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Attitudes of editors of core clinical journals about whether systematic reviews are original research and their value for publication: a mixed-methods study

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3 **Attitudes of editors of core clinical journals about whether systematic reviews are**
4 **original research and their value for publication: a mixed-methods study**
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Abstract

Objectives: The development of research methodology for qualitative and quantitative synthesis of evidence led to the emergence of systematic reviews as research synthesis method. However, it has been shown that not all journal editors consider systematic reviews (SRs) to be original research studies, and that not all core clinical journals publish SRs. The aim of this study was to analyze whether editors of core clinical journals consider that systematic reviews (SRs) are original research.

Design: We conducted a survey of editors of core clinical journals, followed by the qualitative interview study.

Participants: We invited editors of 119 core clinical journals to participate in the study.

Methods: We contacted editors via e-mail with the following questions: do you consider that SRs are original research?; do you publish SRs in your journal?; and in which section? Editors were invited to participate in a follow-up qualitative interview study.

Results: We received responses from 73 editors representing 72 (62%) journals; 52 (80%) of editors considered SRs original research, either for any type of SR (65%) or only for SRs with a meta-analysis (15%). Compared to results of such study from 2009, similar proportion of editors considered SRs to be original studies, had conditional acceptance of SRs' originality or published SRs. Interviews with editors indicated that various criteria are considered when deciding whether a SR is original research, including methodology, reproducibility, originality of idea and level of novelty.

Conclusion: Compared to results obtained in 2009, we found similar proportion of editors of core clinical journals who consider that systematic reviews are original research, and who had conditional acceptance of systematic reviews' originality. Interviews with editors revealed that there is no uniform approach to defining what makes a systematic review, or any study, original, and that these concepts of originality of research are evolving.

Keywords: systematic reviews; editors; original research; opinions

1. Introduction

Global scientific output is growing exponentially,[1] leaving users of research evidence to grapple with numerous individual studies, which may have different conclusions even if they cover the same topic. The development of research methodology for qualitative and quantitative synthesis of evidence led to the emergence of systematic reviews as research synthesis method.[2] This was also suggested in studies examining the status of systematic reviews in participants who could be considered influencers in research community.[3, 4]

In 2012, Meerpohl et al. published a survey of editors of core clinical journals regarding their attitudes about the value of systematic reviews (SRs) for journals.[3] The study included 65 editors of the 118 journals, who were surveyed in April 2009. The editors were asked if they considered SRs to be original research, whether their journal published SRs and in which section SRs were published. The results indicated that 71% of the respondents considered SRs to be original studies and the majority of their journals published SRs.[3]

A study published in 2017 examined the acceptance of SRs as a doctoral thesis in European biomedical doctoral (PhD) program.[4] Almost half of the surveyed participants, who identified themselves as being in charge of doctoral programs, reported that in their institutions a systematic review is an acceptable piece of research for an entire or at least part of a PhD thesis, but the majority of surveyed individuals did not have sufficient knowledge about basic concepts of SR methodology.[4] However, more than a half of the participants indicated agreement with the statement that “systematic reviews do not produce enough new knowledge for a dissertation”. A third of the respondents indicated that there was a lack of appreciation for SR methodology among faculty members.[4]

The aim of this study was to follow-up on the attitudes of journal editors towards SRs 9 years after the initial study. We expected that the proportion of editors who consider SR to be original research had increased since 2009 and that more of the surveyed journals now publish SRs.

2. Methods

2.1. Survey

2.1.1. Participants

We invited editors of 118 journals labelled as Core Clinical Journals by the National Library of Medicine, USA in February 2018.[5] We retrieved editors' names and contact details from journal web sites.

2.1.2. Survey

We surveyed editors via e-mail, using the following four questions: (i) Do you consider a systematic review manuscript an original research project? (ii) Do you publish systematic reviews in the journal you edit? (iii) In which section of your journal would you publish a systematic review? (iv) Would you participate in a follow-up qualitative study via Skype?

We sent up to three email reminders approximately one week apart (MK, LP). We did not send reminders to the editors who responded that they do not wish to participate in the study.

Each study participant was assigned a code and coded responses were entered in to a spreadsheet with anonymized responses that were shared with other co-authors. One author initially evaluated and categorized responses (MK), in consultation with another author if necessary (LP).

2.1.3. Analysis of systematic reviews published in targeted journals

For all included journals we assessed the types and characteristics of the published SRs. We performed a search on PubMed using journal name and limits for SRs and meta-analyses (MA); search results were screened by two authors independently to verify that these publications were indeed SRs or meta-analyses. Characteristics we analyzed in those SRs are shown in Box 1. We hand-searched the contents of journals published in 2017 if we did not find any SRs or meta-analyses by searching PubMed. If by hand searching we did not find any SRs or meta-analyses published in the journals included in 2017, we evaluated instructions for authors of journals that did not publish any SR to see if they had any guidance about submitting SRs and meta-analyses.

2.1.4. Statistics

We analyzed data using frequencies, percentages and interquartile range (IQR) to describe the results. Differences in proportions of key results between this study and the previous study[3] were analyzed with the Chi-square test. Proportions were reported with 95% confidence

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3 intervals (95% CI). For analyses we used MedCalc (MedCalc Corp., Mariakerke, Belgium).
4 Statistical significance was set at $p < 0.05$.
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10 **2.2. Qualitative study**

11 *2.2.1. Participants*

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15 We conducted a qualitative study with the editors who accepted to take part in the follow-up
16 interview. Participants were informed who will conduct the interview, and that the authors
17 intend to publish the study results.
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21 *2.2.2. Interviews:* The qualitative study was conducted using semi-structured interviews. After
22 the inclusion of the first 15 participants we stopped inviting further editors. At this time new
23 themes stopped emerging and we concluded that information saturation was achieved. The
24 first interview was conducted on July 6th, 2018, and the last on September 7th, 2018. We used
25 open-ended semi-structured questions to enhance the discussion about originality of SRs
26 (Supplementary file 1). Participants were not led to provide specifically any answer. We used
27 the Consolidated Criteria for Reporting Qualitative Studies (COREQ) to guide the reporting
28 of the study.[6]
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34 *2.2.3. Research team and reflexivity*

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36 One author conducted all interviews (LP). The author that conducted interviews did not
37 personally know any editors that were invited to participate.
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40 *2.2.4. Conduct of interviews*

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43 Interviews were conducted individually via teleconferencing software (Skype or Zoom) or via
44 telephone, based on the choice of participants. All conversations were recorded. After each
45 interview a transcript was made and analyzed, to monitor for the point of information
46 saturation. Transcripts and recordings of interviews were not sent to study participants for
47 checking, commenting and/or correction. Instead, the final draft of the manuscript was sent to
48 the editors for their insight into the collected results.
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53 *2.2.5. Data analysis and reporting:* To ensure uniformity, all transcripts of interview
54 recordings were made by one researcher (LP), and another member of the team checked all
55 transcripts and analyzed them (MK). In the purpose of reporting, the participants' names were
56 coded. The transcripts were analyzed via qualitative content analysis.[7] Meaningful units,
57 including complete sentences or parts of sentences, were defined as units of analysis. Two
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3 researchers did the coding; the results were then compared, and any discrepancies were
4 resolved by discussion until reaching consensus.
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8 *2.2.6. Ethics*

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10 The study protocol was approved by the Ethics Committee of the University of Split School
11 of Medicine. In the e-mail potential participants received information about the study and they
12 were informed that their response to the email will be considered an informed consent to
13 participate in the survey. Consent for interviews was also obtained via email.
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3. Results

3.1. Survey among editors of core clinical journals

Of 118 contacted editors, we received responses from 73 editors representing 72 (62%) journals.

3.1.1. Editors' responses

Of the 73 respondents, 8 (11%) did not answer the first question despite our repeated attempts to obtain missing answers. Among the remaining 65 editors who responded the first question, 42 (65%) considered SRs to be original studies, 13 (20%) did not, and 10 (15%) indicated that only a SR with a MA was an original study. Overall, 52 (80%) editors considered SRs original research, either for any type of SR or only for SRs with a meta-analysis. This proportion was 71% (46 of 65) in the previous study;^[3] the difference was not statistically significant ($p=0.23$; $\chi^2=1.412$, $df=1$; 9% increase, 95% CI: -5.8 to 23.3). The proportion of editors with conditional acceptance of SRs was 15% (10 of 65). In the previous study^[3] it was 14% (9 of 65). The difference was not significantly different ($p=0.87$; $\chi^2=0.026$, $df=1$; 1% increase, 95% CI: -11.4 to 13.4).

Four editors did not answer the second question. Of the remaining 69 editors, 63 (91%) responded that they had published SRs in their journals, 6 (9%) that they had not. In the previous study 94% (60 of 64) of editors indicated they published SRs; there was no significant difference between these proportions ($p=0.51$; $\chi^2=0.425$, $df=1$; 3% increase, 95% CI: -6.9 to 12.8).

Out of 63 editors that declared they had published SRs, 16 (25%) editors published SRs in a journal section devoted to original studies, 19 (30%) in the review section or separate section of the journal, 10 (16%) of them publish SRs in the section for original studies if they have a MA, and in the review section if they do not.

More than a quarter of editors ($n=18$, 29%) indicated that they did not have a particular section for publishing SRs in their journal, and that they simply published them in the section that corresponds to the topic of the manuscript. Five (8%) editors did not answer the third survey question.

Among the surveyed editors 24 (33%) accepted to participate in the follow-up interview, 17 (23%) declined, and 32 (44%) of editors did not answer, even after a reminder.

Of the 24 editors who accepted to participate in the interview, 14 (58%) answered the first question that they considered SRs to be original studies, 6 (25%) answered that they did not, 3 (13%) answered that they considered SRs to be original if they had a MA incorporated, and one (4%) accepted to participate in the interview without providing the answer to the first survey question.

Additionally, four editors who responded to the survey, but did not participate in the qualitative part of the study, offered their opinions regarding originality of SRs via e-mail

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3 together with responses to the three survey questions. Two of them indicated that SR is
4 original if it has methodological rigor; as one of them put it: “Cochrane-type review, with
5 good scientific rigor combined with a thorough review of the literature, is original research.”
6 One of them remarked that a review can never be original research, with one exception: *That*
7 *exception is when a systematic exploration of the evidence (usually meta-analysis) is used to*
8 *test a new hypothesis, one that had not previously been considered or addressed in the data*
9 *analysis. Even then, I would not consider it completely original but an original application of*
10 *the work of other investigators.* The fourth elaborated that MA is considered new data, and
11 therefore only SR with MA would be considered original study.
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17 3.1.2. Analysis of systematic reviews published in core clinical journals

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19 Among the 118 included Core Clinical Journals 110 published a median of 14 articles (range
20 1 to 528) indexed by PubMed as SR or MA, while 8 did not publish a single such manuscript.
21 The analysis of instructions for authors of 8 journals that did not publish SR in analyzed
22 period showed that only one journal had guidance for authors regarding submission of SR or
23 MA. Because one journal published 528 articles indexed as SR or MA by PubMed, we
24 analyzed in detail the first 30% of these articles (n=158). Altogether we analyzed 2240
25 journal articles. Using those criteria, we found that 1187 (53%) were indeed a SR, scoping
26 review, overview of systematic reviews (OSR) or a rapid review that used systematic
27 searching methods and the others were not. For individual journals, the median percent of
28 articles that were SRs was 50% (IQR 33% to 67%). We also found that 2 of the 6 journals for
29 which editors responded that they did not publish SRs actually published at least one in 2017.
30 A detailed analysis of 1187 published SRs is shown in Box 1.
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37 3.2. Qualitative study

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39 Fifteen (21%) editors participated in the follow-up interview. We stopped recruiting new
40 editors after achieving thematic saturation. Interviews lasted between 6 and 25 min (median
41 12 min, IQR 9 to 16.5 min). The names of the interviewed editors were coded as “E1”-“E15”.
42 Eight editors reported in the initial survey that SRs are original studies, 3 considered SR to be
43 an original study only if it incorporated a MA, and 4 did not consider SRs to be original
44 studies.
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50 3.2.1. Is any type of systematic review an original study?

51 Eight editors who considered SRs original studies were asked if they felt any different
52 regarding the type of evidence synthesis, for example SR with or without meta-analysis,
53 scoping review, OSRs and any other type of SR or they thought any type of SR should be
54 considered an original study.
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57 Four editors indicated that all types of SR are original studies. One editor considered all SRs
58 original if they passed peer-review scrutiny. One editor indicated that all SRs can be
59 considered original studies but pointed out that he would still not publish a study which was
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3 not informative, such as an empty SR, i.e. a review in which no eligible studies were found
4 after literature search.[8] One editor stated that a SR with a MA was still more novel than SR
5 without MA. This indicates that certain editors equate originality of research with novelty,
6 and that certain types of studies, such as SRs, can have a whole spectrum of considerations
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9 *E12: ...from my point of view, the actual name or type of the systematic review is not*
10 *that important. I think what I look is did they searched certain number of databases,*
11 *did they do it in a systematic way, did they follow methods.*

12
13 Three editors, who considered only SRs with MA as an original study, were asked if they
14 thought meta-analysis was the only thing that makes a systematic review an original study.
15 Two editors insisted that MA is essential for SRs to be considered original, while the third
16 was more ambivalent:
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19 *E1: ... I think that in the academic world of medicine we begin to recognize that not*
20 *all science is discovery science, that there is also science of integrating results and so*
21 *I think in that sense systematic reviews perhaps could be eventually consider original.*
22 *But, in my research it is only a matter of in which section you put it, and we could as*
23 *well put it in the section of original studies.*

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26 Four editors who did not consider SRs to be original studies had the same opinion about any
27 type of SR and analytic methods used in such studies.
28

29 Two editors stated that there may be a continuum of considerations about originality of SRs.
30 Editor E5 indicated that original SRs are those that bring new knowledge, and therefore, that
31 there is no universal answer; that this should be judged individually for each SR:
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34 *E5: This should be judged on a case-by-case scenario. In my field, if you look at*
35 *systematic reviews about influenza or vaccines, there have been multiple systematic*
36 *reviews that did not bring any new knowledge. So, these studies should be judged*
37 *individually.*

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41 Editor E15 was ambivalent about the response; this editor considered that SRs were original if
42 they contain MA but acknowledged that SR authors may have planned to do a SR with MA,
43 but whether MA is possible or not, this is often difficult to determine at the onset. MA may
44 not be possible because of clinical or statistical heterogeneity:
45
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47 *E15: So it is not the fault of authors; they have done everything by the book. So I think*
48 *there is some fluidity in this respect, and this division of original and non-original*
49 *systematic review is artificial.*

50 51 52 3.2.2. Elements of originality in systematic reviews

53 All editors were asked to define what makes a SR an original study or which elements are
54 missing in SRs to be considered original. The answers are stated in Table 1. Responses
55 included specific elements of systematic review methodology, originality of idea and
56 usefulness of SRs. Editor E9 opined that “original is bad descriptor for research”.
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Four editors who did not consider SRs original studies were asked if they considered any secondary study to be original. Two indicated that only primary studies could be considered original, one did not provide an answer to this question while the fourth editor was ambiguous:

E10: *Systematic reviews are taking data and analyzing them in different ways, and asking different questions, and so I do not value them as highly as primary or plain secondary research. ...secondary studies could be considered original as long as they are not systematic reviews.*

3.2.3. Editors' opinion about value of systematic reviews

The editors provided the following responses to describe the main value of SRs: (i) synthesis of data (9 editors); (ii) providing answers to the posed clinical question (9 editors); (iii) data analysis (2 editors); (iv) impartial and free of bias (3 editors); (v) underlining guidelines (1 editor); (vi) pointing where evidence is insufficient (1 editor); (vii) independent and transparent methods using standardized assessment (1 editor).

E4: *independent assessment based on transparent methods of the evidence on a topic, including not only thorough search and systematic search of the evidence and the synthesis but also a standardized assessment of its quality and overall value ... it's systematic methods and their assessment is independent from conflict of interest in a broad sense...*

3.2.4. Definition of original research

A question that emerged during one of the first interviews was the issue of a definition of original research. An editor asked interviewer to provide our definition of originality and explained that the answer depends on the definition of originality.

E9: *"This whole issue of originality depends on how one defines original research. If you do not define what original research is, then the question about whether systematic reviews are original studies is not fair."*

Since there is no universally agreed definition of what constitutes an original research, we discussed this remark within our team and decided to ask all subsequent editors how they would define an original study. Ten editors that were interviewed subsequently provided their definition of original studies, which we divided into six categories (Table 2). The original research was defined as: (i) one that brings new knowledge, data, information and conclusions; (ii) study that provides primary data analysis; (iii) definition according to the Boyer's model of scholarship; (iv) study that has not been published before; (v) one which is replicable and done in accordance with criteria for the study in terms of scholarly inquiry; and (vi) study where authors generate hypothesis, proceed in formal manner, choose methodology, share results, discuss limitations, provide conclusions, and where people deserve authorship (Table 2).

