

**Assessing qualitative data richness and thickness: Development of an evidence-based tool for use in qualitative evidence synthesis**

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## METHODS ARTICLE

# Assessing qualitative data richness and thickness: Development of an evidence-based tool for use in qualitative evidence synthesis

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## Abstract

**Background:** Well-conducted qualitative evidence syntheses (QESs) can provide invaluable insights into complex phenomena. However, the development of an in-depth understanding depends on the analysis of rich, thick data from the included primary qualitative studies. Sampling may be needed if there are too many eligible studies. Data richness and thickness are among several criteria that can be taken into consideration when sampling studies for inclusion. However, existing tools do not address explicitly the assessment of both data richness and thickness in the context of QES.

**Methods:** To address this gap, we have developed, piloted, and conducted initial user testing of a richness and thickness assessment tool. The tool has been in development since 2014. Three pilot versions from three review teams have been used in six Cochrane reviews. Key members from the original three review teams subsequently came together to create a consensus-based definitive version 1 of the tool. Four review authors piloted the version 1 tool, which has been subject to initial user testing. The version 1 assessment tool consists of two components: assessing the thickness of contextual data and assessing the richness of conceptual data. The accompanying guidance emphasizes the importance of assessing data that addresses the review question.

**Results:** The paper provides guidance on how to apply the tool, emphasizing the importance of reaching a consensus among review authors and fostering a shared understanding of what constitutes rich and thick data in the context of the review. The potential challenges related to the time and resource constraints of this additional review process are acknowledged.

**Conclusion:** Version 1 of the tool represents a significant development in QES methodology, filling a critical gap and enhancing the transparency and rigor of the

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sampling process. The authors invite feedback from the research community to further test, refine and improve this tool based on wider user experiences.

### KEYWORDS

conceptual richness, contextual thickness, data assessment, evaluation, framework synthesis, meta-ethnography, QES, qualitative evidence synthesis, qualitative research, sampling, systematic review, thematic synthesis, tool development

## 1 | INTRODUCTION

Qualitative evidence syntheses (QESs), also known as systematic reviews of qualitative research, aim to explore people's perceptions and experiences of the world around them or specific phenomena of interest by synthesizing data from qualitative studies across a range of settings [1]. There are numerous QES methods that vary in purpose, complexity, and epistemological location [2–4].

When well-conducted, a QES can provide an in-depth understanding of complex phenomena while focusing on the experiences and perceptions of research participants and taking into consideration other contextual factors [2, 5, 6]. However, an in-depth understanding of the phenomena of interest also depends on the richness and thickness of data in the included studies.

Cochrane methodologists have differentiated between “conceptual richness” and “contextual thickness” of data [2, 7]. The conceptual richness of a study refers to the degree and ways in which concepts or theories are utilized and expanded upon to extract deeper insights from the viewpoint of the participants, known as subjective meaning. This approach allows for interpretation of rich data that is potentially transferable to different contexts. Popay et al. [7] suggest that privileging and interpreting the subjective meaning of participants in sufficient depth is a primary marker of conceptual quality in a qualitative study. The conceptual richness of data is also associated with the degree of data transformation. That is, conceptually rich findings are those that are linked to, or further develop, theoretical and conceptual understandings of the phenomena of interest and the degree of researcher interpretation of the meaning of data from the participant perspective [8–10]. When referring to conceptual data the descriptors “rich” and “poor” are used, although how assessments of “rich” and “poor” data are operationalized and reported are diverse and often vague.

The contextual thickness of a study relates to the degree of detail or level of description of the social and research context, including the participants, setting, methods, and processes. Popay and colleagues suggest that the degree of description (or thickness) of the social context is another primary marker of study quality [7]. For contextual data, the descriptors “thick” or “thin” are used [2]. Whilst richness and thickness are distinct aspects, it is important to acknowledge that many authors use these interchangeably. Thus, highlighting the relevance of and need for further guidance on how to recognize and assess these domains.

For some QES topics, there are many primary qualitative studies available. However, a large number of primary qualitative studies with a high volume of data is not necessarily viewed as an advantage as it can threaten the quality of the synthesis [11, 12, 13]. Analysis and synthesis of qualitative data require a detailed engagement with text and large volumes of data make this difficult. As has been argued in relation to primary qualitative research [14, 15], the more data a researcher has to synthesize, the less depth of understanding is likely to be gained from these data. This contrasts with reviews of intervention effectiveness where leaving out a single relevant study that meets the inclusion criteria can introduce bias.

