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The development of ARCADIA: a tool for assessing the quality of peer review reports in biomedical research

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The development of ARCADIA: a tool for assessing the quality of peer review reports in biomedical research

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Objective: To develop a tool to assess the quality of peer review reports in biomedical research.

Methods: We conducted an online survey intended for biomedical editors and authors. The survey aimed to 1) determine if participants endorse the proposed definition of peer review report quality; 2) identify the most important items to include in the final version of the tool; and 3) identify any missing items. Participants rated on a 5-point scale whether an item should be included in the tool and they were also invited to comment on the importance and wording of each item. Principal component analysis (PCA) was performed to examine items redundancy and a general inductive approach was used for qualitative data analysis.

Results: A total of 446 biomedical editors and authors participated in the survey. Participants were mainly male (65.9%), middle-aged (mean=50.3, SD=13) and with PhD degrees (56.4%). The majority of participants (84%) agreed on the definition of peer review report quality we proposed. The 20 initial items included in the survey questionnaire were generally highly rated with a mean score ranging from 3.38 (SD=1.13) to 4.60 (SD=0.69) (scale 1 to 5). Participants suggested 13 items that were not included in the initial list of items. A steering committee composed of five members with different expertise discussed the selection of items to include in the final version of the tool. The final checklist includes 14 items encompassed in five domains (Importance of the study, Robustness of the study methods, Interpretation and discussion of the study results, Reporting and transparency of the manuscript, Characteristics of peer reviewer's comments).

Conclusion: ARCADIA tool could be used regularly by editors to evaluate the reviewers' work, and also as an outcome when evaluating interventions to improve the peer review process.

Words count: (abstract: 290, word limit: 300), (main text: 3999, word limit: 4000), 4 tables, 1 figure, 1 web application, 7 supplementary files

Keywords: Peer review, Report, Checklist, Quality control, Survey

Strengths and limitations of this study

- ARCADIA constitutes the first evidence-based tool that has been systematically developed to assess the quality of peer review reports.
- Its development is based on an exhaustive review of the literature and on empirical data from a large and heterogeneous sample of both biomedical editors and authors.
- ARCADIA has not yet been validated.

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Background

Editorial peer review stands as the gateway to scientific publication. The process was established to ensure that research papers are vetted by independent experts before they are published, although it is recently being increasingly questioned due to beliefs that it is flawed [1,2]. Despite efforts over the last 30 years to "make peer review scientific", its impact is still considered suboptimal [3].

Peer reviewers, who are the pivotal actors in this process, are requested to write a review report evaluating the submitted manuscript. A peer review report helps authors improve the quality of their manuscripts, and it also helps editors make an informed decision about the outcome of the manuscript. However, evidence shows that these peer review reports are often of poor quality [4,5].

Tools for assessing the quality of peer review reports have been proposed, of which we have conducted a systematic review and identified 24 tools: 23 scales and 1 checklist [6]. However, none reported any definition of peer review report quality, only one described the scale development, and 10 provided measures of reliability and validity. Further, the development and validation process resulted from a small consensus of people, and the concepts evaluated by these tools were quite heterogeneous.

In 2016, Bruce et al. published a review evaluating the impact of interventions to improve the quality of the peer review process [5]. The authors showed that it is essential to clarify the outcomes (such as, for example, the quality of peer review reports), which should be used in randomized controlled trials to evaluate these interventions.

A validated tool is direly needed to clearly define the quality of a peer review report in biomedical research. This tool could be used regularly by editors to evaluate the reviewers' work, and also as an outcome when evaluating interventions to improve the peer review process. In the present study, we report on the development of a new tool to assess peer review reports in biomedical research.

Methods

The study was approved by the Research Committee of the Governing Council of the Universitat Politècnica de Catalunya, Barcelona Tech, Spain (Reference: EC 02, Date: 02/05/2018).

Steering committee

We formed a steering committee of five members (CS, DH, AR, IB and JAG), whose expertise include clinical epidemiology, biostatistics, social science and editorial peer review. The steering committee agreed on how to define peer review report quality; they agreed on the survey questionnaire based on the results of a previous systematic review [6]; they interpreted the results of the survey; and they agreed on the final version of the tool.