3.2.5. Using systematic reviews for making clinical decisions

All editors were asked if clinical decisions should be based on SRs or primary studies. Eight editors responded that clinical decision should be based both on SRs and primary studies, six editors gave some advantage to SRs for making such decisions, and one editor stated that decisions should be made on high quality evidence, regardless of the study type.

3.2.6. Additional relevant themes

In the end of the interview, editors were asked to freely express anything else they would like to add regarding originality of SRs. Among the most common comments were questions whether it matters at all how SRs are categorized in terms of originality as long as they are useful. Editors gave various comments about production and publication of SRs, proliferation of SRs and their quality (Table 3).

Some of the practical aspects of this categorization included eligibility of SRs as publications qualifying candidates for academic advancement or acceptance of SRs as a PhD thesis.

E1: I guess that depends on what you call original, and does it matter if you call it original or not – I don't know does it matter. I guess it could matter to a PhD thesis committee or a promotion committee, but maybe they need to stop and think about what they are doing, and why they are doing it, and who it is that they are trying to train and what it means. In our institution we definitely have scholarship of synthesis, so meta-analyses and systematic reviews would get strong weight on our promotion committee. We have already moved in that direction.

Six editors indicated that they would consider SRs to be an eligible study design for a PhD thesis, one said that SRs should not be eligible for a PhD thesis, and one editor considered that a candidate should prepare at least two SRs or a SR and a primary study if this study design will be considered for a PhD thesis.

E4: Somebody can oppose systematic review within a PhD thesis because they don't know that people learn a lot by doing systematic reviews. They become better researchers if they do them.

Editor E6 indicated that there should not be restrictions regarding study designs while conducting academic thesis, because it is important to focus on learning outcomes, and that the only goal of a thesis should not be putting hands on patients because we are moving towards electronic medical records anyway

E6: We are not going to be doing individual data collection in five years or so. So we should be paying less attention to how we were doing things when we were younger, because then the only way to collect data was putting hands on a patient, or getting data from their chart, getting information by asking patient, observing, video-taping, etc., etc. But if now the data has already been collected, the old-fashioned way is very expensive method to gain knowledge. But my main point is whether that is our key competency, to collect an information directly from a patient.

4. Discussion

We followed up on the study of Meerpohl et al. from 2009[3] and found similar proportion of editors of Core Clinical Journals who considered systematic reviews original studies. Majority of editors published SRs, and a quarter of editors published them in the section of a journal devoted to original studies. Interviews with editors indicated that various elements are considered when deciding whether a SR is an original study.

Eighty percent of the surveyed editors considered SRs or only SRs with MA original research. This number is higher compared to 71% of editors who considered that SRs are original research projects in 2009,[3] but not significantly higher. There was no difference between the proportion of editors who considered SRs to be original research compared to the earlier study.[3] These results indicate minimal changes of editors' attitudes between these two studies in terms of the premise that SRs are original research.

In the qualitative part of our study, many editors indicated that the concept of originality of SRs is still evolving and that there is a continuum of considerations to be made. One editor, who considered that SR is an original study, stated that a SR with a MA is still more novel than SR without MA. This indicates that certain editors equate originality of research with novelty. This also indicates that for some editors there are no firm categories about novelty and originality of SRs. Instead, these are judged as a whole spectrum, where different characteristics or certain items of methodology, can influence perception of a study.

Another editor, with the same opinion that SR with MA is an original study acknowledged that MA may not be justifiable, and that this can be only determined after SR authors have already done a lot of work. In this case the definition of originality of the study would depend on data that were found, and not on the initial idea. This would make decisions about originality of a SR highly unpredictable; someone could embark on doing an original study, and end up with a non-original study, depending on the results.

Furthermore, responses of editors during interviews indicate that there is a lot of fluidity in defining original research. There was no consensus among editors about what constitutes original research and what makes SRs original. Some editors quoted methodology and reproducibility; some originality of idea and level of novelty. Some insisted on analyses, presence of meta-analysis, or another type of analysis, which would bring quantitative aspect to a qualitative summary in a SR. For one editor, SR without MA is semi-quantitative, and thus not original. However, if we duly take quantitative data as a paramount defining element of original research, then the whole field of qualitative studies would come under question as non-original.

Furthermore, some editors did not consider SRs or SRs without MA original research projects, because authors of such studies did not produce the data but relied on data collected by others. However, as other editors have mentioned, there are now a plethora of study designs in clinical medicine that include data which were not collected first hand. Studies that rely on electronic health records, or data collected via instruments, or any type of retrospective studies relying on data that somebody else collected, would then not be considered original according to these criteria.

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3 Two editors cited Ernest Boyer's model of scholarship as an argument why they do not
4 consider SR to be original research.[9] According to this model, introduced in 1990, there are
5 four categories of scholarship, where original research is one category and the integration that
6 involves synthesis of information is another category.[9] However, one of the interviewed
7 editors remarked that indeed there are different types of scholarship, and therefore different
8 types of original research.
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11 Our survey also indicated that the majority (91%) of editors published SRs. The difference to
12 the previously reported proportion (94%)[3] is not significant. A quarter of editors published
13 SRs in the original study section of the journal, which is a decline in comparison to earlier
14 results that a third of editors published them in an original study section in 2009.[3] However,
15 it also has to be emphasized that some editors remarked in interviews that they find it
16 completely irrelevant in which section a SR is published, because they have thematic sections
17 where they publish manuscript of any study design, including SRs. Therefore, the finding that
18 fewer SRs are published in sections devoted to original studies may simply be an indication
19 that more journals organize manuscript in thematic sections, and not according to the
20 perceived originality of a contribution.
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22
23 Few manuscripts so far were devoted to the considerations of originality of SRs. Aveyard and
24 Sharp[10] postulated that SRs are 'original empirical research' because they (quote): '*review,*
25 *evaluate and synthesise all the available primary data, which can be either quantitative or*
26 *qualitative*'. One editor in our qualitative study remarked that it does not matter whether a SR
27 is considered original research, as long as it is valuable. This was also pointed out before by
28 Biondi-Zoccai et al., who considered that the main criteria to judge a SR should be its novelty
29 and usefulness, and not whether a SR is original/primary or secondary research.[11]
30

31
32 There may be practical aspects in considerations whether a SR is an original study or not,
33 such as during evaluating candidates for academic promotion, or allowing students to use SR
34 as a study design in their academic thesis. Although these topics were not the subject of our
35 study, several editors indicated that they would be in favor of recognizing SRs both as studies
36 that can be counted for academic promotion, and for conducting PhD thesis. There were also
37 discrepant opinions regarding SRs within PhD theses, as well as considerations that
38 acceptability of a SR for PhD thesis may depend on a research field. It has been shown
39 recently that the topic of acceptability of a SR for PhD theses is debated in the academic
40 community as well; about half of surveyed individuals in charge of European PhD programs
41 indicated that SRs are accepted as a study design in their schools.[4]
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44 In addition to analyzing editors' opinions, we also assessed SRs that the target journals
45 published in 2017. Overwhelming majority of the analyzed journals (93%) published at least
46 one SR in 2017, and among the remaining 8 journals, one had instructions for authors
47 regarding submission of SRs. Six editors indicated that their journal does not publish SRs, but
48 our analysis indicated that 2 of those 6 journals actually did publish SRs in year 2017.
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Strengths and limitations

One strength of this study is its high response rate (62%). Furthermore, the proportion of editors with different answers to the question about whether SRs are original studies was very similar among editors who participated in the survey and editors who participated in follow-up interviews, indicating the editors were equally keen to participate in the interview regarding their consideration of SRs as original studies or not. Therefore, we can argue that interviews did not suffer from selection bias in terms of including only editors with uniform opinions regarding SRs being or not being original studies. Another strength of this study is the addition of qualitative data collection to the original study design of Meerpohl et al.[3] Through these interviews we obtained more nuanced responses regarding editors' opinion about whether SRs are original studies, and what is an original study anyway.

A limitation of the study is its focus on the editors of core clinical journals, which is a limited sample to begin with. It is possible that different responses would have been obtained if we had surveyed a broader sample of editors. Our decision to use this cohort of journals was guided by the preceding study by Meerpohl et al.,[3] to serve as a historical control.

In conclusion, compared to results obtained in 2009, we found similar proportion of editors of core clinical journals who consider that systematic reviews are original research, and who had conditional acceptance of systematic reviews' originality. Interviews with editors revealed that there is no uniform approach to defining what makes a systematic review, or any study, original, and that these concepts of originality of research are evolving. Editorial organizations, which set standards of publishing, should address this issue.

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13 **Conflict of interest**
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15 The authors have no financial conflict of interests. Authors JJM, EvE, AM and LP are
16 affiliated with Cochrane.
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Table 2. Definitions of original research provided by editors

Table 3: Additional comments of editors regarding systematic reviews

Supplementary file 1. Open-ended questions for facilitating semi-structured questionnaire

Box 1. Characteristics of systematic reviews published by target journals in 2017.

Methods: We analyzed the following characteristics of systematic reviews published by target journals in 2017: i) topic (therapeutic, epidemiology, diagnosis/prognosis or other), ii) types of studies included, such as randomized controlled studies (RCTs), non-randomized studies (NRS), both randomized and non-randomized studies, systematic reviews or meta-analyses (SR/MA), SR/MA and primary research, SR and overview of SR (OSR) and those that did not define which studies were included, iii) presence of meta-analysis (yes, no), iv) update of a previous review (yes, no), v) type of review (systematic review, overview of systematic reviews, rapid review, scoping review).

Results: Detailed analysis of 1187 published SRs indicated that they most commonly addressed therapeutic interventions (n=585, 49%), epidemiology (n=281, 24%), diagnostic accuracy (n=105, 9%), prognostic issues (n=69, 6%) or other topics (n=147, 12%).

Regarding the type of included studies, the majority of SRs did not indicate in their methods what kind of studies were eligible for inclusion (n=301, 25%). There were 295 (25%) SRs that included both RCTs and NRS, 281 (24%) studies included only RCTs and 264 (22%) studies included only NRS. In 28 (2%) SRs, both primary research and SR/MA were included; 17 (1%) reviews included SR/MA, and one review (0.1%) included both SR and OSR in the review.

Of all the analyzed SRs, only 19 (2%) were an update of a previous SR. In 750 (63%) SRs, a meta-analysis was conducted. Most of the reviews were classic SRs that included only primary studies (N=1126, 95%); 28 (2%) SRs included both primary research and SR/MA so we defined them as SR/OSR; 19 (2%) OSRs, including one study that did not define which studies it included but called itself an OSR and one that included both SR/MA and OSR. Twelve (1%) SRs were scoping reviews and one was a rapid review (0.1%).

Table 1. Opinions of interviewed editors about elements of originality present or missing in systematic reviews

Editor	Is systematic review an original study?	Elements of originality present or missing in a systematic review; quotes
E2	Yes	New idea, analysis of bias, heterogeneity and level of evidence, provided summary and conclusion
E3	Yes	Done with high quality, using PRISMA guidelines
E4	Yes	Useful to improve or inform, either to advance knowledge or to improve and inform new research
E5	Yes	Meta-analysis helps in this respect, for a systematic review to be consider novel
E8	Yes	Different look at an old topic, something unique, probably in terms of search, novelty of the question, methods for searching
E11	Yes	Methodology involved in approach to search, careful process of filtering studies, looking at limitations of included studies, approaching a topic that requires some in-depth consideration, and involving a thought process in summarizing data, reporting results, discussing them and providing conclusions approach to search strategy, analysis of results, discussion, limitations, and making conclusions based on analyses
E12	Yes	Following the methodology, searching significant number of databases, they have to explain how they selected study they are going to review, what were the criteria, they have to talk about quality of the evidence, they have to summarize the results, it has to be a significant body of work, an element of quantity or magnitude
E13	Yes	Original question that hasn't been answered before, new search strategy, a new methodology, a reinterpretation of the results
E1	Only with meta-analysis	Original thought
E7	Only with meta-analysis	Some kind of analysis, it does not have to be meta-analysis; it can be another type of analysis
E15	Only with meta-analysis	I would consider a systematic review without meta-analysis a semi-quantitative review and therefore not original study
E6	No	Original research starts with a data source that is in most of nursing a human, and systematic reviews have data source that is secondary
E9	No	If you define original research as focused on discovery, then systematic reviews are not original in that sense. It does not

		have to do anything with methodology, but type of research. Primary studies that offer integration of existing research and synthesis are original research.
E10	No	Scientific method is different than in what I consider to be original
E14	No	In my opinion, if it does not touch the original data, it is not original

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Table 2. Definitions of original research provided by editors

Editor	Is systematic review an original study?	Quote about definition of original research
E6	No	I define original research as that which involved individuals and their data and secondary research as that which doesn't.
E7	Only with meta-analysis	Original is what has not been published before.
E8	Yes	To me, to be a study it has to be done in accordance with criteria for the study in terms of scholarly inquiry, so that it can be replicated, people can use the same search terms, etc.
E9	No	...if we look at it as a scholarship of discovery, and Boyer's model, I would not consider any type of systematic review to be original research.
E10	No	A study that is hypothesis driven, that generates a new knowledge and applies appropriate methods to get there.
E11	Yes	A study where authors generate hypothesis, proceed in formal manner, choose methodology, share results, discuss limitations, and provide conclusions. Also, where people deserve authorship for what they have done.
E12	Yes	...original study is the study that will generate new conclusion, new data, new information, and that requires significant intellectual effort on the part of investigators.
E13	Yes	I guess original research would be analyzing results and generating outcomes, or conclusions which haven't necessarily been done by other people before.
E14	No	As an editor, an original study is a study in which someone produces data.
E15	Only with meta-analysis	A study that has new knowledge generated. New knowledge can also be generated through synthetic process of meta-analysis, but not qualitative data synthesis of systematic review without meta-analysis.

Table 3: Additional comments of editors regarding systematic reviews

Editor	Is systematic review an original study?	Additional comment
E1	Only with meta-analysis	I feel like we are in an evolution, you know. Even though it has been ten years since your first study, I do not think that people necessarily understand what a systematic review is. ... We do require systematic review authors to do a research checklist, we do require protocol registration, but we are not rigid about it, we don't actually check if they did. We do not actually check if they followed it, which would be ideal to do, but that would just take a lot of people to do that, and we do not have resources for that.
E2	yes	Editor who looks seriously at their impact factor will love to publish meta-analysis and systematic reviews that are good.
E3	yes	...there are too many systematic reviews being submitted, and that is because it's easy, you don't have to leave the comfort of your home or office, you can collect data and write your manuscript. So the quality is not very good because the motivation is wrong. The motivation is to become published, the motivation is not to influence care.
E4	yes	Well, as an editor, I find it difficult to find a balance between quality and useful message from a submitted systematic review.
E6	no	... I publish systematic reviews, I am a fan of systematic reviews. And I think they do more to move knowledge than a lot of original research does, because it takes the whole body of original research in that area and it elevates it.
E10	no	I think systematic reviews are scholarship. Boyer in 1990 or 1999 defined four different types of scholarship; original research is one, and synthesis is another. And I think it is incredibly important in terms of scholarship and academic advancement. Systematic reviews are maybe routinized in the way they are done, or the way data is collected, but they are hard to do a good one.
E14	no	People do systematic reviews because they have to build the CV and they don't have access to their own data, or they are not able to generate their own data. And we see this coming from various parts of the world, where we know that investigative resources are thin. And there is considerable confusion in the scientific and clinical communities about what a systematic review is and how much significance should be attached to it.