To manage a high number of eligible studies, review authors can opt to select the most appropriate qualitative studies for inclusion in their QES by sampling from the eligible studies [12, 16–19]. There are several criteria that can be taken into consideration when sampling. These include, amongst many others, the relevance of the studies to answering review questions, the need to incorporate contradictory data/disconfirming cases or alternative lines of argument and refutational analyses, [16], the methodological quality of studies or the richness and thickness of the studies that met the inclusion criteria [12]. These criteria are linked to the domains in GRADE-CERQual and are used in a subsequent step in the synthesis to assess the confidence the review authors have in the review findings [16, 20].

The type of QES being undertaken and the method of synthesis selected are important considerations when deciding how to approach the synthesis process, including sampling. Sampling may not be necessary for QES approaches which seek only to synthesize and describe data without transforming them, such as meta-aggregation [21–23]. In contrast, other types of QES approaches which involve transformation and interpretation of synthesized data, such as meta-ethnography [24], thematic synthesis [25], and Best Fit Framework synthesis [26] may require review teams to sample from the studies that meet their inclusion criteria. In such cases, using data thickness/richness as criteria for purposively sampling studies is a well-suited and important sampling strategy [12, 27, 28].

Before the development and use of the data thickness/richness tool in a QES conducted by Ames and colleagues in 2017 [28], to our knowledge no published systematic tools were available to assess the richness or thickness of data in primary qualitative studies for inclusion in a QES [29]. However, there were examples of approaches that relied heavily on expert judgment to assess theoretical adequacy. These

approaches were not developed beyond the specific reviews in which they were implemented [30]. To address this gap, we have developed and piloted an assessment tool and conducted some initial user testing. The tool can help to improve the transparency and consistency of data thickness/richness assessments and how these assessments are reported, as well as enhance the comparability of QES methods and avoid duplication of efforts in developing this type of tool.

The aim of this methodological research was to develop and provide general guidance for the use of a richness and thickness assessment tool. This tool aims to assist review authors in systematically and transparently assessing the thickness and richness of data in the qualitative studies they include.

We first present the methods and processes for developing and piloting three initial versions of the tool. In the findings section, we present Version 1 of the assessment tool, which was developed based on four pilot tools [12, 29, 31, 32]. We also provide guidance to review authors on how to use and implement the data thickness/richness tool in their QES.

## 2 | METHODS

### 2.1 | Initial development of the tool in four QESs

Three Cochrane authors (Heather M. R. Ames, Simon Lewin, and Claire Glenton) identified a need in 2013 to develop a transparent and systematic way to assess the thickness/richness of data in studies that met the inclusion criteria for a QES. This resulted from the need to identify and prioritize a rich sample from many studies that met the inclusion criteria for their QES exploring communication about routine childhood vaccination, and the lack of a suitable tool in the literature to assess data richness. They developed a five-point tool, which was applied to the included studies in two QESs: a thematic synthesis and a framework synthesis [12, 29] (Pilot 1). (Supporting Information S1: [File S1](#)).

After publication, two other review teams further developed the assessment tool for use in meta-ethnographies (Pilot 2 and Pilot 3). France et al. [32, 33] piloted a three-point tool to assess data thickness/richness drawing on Ames' approach and theoretical work by Popay et al. [6] (Supporting Information S2: [File S2](#)). Drawing on theoretical work by Sandelowski and Barroso [8], Cooper et al. [31] piloted a five-point tool focusing on the assessment of conceptual richness of studies meeting the inclusion criteria for their meta-ethnography (Supporting Information S1: [File S3](#)). For an overview of the different pilot tools see [Table 1](#).

The review author teams reached an agreement across all three pilot tools (as described in the Supporting Information: [Files S1–S3](#)) and also received input from the Cochrane editorial and methods groups involved with their reviews (Cochrane Consumer and Communication Group, Cochrane Effective Practice and Organisation of Care Group, Cochrane Pain, Palliative and Supportive Care, and Cochrane Qualitative and Implementations Methods Group). Each review also went through a peer review process where the decisions related to assessing and reporting data richness and thickness as part of the sampling strategy were discussed, debated, and refined before publication.

### 2.2 | Consensus and piloting of the version 1 thickness/richness assessment tool

When coming together to develop version 1, the three review teams discussed their experiences of implementing and reporting the pilot data thickness/richness assessment tools. Ames first compared the different pilot tools and assessment domains created by the three review teams. She blended the pilot tools and assessment domains to create a draft version 1 of the tool. These were presented at an author meeting for discussion and revision. The team also explored other conceptualizations and presentations of thick descriptions [6, 34–36] to help further refine the tool.

