products)	• All products limited to single comparison • 3 limited to emerging technology • 4 limited number of questions • 2 limited other aspects of scope (comparisons, questions, outcomes)	Hospital administrators, payers, clinicians, policy makers	Give user a picture of available evidence and regulatory issues; coverage decisions; clinical decisions
< 4 weeks (6 products)	• All products limited to emerging technology • 2 limited to single comparison • 4 limited number of questions • None limited the number of studies	Health system and hospital administrators, clinicians, payers, policy makers	Allow user to do own research; coverage decisions, purchasing decisions; assess the need for future research
4-8 weeks (11 products)	• 4 products limited to single comparison • 4 limited to emerging technology • 5 limited number of questions • 2 limited the number of studies • 4 limited other aspects of scope (comparisons, questions, outcomes)	Policy makers, service providers, clinicians, hospital administrators, payers	Purchasing decisions; designing care delivery; clinical decisions; coverage decisions; policy; allow user to do own research
2-3 months (7 products)	• 5 products limited to single comparison • 2 limited to emerging technology • 4 limited number of questions • 2 limited number of studies • 1 limited other aspects of scope (comparisons, questions, outcomes)	Hospital administrators, policy makers, research institutions, government, manufacturers, clinicians, payers	Research prioritization; background; purchasing decisions; practice decisions; coverage decisions
Minimum of 3 months (7 products)	• 3 products limited to single comparison • 1 limited to emerging technology • 5 limited number of questions • 6 limited other aspects of scope (comparisons, questions, outcomes)	Hospital and health system administrators, research institutions, government, industries, policy makers, payers	Policy; coverage decisions; purchasing decisions

Production Time: Within 1 Week

Timeframe. Five products from five organizations were completed within 1 week (up to 5 days). These products were referred to as: ultra-rapid review, scoping review, search and summary, mini-review, and "answers." Time to completion ranged from 5 minutes (computer algorithm in which user enters query) to "less than 1 week."

Methods. Typically, these products involved searching a limited number of electronic databases (1 to 3). The use of grey literature was generally limited; only two reported sources in addition to electronic databases. Most restricted the type of studies included; for example, one used existing reviews if possible, and another limited to controlled trials. Only one program reported that they reviewed the full text of articles. None of these products involved dual study selection or dual data extraction. Most focused on a limited number of extraction elements; two of them focused on only one outcome. Only one of the five products involved quality assessment and grading the quality of evidence. Most products involved some form of internal review (e.g., by director of the program), but none had external review (e.g., peer review). Most products provided a narrative review with minimal synthesis (i.e., integration of findings across studies). Two provided conclusions and/or recommendations; others allowed end-users to formulate conclusions.

Production Time: Less Than 4 Weeks

Timeframe. Six products from five organizations were completed in less than 4 weeks. Time to completion ranged from 5 to 10 business days to "less than 4 weeks." These products were referred to variably, e.g., rapid response, brief, summary of abstracts, evidence inventory.

Methods. Most indicated that the literature search, in terms of electronic databases, was limited; however, most listed at least four databases that were routinely searched. Most reported use of grey literature; only two reported that no grey literature searching was done. Five products reported on language restrictions and all of these focused on English only. Four products described limiting the search dates to the most recent 5 years, one indicated that date restrictions were sometimes considered, and one indicated no date restrictions. The use of primary vs. secondary sources varied: three products reported including systematic reviews and HTAs and one product did not include other designs if a systematic review or HTA was available. In four products, there was no full text review; in addition, one product only performed full text review if the abstract was not sufficiently detailed, and one product performed full text review but for limited information. All products limited the number of extraction elements and two products did no data extraction. None of these products involved dual study selection or dual data extraction. None of the six products involved quality assessment or grading the quality of evidence. Most products involved some form of internal review (e.g., by director of the program), but none had external review (e.g., peer review). Five of the products involved no synthesis, while one product included a qualitative synthesis. One product included key messages and another included opinions of the review authors with caveats.

Production Time: 4 to 8 Weeks

Timeframe. Eleven products from eight organizations were completed in 4 to 8 weeks. These products were referred to variably, e.g., technology brief, evidence brief, evidence summary, evidence advisory, summary with critical appraisal, rapid response, rapid review, and HTA.

Methods. The extent of searching electronic databases varied considerably from 2 databases to "any and all" depending on the topic; the majority listed 4 to 5 databases. All conducted some searching of the grey literature. Five products described limiting to English language studies; only one product mentioned no language restrictions. Six mentioned possible limits to the search dates depending on the topic. Four products relied on existing systematic reviews or HTAs if available. Most indicated that they conducted full text review; in one case no data extraction was done. Five specifically mentioned that the number of extraction elements was limited. Only two reported dual study selection. One reported dual data extraction while two others reported extraction with verification by a second reviewer. Quality assessment was conducted in the majority of cases, with two specifically indicating no quality assessment. Five reported grading the quality of evidence, one reported that it had been done on occasion, and one reported that it was under consideration. Only two products described external peer review and in one case peer review was not always done. Where data were synthesized, a qualitative approach was used in all cases. None reported conducting a quantitative analysis. Five indicated that they provide conclusions and/or recommendations, two provide key messages, and four provide no conclusions or recommendations.

Production Time: 2 to 3 Months

Timeframe. Seven products from six organizations fell into this category where product completion averaged approximately 2 months, but ranged from 1-3 months to 2-4 months (i.e., all had an upper limit of more than 2 months as distinct from the previous category). These products were referred to variably, e.g., literature summary, emerging technology report, "rapid and responsive HTA," HTA, evidence review, and "snapshot" review.

Methods. The extent of searching electronic databases was variable: two described searches as comprehensive, one limited searches to 3 electronic databases, and the other products listed examples of databases but did not provide detail on any limits. All but one product reported searching for grey literature. Of the four products that reported on language, all restricted to English only. Two indicated that searches were limited to the most recent 5 years, while two indicated that searches were sometimes limited by date. Only two products indicated that they rely on or preferentially use existing systematic reviews or HTAs. In five cases, reviewers conducted full text review, one did not, and one did not extract data. Additionally, three products reported that the number of extraction elements was limited. Only one product reported dual study selection, and no products reported dual data extraction. Three products did not do quality assessment, while two products did so in a limited fashion. Only two products reported grading the quality of evidence. Peer review was mentioned for only one product; however, three products mentioned external review by experts or manufacturers. Two products reported doing no synthesis, three reported a qualitative synthesis, and two reported conducting quantitative analyses when possible. Four products did not provide conclusions or recommendations, while three report conclusions but not recommendations.

Production Time: Minimum of 3 Months

Timeframe. Seven products from six organizations required a minimum of 3 months with maximum time to completion ranging from 4 to 8 months. These products were referred to

variably, e.g., rapid review (in three cases), evidence check, streamlined review, and summary review.

Methods. The extent of searching electronic databases varied considerably: limits were described in three cases, while in another three cases the searches were described as not limited or "comprehensive." Most reported use of grey literature; only one reported that no grey literature searching was done and the other indicated that grey literature searching was decided upon with the nominator. Six products reported on language restrictions and all of these focused on English only. Four products indicated restricting the search dates, either to the most recent 5 years or restrictions based on topic area and in discussion with nominator. In four cases, the product would rely on existing systematic reviews or HTAs if available; one of these was described as a review of reviews and would not include primary studies. In the majority of cases, reviewers conducted full text review. Four products limited the number of extraction elements; extent of data extraction was unclear for the remaining products. One product involved dual study selection, while methods for the remaining products were variable, e.g., sometimes a second person would check, or only check excluded studies. No products involved dual data extraction; four products reported single extraction with verification by another reviewer. Five products involved quality assessment, one indicated that quality assessment varies, and only one reported that no quality assessment was done. Four products indicated that grading of the quality of evidence was done, and one product indicated that this is at the discretion of the nominator. For four products, it was reported that external peer review was done. All products involved a qualitative synthesis; two specified that a quantitative synthesis is done if the data allow and one indicated that quantitative analysis is done at the discretion of the nominator. All products indicated that they provide conclusions and/or recommendations.

A Typology of Rapid Review Products

Once the data on different dimensions of the review process had been extracted, it became clear that while the methods that rapid review products use are very heterogeneous, they can also be fairly readily grouped into four categories according to the level of synthesis: evidence inventories, rapid responses, what we chose to call true rapid reviews, and automated approaches.

- Evidence inventories list what evidence is available, and often other contextual information needed for making decisions, but do no synthesis and do not attempt to present summaries or conclusions.
- Rapid responses organize and evaluate the literature to present the end-user with an answer based on the best available evidence but do not attempt to formally synthesize the evidence into a new conclusion. Usually this means reporting the conclusions of guidelines or systematic reviews, but some rapid response products apply a best evidence approach and report the results of primary studies if no secondary sources are available.
- "True" rapid reviews perform a synthesis (qualitative, quantitative, or both) to provide the end-user with an answer about the direction of evidence and possibly the strength of the evidence.
- Automated approaches are databases of extracted study elements that use computer algorithms to generate meta-analyses in response to questions. These are very different than other rapid products or systematic reviews, in that the search, extraction and grading are dissociated from the analysis, which is performed according to preset computer

programs. However, they do produce a synthesized conclusion in less than 6 months and therefore will be briefly described.