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3 **Supplementary file 1. Open-ended questions for facilitating semi-structured**
4 **questionnaire**
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- 8 1. Do you think that systematic reviews are original studies?
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10 If the answer to #1 is no:

- 11 2. Do you feel the same about any type of systematic review, or there are certain types of
12 systematic reviews that you could consider “more original” compared to others, for
13 example if a systematic review has a meta-analysis?
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15 3. In your opinion, what elements of originality are missing in systematic reviews, to be
16 considered original studies?
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18 4. Can any secondary study be considered as an original research study, or only primary
19 studies should be considered original research studies?
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21 5. In your opinion, what is the value of systematic reviews?
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23 6. Should clinical decisions be made based on systematic reviews or primary studies?
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26 If the answer to #1 is yes:

- 27
28 7. Do you feel any different regarding the type of evidence synthesis, for example
29 systematic review with or without meta-analysis, scoping systematic review,
30 overviews of systematic reviews... or you think any type of systematic review should
31 be considered an original study?
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33 8. What do you think that makes a systematic review original study?
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35 9. Are there any elements of methodology that definitely make systematic reviews
36 original?
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38 10. In your opinion, what is the value of systematic reviews?
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40 11. Should clinical decisions be made based on systematic reviews or primary studies?
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BMJ Open

Attitudes of editors of core clinical journals about whether systematic reviews are original research and their value for publication: a mixed-methods study

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3 **1 Attitudes of editors of core clinical journals about whether systematic reviews are**
4 **2 original research and their value for publication: a mixed-methods study**
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3 **Abstract**
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6 **Objectives:** In 2009, not all journal editors considered systematic reviews (SRs) to be original
7 research studies, and not all PubMed Core Clinical Journals published SRs. The aim of this
8 study was to conduct a new analysis about editors' opinion regarding SRs as original research.
9

10 **Design:** We conducted a survey of editors and qualitative interview study.
11

12 **Participants:** Editors of 118 PubMed Core Clinical Journals.
13

14 **Methods:** We contacted editors via e-mail and asked them whether they considered SRs
15 original research, whether they published SRs in the journal, and if yes, in which section. We
16 searched PubMed for any SRs (or meta-analyses) published in the included journals in 2017;
17 if we did not find any, we hand-searched these journals. Editors were invited to participate in
18 a follow-up qualitative interview study.
19
20

21 **Results:** We received responses from 73 editors representing 72 (62%) journals. 52 (80%)
22 editors considered SRs original research, either for any type of SR (65%) or only for SRs with
23 a meta-analysis (15%). Compared to the results of the 2009 study of Core Clinical Journals, a
24 similar proportion of editors considered SRs to be original studies, had conditional acceptance
25 of SRs' originality or published SRs. Interviews with editors showed that they used various
26 criteria to decide whether a SR is original research, including methodology, reproducibility,
27 originality of idea and level of novelty.
28
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30 **Conclusion:** The majority of editors of core clinical journals still consider that systematic
31 reviews are original research, and still some had conditional acceptance of systematic
32 reviews' originality. Among editors there was no uniform approach to defining what makes a
33 systematic review, or any study, original. This indicates that the concepts of originality of
34 systematic reviews, and research are evolving, and that this would be a relevant topic for
35 further discussion.
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41 **Keywords:** systematic reviews; editors; original research; opinions
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3 58 **Strengths and limitations of this study**
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- 5 59 - This mixed-methods study combines an online survey with qualitative research
6 60 methods; one of its strength is the high response rate of editors (62%);
7
8 61 - The study provides more detailed data about editors' reasoning about the originality of
9 62 systematic reviews.
10
11 63 - A limitation of this study is our use of a sample of journals indexed as PubMed Core
12 64 Clinical Journals and the possibility that some journal editors were surveyed both in
13 65 the earlier study and in this follow-up study. However, none of the editors indicated
14 66 that they participated in the earlier study;
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17 67 - The study relied on PubMed's indexing to identify SRs and MAs published by the
18 68 included journals; hand-searching of all journals may have yielded some additional
19 69 SRs.
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1. Introduction

Global scientific output is growing exponentially,[1] leaving users of research evidence to grapple with numerous individual studies, which may have different conclusions even if they cover the same topic. The development of research methodology for qualitative and quantitative synthesis of evidence led to the emergence of systematic reviews as research synthesis method.[2] This was also suggested in studies examining the status of systematic reviews in participants who could be considered influencers in research community.[3, 4]

In 2012, Meerpohl et al. published a survey of editors of core clinical journals regarding their attitudes about the value of systematic reviews (SRs) for journals.[3] The study included 65 editors of the 118 journals, who were surveyed in April 2009. The editors were asked if they considered SRs to be original research, whether their journal published SRs and in which section SRs were published. The results indicated that 71% of the respondents considered SRs to be original studies and the majority of their journals published SRs.[3]

A study published in 2017 examined the acceptance of SRs as a doctoral thesis in European biomedical doctoral (PhD) program.[4] Almost half of the surveyed participants, who identified themselves as being in charge of doctoral programs, reported that in their institutions a systematic review is an acceptable piece of research for an entire or at least part of a PhD thesis, but the majority of surveyed individuals did not have sufficient knowledge about basic concepts of SR methodology.[4] However, more than a half of the participants indicated agreement with the statement that “systematic reviews do not produce enough new knowledge for a dissertation”. A third of the respondents indicated that there was a lack of appreciation for SR methodology among faculty members.[4]

In the years since the study of Meerpohl et al. was conducted, the number of published SRs has increased, as well as their influence,[5]. The aim of this study was to follow-up on the attitudes of journal editors towards SRs. We hypothesized that the proportion of editors who consider SR to be original research had increased since 2009 and that more of the surveyed journals now publish SRs.

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100 2. Methods

101

102 2.1. Survey

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104 2.1.1. Participants

105 We invited editors of 118 journals labelled as Core Clinical Journals by the National Library
106 of Medicine, USA in February 2018.[6] The list of journals that were considered Core
107 Clinical Journals in 2009 (when the previous study was conducted)[3] and in 2018 is available
108 in Supplementary file 1. We retrieved editors' names and contact details from journal web
109 sites.

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111 2.1.2. Survey

112 We surveyed editors via e-mail, using the following four questions: (i) Do you consider a
113 systematic review manuscript an original research project? (ii) Do you publish systematic
114 reviews in the journal you edit? (iii) In which section of your journal would you publish a
115 systematic review? (iv) Would you participate in a follow-up qualitative study via Skype?

116 We sent up to three email reminders approximately one week apart (MK, LP). We did not
117 send reminders to the editors who responded that they do not wish to participate in the study.

118 Each study participant was assigned a code and coded responses were entered in to a
119 spreadsheet with anonymized responses that were shared with other co-authors. One author
120 initially evaluated and categorized responses (MK), in consultation with another author if
121 necessary (LP).

122

123 2.1.3. Analysis of systematic reviews published in targeted journals

124 For all included journals we assessed the types and characteristics of the published SRs. We
125 performed a search on PubMed using journal name and limits for SRs and meta-analyses
126 (MA) and for articles published in 2017; search results were screened by two authors
127 independently to verify that these publications were indeed SRs or meta-analyses.

128 Characteristics we analyzed in those SRs are shown in Box 1. We hand-searched the contents
129 of journals published in 2017 if we did not find any SRs or meta-analyses by searching
130 PubMed. If by hand searching we did not find any SRs or meta-analyses published in the
131 journals included in 2017, we evaluated instructions for authors of journals that did not
132 publish any SR to see if they had any guidance about submitting SRs and meta-analyses.

133

134 2.1.4. Statistics

135 We analyzed data using frequencies, percentages and interquartile range (IQR) to describe the
136 results. Differences in proportions of key results between this study and the previous study[3]
137 were analyzed with the Chi-square test. Proportions were reported with 95% confidence

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3 138 intervals (95% CI). For analyses we used MedCalc (MedCalc Corp., Mariakerke, Belgium).
4 139 Statistical significance was set at $p < 0.05$.

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9 10 142 **2.2. Qualitative study**

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13 14 144 *2.2.1. Participants*

15 145 We contacted the editors who accepted to take part in the follow-up interview when
16 146 responding to the survey. Participants were informed who will conduct the interview, and that
17 147 the authors intend to publish the study results.

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21 149 *2.2.2. Interviews:* The qualitative study was conducted using semi-structured interviews.
22 150 Twenty-four editors volunteered to be interviewed. After 15 interviews we stopped inviting
23 151 further editors because we reached the level of saturation of identified themes. The first
24 152 interview was conducted on July 6th, 2018, and the last on September 7th, 2018. We used
25 153 open-ended semi-structured questions to enhance the discussion about originality of SRs
26 154 (Supplementary file 2). Participants were not led to provide specifically any answer. We used
27 155 the Consolidated Criteria for Reporting Qualitative Studies (COREQ) to guide the reporting
28 156 of the study.[7]

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34 158 *2.2.3. Research team and reflexivity*

35 159 One author conducted all interviews (LP). The author that conducted interviews did not
36 160 personally know any editors that were invited to participate.

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40 162 *2.2.4. Conduct of interviews*

41 163 Interviews were conducted individually via teleconferencing software (Skype or Zoom) or via
42 164 telephone, based on the choice of participants. All conversations were recorded. After each
43 165 interview a transcript was made and analyzed, to monitor for the point of information
44 166 saturation. Transcripts and recordings of interviews were not sent to study participants for
45 167 checking, commenting and/or correction. Instead, the final draft of the manuscript was sent to
46 168 the editors for their insight into the collected results.

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52 170 *2.2.5. Data analysis and reporting:* To ensure uniformity, all transcripts of interview
53 171 recordings were made by one researcher (LP), and another member of the team checked all
54 172 transcripts and analyzed them (MK). In the purpose of reporting, the participants' names were
55 173 coded. The transcripts were analyzed via qualitative content analysis.[8] Meaningful units,
56 174 including complete sentences or parts of sentences, were defined as units of analysis. Two

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3 175 researchers did the coding; the results were then compared, and any discrepancies were
4 176 resolved by discussion until reaching consensus.
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8 178 *2.2.6. Ethics*

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10 179 The study protocol was approved by the Ethics Committee of the University of Split School
11 180 of Medicine. Potential participants received information about the study via an e-mail, and
12 181 they were informed that their response to the email will be considered an informed consent to
13 182 participate in the survey. Consent for interviews was also obtained via email.
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17 184 **2.3. Patient and public involvement**

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21 186 No patient involved.
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187 3. Results

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189 3.1. Survey among editors of core clinical journals

190 Of 118 contacted editors, we received responses from 73 editors representing 72 (62%)
191 journals. Supplementary file 1 shows a list of included Core Clinical Journals in 2009 and
192 2018. Since 2009, 13 new journals were added to the list of Core Clinical Journals, while the
193 same number was dropped from the list. So the total number of Core Clinical Journals in both
194 years was the same.

195

196 3.1.1. Editors' responses

197 Of the 73 respondents, 8 (11%) did not answer the first question despite our repeated attempts
198 to obtain missing answers. Among the remaining 65 editors who responded the first question,
199 42 (65%) considered SRs to be original studies, 13 (20%) did not, and 10 (15%) indicated that
200 only a SR with a MA was an original study. Overall, 52 (80%) editors considered SRs
201 original research, either for any type of SR or only for SRs with a meta-analysis. This
202 proportion was 71% (46 of 65) in the previous study;^[3] the difference was not statistically
203 significant ($p=0.23$; $\chi^2=1.412$, $df=1$; 9% increase, 95% CI: -5.8 to 23.3). The proportion of
204 editors with conditional acceptance of SRs was 15% (10 of 65). In the previous study^[3] it
205 was 14% (9 of 65). The difference was not significantly different ($p=0.87$; $\chi^2=0.026$, $df=1$;
206 1% increase, 95% CI: -11.4 to 13.4).

207 Four editors did not answer the second question. Of the remaining 69 editors, 63 (91%)
208 responded that they had published SRs in their journals, 6 (9%) that they had not. In the
209 previous study 94% (60 of 64) of editors indicated they published SRs; there was no
210 significant difference between these proportions ($p=0.51$; $\chi^2=0.425$, $df=1$; 3% increase, 95%
211 CI: -6.9 to 12.8).

212 Out of 63 editors that declared they had published SRs, 16 (25%) editors published SRs in a
213 journal section devoted to original studies, 19 (30%) in the review section or separate section
214 of the journal, 10 (16%) of them publish SRs in the section for original studies if they have a
215 MA, and in the review section if they do not.

216 More than a quarter of editors ($n=18$, 29%) indicated that they did not have a particular
217 section for publishing SRs in their journal, and that they simply published them in the section
218 that corresponds to the topic of the manuscript. Five (8%) editors did not answer the third
219 survey question.

220 Among the surveyed editors 24 (33%) accepted to participate in the follow-up interview, 17
221 (23%) declined, and 32 (44%) of editors did not answer, even after a reminder.

222 Of the 24 editors who accepted to participate in the interview, 14 (58%) answered the first
223 question that they considered SRs to be original studies, 6 (25%) answered that they did not, 3
224 (13%) answered that they considered SRs to be original if they had a MA incorporated, and
225 one (4%) accepted to participate in the interview without providing the answer to the first
226 survey question.

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3 227 Additionally, four editors who responded to the survey, but did not participate in the
4 228 qualitative part of the study, offered their opinions regarding originality of SRs via e-mail
5 229 together with responses to the three survey questions. Two of them indicated that SR is
6 230 original if it has methodological rigor; as one of them put it: “Cochrane-type review, with
7 231 good scientific rigor combined with a thorough review of the literature, is original research.”
8 232 One of them remarked that a review can never be original research, with one exception: *That*
9 233 *exception is when a systematic exploration of the evidence (usually meta-analysis) is used to*
10 234 *test a new hypothesis, one that had not previously been considered or addressed in the data*
11 235 *analysis. Even then, I would not consider it completely original but an original application of*
12 236 *the work of other investigators.* The fourth elaborated that MA is considered new data, and
13 237 therefore only SR with MA would be considered original study.
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20 239 3.1.2. Analysis of systematic reviews published in core clinical journals

21 240 Among the 118 included Core Clinical Journals 110 published a median of 14 articles (range
22 241 1 to 528) indexed by PubMed as SR or MA, while 8 did not publish a single such manuscript.

23 242 Among the 6 editors that previously declared that they did not publish SRs, there were only 2
24 243 editors in whose journals our search did not find a SR or a MA published in 2017. Four stated
25 244 that they did not publish but our search found SRs or MAs published in their journal in 2017.

26 245 The analysis of instructions for authors of 8 journals that did not publish SR in analyzed
27 246 period showed that only one journal had guidance for authors regarding submission of SR or
28 247 MA. Because one journal published 528 articles indexed as SR or MA by PubMed, we only
29 248 analyzed in detail the first 30% of these articles in order of publication (n=158). Altogether
30 249 we analyzed 2240 journal articles. Using those criteria, we found that 1187 (53%) were
31 250 indeed a SR, scoping review, overview of systematic reviews (OSR) or a rapid review that
32 251 used systematic searching methods and the others were not. For individual journals, the
33 252 median percent of articles that were SRs was 50% (IQR 33% to 67%). We also found that 2 of
34 253 the 6 journals for which editors responded that they did not publish SRs actually published at
35 254 least one in 2017. A detailed analysis of 1187 published SRs is shown in Box 1.
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44 256 3.2. Qualitative study

45 257 Fifteen (21%) editors participated in the follow-up interview. We stopped recruiting new
46 258 editors after achieving thematic saturation. Interviews lasted between 6 and 25 min (median
47 259 12 min, IQR 9 to 16.5 min). The names of the interviewed editors were coded as “E1”-“E15”.
48 260 Eight editors reported in the initial survey that SRs are original studies, 3 considered SR to be
49 261 an original study only if it incorporated a MA, and 4 did not consider SRs to be original
50 262 studies.
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56 264 3.2.1. Is any type of systematic review an original study?

57 265 Eight editors who considered SRs original studies were asked if they felt any different
58 266 regarding the type of evidence synthesis, for example SR with or without meta-analysis,
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3 267 scoping review, OSRs and any other type of SR or they thought any type of SR should be
4 268 considered an original study.

6 269 Four editors indicated that all types of SR are original studies. One editor considered all SRs
7 270 original if they passed peer-review scrutiny. One editor indicated that all SRs can be
8 271 considered original studies but pointed out that he would still not publish a study which was
9 272 not informative, such as an empty SR, i.e. a review in which no eligible studies were found
10 273 after literature search.[9] One editor stated that a SR with a MA was still more novel than SR
11 274 without MA. This indicates that certain editors equate originality of research with novelty,
12 275 and that certain types of studies, such as SRs, can have a whole spectrum of considerations

16 276 *E12: ...from my point of view, the actual name or type of the systematic review is not*
17 277 *that important. I think what I look is did they searched certain number of databases,*
18 278 *did they do it in a systematic way, did they follow methods.*

20 279 Three editors, who considered only SRs with MA as an original study, were asked if they
21 280 thought meta-analysis was the only thing that makes a systematic review an original study.
22 281 Two editors insisted that MA is essential for SRs to be considered original, while the third
23 282 was more ambivalent:

26 283 *E1: ... I think that in the academic world of medicine we begin to recognize that not*
27 284 *all science is discovery science, that there is also science of integrating results and so*
28 285 *I think in that sense systematic reviews perhaps could be eventually consider original.*
29 286 *But, in my research it is only a matter of in which section you put it, and we could as*
30 287 *well put it in the section of original studies.*

33 288 Four editors who did not consider SRs to be original studies had the same opinion about any
34 289 type of SR and analytic methods used in such studies.