Once a consensus was reached, four authors (Heather M. R. Ames, Emma F. France, Sara Cooper, and Mayara S. Bianchim), drawn from the three review teams involved in the initial pilots, piloted the version 1 tool on 10 included studies selected by HA from a recent, yet to be

**TABLE 1** Overview of the pilot tools.

Pilot	Tool	Review methodology
Pilot 1a: Ames 2017 [29]	5-point tool	Thematic synthesis
Pilot 1b: Ames 2019 [12]	5-point tool limited to assessing data addressing the review question	Framework synthesis
Pilot 2: France 2023 [33]	3-point tool drawing on pilot 1b and theoretical work by Popay et al. [6]	Meta-ethnography
Pilot 3: Cooper 2021 [31]	5-point tool with a specific focus on conceptual richness drawing on Sandelowski and Barroso [8]	Meta-ethnography

published QES on experiences of interventions for chronic low back pain in people over 60 years [37]. The studies were selected to represent a variety of data richness and thickness.

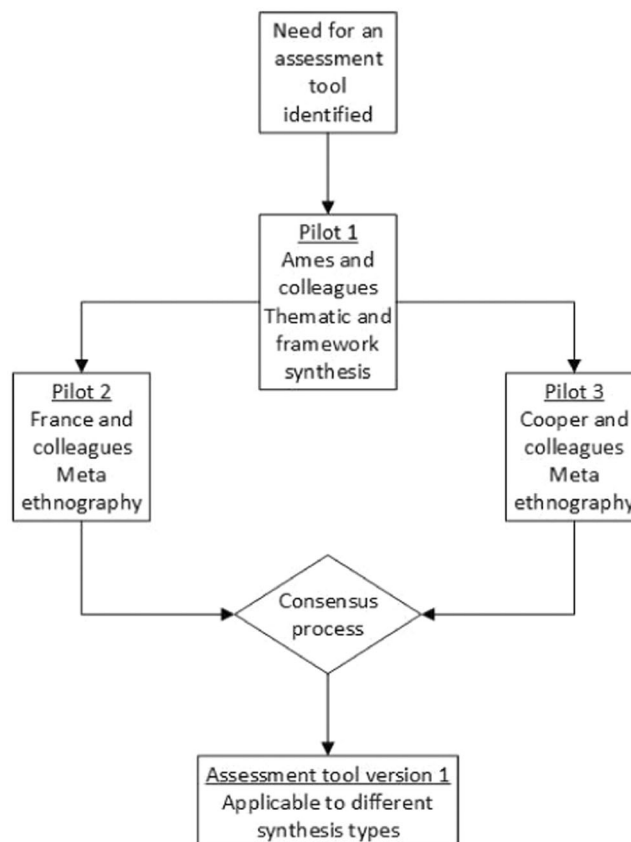
This piloting was done in two stages. In the first stage, all four authors (Heather M. R. Ames, Emma F. France, Sara Cooper, and Mayara S. Bianchim) piloted the version 1 tool on two studies, [38, 39] met to discuss their experiences with using the tool, updated the tool and guidance as needed and developed the assessment criteria. Next, they piloted the tool on eight further studies [40–47]. Each study was assessed by two authors. In a follow up meeting, five authors (Heather M. R. Ames, Emma F. France, Sara Cooper, Mayara S. Bianchim, and Jane Noyes) discussed and compared their assessments. Based on this discussion, they adjusted the tool to a sliding tool with four assessment criteria to accommodate studies that sat between two points and agreed the tool guidance and assessment criteria.

For an overview of the development process see Figure 1. Table 2 describes the contributions of each pilot tool to the development of the version 1 tool.

### 3 | FINDINGS

In this section, we present version 1 of the data richness/thickness assessment tool and provide general guidance for review author teams looking to implement the tool as part of their synthesis process.

Each of the data thickness and richness assessments are undertaken and mapped onto different sliding tools (Figure 2). Monochromatic versions of the tools are available in Supporting Information S3: Appendix S1. Once a judgment has been made, the review author can mark it on the sliding tool digitally or by hand. We adapted the original reporting of a three-point cardinal number tool to a sliding tool with four markers because it was difficult for the review authors involved in the pilot to make a single numerical judgment; assessments of papers commonly fell between two points on the tool. A sliding tool allows for nuance that is more consistent with a qualitative approach and should provide a better platform for discussion and comparisons between reviewers. The same tool can be used for assessing both data richness and data thickness for each study. Reporting of data richness and thickness can be recorded on two individual tools (see Figure 2) or combined on a single tool (see Figure 3).