Ten organizations produced only one type of product, six organizations produced two types of products, and three produced three types of products. Four produced more than one version of the same category of products, either to maximize what could be produced in the time allowed, or because they had more than one end-user with distinct needs. It should be noted that these categories are somewhat subjective, and that numbers do not always add up because it was not possible to get information on all dimensions for all products. Therefore, the numbers reported below give a sense of frequencies but may not be representative or reproducible. We have linked to examples primarily from the Canadian Agency for Drugs and Technologies in Health (CADTH) because CADTH produces three of the four types and all the reports are publically available; we also included one report from the Center for Evidence Based Practice to illustrate variation.

Inventories

General Description

An example of an evidence inventory is the CADTH Literature Summary "Mobile Apps for Improving Health: Clinical Evidence."[19] This product presents a list of the publications available, organized by secondary sources, randomized controlled trials, and non-randomized controlled trials. The key message was "two systematic reviews, seven randomized controlled trials, and three non-randomized studies were identified regarding the use of nutritional and physical activity applications (apps) for promoting healthy lifestyles. No literature was identified regarding the use of nutritional and physical activity apps for preventing chronic disease."[19] This allows the reader to judge the extent of evidence and find it for themselves, but does not offer any answers about the direction of evidence. These products may be considered consultations and may assist decision makers in specifying the scope of their question(s).

We identified six examples of inventories produced by six organizations, four based in the United States and two in Canada. Terms used included Search and Summary, Literature Summary, Evidence Inventory, Rapid Review, Hotline Response, Product Brief, Reference list, and QwikNote. The length of time needed to produce them ranged from 3 days to 6 weeks, with most taking around 15 working days. The most commonly cited report length was 10 pages. They were generally described as a list of available studies (with either abstracts or links to full studies) that addressed the questions, generally organized in some kind of best evidence approach. One also included summaries of guidelines or systematic reviews if available. A couple included contextual information relevant to implementation, such as regulatory approval. Six appear to be aimed at system-level decision makers (health system, payer, policy maker). One producer also specified clinicians as end-users, but in the context of providing library services to practicing clinicians who did not have access to a librarian in their practice setting. When a statement of purpose was available, it generally described providing a picture of the available evidence, and/ or providing the information to make an initial decision about coverage, purchase, or implementation, often to determine whether further research was needed.

Methods for Time Reduction

Three products explicitly limited the scope of the report, either by limiting the number of comparisons and/or number of questions, or by limiting the product to emerging technologies with a small evidence base, but three did not mention limiting scope and none mentioned either explicit or implicit limits on the number of studies that could be included. Comprehensiveness was also generally not limited: three mentioned limiting the search to 1 to 2 databases, only one completely excluded grey literature while two put some limits. However, three inventories always set time limits on the literature search and one sometimes did. Three preferentially looked for existing systematic reviews or HTAs, one never included secondary studies, while all included primary studies. Only one undertook full text review and only three carried out even limited extraction. Rigor and quality control was tightly curtailed, however, with none carrying out dual selection or extraction, and only three undergoing internal review by a supervisor or internal expert. None underwent any external review. None synthesized the findings into a conclusion, beyond possibly whether there was enough evidence for a systematic review.

In summary, evidence inventories appear to be a rapid product that is targeted at hospital administrators and payers and is designed to demonstrate what evidence is available to make decisions, including whether investing in further review is worthwhile. They are not necessarily limited by scope or comprehensiveness, but because they do not attempt any evaluation (beyond organizing studies by study type) or synthesis, they are on average the fastest type of product to produce.

Rapid Responses

General Description

Two examples of rapid responses are the Center for Evidence Based Practice's (CEP) Evidence Advisories and CADTH's Summary of Abstracts. A CEP Evidence Advisory on administration of intravenous insulin reviewed and evaluated the available guidelines and concluded: "The guidelines suggest performing double-checks of insulin doses and insulin administration, but lack detailed information on personnel and practice. Neither of the guidelines provides references to specific studies supporting recommendations. [low-quality evidence]."[20] A CADTH Summary of Abstracts on Short-Acting Intramuscular Olanzapine for Acute Agitation concluded: "Three non-randomized studies were identified regarding the clinical effectiveness of short-acting intramuscular (SAIM) olanzapine for the treatment of acute agitation associated with bipolar disorder or schizophrenia. One study comprised only patients with schizophrenia or schizoaffective disorder. Compared with ziprasidone, patients taking olanzapine had a greater length of hospital stay. The authors reported that second generation SAIM antipsychotics were not associated with a shorter length of stay than treatment with haloperidol, required more injections than haloperidol, and were more costly."[20] The report then goes on to describe two other studies. Both of these reports provide the reader with what the best available evidence suggests the direction of evidence is, but do not synthesize the body of evidence into an independent conclusion.

We identified 10 examples of rapid responses produced by 9 organizations, 3 based in the United States, 2 in the UK, 3 in Canada, and 1 in Australia. Terms used included answers, evidence advisory, rapid response, tech note, and Responsive Innovation Evidence Review. The time taken to complete them ranged from 5 days to 3 months, with most time estimates falling around 1 to 2 months. Report length (where information was provided) ranged

from 1 to 15 pages, with under 10 pages being the most common. Of the products that targeted particular end-users, four were intended to be used by policy makers or health system administrators and one by payers for purchase or coverage decisions. Three were intended to be used by clinicians and one by service providers to support clinical care or design care delivery. (Note: some products had more than one targeted end-user).

Methods for Time Reduction

Scope was not necessarily a limiting factor—three specifically limited the scope, four did not, and three sometimes did. Some specifically mentioned that they were willing to consider broad and complicated questions. Only one was limited to new or emerging technologies. However seven limited the number of questions that could be asked and three either explicitly limited the number of studies that could be considered or else adjusted other parameters to ensure that the number of studies was not overwhelming. Of note, the rapid response that was produced in under 5 days was the most tightly constrained—limiting scope, number of questions, number of studies, and focusing on new technologies.

The number of databases searched ranged from two to four and several reported a recursive approach, stopping the search as soon as enough data was acquired. Only two excluded grey literature, although two set limits. Five of the 10 rapid response products limited search dates, usually to the past 5 years, and a couple sometimes restricted inclusion to applicable settings. For the nine products for which this information was available, all preferentially used systematic reviews or guidelines; primary studies were only used if there were no reliable and recent systematic reviews. One product was only created if systematic reviews were available. For those for which data were available, about five did full text review, while three did not, but only limited extraction was done. There was no dual review or extraction (although there was oversight in one case). Four underwent internal review, one occasionally underwent internal review, and only one occasionally might go for external peer review—although some producers viewed public posting as a kind of peer review.

Although most did not assess quality or risk of bias, two did and one sometimes evaluated the strength of the evidence. Three reported some level of qualitative synthesis (although without doing a quality assessment), and none attempted quantitative synthesis. The level of conclusion was generally presented as a summary of the best evidence, or a narrative discussion of the best evidence, with perhaps key messages or points to consider.

In summary, as their name implies, rapid responses attempt to give a quick answer based on the best available evidence to support a purchase or clinical decision, and less often a coverage decision. There is more limitation of scope and comprehensiveness than with inventories. However, the key time saving is achieved by skipping synthesis and instead relying on existing systematic reviews or guidelines to provide a reasonably reliable answer.

Rapid Reviews

General Description

An example of a rapid review is CADTH's summary with critical appraisal "Bariatric Surgical Procedures for Obese and Morbidly Obese Patients."[21] This report described and critiqued the available studies, and qualitatively synthesized the results to produce a conclusion that encompassed the totality of the evidence:

> Results consistently demonstrated that Roux-en-Y gastric bypass (RYGB) was associated with a greater weight reduction relative to laparoscopic adjustable gastric banding (LAGB), but was also associated with a higher risk for procedural adverse events and a longer duration of hospitalization after the procedure. The evidence of effectiveness and safety for sleeve gastrectomy suggested that it is less effective than RYGB for weight loss but associated with a reduced risk for complications, and more effective for weight loss compared with LAGB, but also more likely to result in complications, but evidence was conflicting.[21]

This approach gives the reader an answer based on a new synthesis of the evidence and is most similar to a standard systematic review.

We identified 18 examples of rapid reviews produced by 15 organizations, 6 based in the United States, 2 in the UK, 3 in Canada, 3 in Australia, and1 in Italy. Terms used included rapid reviews, evidence reviews, emerging technology report, streamlined review, summary review, evidence check, evidence summary, CompNote, Summary with critical appraisal, and Tech Brief. The time taken to complete them ranged from 3 days to 6 months, with most time estimates falling around 2 to 4 months. Report length (where information was provided) ranged from 1 to 150 pages, with 20 pages being the most common. Of those that defined an audience, seventeen were intended to be used by payers, policy makers, or health system administrators for coverage or purchase decisions, and only one was intended to be used by clinicians.