36 290 Two editors stated that there may be a continuum of considerations about originality of SRs.
37 291 Editor E5 indicated that original SRs are those that bring new knowledge, and therefore, that
38 292 there is no universal answer; that this should be judged individually for each SR:

41 293 *E5: This should be judged on a case-by-case scenario. In my field, if you look at*
42 294 *systematic reviews about influenza or vaccines, there have been multiple systematic*
43 295 *reviews that did not bring any new knowledge. So, these studies should be judged*
44 296 *individually.*

48 298 Editor E15 was ambivalent about the response; this editor considered that SRs were original if
49 299 they contain MA but acknowledged that SR authors may have planned to do a SR with MA,
50 300 but whether MA is possible or not, this is often difficult to determine at the onset. MA may
51 301 not be possible because of clinical or statistical heterogeneity:

54 302 *E15: So it is not the fault of authors; they have done everything by the book. So I think*
55 303 *there is some fluidity in this respect, and this division of original and non-original*
56 304 *systematic review is artificial.*

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3.2.2. Elements of originality in systematic reviews

All editors were asked to define what makes a SR an original study or which elements are missing in SRs to be considered original. The answers are stated in Table 1. Responses included specific elements of systematic review methodology, originality of idea and usefulness of SRs. Editor E9 opined that “*original is bad descriptor for research*”. Four editors who did not consider SRs original studies were asked if they considered any secondary study to be original. Two indicated that only primary studies could be considered original, one did not provide an answer to this question while the fourth editor was ambiguous:

E10: *Systematic reviews are taking data and analyzing them in different ways, and asking different questions, and so I do not value them as highly as primary or plain secondary research. ...secondary studies could be considered original as long as they are not systematic reviews.*

3.2.3. Editors' opinion about value of systematic reviews

The editors provided the following responses to describe the main value of SRs: (i) synthesis of data (9 editors); (ii) providing answers to the posed clinical question (9 editors); (iii) data analysis (2 editors); (iv) impartial and free of bias (3 editors); (v) underlining guidelines (1 editor); (vi) pointing where evidence is insufficient (1 editor); (vii) independent and transparent methods using standardized assessment (1 editor).

E4: *independent assessment based on transparent methods of the evidence on a topic, including not only thorough search and systematic search of the evidence and the synthesis but also a standardized assessment of its quality and overall value ... it's systematic methods and their assessment is independent from conflict of interest in a broad sense...*

3.2.4. Definition of original research

A question that emerged during one of the first interviews was the issue of a definition of original research. An editor asked interviewer to provide our definition of originality and explained that the answer depends on the definition of originality.

E9: *”This whole issue of originality depends on how one defines original research. If you do not define what original research is, then the question about whether systematic reviews are original studies is not fair.”*

Since there is no universally agreed definition of what constitutes an original research, we discussed this remark within our team and decided to ask all subsequent editors how they would define an original study. Ten editors that were interviewed subsequently provided their definition of original studies, which we divided into six categories (Table 2). The original research was defined as: (i) one that brings new knowledge, data, information and conclusions; (ii) study that provides primary data analysis; (iii) definition according to the Boyer's model of scholarship; (iv) study that has not been published before; (v) one which is

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3 347 replicable and done in accordance with criteria for the study in terms of scholarly inquiry; and
4 348 (vi) study where authors generate hypothesis, proceed in formal manner, choose
5 349 methodology, share results, discuss limitations, provide conclusions, and where people
6 350 deserve authorship (Table 2).
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10 352 3.2.5. Using systematic reviews for making clinical decisions

11 353 All editors were asked if clinical decisions should be based on SRs or primary studies. Eight
12 354 editors responded that clinical decision should be based both on SRs and primary studies, six
13 355 editors gave some advantage to SRs for making such decisions, and one editor stated that
14 356 decisions should be made on high quality evidence, regardless of the study type.
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20 358 3.2.6. Additional relevant themes

21 359 In the end of the interview, editors were asked to freely express anything else they would like
22 360 to add regarding originality of SRs. Among the most common comments were questions
23 361 whether it matters at all how SRs are categorized in terms of originality as long as they are
24 362 useful. Editors gave various comments about production and publication of SRs, proliferation
25 363 of SRs and their quality (Table 3).
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29 364 Some of the practical aspects of this categorization included eligibility of SRs as publications
30 365 qualifying candidates for academic advancement or acceptance of SRs as a PhD thesis.

31 366 *E1: I guess that depends on what you call original, and does it matter if you call it*
32 367 *original or not – I don't know does it matter. I guess it could matter to a PhD thesis*
33 368 *committee or a promotion committee, but maybe they need to stop and think about*
34 369 *what they are doing, and why they are doing it, and who it is that they are trying to*
35 370 *train and what it means. In our institution we definitely have scholarship of synthesis,*
36 371 *so meta-analyses and systematic reviews would get strong weight on our promotion*
37 372 *committee. We have already moved in that direction.*
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42 373 Six editors indicated that they would consider SRs to be an eligible study design for a PhD
43 374 thesis, one said that SRs should not be eligible for a PhD thesis, and one editor considered that
44 375 a candidate should prepare at least two SRs or a SR and a primary study if this study design
45 376 will be considered for a PhD thesis.
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48 377 *E4: Somebody can oppose systematic review within a PhD thesis because they don't*
49 378 *know that people learn a lot by doing systematic reviews. They become better*
50 379 *researchers if they do them.*
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52 380 Editor E6 indicated that there should not be restrictions regarding study designs while
53 381 conducting academic thesis, because it is important to focus on learning outcomes, and that
54 382 the only goal of a thesis should not be putting hands on patients because we are moving
55 383 towards electronic medical records anyway
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58 384 *E6: We are not going to be doing individual data collection in five years or so. So we*
59 385 *should be paying less attention to how we were doing things when we were younger,*
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3 386 *because then the only way to collect data was putting hands on a patient, or getting*
4 387 *data from their chart, getting information by asking patient, observing, video-taping,*
5 388 *etc., etc. But if now the data has already been collected, the old-fashioned way is very*
6 389 *expensive method to gain knowledge. But my main point is whether that is our key*
7 390 *competency, to collect an information directly from a patient.*
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4. Discussion

We followed up on the study of Meerpohl et al. [3] and found a similar proportion of editors of Core Clinical Journals who considered systematic reviews original studies. Most editors published SRs, and a quarter of them published them in the section of their journal devoted to original studies. Interviews with editors indicated that various elements are considered when deciding whether a SR is an original study.

Eighty percent of the surveyed editors considered SRs per se or only SRs with MA original research. This number is slightly higher compared to 71% of editors who considered that SRs are original research projects in 2009,[3] but the difference is not statistically significant.

There was no difference between the proportion of editors who considered SRs to be original research compared to the earlier study.[3] These results indicate minimal changes of editors' attitudes between these two studies in terms of the premise that SRs are original research.

We went beyond the initial study by Meerpohl et al. [3] with a qualitative study because we wanted to gather richer data, to give the editors an opportunity to explain their attitudes, and to get more details about what they consider original or non-original regarding SRs.

In the qualitative part of our study, many editors indicated that the concept of originality of SRs is still evolving and that there is a continuum of considerations to be made. One editor, who considered that SR is an original study, stated that a SR with a MA is still more novel than SR without MA. This indicates that certain editors equate originality of research with novelty. This also indicates that for some editors there are no firm categories about novelty and originality of SRs. Instead, these are judged as a whole spectrum, where different characteristics or certain items of methodology, can influence perception of a study.

Another editor, with the same opinion that SR with MA is an original study acknowledged that MA may not be justifiable, and that this can be only determined after SR authors have already done a lot of work. In this case the definition of originality of the study would depend on data that were found, and not on the initial idea. This would make decisions about originality of a SR highly unpredictable; someone could embark on doing an original study, and end up with a non-original study, depending on the results.

Furthermore, responses of editors during interviews indicate that there is a lot of fluidity in defining original research. There was no consensus among editors about what constitutes original research and what makes SRs original. Some editors quoted methodology and reproducibility; some originality of idea and level of novelty. Some insisted on analyses, presence of meta-analysis, or another type of analysis, which would bring quantitative aspect to a qualitative summary in a SR. For one editor, SR without MA is semi-quantitative, and thus not original. However, if we duly take quantitative data as a paramount defining element of original research, then the whole field of qualitative studies would come under question as non-original.

Furthermore, some editors did not consider SRs or SRs without MA original research projects, because authors of such studies did not produce the data but relied on data collected by others. However, as other editors have mentioned, there are now a plethora of study designs in clinical medicine that include data which were not collected first hand. Studies that

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3 434 rely on electronic health records, or data collected via instruments, or any type of
4 435 retrospective studies relying on data that somebody else collected, would then not be
5 436 considered original according to these criteria.

7 437 Two editors cited Ernest Boyer's model of scholarship as an argument why they do not
8 438 consider SR to be original research.[10] According to this model, introduced in 1990, there
9 439 are four categories of scholarship, where original research is one category and the integration
10 440 that involves synthesis of information is another category.[10] However, one of the
11 441 interviewed editors remarked that indeed there are different types of scholarship, and
12 442 therefore different types of original research.

16 443 Our survey also indicated that the majority (91%) of editors published SRs. The difference to
17 444 the previously reported proportion (94%)[3] is not significant. A quarter of editors published
18 445 SRs in the original study section of the journal, which is a decline in comparison to earlier
19 446 results that a third of editors published them in an original study section in 2009.[3] However,
20 447 it also has to be emphasized that some editors remarked in interviews that they find it
21 448 completely irrelevant in which section a SR is published, because they have thematic sections
22 449 where they publish manuscript of any study design, including SRs. Therefore, the finding that
23 450 fewer SRs are published in sections devoted to original studies may simply be an indication
24 451 that more journals organize manuscript in thematic sections, and not according to the
25 452 perceived originality of a contribution.

29 453 Few manuscripts so far were devoted to the considerations of originality of SRs. Aveyard and
30 454 Sharp[11] postulated that SRs are 'original empirical research' because they (quote): *'review,*
31 455 *evaluate and synthesise all the available primary data, which can be either quantitative or*
32 456 *qualitative'*. One editor in our qualitative study remarked that it does not matter whether a SR
33 457 is considered original research, as long as it is valuable. This was also pointed out before by
34 458 Biondi-Zoccai et al., who considered that the main criteria to judge a SR should be its novelty
35 459 and usefulness, and not whether a SR is original/primary or secondary research.[12]

39 460 There may be practical aspects in considerations whether a SR is an original study or not,
40 461 such as during evaluating candidates for academic promotion, or allowing students to use SR
41 462 as a study design in their academic thesis. Although these topics were not the subject of our
42 463 study, several editors indicated that they would be in favor of recognizing SRs both as studies
43 464 that can be counted for academic promotion, and for conducting PhD thesis. There were also
44 465 discrepant opinions regarding SRs within PhD theses, as well as considerations that
45 466 acceptability of a SR for PhD thesis may depend on a research field. It has been shown
46 467 recently that the topic of acceptability of a SR for PhD theses is debated in the academic
47 468 community as well; about half of surveyed individuals in charge of European PhD programs
48 469 indicated that SRs are accepted as a study design in their schools.[4]

53 470 In addition to analyzing editors' opinions, we also assessed SRs that the target journals
54 471 published in 2017. Overwhelming majority of the analyzed journals (93%) published at least
55 472 one SR in 2017, and among the remaining 8 journals, one had instructions for authors
56 473 regarding submission of SRs. Six editors indicated that their journal does not publish SRs, but
57 474 our analysis indicated that 2 of those 6 journals actually did publish SRs in year 2017.

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5 476 *Strengths and limitations*

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7 477 One strength of this study is its high response rate (62%). Furthermore, the proportion of
8 478 editors with different answers to the question about whether SRs are original studies was very
9 479 similar among editors who participated in the survey and editors who participated in follow-
10 480 up interviews, indicating the editors were equally keen to participate in the interview
11 481 regarding their consideration of SRs as original studies or not. Therefore, we can argue that
12 482 interviews did not suffer from selection bias in terms of including only editors with uniform
13 483 opinions regarding SRs being or not being original studies. Another strength of this study is
14 484 the addition of a qualitative data collection to the study design as compared to Meerpohl et
15 485 al.[3] Through the interviews we obtained more nuanced responses regarding editors' opinion
16 486 about whether SRs are original studies, and what is an original study anyway. These
17 487 additional data provide rich insight into the reasoning of editors, and may provide inspiration
18 488 for further studies and actions in this field. Certain tangible benefits can depend on whether a
19 489 SR is regarded as original research or not. Consequently, it would be beneficial if relevant
20 490 organizations, such as learned societies and associations of editors, would address the issue
21 491 and provide some guidance.

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27 492 Our study had several limitations. We focused on the editors of PubMed Core Clinical
28 493 Journals, which is a limited sample to begin with. It is possible that different responses would
29 494 have been obtained if we had surveyed a broader sample of editors. Our decision to use this
30 495 cohort of journals was guided by the preceding study by Meerpohl et al.,[3] to serve as a
31 496 historical control.

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34 497 Although 9 years have passed between the two studies, it is possible that some involved
35 498 editors did not change over time and that they were included both in the first and in the
36 499 second study. In our study, we did not include any questions to verify this. The list of Core
37 500 Clinical Journals was similar between the two analyzed years; there were 13 journals that
38 501 were replaced by another one compared to the first study. However, none of the contacted
39 502 editors mentioned that they participated in the first study.

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43 503 We used PubMed to search for published SRs and MAs. If those were not indexed correctly in
44 504 PubMed we could have missed some. For this reason, we hand-searched all journals for which
45 505 we did not find any SRs or MAs.

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47 506 Another relevant consideration is the definition of a SR. We did not give editors any *a priori*
48 507 definition of what could be considered a systematic review, and not a single editor asked
49 508 which definition of a SR we used in the study. Presently, there is no consensus definition of a
50 509 SR, and which methodology, or characteristics a study should have in order to be considered a
51 510 SR. For example, it has been suggested that a study should not be called a SR if the authors
52 511 searched only one database, or if there is only one author.[13]

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54
55 512 In conclusion, compared to results obtained in 2009, we found a similar proportion of editors
56 513 of core clinical journals who consider that systematic reviews are original research, and who
57 514 had conditional acceptance of systematic reviews' originality. Interviews with editors
58 515 revealed that there is no uniform approach to defining what makes a systematic review (or any

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516 study) a piece of original research, and that these concepts of originality of research are
517 evolving. Editorial organizations, which set standards of publishing, should address this issue.
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7

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9

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11

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13

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20 529

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33 538 **Data sharing statement**
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35 539 Data collected during this study are available from the corresponding author on reasonable
36 540 request.
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3 582 **List of tables and supplementary files**
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7 584 Box 1. Characteristics of systematic reviews published by target journals in 2017.
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9 585

10 586 Table 1. Opinions of interviewed editors about elements of originality present or missing in
11 587 systematic reviews
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13 588 Table 2. Definitions of original research provided by editors
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15 589 Table 3: Additional comments of editors regarding systematic reviews
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18 591 Supplementary file 1. List of journals that were considered Core Clinical Journals in 2009 and
19 592 in 2018
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21 593 Supplementary file 2. Open-ended questions for facilitating semi-structured interviews
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Box 1. Characteristics of systematic reviews published by target journals in 2017.

Methods: We analyzed the following characteristics of systematic reviews published by target journals in 2017: i) topic (therapeutic, epidemiology, diagnosis/prognosis or other), ii) types of studies included, such as randomized controlled studies (RCTs), non-randomized studies (NRS), both randomized and non-randomized studies, systematic reviews or meta-analyses (SR/MA), SR/MA and primary research, SR and overview of SR (OSR) and those that did not define which studies were included, iii) presence of meta-analysis (yes, no), iv) update of a previous review (yes, no), v) type of review (systematic review, overview of systematic reviews, rapid review, scoping review).

Results: Detailed analysis of 1187 published SRs indicated that they most commonly addressed therapeutic interventions (n=585, 49%), epidemiology (n=281, 24%), diagnostic accuracy (n=105, 9%), prognostic issues (n=69, 6%) or other topics (n=147, 12%).

Regarding the type of included studies, the majority of SRs did not indicate in their methods what kind of studies were eligible for inclusion (n=301, 25%). There were 295 (25%) SRs that included both RCTs and NRS, 281 (24%) studies included only RCTs and 264 (22%) studies included only NRS. In 28 (2%) SRs, both primary research and SR/MA were included; 17 (1%) reviews included SR/MA, and one review (0.1%) included both SR and OSR in the review.