**FIGURE 1** The development process of the data thickness/richness assessment tool.

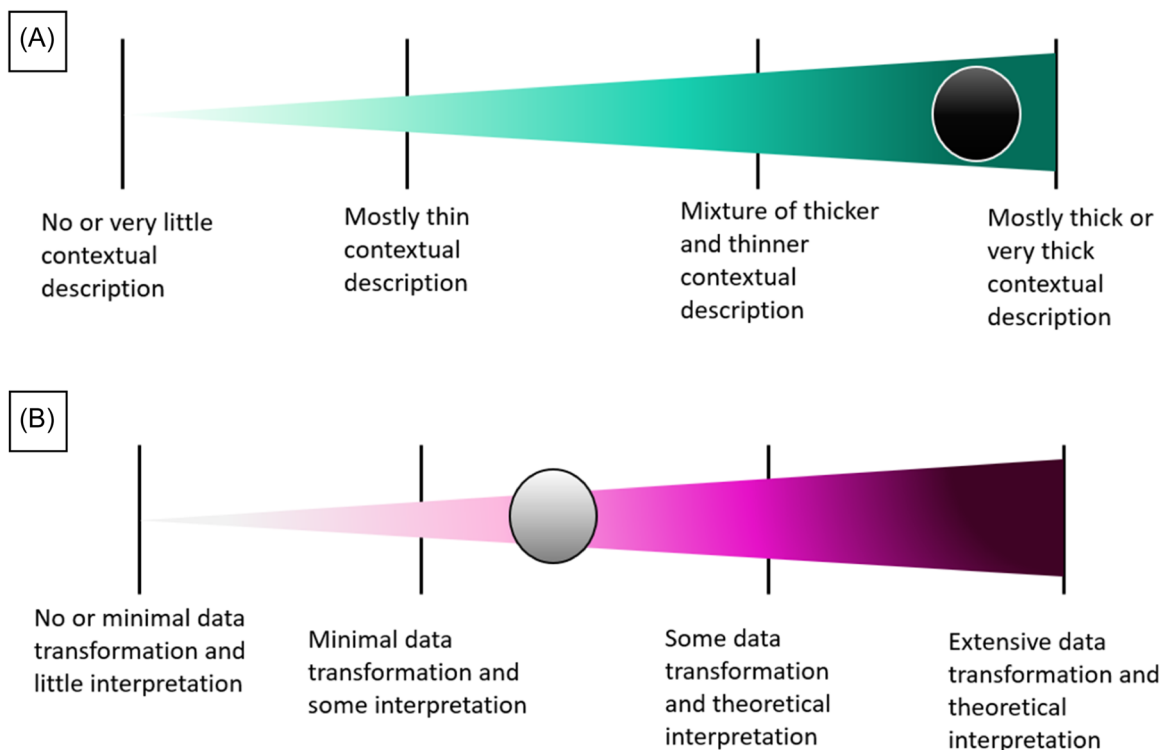
**TABLE 2** Contributions of the pilot tools to the development of the final version 1 tool.

Pilot	Rationale for developing tool	Contribution to final version 1 tool	Use
Pilot 1a: Ames 2017 [29]	The authors wanted rich data to work with. They believed that this type of data would benefit the synthesis by providing more detailed descriptions of context and concepts as well as a larger quantity of data to be included in the analysis. As at that time, there were no existing tools to help assess data richness in qualitative studies, they decided to develop a tool to assess the data richness of the studies.	Original tool that provided the foundation for adaptations performed by Cooper et al. [31] and France et al. [33]	One of the stages of the authors' sampling strategy was based on scoring the data richness of the eligible studies.
Pilot 1b: Ames 2019 [11]	The authors decision to include data richness as a part of their sampling frame was based on the rationale that rich/thick data can provide in-depth insights into the phenomenon of interest, allowing the researcher to better interpret the meaning and context of findings presented in the primary studies.	Elaboration of the original tool provided the foundation for adaptations performed by Cooper et al. [31] and France et al. [33]	The authors quickly realized that the large number of studies that they had included would hamper the quality of their synthesis. They decided to develop a way to purposively sample studies into their synthesis that would give them the best data to answer their question. They then developed a three-step sampling frame which included richness as one of the criteria.
Pilot 2: France 2023 [33]	A meta-ethnography ideally requires studies with rich and thick qualitative data including detailed context and setting descriptions. France and her team needed a tool to rate the richness/thickness of findings from a large number ( $n = 170$ ) of eligible studies identified from comprehensive literature searches.	The team included in their revised tool a focus on the contextual detail of studies as well as the richness, and not just the volume of findings compared to Ames original tool [11].	The richness of study findings was one aspect of a wider sampling strategy for the meta-ethnography. This strategy took into account the relevance of the geographical settings; participant characteristics, for example in terms of age, type of chronic pain; and how closely related the aim of each study was to the aim of the meta-ethnography.
Pilot 3: Cooper 2021 [31]	The team had not intended to develop a tool when they began their review. Rather, they developed it iteratively in response to the need that arose during the review process to have a way of assessing the "conceptual richness" of studies. The large number of studies that met the review inclusion criteria ( $n = 173$ ), together with time and resource constraints, meant that the team took a pragmatic approach that was fit for the purpose of their review.	The team adapted Ames original tool "data richness" to fully align with their specific need for conceptually rich studies.	"Conceptual richness" was the primary sampling criterion for their meta-ethnography. This was to ensure that those studies included in the analysis contained sufficient conceptual depth to enable adequate interpretation, translation, and potential development of new theory or explanatory concepts.