Defining the tool's objective

The tool aims to assess the quality of peer review reports in biomedical research. We defined the quality of a peer review report as "the extent to which a peer review report helps editors make a fair decision and authors improve the quality of the submitted manuscript".

Generating the items

A systematic review allowed identifying 24 tools aimed at assessing the quality of peer review reports [6]. We extracted 132 items from these tools. All redundant items were merged and we included all items that met our definition of peer review report quality. Overall, 20 items were identified for assessing peer review report quality (Table 1).

Survey

We conducted an online survey of editors and authors in order to: 1) determine if they endorse the proposed definition of peer review report quality; 2) identify the most important items to include in the final tool; and 3) identify any new items that should be included.

Survey questionnaire

The questionnaire was constructed using the online survey software SurveyMonkey [7]. It was structured into four main parts and included both open and multiple-choice questions. First, the participants were asked to agree ("yes/no/partially") on the definition we provided for peer review report quality. They were also invited to add any comments or ideas on how to improve the definition. Second, they were asked to rate the importance of the 20 items for assessing the quality of peer review reports we identified. Their responses were based on a 1–5 Likert scale (1 being not important and 5

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very important). In particular, we asked the participants if the item should be included in a tool for assessing the quality of peer review reports. Moreover, they were invited to comment on the importance and wording of each item. In order to eliminate the question order effect, the items appeared in random order for each respondent. Third, the participants were invited to suggest any additional items missing that they considered important for assessing the quality of peer review reports. Finally, the questionnaire included nine demographic questions related to sex, age, education level, job title, referring institution and job experience as biomedical editor and/or author. We developed two versions of the questionnaire because biomedical editors and authors were recruited differently, despite the fact that some of them could play both roles (see Supplementary file 1). The two versions were structured in the same way; they only differed in some questions related to the demographic characteristics. The questionnaire was piloted among six experienced scientific editors and authors, followed by a subsequent revision based on their feedback.

Participants and recruitment strategy

We targeted biomedical editors and authors using a purposive sampling approach to recruit a heterogeneous sample of information-rich cases [8].

Biomedical editors

By means of standardized email, we invited two groups of editors to participate in the survey: 586 biomedical editors from 43 journals in the BMJ Publishing group; and 478 editors from 235 journals identified in a previous cross-sectional bibliometric study [9] (see Supplementary file 2). The survey was also distributed to 27 editors from 48 journals in BMC (part of Springer Nature), using internal email, and to members of the European Association of Science Editors (EASE) through their newsletter. In the invitation email and newsletter, the editors were encouraged to forward the survey to colleagues who might be interested in issues related to peer review. This recruitment strategy, known as snowballing, allowed us to identify "information-rich key informants" [8]. On the first page of the survey, participants were informed that the collected data would be anonymous, and they were further asked if they would agree to share their de-identified data in an open access repository. Two reminder emails were sent to non-respondents. Finally, the survey was promoted on Twitter and on the EASE blog [10] and Methods in Research on Research (MiRoR) [11] websites.

Authors

Searching the top 30-biomedical journals with the highest impact factors, we identified 4396 corresponding authors of articles that reported original research and which were published in Medline

between February 1 and October 31 2018 (see Supplementary file 3). We used the R package easyPubMed to extract the email contacts [12]. The corresponding authors received a standardized email that explained the purpose of the study and included a link to the survey (see Supplementary file 2). The first page of the survey informed participants that the data were collected anonymously and also asked if they would agree to share their de-identified data in an open access repository. Two reminder emails were sent to non-respondents.

Data analysis

We described the demographic data in terms of frequencies and percentages. The importance of the 20 items to assess peer review report quality is described in means and proportions of editors or authors who rated the importance of the items from 1 to 5. The items were also sorted according to the mean raking of all participants and either editors or authors. We also calculated Pearson correlations among items. The calculations and graphical representations were all obtained using the statistical software R 3.5.0 [13].