Of all the analyzed SRs, only 19 (2%) were an update of a previous SR. In 750 (63%) SRs, a meta-analysis was conducted. Most of the reviews were classic SRs that included only primary studies (N=1126, 95%); 28 (2%) SRs included both primary research and SR/MA so we defined them as SR/OSR; 19 (2%) OSRs, including one study that did not define which studies it included but called itself an OSR and one that included both SR/MA and OSR. Twelve (1%) SRs were scoping reviews and one was a rapid review (0.1%).

624 **Table 1. Opinions of interviewed editors about elements of originality present or missing**
 625 **in systematic reviews**

Editor	Is systematic review an original study?	Elements of originality present or missing in a systematic review; quotes
E2	Yes	New idea, analysis of bias, heterogeneity and level of evidence, provided summary and conclusion
E3	Yes	Done with high quality, using PRISMA guidelines
E4	Yes	Useful to improve or inform, either to advance knowledge or to improve and inform new research
E5	Yes	Meta-analysis helps in this respect, for a systematic review to be consider novel
E8	Yes	Different look at an old topic, something unique, probably in terms of search, novelty of the question, methods for searching
E11	Yes	Methodology involved in approach to search, careful process of filtering studies, looking at limitations of included studies, approaching a topic that requires some in-depth consideration, and involving a thought process in summarizing data, reporting results, discussing them and providing conclusions approach to search strategy, analysis of results, discussion, limitations, and making conclusions based on analyses
E12	Yes	Following the methodology, searching significant number of databases, they have to explain how they selected study they are going to review, what were the criteria, they have to talk about quality of the evidence, they have to summarize the results, it has to be a significant body of work, an element of quantity or magnitude
E13	Yes	Original question that hasn't been answered before, new search strategy, a new methodology, a reinterpretation of the results
E1	Only with meta-analysis	Original thought
E7	Only with meta-analysis	Some kind of analysis, it does not have to be meta-analysis; it can be another type of analysis
E15	Only with meta-analysis	I would consider a systematic review without meta-analysis a semi-quantitative review and therefore not original study
E6	No	Original research starts with a data source that is in most of nursing a human, and systematic reviews have data source that is secondary
E9	No	If you define original research as focused on discovery, then systematic reviews are not original in that sense. It does not

		have to do anything with methodology, but type of research. Primary studies that offer integration of existing research and synthesis are original research.
E10	No	Scientific method is different than in what I consider to be original
E14	No	In my opinion, if it does not touch the original data, it is not original

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628 **Table 2. Definitions of original research provided by editors**

629

Editor	Is systematic review an original study?	Quote about definition of original research
E6	No	I define original research as that which involved individuals and their data and secondary research as that which doesn't.
E7	Only with meta-analysis	Original is what has not been published before.
E8	Yes	To me, to be a study it has to be done in accordance with criteria for the study in terms of scholarly inquiry, so that it can be replicated, people can use the same search terms, etc.
E9	No	...if we look at it as a scholarship of discovery, and Boyer's model, I would not consider any type of systematic review to be original research.
E10	No	A study that is hypothesis driven, that generates a new knowledge and applies appropriate methods to get there.
E11	Yes	A study where authors generate hypothesis, proceed in formal manner, choose methodology, share results, discuss limitations, and provide conclusions. Also, where people deserve authorship for what they have done.
E12	Yes	...original study is the study that will generate new conclusion, new data, new information, and that requires significant intellectual effort on the part of investigators.
E13	Yes	I guess original research would be analyzing results and generating outcomes, or conclusions which haven't necessarily been done by other people before.
E14	No	As an editor, an original study is a study in which someone produces data.
E15	Only with meta-analysis	A study that has new knowledge generated. New knowledge can also be generated through synthetic process of meta-analysis, but not qualitative data synthesis of systematic review without meta-analysis.

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632 **Table 3: Additional comments of editors regarding systematic reviews**

Editor	Is systematic review an original study?	Additional comment
E1	Only with meta-analysis	I feel like we are in an evolution, you know. Even though it has been ten years since your first study, I do not think that people necessarily understand what a systematic review is. ... We do require systematic review authors to do a research checklist, we do require protocol registration, but we are not rigid about it, we don't actually check if they did. We do not actually check if they followed it, which would be ideal to do, but that would just take a lot of people to do that, and we do not have resources for that.
E2	yes	Editor who looks seriously at their impact factor will love to publish meta-analysis and systematic reviews that are good.
E3	yes	...there are too many systematic reviews being submitted, and that is because it's easy, you don't have to leave the comfort of your home or office, you can collect data and write your manuscript. So the quality is not very good because the motivation is wrong. The motivation is to become published, the motivation is not to influence care.
E4	yes	Well, as an editor, I find it difficult to find a balance between quality and useful message from a submitted systematic review.
E6	no	... I publish systematic reviews, I am a fan of systematic reviews. And I think they do more to move knowledge than a lot of original research does, because it takes the whole body of original research in that area and it elevates it.
E10	no	I think systematic reviews are scholarship. Boyer in 1990 or 1999 defined four different types of scholarship; original research is one, and synthesis is another. And I think it is incredibly important in terms of scholarship and academic advancement. Systematic reviews are maybe routinized in the way they are done, or the way data is collected, but they are hard to do a good one.
E14	no	People do systematic reviews because they have to build the CV and they don't have access to their own data, or they are not able to generate their own data. And we see this coming from various parts of the world, where we know that investigative resources are thin. And there is considerable confusion in the scientific and clinical communities about what a systematic review is and how much significance should be attached to it.

633

Supplementary file 1. List of journals that were considered Core Clinical Journals in 2009 and in 2018 (X stands for those that were included in a given year, and 0 for those that were not included)

#	Journal Title (NLM-Abbreviation)	Core Clinical Journal in 2009	Core Clinical Journal in 2018
1	Acad Med	x	x
2	Am Fam Physician	x	x
3	Am Heart J	x	x
4	Am J Cardiol	x	x
5	Am J Clin Nutr	x	x
6	Am J Clin Pathol	x	x
7	Am J Med	x	x
8	Am J Med Sci	x	x
9	Am J Nurs	x	x
10	Am J Obstet Gynecol	x	x
11	Am J Ophthalmol	x	x
12	Am J Pathol	x	x
13	Am J Phys Med Rehabil	x	x
14	Am J Psychiatry	x	x
15	Am J Public Health	x	x
16	Am J Respir Crit Care Med	x	x
17	Am J Roentgenol	x	x
18	Am J Surg	x	x
19	Am J Trop Med Hyg	x	x
20	Anaesthesia	x	x
21	Anesth Analg	x	x
22	Anesthesiology	x	x
23	Ann Emerg Med	x	x
24	Ann Intern Med	x	x
25	Ann Oto Rhinol Laryn	x	x
26	Ann Surg	x	x

27	Ann Thorac Surg	x	x
28	Arch Dermatol	x	o
29	Arch Dis Child	x	x
30	Arch Dis Child-Fetal	x	x
31	Arch Environ Occup H	x	x
32	Arch Gen Psychiatry	x	o
33	Arch Intern Med	x	o
34	Arch Neurol-Chicago	x	o
35	Arch Ophthalmol	x	o
36	Arch Otolaryngol Head Neck Surg	x	o
37	Arch Pathol Lab Med	x	x
38	Arch Pediatr Adolesc Med	x	o
39	Arch Phys Med Rehabil	x	x
40	Arch Surg	x	o
41	Arthritis Rheum	x	x
42	BJOG	x	x
43	Blood	x	x
44	BMJ	x	x
45	Bone Joint J	o	x
46	Br J Radiol	o	x
47	Br J Surg	x	x
48	Brain	x	x
49	CA Cancer J Clin	x	x
50	Cancer	x	x
51	Chest	x	x
52	Circulation	x	x
53	Clin Orthop Relat Res	x	x
54	Clin Pediatr (Phila)	x	x
55	Clin Pharmacol Ther	x	x
56	Clin Toxicol (Phila)	x	x

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87	J Neurosurg	x	x
88	J Nurs Adm	x	x
89	J Oral Maxillofac Surg	x	x
90	J Pediatr	x	x
91	J Acad Nutr Diet	o	x
92	J Thorac Cardiovasc Surg	x	x
93	J Trauma	x	o
94	J Trauma Acute Care Surg	o	x
95	J Urol	x	x
96	JAMA	x	x
97	JAMA Dermatol	o	x
98	JAMA Intern Med	o	x
99	JAMA Neurol	o	x
100	JAMA Ophthalmol	o	x
101	JAMA Otolaryngol Head Neck Surg	o	x
102	JAMA Pediatr	o	x
103	JAMA psychiatry	o	x
104	JAMA Surg	o	x
105	Lancet	x	x
106	Mayo Clin Proc	x	x
107	Med Clin North Am	x	x
108	Med Lett Drugs Ther	x	x
109	Medicine (Baltimore)	x	x
110	N Engl J Med	x	x
111	Neurology	x	x
112	Nurs Clin North Am	x	x
113	Nurs Outlook	x	x
114	Nurs Res	x	x
115	Obstet Gynecol	x	x
116	Orthop Clin North Am	x	x

117	Pediatr Clin North Am	x	x
118	Pediatrics	x	x
119	Phys Ther	x	x
120	Plast Reconstr Surg	x	x
121	Postgrad Med	x	x
122	Prog Cardiovasc Dis	x	x
123	Public Health Rep	x	x
124	Radiol Clin North Am	x	x
125	Radiology	x	x
126	Rheumatology (Oxford)	x	x
127	South Med J	x	x
128	Surg Clin North Am	x	x
129	Surgery	x	x
130	Transl Res	x	x
131	Urol Clin North Am	x	x

Supplementary file 2. Open-ended questions for facilitating semi-structured questionnaire

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7 1. Do you think that systematic reviews are original studies?

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9 If the answer to #1 is no:

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11 2. Do you feel the same about any type of systematic review, or there are certain types of
12 systematic reviews that you could consider “more original” compared to others, for example if a
13 systematic review has a meta-analysis?

14
15 3. In your opinion, what elements of originality are missing in systematic reviews, to be
16 considered original studies?

17
18 4. Can any secondary study be considered as an original research study, or only primary studies
19 should be considered original research studies?

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21 5. In your opinion, what is the value of systematic reviews?

22
23 6. Should clinical decisions be made based on systematic reviews or primary studies?

24
25 If the answer to #1 is yes:

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27 7. Do you feel any different regarding the type of evidence synthesis, for example systematic
28 review with or without meta-analysis, scoping systematic review, overviews of systematic reviews...
29 or you think any type of systematic review should be considered an original study?

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31 8. What do you think that makes a systematic review original study?

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33 9. Are there any elements of methodology that definitely make systematic reviews original?

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35 10. In your opinion, what is the value of systematic reviews?

36
37 11. Should clinical decisions be made based on systematic reviews or primary studies?
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Standards for Reporting Qualitative Research (SRQR)*

<http://www.equator-network.org/reporting-guidelines/srqr/>

Page/line no(s).

Title and abstract

<p>Title - Concise description of the nature and topic of the study Identifying the study as qualitative or indicating the approach (e.g., ethnography, grounded theory) or data collection methods (e.g., interview, focus group) is recommended</p>	1/1-2
<p>Abstract - Summary of key elements of the study using the abstract format of the intended publication; typically includes background, purpose, methods, results, and conclusions</p>	2/32-53

Introduction

<p>Problem formulation - Description and significance of the problem/phenomenon studied; review of relevant theory and empirical work; problem statement</p>	4/75-98
<p>Purpose or research question - Purpose of the study and specific objectives or questions</p>	4/99-102

Methods

<p>Qualitative approach and research paradigm - Qualitative approach (e.g., ethnography, grounded theory, case study, phenomenology, narrative research) and guiding theory if appropriate; identifying the research paradigm (e.g., postpositivist, constructivist/ interpretivist) is also recommended; rationale**</p>	5/109-112 6/148-150
<p>Researcher characteristics and reflexivity - Researchers' characteristics that may influence the research, including personal attributes, qualifications/experience, relationship with participants, assumptions, and/or presuppositions; potential or actual interaction between researchers' characteristics and the research questions, approach, methods, results, and/or transferability</p>	6/162-163
<p>Context - Setting/site and salient contextual factors; rationale**</p>	5/109-112 6/148-150
<p>Sampling strategy - How and why research participants, documents, or events were selected; criteria for deciding when no further sampling was necessary (e.g., sampling saturation); rationale**</p>	5/115-124 6/152-159
<p>Ethical issues pertaining to human subjects - Documentation of approval by an appropriate ethics review board and participant consent, or explanation for lack thereof; other confidentiality and data security issues</p>	7/182-185
<p>Data collection methods - Types of data collected; details of data collection procedures including (as appropriate) start and stop dates of data collection and analysis, iterative process, triangulation of sources/methods, and modification of procedures in response to evolving study findings; rationale**</p>	5/109-112 5/115-124 6/152-159

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2	Data collection instruments and technologies - Description of instruments (e.g.,	5/109-112
3	interview guides, questionnaires) and devices (e.g., audio recorders) used for data	5/115-124
4	collection; if/how the instrument(s) changed over the course of the study	6/152-159
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6	Units of study - Number and relevant characteristics of participants, documents,	7/166-167
7	or events included in the study; level of participation (could be reported in results)	8/213-214
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10	Data processing - Methods for processing data prior to and during analysis,	5/121-135
11	including transcription, data entry, data management and security, verification of	6/166-171
12	data integrity, data coding, and anonymization/de-identification of excerpts	
13	Data analysis - Process by which inferences, themes, etc., were identified and	5-6/138-142
14	developed, including the researchers involved in data analysis; usually references a	6-7/173-179
15	specific paradigm or approach; rationale**	
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17	Techniques to enhance trustworthiness - Techniques to enhance trustworthiness	5/109-112
18	and credibility of data analysis (e.g., member checking, audit trail, triangulation);	6/173-175
19	rationale**	
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Results/findings

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23	Synthesis and interpretation - Main findings (e.g., interpretations, inferences, and	
24	themes); might include development of a theory or model, or integration with	
25	prior research or theory	8-9/ 190-262
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27	Links to empirical data - Evidence (e.g., quotes, field notes, text excerpts,	
28	photographs) to substantiate analytic findings	9-13/265-389
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Discussion

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32	Integration with prior work, implications, transferability, and contribution(s) to	
33	the field - Short summary of main findings; explanation of how findings and	
34	conclusions connect to, support, elaborate on, or challenge conclusions of earlier	
35	scholarship; discussion of scope of application/generalizability; identification of	
36	unique contribution(s) to scholarship in a discipline or field	14-15/393-474
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38	Limitations - Trustworthiness and limitations of findings	16-17/477-517
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Other

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42	Conflicts of interest - Potential sources of influence or perceived influence on	
43	study conduct and conclusions; how these were managed	18/527-528
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45	Funding - Sources of funding and other support; role of funders in data collection,	
46	interpretation, and reporting	18/523-524
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*The authors created the SRQR by searching the literature to identify guidelines, reporting standards, and critical appraisal criteria for qualitative research; reviewing the reference lists of retrieved sources; and contacting experts to gain feedback. The SRQR aims to improve the transparency of all aspects of qualitative research by providing clear standards for reporting qualitative research.

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**The rationale should briefly discuss the justification for choosing that theory, approach, method, or technique rather than other options available, the assumptions and limitations implicit in those choices, and how those choices influence study conclusions and transferability. As appropriate, the rationale for several items might be discussed together.