Methods for Time Reduction

Careful scoping appears to be the primary way most rapid reviews achieved their deadlines. Twelve limited the scope to a single comparison (another did sometimes), 8 limited questions to emerging technologies where it was known the evidence base would be sparse, 11 limited the number of questions that could be considered (1 did sometimes), and 15 limited the number of studies that could be included in the final report, either explicitly or through adjusting the scope. In some cases, a maximum number of studies were set and if the initial search went past the limit, the scope would have to be further reduced or the topic would have to be promoted to a standard systematic review. A few limited the number of database searches, but more said they used the same search pattern as for standard systematic reviews. Grey literature was excluded for only one, although four reported limited or variable use of grey literature. Nine always or sometimes set date limits on searches and a few used study size to limit inclusion. Ten used existing systematic reviews preferentially, but often mentioned updating them and only one never used primary studies. However five preferentially used primary trials, with existing systematic reviews used as reference sources or background if at all. Only one did not always do a full-text review, but almost all significantly restricted the number of items that were extracted. About a third had some kind of check on screening and extraction (although only one did full dual screening). Eleven had internal review, while 10 had some form of external review, either external experts or peer review. Sixteen did quality rating of the included studies, while 10 formally rated the strength of evidence and 2 did sometimes or were considering doing so. All performed qualitative synthesis while seven also performed quantitative synthesis and some did both (six). All provided conclusions, although some added a number of caveats.

In summary, this type of report appears to be the most comparable to a standard systematic review, albeit one with a tightly constrained scope and that often sacrifices quality control measures in order to provide a timely response.

Automated Approaches

Two of the products that were identified in our search for rapid reviews did not fit neatly into the three categories described above. However, because they involved a systematic search and synthesis of the evidence to produce an answer about the direction and strength of evidence, we felt they met our broad inclusion criteria. Both products were essentially algorithms attached to search engines and databases of extracted studies that can be used to produce meta-analyses on command. Because we only had two examples, we were not comfortable making general observations about this type of rapid product. However, it is important to note that they do exist and represent a potentially attractive strategy to provide timely evidence for decision making and to support clinical care, given the labor intensive nature of most evidence reviews. Empiric research regarding the accuracy and reliability of these approaches is needed.

Comparing Systematic Review and Rapid Review Approaches

Philosophical Differences Distinguishing a Systematic Review and a Rapid Review

Through our interviews with a large number of organizations who develop rapid products, it became clear that the development of a rapid product in most cases is not simply a "mini-systematic review with corners cut" but that the very essence of developing rapid products differs from that of systematic reviews. Table 3 describes thematic differences that arose from interviews. These core differences in large part explain the observed differences in products.

One of the biggest differences between rapid products and standard systematic reviews is the relationship with the stakeholder. In many ways, this feature drives other differences. Rapid products are often conducted to help a specific end-user make a specific decision in an identified timeframe. Because of this, the question for the reviewer is often what can be provided in the time allowed. This in large part explains the broad portfolio of products often produced by rapid response groups (ranging from lists of relevant studies and guidelines to reports that include synthesis and evidence grading) and differences in formats compared with systematic reviews. The often compressed timeframe also explains the choice of some groups to rely heavily on prior systematic reviews and different presentation formats. Finally, maintaining a highly skilled staff is especially critical to rapid response groups who need to produce reports in a short timeframe and understand the type of products that might meet the needs of the decision maker.

Table 3. Philosophical approaches to rapid and systematic reviews (based on Key Informant interviews)

Product Features	Rapid Review	Systematic Review
Emphasis/Priority	*End-user*: Provide information to help a specific decision maker make a decision	*Product:* Conduct a comprehensive, unbiased and rigorous systematic review (often with multiple stakeholders in mind)
Relationship With End-User	Continuous *intimate relationship* with a specific end-user in iterative fashion throughout work to ensure product will meet end-user's need	*Arms-length relationship* with end-users engaged at specific time points, and review group separated from end-users during certain phases to reduce bias
Role of Other Reviews	Often high *reliance on systematic reviews* for information	Often *limited use* of reviews. Systematic reviews one among many sources. The primary role of systematic reviews may be to identify primary studies
Organizational Features/Staffing	High *reliance on maintaining highly trained staff* to conduct reviews	Useful to have experienced staff but *not essential* (e.g., more time/possibility to train staff during conduct of the review)
Spectrum of Products	*Broad range* – feature determining type of product is time allowed and needs of decision maker	*Consistent comprehensive product*
Scope	More routinely f*ocused* question	Range from focused to *broad* questions

Differences Between a Systematic Review and a Rapid Product

Few rapid products encompass all the characteristics of a comprehensive systematic review. The following list highlights some key differences identified by the Key Informants (KIs) at the various stages of a systematic review. We compare these strategies to systematic reviews produced through the EPC Program.

- Research question: The research question for a rapid product is generally narrower than a systematic review. Systematic reviews produced through the EPC Program often answer several broad overarching questions whereas rapid products commonly limit the number and scope of questions that they answer. KIs commonly mentioned focusing on new or emerging technologies (which have limited evidence) or single interventions or therapies within a narrow population.
- Topic refinement: Rapid response groups generally work closely with the nominator (or end-user) to refine the topic. The topic refinement process for a rapid product often involves a single reviewer meeting with an individual requestor, either via email or telephone. The scope and research question is often determined in a matter of days or weeks. Within the EPC Program, the topic refinement process for standard systematic reviews involves a team of reviewers working with a group of technical experts over an extended period of time, often up to several months.
- Literature search: The literature search for a systematic review is extensive, including multiple databases as well as grey literature searching, with a goal of capturing all available evidence on a given topic. Rapid responses often limit the search with very few organizations interviewed regularly searching more than five databases. Most organizations relied on Cochrane, PubMed and Medline and less than half of the rapid

products included a search for grey literature. Some organizations described stopping a search when "enough" evidence was found and using only existing systematic reviews

- Literature Screening/Extraction: Systematic reviews often use a dual review process for full text article review and data extraction whereas most rapid response groups utilized a single reviewer and some did not include full text review. Most rapid products include data extraction performed by one person and some rapid products do not include any data extraction or severely restrict the number of data items extracted.
- Synthesis: While it is common to perform quantitative analyses in systematic reviews, very few rapid products involved quantitative synthesis. Some rapid products included a qualitative analysis while some did not include any synthesis.
- Review: Systematic reviews produced through the EPC Program often involve extensive internal and external review. Internal review follows a structured process with input from the Program and an arms-length editor from another EPC. External review involves public posting and traditional peer review. Some rapid products included an internal review and few included external review.
- Overall process: Overall systematic reviews are more comprehensive in their approach; those conducted through the EPC Program follow established methods and procedures. Rapid products have greater variation in methodological practices in order to achieve a product in a shortened time span.

Potential Concerns in Conducting Rapid Reviews

Several of the interviewed organizations expressed concerns in developing rapid products. Due to the shortened timeline of the products, the process often involves a narrow and/or a limited selection and review of the literature. This process increases the risk of missing evidence. Additionally, the shortened timeline under which to review and consider the available evidence limits the thought process. This can trigger inherent uncertainty in the findings of a rapid product. Another concern expressed by rapid product producers is that the final products may be mistaken as full systematic reviews by certain requestors (i.e., reviews that have followed accepted standards for systematic reviews). This may especially be a concern for organizations that produce both full systematic reviews and rapid products. Explicitly outlining the trade-offs and limitations of a rapid product as compared with a systematic review at the beginning of the process can help to eliminate the chances of the rapid product being interpreted as a comprehensive review. Further, some organizations place disclaimers on the report in an effort to avoid any misinterpretation of what the product offers.

Empiric Evidence Comparing Results of Rapid Products With Systematic Reviews

Electronic and hand searches identified 12 studies that appeared to represent empiric evidence comparing results of rapid products with systematic reviews but only two studies presented empiric evidence related to this current project.[14,22,23] Both studies were conducted in the context of HTAs.

Van de Velde et al.[23] presented a case study comparing results of a rapid review on potato peels for burns with those of a systematic review. The authors reported that the rapid review identified three RCTs, which was two more than were included in the systematic review. The results and conclusions of the two reports were different. However, the limited detail on the

methods used to conduct the systematic review makes this case study of little value for our purposes.

In 2007, the Australian Safety and Efficacy Register of New Interventional Procedures – Surgical (ASERNIP-S)[14] examined the use of rapid reviews in HTA. As part of the report, the authors compared the results and conclusions of rapid reviews with those of full systematic reviews or HTA reports. They searched websites of HTA agencies to identify rapid reviews on surgical interventions published between 2001 and 2004. Rapid reviews were defined as "any HTA report or systematic review that took between 1 and 6 months to produce and included a comprehensive or systematic literature search." The rapid reviews were then matched with a full systematic review (i.e., production was not limited by time), written on the same topic, and produced within 1 year of the matching rapid review.