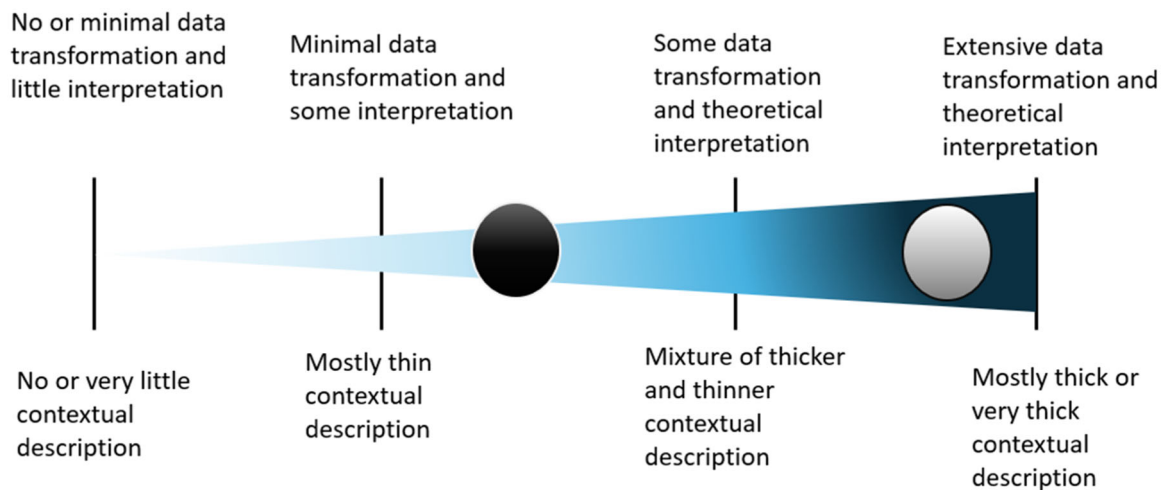
An important factor to keep in mind when assessing studies is to only assess data that address the review question, as specified in the review protocol. The data thickness/richness assessments are meant to help review authors select for inclusion those primary studies that include rich and thick data that address the review question. When assessing a primary study, if a review team considers data that does not address the review question, the study may be assessed as being conceptually rich and contextually thick but contribute very little data to the synthesis.

To help ensure that they are considering data that address the review question, review authors can make a judgment about the amount of data in a study that addresses the review question before they go on to assess data richness and thickness. This would help review authors become familiar with the included studies before proceeding to other assessments. For example, review authors could assess included studies against pre-determined criteria related to the amount of data addressing the review question. See Table 3 for suggested data relevance categories.

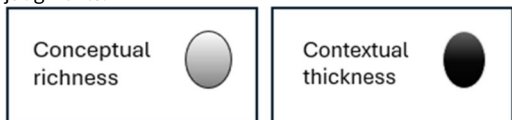
Although Table 3 provides guidance on how to use the sliding tool to assess the amount of data in a primary study that addresses the review question; the tool was not developed to provide a definitive numeric assessment or gold standard to measure studies against. Ideally, at least two review authors would pilot the tool together or independently on a small number of studies and then reach a consensus through discussion. The intention is to discuss and reach an agreement on the amount of data in the study that addresses the review.



**FIGURE 2** The sliding data (A) thickness assessment tool and (B) richness assessment tool.



**FIGURE 3** An assessment example where the assessments are recorded on the same tool and different colors are used to differentiate the judgments.



After assessments of the amount of data that addresses the review question are made, review authors can then decide how they want to proceed with the data thickness/richness assessments. For example, they could begin with the studies with the most data addressing the review question first.