Reference:

O'Brien BC, Harris IB, Beckman TJ, Reed DA, Cook DA. **Standards for reporting qualitative research: a synthesis of recommendations.** *Academic Medicine*, Vol. 89, No. 9 / Sept 2014
DOI: 10.1097/ACM.0000000000000388

For peer review only

BMJ Open

Attitudes of editors of core clinical journals about whether systematic reviews are original research: a mixed-methods study

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Primary Subject Heading:	Research methods
Secondary Subject Heading:	Epidemiology, Medical publishing and peer review
Keywords:	systematic reviews, editors, original research, opinions

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Manuscripts

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3 **1 Attitudes of editors of core clinical journals about whether systematic reviews are**
4 **2 original research: a mixed-methods study**
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8 4 Marina Krnic Martinic¹, Joerg J Meerpohl², Erik von Elm³, Florian Herrle⁴, Ana Marusic^{5,6},
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1
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3 **Abstract**
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6 **Objectives:** In 2009, not all journal editors considered systematic reviews (SRs) to be original
7 research studies, and not all PubMed Core Clinical Journals published SRs. The aim of this
8 study was to conduct a new analysis about editors' opinion regarding SRs as original research.
9

10 **Design:** We conducted a survey and qualitative interview study of journal editors.
11

12 **Participants:** All editors listed as editor-in chief of 118 PubMed Core Clinical Journals.
13

14 **Methods:** We contacted editors via e-mail and asked them whether they considered SRs
15 original research, whether they published SRs in the journal, and if yes, in which section. We
16 searched PubMed for any SRs (or meta-analyses) published in the included journals in 2017;
17 if we did not find any, we hand-searched these journals. Editors were invited to participate in
18 a follow-up qualitative interview study.
19
20

21 **Results:** We received responses from 73 editors representing 72 (62%) journals. Fifty-two
22 (80%) editors considered SRs original research, either for any type of SR (65%) or only for
23 SRs with a meta-analysis (15%), and almost all (91%) of editors published SRs. Compared to
24 the results of the 2009 study of Core Clinical Journals, a similar proportion of editors
25 considered SRs to be original studies (71%), accepted SRs as original upon certain condition
26 such as presence of meta-analysis (14%) or published SRs (94%). Interviews with editors
27 showed that they used various criteria to decide whether a SR is original research, including
28 methodology, reproducibility, originality of idea and level of novelty.
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32 **Conclusion:** The majority of editors of core clinical journals consider that systematic reviews
33 are original research. Among editors there was no uniform approach to defining what makes a
34 systematic review, or any study, original. This indicates that the concepts of originality of
35 systematic reviews, and research are evolving, and that this would be a relevant topic for
36 further discussion.
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41 **Keywords:** systematic reviews; editors; original research; opinions
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3 58 **Strengths and limitations of this study**
4

- 5 59 - This mixed-methods study combines an online survey with qualitative research
6 60 methods.
7
8 61 - This study had a high response rate of editors (62%).
9
10 62 - The study provides more detailed data about editors' reasoning about the originality of
11 63 systematic reviews.
12
13 64 - A limitation of this study is our use of a sample of journals indexed as PubMed Core
14 65 Clinical Journals and the possibility that some journal editors were surveyed both in
15 66 the earlier study and in this follow-up study, although none of the editors indicated
16 67 that they participated in the earlier study.
17
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19 68 - The study relied on PubMed's indexing to identify SRs and MAs published by the
20 69 included journals; hand-searching of all journals may have yielded some additional
21 70 SRs.
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73 1. Introduction

74 Global scientific output is growing exponentially,[1] leaving users of research evidence to
75 grapple with numerous individual studies, which may have different conclusions even if they
76 cover the same topic. The development of research methodology for qualitative and
77 quantitative synthesis of evidence led to the emergence of systematic reviews as research
78 synthesis method.[2] This was also suggested in previous studies examining the status of
79 systematic reviews in research community.[3, 4]

80 In 2012, Meerpohl et al. published a survey of editors of core clinical journals regarding their
81 attitudes about the value of systematic reviews (SRs) for journals.[3] The study included 65
82 editors of the 118 journals, who were surveyed in April 2009. The editors were asked if they
83 considered SRs to be original research, whether their journal published SRs and in which
84 section SRs were published. The results indicated that 71% of the respondents considered SRs
85 to be original studies and the majority of their journals published SRs.[3]

86 A study published in 2017 examined the acceptance of SRs as a doctoral thesis in European
87 biomedical doctoral (PhD) program.[4] Almost half of the surveyed participants, who
88 identified themselves as being in charge of doctoral programs, reported that in their
89 institutions a systematic review is an acceptable piece of research for an entire or at least part
90 of a PhD thesis, but the majority of surveyed individuals did not have sufficient knowledge
91 about basic concepts of SR methodology.[4] However, more than a half of the participants
92 indicated agreement with the statement that “systematic reviews do not produce enough new
93 knowledge for a dissertation”. A third of the respondents indicated that there was a lack of
94 appreciation for SR methodology among faculty members.[4]

95 In the years since the study of Meerpohl et al. was conducted, the number of published SRs
96 has increased, as well as their influence.[5] On the other hand, it has been suggested that there
97 is an overproduction of redundant, misleading, and conflicted SRs and MAs in addition to the
98 marked publication growth.[6] The aim of this study was to follow-up on the attitudes of
99 journal editors towards SRs. We hypothesized that the proportion of editors who consider SR
100 to be original research had increased since 2009 and that more of the surveyed journals now
101 publish SRs.

102

103 2. Methods

104

105 2.1. Survey

106

107 2.1.1. Participants

108 We invited editors of 118 journals labelled as Core Clinical Journals by the National Library
109 of Medicine, USA in February 2018.[7] The list of journals that were considered Core
110 Clinical Journals in 2009 (when the previous study was conducted) [3] and in 2018 is
111 available in Supplementary file 1. We retrieved editors' names and contact details from
112 journal web sites. Ten journals indicated that they had more than one editor-in-chief; eight of
113 those 10 journals had two editors-in chief, one had three, and one had four editors-in-chief. In
114 total, there were 131 editors-in-chief listed for the 118 journals.

115

116 2.1.2. Survey

117 We surveyed editors via e-mail, using the following four questions: (i) Do you consider a
118 systematic review manuscript an original research project? (ii) Do you publish systematic
119 reviews in the journal you edit? (iii) In which section of your journal would you publish a
120 systematic review? (iv) Would you participate in a follow-up qualitative study via Skype?

121 We sent up to three email reminders approximately one week apart (MK, LP). We did not
122 send reminders to the editors who responded that they do not wish to participate in the study.

123 Each study participant was assigned a code and coded responses were entered in to a
124 spreadsheet with anonymized responses that were shared with other co-authors. One author
125 initially evaluated and categorized responses (MK), in consultation with another author if
126 necessary (LP).

127

128 2.1.3. Analysis of systematic reviews published in targeted journals

129 For all included journals we assessed the types and characteristics of the published SRs. We
130 performed a search on PubMed using journal name and limits for SRs and meta-analyses
131 (MA) and for articles published in 2017; search results were screened by two authors
132 independently to verify that these publications were indeed SRs or meta-analyses.
133 Characteristics we analyzed in those SRs are shown in Box 1. We hand-searched the contents
134 of journals published in 2017 if we did not find any SRs or meta-analyses by searching
135 PubMed. If by hand searching we did not find any SRs or meta-analyses published in the
136 journals included in 2017, we evaluated instructions for authors of journals that did not
137 publish any SR to see if they had any guidance about submitting SRs and meta-analyses.

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139 2.1.4. Statistics

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3 140 We analyzed data using frequencies, percentages and interquartile range (IQR) to describe the
4 141 results. Differences in proportions of key results between this study and the previous study[3]
5 142 were analyzed with the Chi-square test. Proportions were reported with 95% confidence
6
7 143 intervals (95% CI). For analyses we used MedCalc (MedCalc Corp., Mariakerke, Belgium).
8
9 144 Statistical significance was set at $p < 0.05$.

10 145

11 146

12 147 **2.2. Qualitative study**

13 148

14 149 *2.2.1. Participants*

15
16 150 We contacted the editors who accepted to take part in the follow-up interview when
17 151 responding to the survey. Participants were informed who will conduct the interview, and that
18 152 the authors intend to publish the study results.

19 153

20 154 *2.2.2. Interviews:* The qualitative study was conducted using semi-structured interviews.
21 155 Twenty-four editors volunteered to be interviewed. After 15 interviews we stopped inviting
22 156 further editors because we reached the level of saturation of identified themes which is usual
23 157 methodology in qualitative research. The first interview was conducted on July 6th, 2018, and
24 158 the last on September 7th, 2018. We used open-ended semi-structured questions to enhance
25 159 the discussion about originality of SRs (Supplementary file 2). Participants were not led to
26 160 provide specifically any answer. We used the Consolidated Criteria for Reporting Qualitative
27 161 Studies (COREQ) to guide the reporting of the study.[8]

28 162

29 163 *2.2.3. Research team and reflexivity*

30 164 One author conducted all interviews (LP). The author that conducted interviews did not
31 165 personally know any editors that were invited to participate.

32 166

33 167 *2.2.4. Conduct of interviews*

34 168 Interviews were conducted individually via teleconferencing software (Skype or Zoom) or via
35 169 telephone, based on the choice of participants. All conversations were recorded. After each
36 170 interview a transcript was made and analyzed, to monitor for the point of information
37 171 saturation. Transcripts and recordings of interviews were not sent to study participants for
38 172 checking, commenting and/or correction. Instead, the final draft of the manuscript was sent to
39 173 the editors for their insight into the collected results.

40 174

41 175 *2.2.5. Data analysis and reporting:* To ensure uniformity, all transcripts of interview
42 176 recordings were made by one researcher (LP), and another member of the team checked all

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3 177 transcripts and analyzed them (MK). In the purpose of reporting, the participants' names were
4 178 coded. The transcripts were analyzed via conventional qualitative content analysis.[9, 10] The
5 179 transcripts were first read as a whole to obtain general attitude of one editor, and afterwards
6 180 the text was analyzed word-by-word highlighting parts of the text that produced meaningful
7 181 units, including complete sentences or parts of sentences, and then a code was attributed to
8 182 those selected parts of text. Codes were sorted into categories related to editors' attitude
9 183 toward SRs. , Two researchers did the coding; the results were then compared, and any
10 184 discrepancies were resolved by discussion until reaching consensus. The codes were entered
11 185 into an Excel spreadsheet for further quantitative analysis. Complete sentences were also
12 186 copied from the interview transcripts to provide original thoughts of editors in the manuscript.
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188 2.2.6. *Ethics*

189 The study protocol was approved by the Ethics Committee of the University of Split School
190 of Medicine. Potential participants received information about the study via an e-mail, and
191 they were informed that their response to the email will be considered an informed consent to
192 participate in the survey. Consent for interviews was also obtained via email.
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195 **2.3. Patient and public involvement**

196

197 No patient involved.
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199 3. Results

200

201 3.1. Survey among editors of core clinical journals

202 Of 118 contacted editors, we received responses from 73 editors representing 72 (62%)
203 journals. Interestingly, two editors from a single journal gave us opposite answers to our
204 survey questions. Response rate based on the number of editors was 73 out of 131 (56%).
205 Supplementary file 1 shows a list of included Core Clinical Journals in 2009 and 2018. Since
206 2009, 13 new journals were added to the list of Core Clinical Journals, while the same number
207 was dropped from the list. So the total number of Core Clinical Journals in both years was the
208 same.

209

210 3.1.1. Editors' responses

211 Of the 73 respondents, 8 (11%) did not answer the first question despite our repeated attempts
212 to obtain missing answers. Among the remaining 65 editors who responded the first question,
213 42 (65%) considered SRs to be original studies, 13 (20%) did not, and 10 (15%) indicated that
214 only a SR with a MA was an original study. Overall, 52 (80%) editors considered SRs
215 original research, either for any type of SR or only for SRs with a meta-analysis. This
216 proportion was 71% (46 of 65) in the previous study;^[3] the difference was not statistically
217 significant ($p=0.23$; $\chi^2=1.412$, $df=1$; 9% increase, 95% CI: -5.8 to 23.3). The proportion of
218 editors with conditional acceptance of SRs was 15% (10 of 65). In the previous study^[3] it
219 was 14% (9 of 65). The difference was not significantly different ($p=0.87$; $\chi^2=0.026$, $df=1$;
220 1% increase, 95% CI: -11.4 to 13.4).

221 Four editors did not answer the second question. Of the remaining 69 editors, 63 (91%)
222 responded that they had published SRs in their journals, 6 (9%) that they had not. In the
223 previous study 94% (60 of 64) of editors indicated they published SRs; there was no
224 significant difference between these proportions ($p=0.51$; $\chi^2=0.425$, $df=1$; 3% increase, 95%
225 CI: -6.9 to 12.8).

226 Out of 63 editors that declared they had published SRs, 16 (25%) editors published SRs in a
227 journal section devoted to original studies, 19 (30%) in the review section or separate section
228 of the journal, 10 (16%) of them publish SRs in the section for original studies if they have a
229 MA, and in the review section if they do not.

230 More than a quarter of editors ($n=18$, 29%) indicated that they did not have a particular
231 section for publishing SRs in their journal, and that they simply published them in the section
232 that corresponds to the topic of the manuscript. Five (8%) editors did not answer the third
233 survey question.

234 Even though 10 journals had more than one editor-in-chief, we received response from more
235 than one editor from only one journal, for which two editors responded. From those two
236 editors we received opposite responses on the first two questions. One did not consider SRs
237 original and said that their journal generally does not publish SRs, and the other one
238 considered SRs original and said SRs are published in their journal. Only the answer to the

239 third question about the section in which SRs are published was the same as both answered
240 SRs were published in no particular section of the journal.

241 Among the surveyed editors 24 (33%) accepted to participate in the follow-up interview, 17
242 (23%) declined, and 32 (44%) of editors did not answer, even after a reminder.

243 Of the 24 editors who accepted to participate in the interview, 14 (58%) answered the first
244 question that they considered SRs to be original studies, 6 (25%) answered that they did not, 3
245 (13%) answered that they considered SRs to be original if they had a MA incorporated, and
246 one (4%) accepted to participate in the interview without providing the answer to the first
247 survey question.

248 Additionally, four editors who responded to the survey, but did not participate in the
249 qualitative part of the study, offered their opinions regarding originality of SRs via e-mail
250 together with responses to the three survey questions. Two of them indicated that SR is
251 original if it has methodological rigor; as one of them put it: "Cochrane-type review, with
252 good scientific rigor combined with a thorough review of the literature, is original research."
253 One of them remarked that a review can never be original research, with one exception: *That*
254 *exception is when a systematic exploration of the evidence (usually meta-analysis) is used to*
255 *test a new hypothesis, one that had not previously been considered or addressed in the data*
256 *analysis. Even then, I would not consider it completely original but an original application of*
257 *the work of other investigators.* The fourth elaborated that MA is considered new data, and
258 therefore only SR with MA would be considered original study.

259

260 3.1.2. Analysis of systematic reviews published in core clinical journals

261 Among the 118 included Core Clinical Journals 110 published a median of 14 articles (range
262 1 to 528) indexed by PubMed as SR or MA, while 8 did not publish a single such manuscript.

263 Among the 6 editors that previously declared that they did not publish SRs, there were only 2
264 editors in whose journals our search did not find a SR or a MA published in 2017. Four stated
265 that they did not publish but our search found SRs or MAs published in their journal in 2017.

266 The analysis of instructions for authors of 8 journals that did not publish SR in analyzed
267 period showed that only one journal had guidance for authors regarding submission of SR or
268 MA. Because one journal published 528 articles indexed as SR or MA by PubMed, we only
269 analyzed in detail the first 30% of these articles in order of publication (n=158). Altogether
270 we analyzed 2240 journal articles. Using those criteria, we found that 1187 (53%) were
271 indeed a SR, scoping review, overview of systematic reviews (OSR) or a rapid review that
272 used systematic searching methods and the others were not. For individual journals, the
273 median percent of articles that were SRs was 50% (IQR 33% to 67%). We also found that 2 of
274 the 6 journals for which editors responded that they did not publish SRs actually published at
275 least one in 2017. A detailed analysis of 1187 published SRs is shown in Box 1.

276

277 3.2. Qualitative study

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3 278 Fifteen (21%) editors participated in the follow-up interview. We stopped recruiting new
4 279 editors after achieving thematic saturation. Interviews lasted between 6 and 25 min (median
5 280 12 min, IQR 9 to 16.5 min). The names of the interviewed editors were coded as “E1”-“E15”.
7 281 Eight editors reported in the initial survey that SRs are original studies, 3 considered SR to be
8 282 an original study only if it incorporated a MA, and 4 did not consider SRs to be original
9 283 studies.

12 284

14 285 3.2.1. *Is any type of systematic review an original study?*

15 286 Eight editors who considered SRs original studies were asked if they felt any different
16 287 regarding the type of evidence synthesis, for example SR with or without meta-analysis,
17 288 scoping review, OSRs and any other type of SR or they thought any type of SR should be
18 289 considered an original study.

21 290 Four editors indicated that all types of SR are original studies. One editor considered all SRs
22 291 original if they passed peer-review scrutiny. One editor indicated that all SRs can be
23 292 considered original studies but pointed out that he would still not publish a study which was
24 293 not informative, such as an empty SR, i.e. a review in which no eligible studies were found
25 294 after literature search.[11] One editor stated that a SR with a MA was still more novel than SR
26 295 without MA. This indicates that certain editors equate originality of research with novelty,
27 296 and that certain types of studies, such as SRs, can have a whole spectrum of considerations

31 297 *E12: ...from my point of view, the actual name or type of the systematic review is not*
32 298 *that important. I think what I look is did they searched certain number of databases,*
33 299 *did they do it in a systematic way, did they follow methods.*

35 300 Three editors, who considered only SRs with MA as an original study, were asked if they
36 301 thought meta-analysis was the only thing that makes a systematic review an original study.
37 302 Two editors insisted that MA is essential for SRs to be considered original, while the third
38 303 was more ambivalent:

41 304 *E1: ... I think that in the academic world of medicine we begin to recognize that not*
42 305 *all science is discovery science, that there is also science of integrating results and so*
43 306 *I think in that sense systematic reviews perhaps could be eventually consider original.*
44 307 *But, in my research it is only a matter of in which section you put it, and we could as*
45 308 *well put it in the section of original studies.*

48 309 Four editors who did not consider SRs to be original studies had the same opinion about any
49 310 type of SR and analytic methods used in such studies.