Seven rapid reviews with matching full reviews were identified. The reviews addressed four topics: drug eluting stents, lung volume reduction surgery, living donor liver transplantation, and hip resurfacing. For living donor liver transplantation, there was one rapid review; for the remaining topics there were two rapid reviews each. The authors presented the clinical outcomes (safety and efficacy) discussed by each review, as well as the overall conclusions, the scope of the report, and the methods used.

Differences in methods were identified between rapid and full reviews. The methods and results of full reviews were reported in more detail than the rapid reviews. Some rapid reviews included only systematic reviews or HTAs, while others conducted searches for and included primary studies. Most rapid reviews were written by single authors or authorship was not reported. Most rapid and full reviews underwent an external review. Searching was not consistently more extensive in full reviews (based on number of databases searched). Full reviews tended to assess the quality of primary studies, while rapid reviews either did not or did not report. Despite these differences, there were no instances in which the essential conclusions of the rapid and the full reviews were opposed. The full reviews consistently provided greater depth of information and more detailed recommendations pertaining to the implementation of each surgical intervention. The authors commented that full reviews may be more appropriate to identify safety outcomes and risk factors associated with an intervention.

The comparisons between rapid and full reviews are limited to the context of HTAs, which are often driven by need for more rapid advice on explicit decisions about use of new health technologies, many with very limited published evidence. Due to the context and the relatively small volume of research, the HTA-based assessments may be only modestly applicable to broader topical systematic reviews with much larger bodies of evidence.

Discussion

Our review of the literature and interviews with prominent producers of rapid products confirms the findings of previous reviews that there is a range of products that are being used to support evidence based decisions that can be produced more quickly than standard systematic reviews. Further, the terms used to describe rapid products and the methods they employ vary widely.

Our analysis of these products by production time generally showed that increasing amounts of time allowed incorporation of more of the standard systematic review methods and quality control mechanisms. For example, the most rapid products (within 1 week) generally: searched a limited number of databases; limited use of grey literature; restricted the types of studies included; did not conduct full text review; did not perform dual study selection or data extraction; focused on a limited number of extraction elements (e.g., only one outcome); did not do quality assessment or grading; provided a narrative review at most with minimal synthesis; and provided minimal conclusions and/or recommendations. Further, none of the most rapid products underwent external peer review. As the timeframes increased many of these limitations were lifted, e.g., more databases searched, use of grey literature and full text review. However, even among the products that took longer to complete (minimum 3 months and up to 8 months), there were variable limitations on database searching, language (i.e., using English only), and search date (e.g., using the most recent 5 years). Further, some relied on existing systematic reviews or HTA reports if available. While there was an increase in full text review with increased production time, the number of extraction elements was still generally limited. In addition, use of dual study selection was variable; most did single data extraction, with data verification by another reviewer at most. Among the reviews with longer production timeframes, there was an increase in the frequency of quality assessment, evidence grading, and external peer review.

To gather a better understanding of the variation, we categorized products based on the extent of synthesis performed, and found that we could describe four distinct types of products, with slightly different approaches and audiences.

- Inventories list what evidence is available, and often other contextual information needed for making decisions, but do not synthesize the evidence or present summaries or conclusions. They are generally systematic and comprehensive; therefore, can provide a useful first step for decisions about coverage or purchase, in particular whether further research is warranted.
- Rapid responses evaluate the literature to present the end-user with an answer based on the best available evidence (usually guidelines or systematic reviews), but do not attempt to formally synthesize the evidence into a conclusion. This type of product was more likely to describe clinicians among end-users.
- “True” rapid reviews perform a synthesis (qualitative, quantitative, or both) to provide the end-user with a conclusive answer about the direction of evidence and possibly the strength of the evidence. The conclusion may be hedged, but it is still a synthesized statement that could be compared with a systematic review. They are generally able to meet time constraints by limiting the scope, are somewhat less comprehensive in their data sources, use fewer quality controls, and the synthesis is usually qualitative.
- Finally, automated approaches are a new and intriguing approach to providing rapid evidence support, and worth future study.

Moving Beyond Methods

Through our interviews with a large number of organizations who develop rapid products it became clear that the conduct of a rapid product in most cases is not simply a "mini-systematic review with corners cut" but that the very essence of developing rapid products differs from that of systematic reviews. One of the biggest differences between rapid products and traditional systematic reviews is the relationship with the stakeholder. Rapid products are often conducted to help a specific end-user make a specific decision in an identified timeframe; therefore, the reviewers needs to make decisions about what they can provide in the time allowed. This in large part explains the broad portfolio of rapid products and reporting formats. The timeframe also explains the choice of some groups to rely heavily on prior systematic reviews. Maintaining a highly skilled staff is critical to rapid response groups who need products in a short timeframe and understand the type of products that might meet the needs of the decision maker. Finally, few and/or narrow questions were also a necessary approach, focusing on new or emerging technologies or single interventions within a narrow population.

Based on our review of the literature, there is almost no empiric evidence comparing results of rapid products with systematic reviews. For the most part, the research represents indirect evidence about whether truncating methods have an impact on results and conclusions. One report that provided direct evidence suggests that there may not be any impact; however, this report was in the context of HTAs and focused exclusively on surgical interventions often early in their implementation. The systematic and rigorous approach implied in the use of the term "review" cannot clearly be completely fulfilled in a more rapid process, but little is known about the impact of truncated methods. Thus, shorter may not always be better, or even as good, but currently available information does not tell us if and when to be concerned. For example, previous research has suggested that lack of quality or risk of bias assessment may result in over-representation of or inappropriate emphasis on poor quality research.[17] Further, previous research has raised the concern that rapid products may not comprehensively address safety issues.[14] The issue of safety assessment did not specifically arise during the Key Informant interviews; however, we found that often rapid products were limited in the scope of the question(s) and the number of outcomes examined, often with a focus on efficacy outcomes. Closer examination of the appropriateness of rapid products for issues of safety is needed. Finally, many rapid products rely on qualitative synthesis which can be more challenging than quantitative synthesis in terms of determining effectiveness and assessing heterogeneity; moreover, many approaches to qualitative synthesis rely on vote counting methods which are not recommended within systematic review standards.

In summary, rapid products have tremendous variation in methodological practices; however, what appears to tie them together is the close relationship with the end-user to generate an evidence base that meets their decision-making needs within a limited amount of time. To date, there is little empiric evidence regarding the validity of results and conclusions based on rapid approaches to reviewing the literature and this was an expressed concern of the interviewees.

What Was Known and What This Paper Adds

Our findings are consistent with previous reviews showing that rapid review methods vary greatly, as do their definitions and applications. For example, a 2010 systematic review of "rapid reviews" examined 45 methodological articles and 25 exemplars of rapid review methods and found many subtle differences among terms used to denote a more accelerated production

process (e.g., rapid, ultra rapid, succinctly timed) for a type of product (e.g., technology assessment, systematic review, evidence assessment). These differences were magnified when considering the associated timeframes which, although not consistently reported, ranged from one to nine months, and overlapped in the time required for or even as long as some traditional systematic reviews and more comprehensive evidence synthesis products (e.g., technology assessments). Also consistent with our findings, the earlier systematic review found that rapid reviews varied in their methodological approaches and how closely these adhered to current standards for systematic reviews.[11] We showed that this methodological variation was related to production time with more standard methods incorporated where more time was available. As we did not review the actual rapid products, we did not assess quality of reporting. Previous reviews and overviews on rapid reviews also raise concerns about potential impacts on the validity of information resulting from truncated methods or timelines.[9-11,24] Our search for and review of empirical evidence showed a substantial gap in this area.

The 12 previous reviews we identified that examined different rapid products do not support substituting any form of rapid product for a standard systematic review, although investigators recognize the value of rapid products for answering narrow efficacy or effectiveness questions within a shorter timeframe and with fewer resources. Our findings showed that often the rapid products are geared towards narrow questions, and that producers take time to appropriately scope the topic in order to meet the constrained timeframes. Previous reviews document methods for shortening the length to complete rapid products, including searching fewer sources, excluding grey literature, applying search filters, and employing only one reviewer for title/abstract reviewing or data extraction. These reviews also found that meta-analyses were rarely conducted in rapid products, although recommendations for producers of rapid products include meta-analyses as worthwhile additions to these evidence summaries. Previous reviewers noted that caution is needed when interpreting evidence when quality assessment has not been done, and recommended enhanced transparency in reporting methods used for the rapid product.