Studies are assessed in relation to each other and the review question and not to an imaginary gold standard. The process is also iterative so assessments may change as the review team works through the assessment of each of the studies and the analysis. If multiple reports are

**TABLE 3** Categories to facilitate assessment of the amount of data in a primary study that addresses the review question.

Amount of data in the study that addresses the review question
Study includes very little data that address the review question
Study includes some data that address the review question
Study includes a moderate amount of data that addresses the review question
Study includes a large amount of data that addresses the review question

published from the same study these should be assessed individually first. The review authors can then decide to make an overall assessment across multiple reports from a single study or to leave them as individual assessments.

It is important to remember that the assessment process is a starting point for further discussion. The discussion and consensus process to undertake and finalize the assessments are as important as where the studies are located on the tool.

## 4 | DATA THICKNESS AND RICHNESS ASSESSMENT TOOL VERSION 1

### 4.1 | Assessing data thickness

The data thickness assessment part of the tool aims to help QES authors assess the contextual thickness of the data in a primary study. Contextual and inter-relational (e.g., interactions between different aspects of the data and its context) descriptions increase the reader's ability to visualize the study participants, context, their interactions with the researcher and so on.

Depending on the focus of the qualitative research study and question, review authors can potentially assess the thickness of contextual description related to the health and social context (e.g., relevant policy and legal frameworks, the health, social care, education, or other type of system and the research problem, why the research is important, etc), as well as descriptions of the participants (sample), study setting, and methods and procedures. When using this tool, review authors should look at the contextual thickness of the study as a whole, that is, across the full study report. Some contextual detail (such as researcher reflexivity and conflicts of interest), for example, may also be reported in the findings, discussion, and supplemental online files.

### 4.2 | Assessing conceptual richness

The data richness assessment part of the tool aims to help QES authors assess the conceptual richness of a primary study. In this context, we define conceptual richness of a study as the degree of abstraction of analysis and interpretation of the data, or what is commonly referred to as the extent of "data transformation," as well as the degree of interpretation of the subjective meaning of participants [6, 8]. This definition in part draws on the typology of the type and nature of qualitative findings developed by Sandelowski and Barroso [8]. This typology conceives qualitative research findings as being located along a continuous spectrum representing the degree of transformation of the data. At one end of the spectrum are less transformed findings; that is, findings that describe patterns in the data. At the other end of the spectrum are more transformed findings that help to interpret and explain the phenomena of interest. These transformed findings have a high level of abstraction and provide theoretical interpretations or explanations of the patterns in the data. In the middle of the spectrum are findings that do more than simply describe the data but are not yet fully transformed data that provide interpretations or explanations of the phenomena of interest. These findings may explore patterns of association in the data and/or link patterns in the data to key theoretical concepts.

The tool we developed to assess conceptual richness in part draws on the terms developed by the original authors [8] to illustrate the different kinds of findings along this spectrum of data transformation. When using this tool, review authors should look at the conceptual richness of the data across the full study report (i.e., not just in the findings section and including supplemental files) including text, tables, infographics, photographs, and other visual ways of presenting conceptual information. See Table 4 for the assessment tool.

Not all types of synthesis will require an assessment of the conceptual richness of included studies—some synthesis methods that do not set out to transform data (e.g., meta-aggregation) can accommodate conceptually thinner studies. However, conceptual richness is important for synthesis methods where data are transformed (e.g., meta-ethnography).



**TABLE 4** Data thickness/richness assessment tool for data that address the review question.<sup>a</sup>

Assessment criteria
<b>Thickness of contextual data</b>
No or very little description that covers minimal aspects of context.
Mostly thin contextual description that covers few aspects of context.
A mixture of some thicker and some thinner contextual description covering some but not all aspects of context, or all aspects but not in sufficient detail.
Mostly thick or very thick contextual description covering most/all aspects of context.
<b>Richness of conceptual data</b>
No or very little transformation of the data in the creation of the findings, and little or no attempt to interpret or explain patterns. No use of theory or conceptual frameworks in the analysis and very little use of relevant empirical literature. No or very little detail on the interpretation of the subjective meaning of actions and behaviors to participants.
Basic application of a theory or conceptual framework to label, present, or organize portions of the data, develop themes or frame the findings. There is little transformation of the data in the creation of the findings and the findings provide little detail on the interpretation of the subjective meaning of actions and behaviors to participants.
Conceptual/thematic description as above but taking it one step further with a degree of theoretical development rooted in the study findings. There is some transformation of the data in the creation of some of the findings, but not the majority. This transformation is intended to further interpret or explain patterns in some aspects of the data or to link these patterns and meanings to key theoretical concepts. Some detail regarding the subjective meaning of actions and behaviors to participants.
The majority of the findings are based on more extensive transformation of the data but some findings may remain very close to the data. The more transformed findings provide theoretical interpretations or explanations of the patterns in the data. These interpretive explanations offer extensions to or propose a new model, framework, theory, or line of argument and attempt to provide integrated explanations of phenomena. Theory or a conceptual framework is integrated throughout the paper. Detailed interpretation of the subjective meaning of actions and behaviors to participants.