51 311 Two editors stated that there may be a continuum of considerations about originality of SRs.
52 312 Editor E5 indicated that original SRs are those that bring new knowledge, and therefore, that
53 313 there is no universal answer; that this should be judged individually for each SR:

56 314 *E5: This should be judged on a case-by-case scenario. In my field, if you look at*
57 315 *systematic reviews about influenza or vaccines, there have been multiple systematic*
58 316 *reviews that did not bring any new knowledge. So, these studies should be judged*
59 317 *individually.*

318

Editor E15 was ambivalent about the response; this editor considered that SRs were original if they contain MA but acknowledged that SR authors may have planned to do a SR with MA, but whether MA is possible or not, this is often difficult to determine at the onset. MA may not be possible because of clinical or statistical heterogeneity:

E15: So it is not the fault of authors; they have done everything by the book. So I think there is some fluidity in this respect, and this division of original and non-original systematic review is artificial.

327

For peer review only

3.2.2. Elements of originality in systematic reviews

All editors were asked to define what makes a SR an original study or which elements are missing in SRs to be considered original. The answers are stated in Table 1. Responses included specific elements of systematic review methodology, originality of idea and usefulness of SRs. Editor E9 opined that “*original is bad descriptor for research*”.

Four editors who did not consider SRs original studies were asked if they considered any secondary study to be original. Two indicated that only primary studies could be considered original, one did not provide an answer to this question while the fourth editor was ambiguous:

E10: *Systematic reviews are taking data and analyzing them in different ways, and asking different questions, and so I do not value them as highly as primary or plain secondary research. ...secondary studies could be considered original as long as they are not systematic reviews.*

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3.2.3. Editors' opinion about value of systematic reviews

The editors provided the following responses to describe the main value of SRs: (i) synthesis of data (9 editors); (ii) providing answers to the posed clinical question (9 editors); (iii) data analysis (2 editors); (iv) impartial and free of bias (3 editors); (v) underlining guidelines (1 editor); (vi) pointing where evidence is insufficient (1 editor); (vii) independent and transparent methods using standardized assessment (1 editor).

E4: *independent assessment based on transparent methods of the evidence on a topic, including not only thorough search and systematic search of the evidence and the synthesis but also a standardized assessment of its quality and overall value ... it's systematic methods and their assessment is independent from conflict of interest in a broad sense...*

353

3.2.4. Definition of original research

A question that emerged during one of the first interviews was the issue of a definition of original research. An editor asked interviewer to provide our definition of originality and explained that the answer depends on the definition of originality.

E9: “*This whole issue of originality depends on how one defines original research. If you do not define what original research is, then the question about whether systematic reviews are original studies is not fair.*”

Since there is no universally agreed definition of what constitutes an original research, we discussed this remark within our team and decided to ask all subsequent editors how they would define an original study. Ten editors that were interviewed subsequently provided their definition of original studies, which we divided into six categories (Table 2). The original research was defined as: (i) one that brings new knowledge, data, information and conclusions; (ii) study that provides primary data analysis; (iii) definition according to the Boyer's model of scholarship; (iv) study that has not been published before; (v) one which is

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3 368 replicable and done in accordance with criteria for the study in terms of scholarly inquiry; and
4 369 (vi) study where authors generate hypothesis, proceed in formal manner, choose
5 370 methodology, share results, discuss limitations, provide conclusions, and where people
6 371 deserve authorship (Table 2).
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10 373 3.2.5. Using systematic reviews for making clinical decisions

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12 374 All editors were asked if clinical decisions should be based on SRs or primary studies. Eight
13 375 editors responded that clinical decision should be based both on SRs and primary studies, six
14 376 editors gave some advantage to SRs for making such decisions, and one editor stated that
15 377 decisions should be made on high quality evidence, regardless of the study type.
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20 379 3.2.6. Additional relevant themes

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22 380 In the end of the interview, editors were asked to freely express anything else they would like
23 381 to add regarding originality of SRs. Among the most common comments were questions
24 382 whether it matters at all how SRs are categorized in terms of originality as long as they are
25 383 useful. Editors gave various comments about production and publication of SRs, proliferation
26 384 of SRs and their quality (Table 3).
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29 385 Some of the practical aspects of this categorization included eligibility of SRs as publications
30 386 qualifying candidates for academic advancement or acceptance of SRs as a PhD thesis.

31
32 387 *E1: I guess that depends on what you call original, and does it matter if you call it*
33 388 *original or not – I don't know does it matter. I guess it could matter to a PhD thesis*
34 389 *committee or a promotion committee, but maybe they need to stop and think about*
35 390 *what they are doing, and why they are doing it, and who it is that they are trying to*
36 391 *train and what it means. In our institution we definitely have scholarship of synthesis,*
37 392 *so meta-analyses and systematic reviews would get strong weight on our promotion*
38 393 *committee. We have already moved in that direction.*
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42 394 Six editors indicated that they would consider SRs to be an eligible study design for a PhD
43 395 thesis, one said that SRs should not be eligible for a PhD thesis, and one editor considered that
44 396 a candidate should prepare at least two SRs or a SR and a primary study if this study design
45 397 will be considered for a PhD thesis.
46
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48 398 *E4: Somebody can oppose systematic review within a PhD thesis because they don't*
49 399 *know that people learn a lot by doing systematic reviews. They become better*
50 400 *researchers if they do them.*
51

52 401 Editor E6 indicated that there should not be restrictions regarding study designs while
53 402 conducting academic thesis, because it is important to focus on learning outcomes, and that
54 403 the only goal of a thesis should not be putting hands on patients because we are moving
55 404 towards electronic medical records anyway
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58 405 *E6: We are not going to be doing individual data collection in five years or so. So we*
59 406 *should be paying less attention to how we were doing things when we were younger,*
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3 407 *because then the only way to collect data was putting hands on a patient, or getting*
4 408 *data from their chart, getting information by asking patient, observing, video-taping,*
5 409 *etc., etc. But if now the data has already been collected, the old-fashioned way is very*
6 410 *expensive method to gain knowledge. But my main point is whether that is our key*
7 411 *competency, to collect an information directly from a patient.*
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For peer review only

414 **4. Discussion**

415 We followed up on the study of Meerpohl et al. [3] and found a similar proportion of editors
416 of Core Clinical Journals who considered systematic reviews original studies. Most editors
417 published SRs, and a quarter of them published them in the section of their journal devoted to
418 original studies. Interviews with editors indicated that various elements are considered when
419 deciding whether a SR is an original study.

420 Eighty percent of the surveyed editors considered SRs per se or only SRs with MA original
421 research. This number is slightly higher compared to 71% of editors who considered that SRs
422 are original research projects in 2009,[3] but the difference is not statistically significant.

423 There was no difference between the proportion of editors who considered SRs to be original
424 research compared to the earlier study.[3] These results indicate minimal changes of editors'
425 attitudes between these two studies in terms of the premise that SRs are original research.

426 We went beyond the initial study by Meerpohl et al. [3] with a qualitative study because we
427 wanted to gather richer data, to give the editors an opportunity to explain their attitudes, and
428 to get more details about what they consider original or non-original regarding SRs.

429 In the qualitative part of our study, many editors indicated that the concept of originality of
430 SRs is still evolving and that there is a continuum of considerations to be made. One editor,
431 who considered that SR is an original study, stated that a SR with a MA is still more novel
432 than SR without MA. This indicates that certain editors equate originality of research with
433 novelty. This also indicates that for some editors there are no firm categories about novelty
434 and originality of SRs. Instead, these are judged as a whole spectrum, where different
435 characteristics or certain items of methodology, can influence perception of a study.

436 Another editor, with the same opinion that SR with MA is an original study acknowledged
437 that MA may not be justifiable, and that this can be only determined after SR authors have
438 already done a lot of work. In this case the definition of originality of the study would depend
439 on data that were found, and not on the initial idea. This would make decisions about
440 originality of a SR highly unpredictable; someone could embark on doing an original study,
441 and end up with a non-original study, depending on the results.

442 Furthermore, responses of editors during interviews indicate that there is a lot of fluidity in
443 defining original research. There was no consensus among editors about what constitutes
444 original research and what makes SRs original. Some editors quoted methodology and
445 reproducibility; some originality of idea and level of novelty. Some insisted on analyses,
446 presence of meta-analysis, or another type of analysis, which would bring quantitative aspect
447 to a qualitative summary in a SR. For one editor, SR without MA is semi-quantitative, and
448 thus not original. However, if we duly take quantitative data as a paramount defining element
449 of original research, then the whole field of qualitative studies would come under question as
450 non-original.

451 Furthermore, some editors did not consider SRs or SRs without MA original research
452 projects, because authors of such studies did not produce the data but relied on data collected
453 by others. However, as other editors have mentioned, there are now a plethora of study
454 designs in clinical medicine that include data which were not collected first hand. Studies that

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3 455 rely on electronic health records, or data collected via instruments, or any type of
4 456 retrospective studies relying on data that somebody else collected, would then not be
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6 457 considered original according to these criteria.

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8 458 Two editors cited Ernest Boyer's model of scholarship as an argument why they do not
9 459 consider SR to be original research.[12] According to this model, introduced in 1990, there
10 460 are four categories of scholarship, where original research is one category and the integration
11 461 that involves synthesis of information is another category.[12] However, one of the
12
13 462 interviewed editors remarked that indeed there are different types of scholarship, and
14 463 therefore different types of original research.

15
16 464 Our survey also indicated that the majority (91%) of editors published SRs. The difference to
17 465 the previously reported proportion (94%)[3] is not significant. A quarter of editors published
18 466 SRs in the original study section of the journal, which is a decline in comparison to earlier
19 467 results that a third of editors published them in an original study section in 2009.[3] However,
20 468 it also has to be emphasized that some editors remarked in interviews that they find it
21 469 completely irrelevant in which section a SR is published, because they have thematic sections
22 470 where they publish manuscript of any study design, including SRs. Therefore, the finding that
23 471 fewer SRs are published in sections devoted to original studies may simply be an indication
24 472 that more journals organize manuscript in thematic sections, and not according to the
25 473 perceived originality of a contribution.

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30 474 Few manuscripts so far were devoted to the considerations of originality of SRs. Aveyard and
31 475 Sharp[13] postulated that SRs are 'original empirical research' because they (quote): '*review,*
32 476 *evaluate and synthesise all the available primary data, which can be either quantitative or*
33 477 *qualitative*'. One editor in our qualitative study remarked that it does not matter whether a SR
34 478 is considered original research, as long as it is valuable. This was also pointed out before by
35 479 Biondi-Zoccai et al., who considered that the main criteria to judge a SR should be its novelty
36 480 and usefulness, and not whether a SR is original/primary or secondary research.[14]

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40 481 There may be practical aspects in considerations whether a SR is an original study or not,
41 482 such as during evaluating candidates for academic promotion, or allowing students to use SR
42 483 as a study design in their academic thesis. Although these topics were not the subject of our
43 484 study, several editors indicated that they would be in favor of recognizing SRs both as studies
44 485 that can be counted for academic promotion, and for conducting PhD thesis. There were also
45 486 discrepant opinions regarding SRs within PhD theses, as well as considerations that
46 487 acceptability of a SR for PhD thesis may depend on a research field. It has been shown
47 488 recently that the topic of acceptability of a SR for PhD theses is debated in the academic
48 489 community as well; about half of surveyed individuals in charge of European PhD programs
49 490 indicated that SRs are accepted as a study design in their schools.[4]

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53 491 In addition to analyzing editors' opinions, we also assessed SRs that the target journals
54 492 published in 2017. Overwhelming majority of the analyzed journals (93%) published at least
55 493 one SR in 2017, and among the remaining 8 journals, one had instructions for authors
56 494 regarding submission of SRs. Six editors indicated that their journal does not publish SRs, but
57 495 our analysis indicated that 2 of those 6 journals actually did publish SRs in year 2017.

496

497 *Strengths and limitations*

498 One strength of this study is its high response rate (62%). Furthermore, the proportion of
499 editors with different answers to the question about whether SRs are original studies was very
500 similar among editors who participated in the survey and editors who participated in follow-
501 up interviews, indicating the editors were equally keen to participate in the interview
502 regarding their consideration of SRs as original studies or not. Therefore, we can argue that
503 interviews did not suffer from selection bias in terms of including only editors with uniform
504 opinions regarding SRs being or not being original studies. Another strength of this study is
505 the addition of a qualitative data collection to the study design as compared to Meerpohl et
506 al.[3] Through the interviews we obtained more nuanced responses regarding editors' opinion
507 about whether SRs are original studies, and what is an original study anyway. These
508 additional data provide rich insight into the reasoning of editors and may provide inspiration
509 for further studies and actions in this field. Certain tangible benefits can depend on whether a
510 SR is regarded as original research or not. Consequently, it would be beneficial if relevant
511 organizations, such as learned societies and associations of editors, would address the issue
512 and provide some guidance.

513 Our study had several limitations. We focused on the editors of PubMed Core Clinical
514 Journals, which is a limited sample to begin with. It is possible that different responses would
515 have been obtained if we had surveyed a broader sample of editors. Our decision to use this
516 cohort of journals was guided by the preceding study by Meerpohl et al.,[3] to serve as a
517 historical control.

518 Although 9 years have passed between the two studies, it is possible that some involved
519 editors did not change over time and that they were included both in the first and in the
520 second study. In our study, we did not include any questions to verify this. The list of Core
521 Clinical Journals was similar between the two analyzed years; there were 13 journals that
522 were replaced by another one compared to the first study. However, none of the contacted
523 editors mentioned that they participated in the first study.

524 We used PubMed to search for published SRs and MAs. If those were not indexed correctly in
525 PubMed we could have missed some. For this reason, we hand-searched all journals for which
526 we did not find any SRs or MAs.

527 Another relevant consideration is the definition of a SR. We did not give editors any *a priori*
528 definition of what could be considered a systematic review, and not a single editor asked
529 which definition of a SR we used in the study. Presently, there is no consensus definition of a
530 SR, and which methodology, or characteristics a study should have in order to be considered a
531 SR. For example, it has been suggested that a study should not be called a SR if the authors
532 searched only one database, or if there is only one author.[15]

533 In conclusion, compared to results obtained in 2009, we found a similar proportion of editors
534 of core clinical journals who consider that systematic reviews are original research, and who
535 had conditional acceptance of systematic reviews' originality. Interviews with editors
536 revealed that there is no uniform approach to defining what makes a systematic review (or any

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3 537 study) a piece of original research, and that these concepts of originality of research are
4 538 evolving. Editorial organizations, which set standards of publishing, should address this issue.

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For peer review only

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3 541 **Acknowledgements**
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13 547 **Contributorship Statement**
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15 548 Study design: JJM, EvE, FH, AM, LP
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17 549 Data collection: MKM, LP
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19 550 Data analysis: MKM, JJM, EvE, FH, AM, LP
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23 552 Approval of the final version of the manuscript: MKM, JJM, EvE, FH, AM, LP
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25 553 Agree to be accountable for the work: MKM, JJM, EvE, FH, AM, LP
26

27 554

28 555 **Conflict of interest**
29

30 556 The authors have no financial conflict of interests. Authors JJM, EvE, AM and LP are
31 557 affiliated with Cochrane.
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34 559 **Data sharing**
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36 560 Data collected during this study are available from the corresponding author on reasonable
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3 607 **List of tables and supplementary files**
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7 609 Box 1. Characteristics of systematic reviews published by target journals in 2017.
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10 611 Table 1. Opinions of interviewed editors about elements of originality present or missing in
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13 613 Table 2. Definitions of original research provided by editors
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15 614 Table 3: Additional comments of editors regarding systematic reviews
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18 616 Supplementary file 1. List of journals that were considered Core Clinical Journals in 2009 and
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21 618 Supplementary file 2. Open-ended questions for facilitating semi-structured interviews
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Box 1. Characteristics of systematic reviews published by target journals in 2017.