Our data collection and analysis build on the findings of this previous work in three important ways. First, as described above, we recognized early on that there was substantial variability across the rapid products and that "rapid reviews" does not reflect a specific methodological approach. As such, we sought to classify these products in a meaningful way. We found a natural grouping according to the extent of synthesis done as part of the report and classified accordingly as inventories (no synthesis), rapid responses (some organization and evaluation of the literature), and rapid reviews (synthesis—qualitative, quantitative, or both). Second, we analyzed the methods by production time showing not simply variation in approaches but instead a systematic increase in comprehensiveness and incorporation of more standard review methods with increased production time. Third, and our unique contribution, was the interviews with producers of rapid products and identification of items beyond the technical aspects of producing reports that seemed to underpin the essence of rapid products. The key factors were the relationship with the end-user and the focus on producing evidence to meet a very specific decisionmaking need. In this context, rapid products may be a reasonable substitute for standard systematic reviews, so long as the end-user understands any potential caveats arising from the methods employed. Rapid products may be a reasonable alternative to standard systematic reviews in the following cases: urgent decisions, decisions not likely to have negative health consequences for large populations, decisions that can be easily changed if new information leads to a change in the appraisal, decisions about low risk interventions, and decisions about low cost interventions. The utility and appropriateness of rapid methods for

safety outcomes needs further evaluation. A further consideration is opportunity costs, e.g., having rapid products on multiple questions of interest to the end-user versus standard systematic reviews for just one or two. We also identified key aspects of the organizations that allow them to produce rapid products, including the capacity to respond quickly to end-user requests and mobilize a highly trained and experienced staff. Our Key Informant interviews reinforced the findings of previous studies highlighting the need for health care researchers to focus on the informational needs and preferences of their target audiences.[25] This focus ensures the conduct of relevant and timely research that decision makers can directly apply to their local contexts.[25,26]

Pragmatic Considerations

Based on our review of the literature and interviews with Key Informants with extensive experience developing rapid products, we offer the following items that should be considered by a group or organization prior to implementing a program that offers reports in a limited timeframe. We believe that many of these factors need to be in place for an effective rapid response program.

- Context: Many organizations reported producing reports for very specific decisionmaking needs in very specific circumstances. The evidence needed to inform decisions in this context is quite different from a systematic review that is intended to be used by multiple stakeholders (who are not necessarily all known or identified during preparation of the review).
- Relationship with the end-user: Most organizations described a continuous and close relationship with a specific end-user involving iterative feedback throughout the work to ensure the product would meet the end-user's needs. This is in contrast to a more "arms-length" relationship with end-users who may be engaged at specific time points during a systematic review, but who may also be separated during certain phases to reduce bias.
- Reliance on secondary sources: Many organizations relied on existing systematic reviews or HTA reports. Methods need to be in place, and acceptable to the end-users, to synthesize and interpret evidence from existing reviews.
- Capacity: Most organizations had extensive experience producing rapid products and had a highly skilled staff that either also prepared standard systematic reviews or HTA reports, or had experience doing so. The ability to mobilize skilled staff quickly was critical for a timely response, efficient back-and-forth communications to refine the questions and scope, and an expedited product.
- Scope: Many organizations restricted the scope of the review to meet reduced timelines. Often questions focused on single interventions, single comparisons, specific populations, or specific outcomes. Many focused on new or emerging technologies for which little evidence was available resulting in the ability to review evidence quickly.
- Methods: The reality of rapid products is that they are not necessarily as comprehensive as systematic reviews and do not meet all the accepted methodological standards. The producers and users need to be able to accept some modification to the methods in order to meet constrained timelines. Interestingly, some interviewees commented that individuals who came from a systematic review background often had a harder time making methodological concessions in the interests of efficiency.
- Reporting and caveats: Pragmatic decisions to limit a review will lead to a tradeoff between preparation of a review that is timely and useful with potentially less accurate findings, and one that is comprehensive and as accurate as possible.[27] Central to the rigor

of the systematic review approach is transparency. As with any systematic review, the methodological approaches and accompanying justifications need to be clearly reported and also reflected on in terms of potential bias and shortcomings in the review conclusions, as well as the potential value of a more comprehensive review.[27] Finally, the issue of protocols and pre-specified methods was not specifically addressed in this work but warrants consideration in the context of rapid products in the interest of transparency.

Strengths and Limitations

Our combined approach of reviewing the literature and conducting Key Informant interviews provided a rich source of information on rapid products, methods, and organizational perspectives. We analyzed and classified rapid products in unique ways that complement existing literature. We identified a select set of Key Informants from a number of well-known organizations that produce rapid products; however, the results may not be representative of all organizations or groups that produce rapid products. We also identified products through our literature review; however, programs captured in this manner may or may not be currently active. We sought to be comprehensive and consistent in the information gathered through the interviews and literature in order to accurately describe all rapid products; however, sometimes the information was limited in the literature and not all interviewees responded to our queries to confirm details. We gathered information on the overall timeframes for completion of rapid review products; however, we do not have detailed information on the total work hours involved in preparing different types of reviews. Further, we do not know whether the timeframes for production reflect real or artificial timelines (i.e., a report is produced in 2 weeks but is there an actual decision waiting to be made at the end of those 2 weeks). We found very limited data on the validity of rapid products and this should be a priority for future research. Of specific interest is the validity of rapid products for assessing safety outcomes. A point that arose while drafting the report is the issue of durability of the findings of rapid products. The issue of updating for standard systematic reviews has received much attention among methodologists and producers of systematic reviews and warrants consideration within the field of rapid products.

Future Directions

The work reported in this paper has helped us understand the approaches undertaken in the production of rapid products, and perspectives from relevant organizations. Many of these organizations have well-established rapid response programs that have existed for years. This fact underscores the value and role of rapid products in some situations and for particular end-users. A next important step is to assess the end-user perspectives on different rapid products, and the acceptability of different approaches to support their decision-making needs. To this end, we plan to conduct additional work gathering feedback from different end-users on concrete rapid product scenarios. These will help highlight the most important differences and trade-offs between rapid products and standard systematic reviews, and help guide decision making about when and where particular products would be helpful. Our results showing variation in rapid products by both timeframe and extent of synthesis will help us establish an interview guide to assess the relative importance of these factors in meeting end-user needs. Further, we will be able to ascertain how closely the timeframes and products are tied to actual decision making (e.g., is a report produced in 2 weeks used to make a decision at the end of those 2 weeks). Finally, we plan to address the issue of updating or “durability” of the products and whether this is an issue or concern for end-users.

We searched for evidence that compared the results and conclusions of rapid products with those from standard systematic reviews, and found little empirical evidence. We did not specifically search for empirical evidence on different aspects and/or methods that may be modified to conduct a review more rapidly (e.g., restricted number of databases searched, recursive approach to searching, restrictions on study designs eligible for inclusion, limited data extraction, lack of quality or risk of bias assessment, reduced quality control mechanism [i.e., dual study selection and data extraction], analytic approaches). However, this paper provides a detailed examination of the granular differences between products that are generated within different timeframes and offers a structure for detailed empirical investigations of how each of these methods impact final results and conclusions, and inform decisionmaking.

Finally, given that most reviews have found heterogeneity across rapid products, it might be helpful in the future to apply functional groupings such as the typology used in this paper (Inventory, Response, Review, and Algorithm). In addition to allowing more conclusive analysis, this kind of framework could also be useful for evolving best practices—since best practices will clearly need to differ based on level of synthesis—and also for any empirical work either comparing rapid products with systematic reviews, or testing the validity of rapid methods.

Conclusions

There is extensive variability in products commonly labelled “rapid reviews.” These products vary on two important dimensions which are captured by the term “rapid review:” the timeframe for completion and extent of review or synthesis. Our review of these products resulted in a classification according to the level of synthesis that we feel is a useful contribution to this field: inventories (no synthesis), rapid responses (some organization and evaluation of the literature), rapid reviews (synthesis—qualitative, quantitative, or both), and automated approaches (computer-generated responses to user-defined queries). We found a systematic increase in comprehensiveness and incorporation of more standard review methods with increased production time. There are a number of dimensions beyond the technical aspects of producing reviews that seemed to underpin the essence of rapid products, including the relationship with the end-user and the focus on producing evidence to meet a specific decision-making need. The well-established and longstanding programs among organizations that produce rapid products underscore the value of these products for end-users as a basis for decision making. More in-depth evaluation of end-user perspectives on rapid products will complement our findings and together will provide a more complete set of considerations for those interested in establishing a rapid response program or producing rapid reviews.

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Appendix A. Search Strategy

32Ovid MEDLINE(R) 1946 to October Week 5 2013
Ovid MEDLINE(R) In-Process & Other Non-Indexed Citations November 6, 2013
Searched: November 6, 2013

1	((rapid or mini or pragmatic or targeted or focused or brief) adj2 (((systematic or evidence or data or knowledge) adj2 (review* or synthes*)) or HTA or health technology assessment*)).ti,ab.	318
2	((rapid or pragmatic) adj2 (review* or HTA or health technology assessment* or evidence assessment*)).ti,ab.	381
3	1 or 2	656
4	3 not animals/	572
5	remove duplicates from 4	519
6	limit 5 to (english language and yr="2000 -Current")	409

Ovid EBM Reviews - Cochrane Methodology Register 3rd Quarter 2012
Searched: November 7, 2013

1	((rapid or mini or pragmatic or targeted or focused or brief) adj2 (((systematic or evidence or data or knowledge) adj2 (review* or synthes*)) or HTA or health technology assessment*)).ti,ab.	22
2	(rapid adj2 review*).ti,ab.	15
3	1 or 2	32

SRC Methods Library
Searched: October 21, 2013
Descriptor search: systematic reviews – rapid
27 records retrieved

Appendix B. Interview Guide

Introduction

The overall mission of the Agency for Healthcare Research and Quality's (AHRQ) Effective Health Care (EHC) Program is to provide evidence-based information to health care stakeholders that is relevant to their needs, timely, objective, scientifically rigorous in construct, and developed and presented with transparency. In the production of systematic reviews, we aim to answer questions about effectiveness of interventions and average population effects. We are aware that for certain conditions and behavioral interventions, these questions may miss important issues.