Principal component analysis of quantitative data

We conducted a principal component analysis (PCA) to examine item redundancy among the 20 items to assess peer review report included in the survey. PCA is a multivariate statistical technique used to reduce the number of variables in a dataset to a smaller number of dimensions [14]. The new dimensions (or *principal components*) are mutually independent and are determined by choosing the directions that explain the most variation in the data. The first principal component (PC1) accounts for the largest possible variance in the data, and each succeeding PC accounts for decreasing amounts of the remaining. This exploratory analysis helps reveal simple underlying structures in complex datasets. We performed PCA using the R package FactoMineR [15].

Inductive content analysis of qualitative data

We used a general inductive approach for qualitative data analysis. In particular, we followed the five steps of inductive analysis proposed by David R. Thomas: 1) Preparation of raw data files; 2) Close reading of text; 3) Creation of codes; 4) Overlapping coding and uncoded text; 5) Continuing revision and refinement of themes system [16]. In the third phase, two investigators (CS and DB) created independently the initial codes from the responses of the first 100 participants for each open-ended question. In order to ensure consistency and credibility, the initial codes were discussed with a third investigator (DH) and a codebook was developed and was used for analysing the remaining responses. In case new codes were successively created from the remaining responses, the emerging

 codes were added to the codebook and applied to entire dataset. Two investigators (CS and DH) reviewed and refined the codebook and further clustered the codes into major themes. We used the software NVivo V.12 for data management and analysis [17].

Selecting items

The steering committee reviewed all items and, ultimately, drafted and refined the final version of the tool. Based on the participants' qualitative and quantitative answers, redundant items were combined, existing items were modified and/or expanded on, and new items proposed by survey participants were added.

Patient or public involvement

Patients and members of the public were not involved in the study.

Results

Participants

Between November 7 2018 and February 4 2019, 198 biomedical editors and 248 authors completed the survey. Participants were mainly male (263/399, 65.9%) with a PhD degree (225/399, 56.4%), and their ages were equally distributed across ranges (mean=50.3, SD=13). They were mainly located in Europe (219/389, 56.3%) and North America (118/389, 30.3%). More than half of the editors had work experience of more than 5 years (91/165, 55.2%), while over one-third of the authors had work experience of more than 20 years (84/224, 37.5%) (see Table 2 and Supplementary file 4).

Definition of peer review report quality

Overall 84% (362/431) participants, precisely 85% (160/188) editors and 83% (202/243) authors, agreed on the definition of peer review report quality that we provided in the survey. The definition was slightly modified to take into account participants comments (Supplementary file 5). The quality of a peer review report is now defined as "the extent to which a peer review report helps, first, editors make an informed and unbiased decision about the manuscripts' outcome and, second, authors improve the quality of the submitted manuscript".

Quantitative results

We created a web application that is publicly available at <u>https://www-eio.upc.edu/redir/ReportQuality</u>. Through the application, the readers can easily access and explore the quantitative results of the survey.

Rating the importance of items

The items were generally highly rated, with a mean score ranging from 3.38 (SD=1.13) to 4.60 (SD=0.69). All the items were scored 4 or 5 by >50% of the participants (see web application). The three items rated as the most important were: 1) *Knowledgeability*; 2) *Methodological quality*; and 3) *Fairness*. The three least important items were: 1) *Originality*, 2) *Presentation and organization*; and 3) *Adherence to RG*.

A peer review report aims to help authors improve their submitted manuscripts and assist editors in taking editorial decisions. Due to this dual objective, we compared editors' and authors' mean scores in order to investigate whether any difference is found in their perceptions regarding the importance of the 20 items that assess peer review report quality. We found little discrepancy in the mean scores between biomedical editors and authors, with only two items indicating any difference: 1) *Timeliness* and 2) *Detail/Thoroughness*. The *Timeliness* of the peer review report was considered more important to authors than to editors (respectively, in the 12th and 16th rank positions). Meanwhile, editors rated the *Detail/Thoroughness* of the reviewer's comments higher than did authors (respectively, in the 11th and 16th rank positions).

Correlations among items

Overall, we found relatively weak positive correlations among items. The largest positive correlations were found between *Relevance* and *Originality*, and between *Fairness* and *Objectivity* (r = 0.55 and 0.43, respectively).