<sup>a</sup>The descriptions and explanations in this table draw on the work of Sandelowski and Barroso [8].

### 4.3 | Assessing both richness and thickness as a part of sampling

Depending on the review question, review authors may need to assess conceptual richness or contextual thickness or both. There are multiple ways of combining these assessments and a decision needs to be made that fits the priorities of the review. For example, review authors could assess the conceptual richness of studies first if theory and conceptual frameworks were prioritized due to the type of synthesis to be carried out or the review question. The richest studies could then be selected and assessed for contextual thickness as a second step before selecting a final sample. If review authors are focused on both richness and thickness equally, they could assess all studies on both points and decide a cut-off point following a combined assessment. Beyond this point, studies meeting the set criteria would be included in the synthesis.

Review authors could also choose to sample all studies above a certain cut off criterion (which could vary from review to review), or use the assessments as a stepwise sampling process, starting with including studies assessed to be the richest/thickest and working down. The assessment of data thickness/richness could also be included as one step in a more complex sampling procedure to achieve maximum variation based on data richness/thickness along with other inclusion criteria such as context, intervention or population [12, 48].

A detailed assessment of contextual description at individual study level can also help in selecting studies that are relevant to addressing the review question and context, as specified in the review protocol. Again, a stepwise approach could be taken to selecting studies based on contextual relevance.

## 4.4 | How to apply the assessment tool in a QES

### 4.4.1 | Piloting the assessment tool and reaching a consensus

The aim of this tool is to aid discussion and comparisons of data thickness/richness judgments and assessments between review authors across studies being assessed for inclusion in a QES. This can facilitate decisions about including the richest and thickest studies in a synthesis. This assessment should focus on the data from the primary study that address the review question (i.e., data that can potentially contribute to the synthesis), and not on all data in the study.

The data thickness/richness assessments can subsequently be combined with other considerations such as ensuring that all perspectives and contexts specified in the review question are covered as part of a sampling frame.

This version 1 assessment tool is not intended to provide a numeric assessment or gold standard to measure studies against. Ideally, at least two review authors would pilot the tool together or independently on a small number of studies and then reach a consensus through discussion. The intention is to debate and discuss complex judgments about whether a study should be included in a QES rather than just come to a consensus about the assessment in relation to the tool. It is also important that review authors make comments or notes that describe the reasoning behind their judgments for each assessment to use in reporting the findings of the assessments later in the review process. Piloting in this way can ensure that all review authors understand and are applying the tool consistently. It is important that the review authors come to a consensus on what is considered as rich and/or thick data in relation to the review question, objectives, and eligibility criteria. This should be informed by an a priori QES protocol. Review authors should keep an audit and decision trail detailing their discussions and decisions. While assessments of contextual thickness and conceptual richness are arguably at least partly intuitive and subjective, having agreed and transparent criteria for defining and judging richness is still important.

The process of assessing data thickness/richness requires review authors to become immersed in the studies that meet the inclusion criteria and to identify data that address the review question. This can be time consuming. Ideally, review authors involved in the data thickness/richness assessments should be the same as those who go on to undertake the data synthesis because they will have an in-depth familiarity with the included studies. The assessment of contextual data thickness may be a task that could be taken on by less experienced researchers, whereas conceptual richness may require a more experienced qualitative researcher/reviewer with a deeper understanding of theory and QES methods.

For QES with a very short timescale for completion, alternative approaches to the gold standard of achieving consensus between two reviewers may need to be considered to meet time and resource constraints. These could include (1) assessing studies until a consensus is reached and then having one reviewer complete the assessments of the remaining studies, (2) having a single reviewer complete all the assessments and then have a second reviewer double check them, or (3) having a single reviewer complete all of the assessments and present the results to the team for discussion.

See Figure 3 for an example of combined thickness and richness assessments.

#### 4.4.2 | Multiple publications contributing to the same study

Another challenge review authors may face is how to gauge an overall assessment for studies with multiple study reports of varying richness or thickness. To reach an overall assessment for studies with multiple study reports of varying richness or thickness, we suggest [31] assessing each article study report separately first, and then using these assessments to make an overall judgment for the study as a whole.