AHRQ engages stakeholders in all facets of their research enterprise, including the producing of systematic reviews, with the goals of ensuring that research findings reflect the needs of diverse users, are relevant to their unique challenges, and are applicable in real-world situations.

Purpose of the Stakeholder Interview

The goal of our project is to understand methods you have used, challenges you and others frequently encounter, and your advice on producing rapid reviews.

We are very interested in learning from your experience.

There are not right or wrong answers, so please feel free to share your thoughts openly.

We would welcome any materials that you would like to share with us either before or after the interview session. Please send any materials to Johanna.anderson2@va.gov.

Ground Rules for the Stakeholder Interview

The interview will be tape recorded, transcribed, and analyzed for overarching themes.

Although the report may list individuals who were interviewed, answers will not be identifiable to individuals or specific organizations.

You may refrain from answering any questions and are welcome to end the interview at any time.

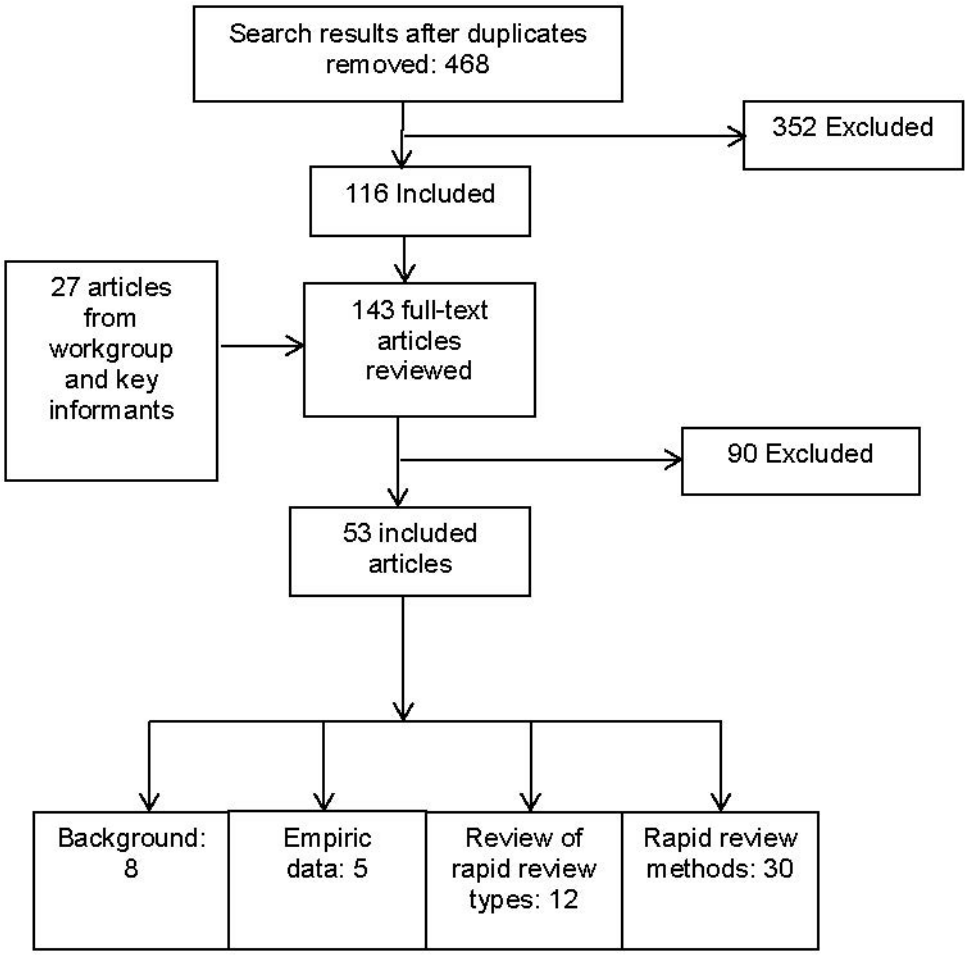
Interview Guide

1. How would you define a rapid review (in regards to time, scope, etc.)?
2. How long have you been doing rapid reviews?
3. Who do you produce rapid reviews for?
   What is your organizational structure for how you produce rapid reviews (i.e., staffing, organizational capacity)?
   a. Who does your rapid reviews? What types of skills/expertise do they have?
4. How do you determine which instances require a rapid review?
5. What is a typical timeline and scope? Representative timeline and scope?
6. Can you describe the methods used to produce a rapid review for each part of the review process (scoping, searching, extraction, synthesis, peer review, conflict of interest)?
   a. In what ways do you gain efficiency in the rapid review process?
   b. Are there any technologies or other tools that help you gain efficiency in the process?

7. Do you have any formal guidance documents that you use internally? Have you published on your methods?
8. What do your rapid review products look like (how long do they take, how many pages, etc.)?
9. What would you say are the advantages of the methods you used to make the process a rapid review? What are the disadvantages, if any?
10. What has been your experience with end-users and how they accept rapid review methods?
11. Would you be willing to share any examples of your work?

Appendix C. Flow of Studies from the Literature Review

Figure 1. Search flow diagram



Appendix D. Characteristics of Rapid Products

This appendix provides four summary tables of rapid products according to: (1) scope and purpose, (2) comprehensiveness, (3) methodological rigor and quality control, and (4) approach to analysis, synthesis, and conclusions. There are 36 products produced by 20 organizations; these are ordered by classification and timeframe.

Table D-1. Scope, end-user, and purpose of different rapid review products

*	Classification	Timeframe	Scope				End-user	Purpose
			Limit to single comparison	Limit to emerging technology	Limit number of questions	Limit number of studies		
E1	Inventory	3-5 days	Y	Y	Y	N	Hosp Admin, Payers	Give user a picture of available evidence and regulatory issues
A1	Inventory	5-10 days	N	N	U	N	Health system admin, clinicians	Allow user to do own research
L1	Inventory	5-15 days	Y	N	Y	N	Hosp Admin, Payers, Policy makers	Payers-coverage, Hospital admin for purchase, policy makers for both
R1	Inventory	1-2 weeks	Y	N	Y	N	Health system administrators, policy makers	Assess need for future research in support of purchase and coverage
I1	Inventory	<4 weeks	N	N	N	N	Hospital admin, clinicians	Assess need for future research
G1	Inventory	1-2 months	N	N	N	N	Admin	Research prioritization
C1	Rapid response	3-5 days	Y	Y	Y	[Y]	Payer	Coverage
D1	Rapid response	<1 week (could be <1 day)	Y	N	Y	N	Clinician	Clinical decisions
A2	Rapid response	15 days	Variable	N	Y	N	Policy maker	U
D3	Rapid response	2-4 weeks	N	N	Y	N	Policy maker	Coverage
F1	Rapid response	4 weeks	N	N	Y	N	Policy maker	Purchase
U1	Rapid response	1 month (minimum)	N	U	U	U	Service providers	Designing care delivery
T1	Rapid response	2-6 weeks	N	N	N	N	Clinicians	Clinical decisions
I2	Rapid response	4-8 weeks	Variable	N	Y	Y	Hosp admin, clinicians	Purchase, clinical decisions
R2	Rapid response	1-3 months	Y	N	Y	Variable	Policy makers	U

Table D-1. Scope, end-user, and purpose of different rapid review products (continued)

*								
	Rapid response	10-12 weeks	Variable	N	U	U	Research inst, govt, manufacturers	Background
	Rapid review	3 days	Y	Y	N	[Y]	Payer	coverage
	Rapid review	4 weeks	N	Y	Y	[Y]	Hospital admin, payer	coverage
	Rapid review	1 month	Y	Y	N	[Y]	Hospital Admin	purchase
	Rapid review	30 days	Y	N	Y	[Y]	Policy, admin	U
	Rapid review	30 days	Y	N	Y	[Y]	Policy, admin	U
	Rapid review	4-6 weeks (up to 16 max)	N	Y	N	N	Policy maker, hosp admin	Purchase, policy
	Rapid review	4-8 weeks (up to 10)	Y	Y	N	Y	Hosp admin	Purchase/deployment
	Rapid review	2 person-months	Y	Y	U	U	Hospital admin	purchase
	Rapid review	8-12 weeks	Y	N	Y	[Y]	Hospital admin, clinicians	Purchase, practice decision
	Rapid review	2-4 months	Y	N	Y	Y	Payer	coverage
	Rapid review	2-4 months	Y	Y	Y	Y	Payer and hospital admin	Coverage, purchase
	Rapid review	3-4 months	N	N	Y	[Y]	Health system admin	U
	Rapid review	3-4 months	Variable	N	U	U	Research inst, govt, industry	Policy, coverage, other
	Rapid review	3-4 months	N	N	Y	[Y]	Policy maker, hosp admin	U
	Rapid review	3-6 months	Y	N	Variable	[Y]	U	U
	Rapid review	3-8 months	Y	N	Y	[Y]	Payer	coverage
	Rapid review	3-6 months (NS)	Y	N	Y	[Y]	Payer	coverage
	Rapid review	3-6 months (NS)	N	Y	Y	[Y]	Policy maker, hosp admin	Purchase, coverage
	Algorithm	5 minutes	Y	N	Y	N	Clinicians, Policy makers	U
	Algorithm	1-6 weeks	N	N	N	Around 30	U	Allow user to do own research

* - working code used for internal purposes

[Y]: No set limit for studies, but other aspects of scope (comparisons, questions, outcomes) adjusted to reduce the number of studies to a manageable number for the timeframe.