Methods: We analyzed the following characteristics of systematic reviews published by target journals in 2017: i) topic (therapeutic, epidemiology, diagnosis/prognosis or other), ii) types of studies included, such as randomized controlled studies (RCTs), non-randomized studies (NRS), both randomized and non-randomized studies, systematic reviews or meta-analyses (SR/MA), SR/MA and primary research, SR and overview of SR (OSR) and those that did not define which studies were included, iii) presence of meta-analysis (yes, no), iv) update of a previous review (yes, no), v) type of review (systematic review, overview of systematic reviews, rapid review, scoping review).

Results: Detailed analysis of 1187 published SRs indicated that they most commonly addressed therapeutic interventions (n=585, 49%), epidemiology (n=281, 24%), diagnostic accuracy (n=105, 9%), prognostic issues (n=69, 6%) or other topics (n=147, 12%).

Regarding the type of included studies, the majority of SRs did not indicate in their methods what kind of studies were eligible for inclusion (n=301, 25%). There were 295 (25%) SRs that included both RCTs and NRS, 281 (24%) studies included only RCTs and 264 (22%) studies included only NRS. In 28 (2%) SRs, both primary research and SR/MA were included; 17 (1%) reviews included SR/MA, and one review (0.1%) included both SR and OSR in the review.

Of all the analyzed SRs, only 19 (2%) were an update of a previous SR. In 750 (63%) SRs, a meta-analysis was conducted. Most of the reviews were classic SRs that included only primary studies (N=1126, 95%); 28 (2%) SRs included both primary research and SR/MA so we defined them as SR/OSR; 19 (2%) OSRs, including one study that did not define which studies it included but called itself an OSR and one that included both SR/MA and OSR. Twelve (1%) SRs were scoping reviews and one was a rapid review (0.1%).

649 **Table 1. Opinions of interviewed editors about elements of originality present or missing**
 650 **in systematic reviews**

Editor	Is systematic review an original study?	Elements of originality present or missing in a systematic review; quotes
E2	Yes	New idea, analysis of bias, heterogeneity and level of evidence, provided summary and conclusion
E3	Yes	Done with high quality, using PRISMA guidelines
E4	Yes	Useful to improve or inform, either to advance knowledge or to improve and inform new research
E5	Yes	Meta-analysis helps in this respect, for a systematic review to be consider novel
E8	Yes	Different look at an old topic, something unique, probably in terms of search, novelty of the question, methods for searching
E11	Yes	Methodology involved in approach to search, careful process of filtering studies, looking at limitations of included studies, approaching a topic that requires some in-depth consideration, and involving a thought process in summarizing data, reporting results, discussing them and providing conclusions approach to search strategy, analysis of results, discussion, limitations, and making conclusions based on analyses
E12	Yes	Following the methodology, searching significant number of databases, they have to explain how they selected study they are going to review, what were the criteria, they have to talk about quality of the evidence, they have to summarize the results, it has to be a significant body of work, an element of quantity or magnitude
E13	Yes	Original question that hasn't been answered before, new search strategy, a new methodology, a reinterpretation of the results
E1	Only with meta-analysis	Original thought
E7	Only with meta-analysis	Some kind of analysis, it does not have to be meta-analysis; it can be another type of analysis
E15	Only with meta-analysis	I would consider a systematic review without meta-analysis a semi-quantitative review and therefore not original study
E6	No	Original research starts with a data source that is in most of nursing a human, and systematic reviews have data source that is secondary
E9	No	If you define original research as focused on discovery, then systematic reviews are not original in that sense. It does not

		have to do anything with methodology, but type of research. Primary studies that offer integration of existing research and synthesis are original research.
E10	No	Scientific method is different than in what I consider to be original
E14	No	In my opinion, if it does not touch the original data, it is not original

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653 **Table 2. Definitions of original research provided by editors**

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Editor	Is systematic review an original study?	Quote about definition of original research
E6	No	I define original research as that which involved individuals and their data and secondary research as that which doesn't.
E7	Only with meta-analysis	Original is what has not been published before.
E8	Yes	To me, to be a study it has to be done in accordance with criteria for the study in terms of scholarly inquiry, so that it can be replicated, people can use the same search terms, etc.
E9	No	...if we look at it as a scholarship of discovery, and Boyer's model, I would not consider any type of systematic review to be original research.
E10	No	A study that is hypothesis driven, that generates a new knowledge and applies appropriate methods to get there.
E11	Yes	A study where authors generate hypothesis, proceed in formal manner, choose methodology, share results, discuss limitations, and provide conclusions. Also, where people deserve authorship for what they have done.
E12	Yes	...original study is the study that will generate new conclusion, new data, new information, and that requires significant intellectual effort on the part of investigators.
E13	Yes	I guess original research would be analyzing results and generating outcomes, or conclusions which haven't necessarily been done by other people before.
E14	No	As an editor, an original study is a study in which someone produces data.
E15	Only with meta-analysis	A study that has new knowledge generated. New knowledge can also be generated through synthetic process of meta-analysis, but not qualitative data synthesis of systematic review without meta-analysis.

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657 **Table 3: Additional comments of editors regarding systematic reviews**

Editor	Is systematic review an original study?	Additional comment
E1	Only with meta-analysis	I feel like we are in an evolution, you know. Even though it has been ten years since your first study, I do not think that people necessarily understand what a systematic review is. ... We do require systematic review authors to do a research checklist, we do require protocol registration, but we are not rigid about it, we don't actually check if they did. We do not actually check if they followed it, which would be ideal to do, but that would just take a lot of people to do that, and we do not have resources for that.
E2	yes	Editor who looks seriously at their impact factor will love to publish meta-analysis and systematic reviews that are good.
E3	yes	...there are too many systematic reviews being submitted, and that is because it's easy, you don't have to leave the comfort of your home or office, you can collect data and write your manuscript. So the quality is not very good because the motivation is wrong. The motivation is to become published, the motivation is not to influence care.
E4	yes	Well, as an editor, I find it difficult to find a balance between quality and useful message from a submitted systematic review.
E6	no	... I publish systematic reviews, I am a fan of systematic reviews. And I think they do more to move knowledge than a lot of original research does, because it takes the whole body of original research in that area and it elevates it.
E10	no	I think systematic reviews are scholarship. Boyer in 1990 or 1999 defined four different types of scholarship; original research is one, and synthesis is another. And I think it is incredibly important in terms of scholarship and academic advancement. Systematic reviews are maybe routinized in the way they are done, or the way data is collected, but they are hard to do a good one.
E14	no	People do systematic reviews because they have to build the CV and they don't have access to their own data, or they are not able to generate their own data. And we see this coming from various parts of the world, where we know that investigative resources are thin. And there is considerable confusion in the scientific and clinical communities about what a systematic review is and how much significance should be attached to it.

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Supplementary file 1. List of journals that were considered Core Clinical Journals in 2009 and in 2018 (X stands for those that were included in a given year, and 0 for those that were not included)

#	Journal Title (NLM-Abbreviation)	Core Clinical Journal in 2009	Core Clinical Journal in 2018
1	Acad Med	x	x
2	Am Fam Physician	x	x
3	Am Heart J	x	x
4	Am J Cardiol	x	x
5	Am J Clin Nutr	x	x
6	Am J Clin Pathol	x	x
7	Am J Med	x	x
8	Am J Med Sci	x	x
9	Am J Nurs	x	x
10	Am J Obstet Gynecol	x	x
11	Am J Ophthalmol	x	x
12	Am J Pathol	x	x
13	Am J Phys Med Rehabil	x	x
14	Am J Psychiatry	x	x
15	Am J Public Health	x	x
16	Am J Respir Crit Care Med	x	x
17	Am J Roentgenol	x	x
18	Am J Surg	x	x
19	Am J Trop Med Hyg	x	x
20	Anaesthesia	x	x
21	Anesth Analg	x	x
22	Anesthesiology	x	x
23	Ann Emerg Med	x	x
24	Ann Intern Med	x	x
25	Ann Oto Rhinol Laryn	x	x
26	Ann Surg	x	x

27	Ann Thorac Surg	x	x
28	Arch Dermatol	x	o
29	Arch Dis Child	x	x
30	Arch Dis Child-Fetal	x	x
31	Arch Environ Occup H	x	x
32	Arch Gen Psychiatry	x	o
33	Arch Intern Med	x	o
34	Arch Neurol-Chicago	x	o
35	Arch Ophthalmol	x	o
36	Arch Otolaryngol Head Neck Surg	x	o
37	Arch Pathol Lab Med	x	x
38	Arch Pediatr Adolesc Med	x	o
39	Arch Phys Med Rehabil	x	x
40	Arch Surg	x	o
41	Arthritis Rheum	x	x
42	BJOG	x	x
43	Blood	x	x
44	BMJ	x	x
45	Bone Joint J	o	x
46	Br J Radiol	o	x
47	Br J Surg	x	x
48	Brain	x	x
49	CA Cancer J Clin	x	x
50	Cancer	x	x
51	Chest	x	x
52	Circulation	x	x
53	Clin Orthop Relat Res	x	x
54	Clin Pediatr (Phila)	x	x
55	Clin Pharmacol Ther	x	x
56	Clin Toxicol (Phila)	x	x

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87	J Neurosurg	x	x
88	J Nurs Adm	x	x
89	J Oral Maxillofac Surg	x	x
90	J Pediatr	x	x
91	J Acad Nutr Diet	o	x
92	J Thorac Cardiovasc Surg	x	x
93	J Trauma	x	o
94	J Trauma Acute Care Surg	o	x
95	J Urol	x	x
96	JAMA	x	x
97	JAMA Dermatol	o	x
98	JAMA Intern Med	o	x
99	JAMA Neurol	o	x
100	JAMA Ophthalmol	o	x
101	JAMA Otolaryngol Head Neck Surg	o	x
102	JAMA Pediatr	o	x
103	JAMA psychiatry	o	x
104	JAMA Surg	o	x
105	Lancet	x	x
106	Mayo Clin Proc	x	x
107	Med Clin North Am	x	x
108	Med Lett Drugs Ther	x	x
109	Medicine (Baltimore)	x	x
110	N Engl J Med	x	x
111	Neurology	x	x
112	Nurs Clin North Am	x	x
113	Nurs Outlook	x	x
114	Nurs Res	x	x
115	Obstet Gynecol	x	x
116	Orthop Clin North Am	x	x

117	Pediatr Clin North Am	x	x
118	Pediatrics	x	x
119	Phys Ther	x	x
120	Plast Reconstr Surg	x	x
121	Postgrad Med	x	x
122	Prog Cardiovasc Dis	x	x
123	Public Health Rep	x	x
124	Radiol Clin North Am	x	x
125	Radiology	x	x
126	Rheumatology (Oxford)	x	x
127	South Med J	x	x
128	Surg Clin North Am	x	x
129	Surgery	x	x
130	Transl Res	x	x
131	Urol Clin North Am	x	x

Supplementary file 2. Open-ended questions for facilitating semi-structured questionnaire

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7 1. Do you think that systematic reviews are original studies?

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9 If the answer to #1 is no:

10 2. Do you feel the same about any type of systematic review, or there are certain types of
11 systematic reviews that you could consider “more original” compared to others, for example if a
12 systematic review has a meta-analysis?
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14 3. In your opinion, what elements of originality are missing in systematic reviews, to be
15 considered original studies?
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17 4. Can any secondary study be considered as an original research study, or only primary studies
18 should be considered original research studies?
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20 5. In your opinion, what is the value of systematic reviews?
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22 6. Should clinical decisions be made based on systematic reviews or primary studies?
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25 If the answer to #1 is yes:

26 7. Do you feel any different regarding the type of evidence synthesis, for example systematic
27 review with or without meta-analysis, scoping systematic review, overviews of systematic reviews...
28 or you think any type of systematic review should be considered an original study?
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30 8. What do you think that makes a systematic review original study?
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32 9. Are there any elements of methodology that definitely make systematic reviews original?
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34 10. In your opinion, what is the value of systematic reviews?
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36 11. Should clinical decisions be made based on systematic reviews or primary studies?
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Standards for Reporting Qualitative Research (SRQR)*

<http://www.equator-network.org/reporting-guidelines/srqr/>

Page/line no(s).

Title and abstract

<p>Title - Concise description of the nature and topic of the study Identifying the study as qualitative or indicating the approach (e.g., ethnography, grounded theory) or data collection methods (e.g., interview, focus group) is recommended</p>	1/1-2
<p>Abstract - Summary of key elements of the study using the abstract format of the intended publication; typically includes background, purpose, methods, results, and conclusions</p>	2/32-54

Introduction

<p>Problem formulation - Description and significance of the problem/phenomenon studied; review of relevant theory and empirical work; problem statement</p>	4/74-94
<p>Purpose or research question - Purpose of the study and specific objectives or questions</p>	4/94-101

Methods

<p>Qualitative approach and research paradigm - Qualitative approach (e.g., ethnography, grounded theory, case study, phenomenology, narrative research) and guiding theory if appropriate; identifying the research paradigm (e.g., postpositivist, constructivist/ interpretivist) is also recommended; rationale**</p>	5/108-114 5/129-137 6/150-161
<p>Researcher characteristics and reflexivity - Researchers' characteristics that may influence the research, including personal attributes, qualifications/experience, relationship with participants, assumptions, and/or presuppositions; potential or actual interaction between researchers' characteristics and the research questions, approach, methods, results, and/or transferability</p>	6/164-165
<p>Context - Setting/site and salient contextual factors; rationale**</p>	5/108-114 5/129-137 6/150-161
<p>Sampling strategy - How and why research participants, documents, or events were selected; criteria for deciding when no further sampling was necessary (e.g., sampling saturation); rationale**</p>	5/108-114 5/129-137 6/150-161
<p>Ethical issues pertaining to human subjects - Documentation of approval by an appropriate ethics review board and participant consent, or explanation for lack thereof; other confidentiality and data security issues</p>	7/189-192
<p>Data collection methods - Types of data collected; details of data collection procedures including (as appropriate) start and stop dates of data collection and analysis, iterative process, triangulation of sources/methods, and modification of procedures in response to evolving study findings; rationale**</p>	5/117-126 5/129-137 6/168-173

Data collection instruments and technologies - Description of instruments (e.g., interview guides, questionnaires) and devices (e.g., audio recorders) used for data collection; if/how the instrument(s) changed over the course of the study	5/117-126 5/129-137 6/168-173
Units of study - Number and relevant characteristics of participants, documents, or events included in the study; level of participation (could be reported in results)	5/108-114 5/129-137 6/154-161
Data processing - Methods for processing data prior to and during analysis, including transcription, data entry, data management and security, verification of data integrity, data coding, and anonymization/de-identification of excerpts	5/117-126 6/140-144 6/175-186
Data analysis - Process by which inferences, themes, etc., were identified and developed, including the researchers involved in data analysis; usually references a specific paradigm or approach; rationale**	5/117-126 6/140-144 6/175-186
Techniques to enhance trustworthiness - Techniques to enhance trustworthiness and credibility of data analysis (e.g., member checking, audit trail, triangulation); rationale**	5/117-126 6/140-144 6/175-186

Results/findings

Synthesis and interpretation - Main findings (e.g., interpretations, inferences, and themes); might include development of a theory or model, or integration with prior research or theory	8-9/ 196-270
Links to empirical data - Evidence (e.g., quotes, field notes, text excerpts, photographs) to substantiate analytic findings	10-14/273-406

Discussion

Integration with prior work, implications, transferability, and contribution(s) to the field - Short summary of main findings; explanation of how findings and conclusions connect to, support, elaborate on, or challenge conclusions of earlier scholarship; discussion of scope of application/generalizability; identification of unique contribution(s) to scholarship in a discipline or field	15-16/410-490
Limitations - Trustworthiness and limitations of findings	17-18/493-533

Other

Conflicts of interest - Potential sources of influence or perceived influence on study conduct and conclusions; how these were managed	19/543-544
Funding - Sources of funding and other support; role of funders in data collection, interpretation, and reporting	19/539-540

*The authors created the SRQR by searching the literature to identify guidelines, reporting standards, and critical appraisal criteria for qualitative research; reviewing the reference lists of retrieved sources; and contacting experts to gain feedback. The SRQR aims to improve the transparency of all aspects of qualitative research by providing clear standards for reporting qualitative research.

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**The rationale should briefly discuss the justification for choosing that theory, approach, method, or technique rather than other options available, the assumptions and limitations implicit in those choices, and how those choices influence study conclusions and transferability. As appropriate, the rationale for several items might be discussed together.

Reference:

O'Brien BC, Harris IB, Beckman TJ, Reed DA, Cook DA. **Standards for reporting qualitative research: a synthesis of recommendations.** *Academic Medicine*, Vol. 89, No. 9 / Sept 2014
DOI: 10.1097/ACM.0000000000000388

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