#### 4.5 | Reporting

We have developed this version 1 tool in line with other calls for transparency and systematic methods in QES [28, 49, 50]. We think it is important that the review authors fully report their methods including how sampling was conducted and how the tool was used in the sampling process. This version 1 data thickness/richness assessment tool should help review authors to report their assessments and sampling in a systematic, clear, and transparent way. When the tool is used, assessments should be reported transparently in Supporting Information or be made available upon request from the review author team. This could be done visually by assembling all of the assessments on a single (enlarged) tool and adding a cut-off line or narratively through description of the review authors' discussions.

### 5 | CONCLUSION

This is the first tool to assess the thickness and richness of data reported in published qualitative studies and fills a gap in methods development. Within this tool, we have tried to create ways of separately examining thickness and richness. However, we acknowledge that these can be contested concepts, and it may sometimes be challenging to separate the two in practice. We believe that the exercise of actively considering these two aspects will contribute to more transparent sampling processes.

The tool was developed using evidence-based and rigorous consensus methods with large and experienced review teams and methodologists in diverse global locations. We believe that the version 1 tool will further improve the overall quality and transparency of the sampling process within QES, further improve the overall conduct and quality of a QES, and provide additional useful information that can contribute to an assessment of methodological limitations in primary qualitative studies.

The tool (using various pilot versions) has already been used in Cochrane reviews [12, 29, 31, 51–54]. The pilot tools helped to systematize the process and make the underlying judgments more transparent [12, 29, 31, 33]. The use of the pilot assessment tools in published QESs added a layer of systemization to the sampling process. It allowed for discussion amongst the review teams and a transparent audit trail around decisions for sampling studies into the synthesis. This process helped to reduce reviewer bias in the sampling process.

While the tool has primarily been utilized to inform decisions during the sampling process, it also holds potential for application during the process of assessing confidence in the review findings using the GRADE-CERQual approach. For instance, review authors could apply a stepwise sampling approach by including initially only the richest studies and then returning to sample further studies with lower richness assessments specifically for QES findings with a GRADE-CERQual assessment of low or very low confidence based on concerns regarding data adequacy (which encompasses an assessment of the data richness of studies contributing to the synthesized finding). This approach is congruent with guidance in the new Cochrane-Campbell Handbook for QES and is an area for further methodological research [55]. See also Chapter 6 in the Handbook [55] on Searching and Sampling.

Further methodological research is needed to explore how the data thickness/richness assessments at individual study level can contribute to subsequent stages of the QES such as the application of GRADE-CERQual where an assessment of data richness and contextual relevance of studies contributing to a synthesized finding are undertaken as part of the adequacy and relevance components. In addition, the version 1 tool could be tested for use when undertaking qualitative “sensitivity analyses” to explore the contributions of rich and less rich studies to the synthesis findings [56] or further exploration of how different review authors interpret and apply the assessments in the tool and what type of guidance would best suit their needs.

We welcome feedback on the tool and the guidance so that it can be further developed based on user experience.

## AUTHOR CONTRIBUTIONS

**Heather M. R. Ames:** Conceptualization; data curation; formal analysis; investigation; methodology; project administration; supervision; visualization; writing—original draft; writing—review and editing. **Emma F. France:** Conceptualization; data curation; formal analysis; investigation; methodology; writing—original draft; writing—review and editing. **Sara Cooper:** Conceptualization; investigation; methodology; writing—original draft; writing—review and editing. **Mayara S. Bianchim:** Conceptualization; data curation; formal analysis; methodology; project administration; writing—original draft; writing—review and editing. **Simon Lewin:** Conceptualization; methodology; writing—original draft; writing—review and editing. **Bey-Marrié Schmidt:** Conceptualization; methodology; writing—original draft; writing—review and editing. **Isabelle Uny:** Conceptualization; methodology; writing—original draft; writing—review and editing. **Jane Noyes:** Conceptualization; data curation; formal analysis; investigation; methodology; supervision; writing—original draft; writing—review and editing.

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## CONFLICT OF INTEREST STATEMENT

Jane Noyes is a member of the Cochrane Editorial Board, Methods Executive, Convenor of the Qualitative and Implementation Methods Group (QIMG) and Editor of the Cochrane-Campbell Handbook of Qualitative Evidence Synthesis. France and Ames are QIMG convenors and Bianchim is a QIMG intern. The other authors declare no conflict of interest.

## DATA AVAILABILITY STATEMENT

All data generated or analyzed during this study are included in this published article and its Supporting Information files.

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## PEER REVIEW

The peer review history for this article is available at <https://www.webofscience.com/api/gateway/wos/peer-review/10.1002/cesm.12059>.

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## SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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