Note: If this aspect was described as sometimes limited, this was counted as a "Yes"

U = unknown

Table D-2. Comprehensiveness of different rapid review products

*	Classification	Timeframe	Number of electronic databases	Grey literature searches	Language restrictions	Date restrictions	Other search restrictions†	Use Existing SRs and/or HTAs	Use primary studies
E1	Inventory	3-5 days	2	Yes	English	Sometimes	Sometimes	No	Yes
A1	Inventory	5-10 days	1+	Limited	Yes	Yes	Yes	Yes	Yes
L1	Inventory	5-15 days	1+	Yes	Yes	Yes	No	Yes	Yes
R1	Inventory	1-2 weeks	U	Limited	Yes	Yes	U	U	Yes
I1	Inventory	<4 weeks	4+	Yes	Yes	Sometimes	Sometimes	Yes	[Yes]
G1	Inventory	1-2 months	U	U	U	U	U	U	U
C1	Rapid response	3-5 days	3	U	U	U	U	U	U
D1	Rapid response	<1 week (could be <1 day)	1+	No	U	No	U	Yes	[Yes]
A2	Rapid response	15 days	1+	Limited	Yes	Yes	Yes	Yes	[Yes]
D3	Rapid response	2-4 weeks	Up to 4	No	U	No	No	Yes	[Yes]
F1	Rapid response	4 weeks	2	Yes	Yes	U	U	Yes	No
U1	Rapid response	1 month (minimum)	3+	Yes	Yes	Sometimes	No	Yes	Yes
T1	Rapid response	2-6 weeks	4	Yes	U	U	Sometimes	Yes	Yes
I2	Rapid response	4-8 weeks	4	Yes	Yes	Sometimes	Sometimes	Yes	No
R2	Rapid response	1-3 months	2+	Limited	U	Yes	U	Yes	Yes
O1	Rapid response	10-12 weeks	3	Yes	Yes	Yes	U	Yes	[Yes]
B1	Rapid review	3 days	2	Yes	U	U	U	U	Yes
E2	Rapid review	4 weeks	2	Yes	U	Sometimes	No	No	Yes
H1	Rapid review	1 month	5	U	Yes	Yes	U	Yes	[Yes]
A3	Rapid review	30 days	1+	Limited	Yes	Yes	U	Yes	[Yes]
A4	Rapid review	30 days	4	Limited	Yes	Yes	U	Yes	[Yes]
J1	Rapid review	4-6 weeks (up to 16)	2-3	U	U	U	U	Yes	[Yes]
C2	Rapid review	4-8 weeks (up to 10)	4	Yes	U	Sometimes	U	Yes	Yes
S1	Rapid review	2 person-months	U	U	U	U	U	U	Yes
I3	Rapid review	8-12 weeks	4+	Yes	Yes	Sometimes	Sometimes	Yes	[Yes]
L2	Rapid review	2-4 months	4	Yes	Yes	Sometimes	Yes	[No]	Yes
L3	Rapid review	2-4 months	5	Yes	Yes	U	Sometimes	[No]	Yes
G2	Rapid review	3-4 months	U	Yes	Yes	No	No	Yes	[Yes]
O2	Rapid review	3-4 months	3	Yes	Yes	Yes	No	[No]	Yes
P1	Rapid review	3-4 months	Variable	Sometimes	Yes	Sometimes	U	Yes	Yes
R3	Rapid review	3-6 months	2+	Limited	U	Yes	U	Yes	Yes
M1	Rapid review	3-8 months‡	2	Yes	Yes	U	Yes	Ye	[Yes]
M2	Rapid review	3-6 months (NS)	2	Yes	Yes	U	Yes	Yes	No
N1	Rapid review	3-6 months (NS)	U	No	Yes	Sometimes	Yes	Yes	Yes
D2	Algorithm	5 minutes	1	No	U	No	No	No	Yes

*	Classification	Timeframe	Number of electronic databases	Grey literature searches	Language restrictions	Date restrictions	Other search restrictions†	Use Existing SRs and/or HTAs	Use primary studies
K1	Algorithm	1-6 weeks	1+	Yes	No	No	No	[No]	Yes

* - working code used for internal purposes
† - these additional restrictions could include limiting studies based on geographic region, setting of care, minimum number of patients, duration
‡ - small (3 months), medium (6 months), large (8 months)
[Yes] – only use primary studies if no SRs or HTAs
[No] – not the focus
NS = not specified; interviewee did not provide more detail on timeframe
U = unknown

Table D-3. Methodological rigor and quality control of different rapid review products

*	Classification	Timeframe	Full text review	Limited data elements extracted	Dual study selection	Dual data extraction	Internal review	External review
E1	Inventory	3-5 days	No	Yes	No	No	No	No
A1	Inventory	5-10 days	No	N/A	No	N/A	Yes	No
L1	Inventory	5-15 days	No	Yes	No	No	Yes	No
R1	Inventory	1-2 weeks	No	N/A	No	No	No	No
I1	Inventory	<4 weeks	Yes	Yes	No	No	Yes	No
G1	Inventory	1-2 months	No	N/A	No	No	No	No
C1	Rapid response	3-5 days	U	U	No	No	U	U
D1	Rapid response	<1 week (could be <1 day)	No	Yes	No	No	No	No
A2	Rapid response	15 days	No	N/A	No	No	Yes	No
D3	Rapid response	2-4 weeks	No	Yes	No	No	No	No
F1	Rapid response	4 weeks	Yes	Yes	U	[Yes]	Yes	Sometimes
U1	Rapid response	1 month (minimum)	U	N/A	U	U	Sometimes	No
T1	Rapid response	2-6 weeks	Yes	Yes	No	No	U	U
I2	Rapid response	4-8 weeks	Yes	Yes	No	No	Yes	No
R2	Rapid response	1-3 months	Yes	Yes	No	No	U	No
O1	Rapid response	10-12 weeks	Yes	N/A	No	N/A	Yes	No
B1	Rapid review	3 days	Yes	N/A	No	No	Yes	No
E2	Rapid review	4 weeks	Yes	Yes	No	No	Yes	No
H1	Rapid review	1 month	Yes	U	No	No	U	U
A3	Rapid review	30 days	Yes	Yes	No	No	Yes	No
A4	Rapid review	30 days	Yes	Yes	No	No	Yes	Yes
J1	Rapid review	4-6 weeks (up to 16 max)	Yes	Yes	Yes	[Yes]	Yes	Yes
C2	Rapid review	4-8 weeks (up to 10)	Yes	Yes	No	No	No	No
S1	Rapid review	2 person-months	U	U	U	U	U	Yes
I3	Rapid review	8-12 weeks	Yes	Yes	No	No	Yes	No
L2	Rapid review	2-4 months	Yes	No	No	No	U	Yes
L3	Rapid review	2-4 months	Yes	Yes	Yes	No	Yes	Yes
G2	Rapid review	3-4 months	Yes	Yes	Yes	[Yes]	Yes	Yes
O2	Rapid review	3-4 months	Yes	Yes	Sometimes	Sometimes	Yes	Sometimes
P1	Rapid review	3-4 months	Sometimes	Yes	U	U	Yes	No
R3	Rapid review	3-6 months	U	U	No	No	U	Yes
M1	Rapid review	3-8 months	Yes	Yes	Partial†	[Yes]	U	Yes
M2	Rapid review	3-6 months (NS)	Yes	Yes	Partial†	[Yes]	U	Yes
N1	Rapid review	3-6 months (NS)	Yes	Sometimes	Yes	[Yes]	Yes	No
D2	Algorithm	5 minutes	No	Yes	No	No	No	No
K1	Algorithm	1-6 weeks	Yes	No	Yes	Yes	Yes	Sometimes

* - working code used for internal purposes; † - second person reviews excludes at title/abstract stage, dual review of full text
N/A – no data extraction
[Yes] – one with verification
NS = not specified; interviewee did not provide more detail on timeframe

Table D-4. Approach to analysis, synthesis, and conclusions in different rapid review products

*	Classification	Timeframe	Quality/ROB appraisal	SOE/GRADE conducted	Qualitative analysis	Quantitative analysis	Conclusions
E1	Inventory	3-5 days	No	No	No	No	No
A1	Inventory	5-10 days	No	No	No	No	Key messages
L1	Inventory	5-15 days	No	No	No	No	Opinion
R1	Inventory	1-2 weeks	No	No	No	No	No
I1	Inventory	<4 weeks	No	No	No	No	No
G1	Inventory	1-2 months	No	No	No	No	No
C1	Rapid response	3-5 days	No	No	No	No	No
D1	Rapid response	<1 week (could be <1 day)	No	No	No	No	No
A2	Rapid response	15 days	No	No	No	No	Summary of best evidence
D3	Rapid response	2-4 weeks	No	No	No	No	Report what studies concluded - no explicit review conclusion
F1	Rapid response	4 weeks	Yes	Sometimes	No	No	Yes
U1	Rapid response	1 month (minimum)	No	U	No	No	Key messages
T1	Rapid response	2-6 weeks	No	No	Yes	No	No
I2	Rapid response	4-8 weeks	Yes	No	Yes	No	Summary of what best guidelines, protocols, and systematic reviews say
R2	Rapid response	1-3 months	No	No	No	No	Summary of best evidence
O1	Rapid response	10-12 weeks	No	No	Yes	No	[Yes]
B1	Rapid review	3 days	Yes	Yes	Yes	No	Yes
E2	Rapid review	4 weeks	Yes	Yes	Yes	No	Yes
H1	Rapid review	1 month	U	Yes	Yes	No	Yes
A3	Rapid review	30 days	Yes	No	Yes	No	Yes
A4	Rapid review	30 days	Yes	No	Yes	No	Yes
J1	Rapid review	4-6 weeks (up to 16 max)	Yes	[No]	Yes	No	Yes
C2	Rapid review	4-8 weeks (up to 10)	Yes	Yes	Yes	No	Yes
S1	Rapid review	2 person-months	Yes	No	Yes	Yes	No
I3	Rapid review	8-12 weeks	Yes	Yes	Yes	No	No
L2	Rapid review	2-4 months	Yes	Yes	Yes	Yes	[Yes]
L3	Rapid review	2-4 months	Yes	No	Yes	No	[Yes]
G2	Rapid review	3-4 months	Yes	Yes	Yes	Yes	Yes
O2	Rapid review	3-4 months	Yes	U	Yes	No	Yes
P1	Rapid review	3-4 months	Sometimes	Sometimes	Sometimes	Sometimes	Opinion
R3	Rapid review	3-6 months	No	No	Yes	No	Yes
M1	Rapid review	3-8 months	Yes	Yes	Yes	Yes	Yes
M2	Rapid review	3-6 months (NS)	Yes	Yes	Yes	Yes	[Yes]
N1	Rapid review	3-6 months (NS)	Yes	Yes	Yes	Yes	Yes
D2	Algorithm	5 minutes	No	No	Yes	Yes	Yes

*	Classification	Timeframe	Quality/ROB appraisal	SOE/GRADE conducted	Qualitative analysis	Quantitative analysis	Conclusions
K1	Algorithm	1-6 weeks	Yes	Yes	No	No	No

* - working code used for internal purposes
[No] – under consideration
[Yes] - yes conclusions, no recommendations
NS = not specified; interviewee did not provide more detail on timeframe
U = unknown

Appendix E. Types of Rapid Review Products Described by Key Informants

This appendix provides additional information that was gathered from the Key Informant interviews. Some of this content overlaps with the information that is presented in the results' section of the main report based on the combined analysis of the Key Informant interviews and the literature.

Interviewees described several rapid review products, some completed within days (Table E-1). Tables E1-4 below describe the products and the names that Key Informants used to describe them according to the timeframe in which they were produced. Most organizations appeared to have started with a product that was produced in several months. Because rapid reviewers have a strong relationship with a particular requestor, they often spoke about asking the requestor when they needed to make the decision, and then the reviewer would work back to present what could be done in that timeframe and explore whether this would be helpful. Over time, various products were developed in the back-and-forth conversation between reviewers and requestors ranging from products that were completed within days to months.

Table E-1. Products completed in days (based on Key Informant interviews)

Name of product	Timeframe	Report Style	Process
Reference List	1-7 days	List of available evidence, sorted by study design.	Work directly with requestor to determine what is needed. Search major databases (Embase, PubMed, Medline, Cochrane) and other HTA agencies.
Scoping Review	3-5 days	List of available evidence.	Patient submitted appeal for single technology or intervention. Search TRIP, PubMed, Cochrane. Send list to committee for decisionmaking.
Rapid Review	3 days	Narrative summary of evidence with recommendation.	Receive questions from health plans and work directly with nominator. Search Medline, Embase and summarize available evidence. Includes quality appraisal and grading.
Rapid Review	7 days or less	1 page narrative summary of evidence.	Work directly with clinicians who submit questions. Search first for existing reviews (TRIP, Cochrane) and go to primary evidence if necessary.

Interviewees also described several rapid review products that use existing reviews as the primary or sole source of evidence. These products were narrative summaries of the existing evidence. Details of these products are outlined in Table E-2.

Table E-2. Products primarily using existing reviews (based on Key Informant interviews)

Name of product	Timeframe	Report Style	Process
Rapid Review	1 week or less	1 page narrative summary of evidence.	Work directly with clinicians who submit questions. Search first for existing reviews (TRIP, Cochrane) and go to primary evidence if necessary.
Evidence Briefing	1 month	Narrative summary of existing evidence.	Work directly with requestors to determine questions/timeframe. Search their own database (DARE) which has quality rated existing reviews. If no reviews are found, do not search primary evidence but tell requestor that no existing reviews are available.

Table E-3 provides an overview of the different rapid products and Table E-4 provides a list of the end-users by timeframe; the information in these tables is based on the Key Informant interviews.

Table E-3. Landscape of rapid products by timeframe (based on Key Informant interviews)

Timeframe	Landscape of reports
< 7 days	There are 4 different reports, the scopes of these were varied but were fairly narrow (single intervention, evaluating effectiveness only, single technology). The styles of these reports varied from a reference list to presenting the scope of the evidence to narratives. Only one included internal review, one study considered feedback on the website as external review. None of the reports performed quantitative analysis, though one did conduct qualitative analysis. One of the four provided recommendations. The number of people working on the reports ranged from 2-10. One type relied on existing SRs.
1-2 weeks	Two reports were conducted in 1 to 2 weeks. Dual review was not conducted for either of these, nor did they rely solely on existing SRs. Neither report conducted dual extraction nor did they conduct quality appraisal, and only one conducted a full text review. Internal or external review was not conducted and no recommendations were provided.
1-2 months	Sixteen reports were conducted and most of these were classified as Rapid Reviews. Others were Brief Reports; Rapid Summary; Evidence Briefing; Medical Technology Assessment; Literature Summary; Health Technology Assessment; Evidence Inventory; Evidence-based Briefs and Evidence Advisory. The purpose for most of these was to be used in health system decisions. Very few of the reports conducted dual study selection. Some used existing SRs but not as the sole source of evidence. Almost all of the data extraction was conducted by just one person, most conducted quality appraisal for primary studies as well as SRs using AMSTAR. Some conducted strength of evidence assessments and the most used method was GRADE. Most of these reports had a structured format, many included evidence tables and a narrative synthesis. Few reports did not conduct any sort of internal or external review; most included external review. Most of the reports conducted qualitative synthesis, and some conducted both qualitative and quantitative synthesis. Very few of the reports provided guidance. 1-10 people could have worked on any given report.
3-6 months	Eight reports were conducted in 3-6 months most of which are referred to as rapid reviews. Literature selection was mostly done by one person. All of these reviews included existing SRs, not as sole data source. Most conducted data extraction by one person, quality appraisal and SOE. Most of the reports had a structured format and the styles of the reports varied but most included external review. None conducted a quantitative analysis, some did a qualitative analysis, and none of the reports provided guidance.
12-18 months	One report was conducted in 12-18 months. This is a single technology appraisal that produces national guidance to inform drug funding. The reviewers did not conduct a literature search as this was already done by the manufacturer. The manufacturer provided most of the report pieces (search, template, synthesis) and the organization acted as a dual reviewer in the process.

Table E-4. End-users of rapid review products by timeframe

Timeframe	End-users of rapid review products
< 7 days	Clinicians, health plan, national health system decisionmakers, patients, regional health system decisionmakers
1-3 weeks	Health systems, hospitals, payers, public health consultants
1-3 months	"Clinical commissioning groups", clinicians, guideline development organizations, health plans, healthcare systems, hospitals, national health system decisionmakers, regional health system decisionmakers
3-6 months	Government organizations, health systems, hospitals, national health system decisionmakers, regional health system decisionmakers, universities
12-18 months	Health system decisionmakers, national policy decisionmakers