Principal Component Analysis

The first principal component (PC1) accounted for 22.1% of data variability. The next two dimensions (PC2 and PC3) accounted for 38.5% of the cumulative variability and contributed gradually, that is, they increased at only small increments. PC1 was positively correlated to all items (or variables), and it showed correlations higher than 0.4 —which is the figure commonly used as a threshold reference for factor loadings — for 16 out of 20 items (see web application). These results illustrate that the data variance was not concentrated in a few components but distributed across all of them; hence, reducing the number of items is not recommended, since this would imply an important loss of data information.

Qualitative results

Comments on importance and/or wording of items

Out of 446 survey participants, 267 (59.9 %) made at least one comment on the importance and/or wording of the items. Based on the initial coding of the comments, we were able to identify eight general themes that they addressed: Peer reviewer; Wording; Importance; Dependency; Responsibility; Item; Structure and content; and Improvement. Table 3 reports the eight themes together with their definition and the most frequent codes (n>5), with example quotes. The entire codebook is found in Supplementary file 5.

New items

Participants suggested 13 items that were not included in the initial list of items. These items are listed in Supplementary file 6. The entire codebook is found in Supplementary file 5.

Steering committee meeting

The steering committee met on the 19/07/2019 to discuss the selection of items to include in the final version of the tool. Their decisions were based on the participants' quantitative and qualitative answers. The flow of the items is summarized in Figure 1.

The items *Relevance* and *Originality* were merged into a new item named *Contribution* (of the study). This decision was based on the high positive correlation found between the two items (0.55) and on the participants' opinions. Furthermore, participants suggested in their comments that the item *Relevance* was "*highly subjective*", because "*each reviewer's decision on relevance reflects what is relevant to them, which may not reflect relevance to the journal*". They also believed that the *Originality* of a study is not always an important aspect for comments in a peer review report, because some manuscripts "*are trying to duplicate findings from previous studies*". They therefore suggested reformulating the two items by asking the reviewer what the study "*adds to our knowledge*".

The steering committee decided to include the item *Interpretation of results* as a domain of the tool instead of a single item, changing the name into *Interpretation and discussion of the study results*. This decision resulted from the addition of two new items (*Conclusions* and *Limitations*), based on the suggestions of survey participants. The domain *Interpretation and discussion of the study results* now encompasses three items: 1) *Study conclusions*; 2) *Study limitations and* 3) *Applicability and generalizability*.

Overall, survey participants believed that the items *Strengths and weaknesses (general)* and *Strengths and weaknesses (methods)* were "confusing to separate". Additionally, the steering committee agreed that *Strengths and weaknesses (methods) and Methodological quality* were also redundant; thus, it was ultimately decided to merge the three items into a new item named *Study methods*.

The items *Objectivity* and *Fairness* were merged because of both the moderate correlation between them (0.43) and the participants' opinions. Participants suggested that the total objectivity of the reviewer's comments is not possible because "*all decisions contain some personal biases and subjectivity*" and they also believed that the term fairness was "*very subjective*" and difficult to define. Additionally, the steering committee agreed to also combine these two items into *Supported by evidence*. The committee finally decided to merge all three items into *Objectivity*, and this was defined as "comments provided in a peer review report should be as objective as possible and, if considered appropriate, include references to support the reviewer's statements".

The steering committee agreed to merge *Structure of reviewer's comments* and *Clarity*, because participants considered both important for making the peer review report easy "to read for both editors and authors". Moreover, participants suggested that the *Detail/Thoroughness* of a peer review report was mostly associated with the quality of a manuscript, because in certain occasions a study can be so poorly conducted that "a reviewer can highlight one or two major methodological flaws" without conducting a detailed review. They therefore believed that a detailed report is not "always necessary" and instead preferred a succinct report that "cuts straight to the critical points". Taking into account the participants' opinions, the steering committee finally decided to include a single item named *Clarity*, which is defined as "a peer review report should be clear, succinct and well organized in order to be understood correctly by editors and authors".

The items *Tone* and *Constructiveness* were merged into *Constructiveness*, which is defined as "a peer review report should contain constructive and polite comments that allow the authors to improve the quality of their work". This decision was based on the participants' opinions that "*the comments should be polite and constructive*".

The item *Adherence to RG* and the new item *Reproducibility* suggested by survey participants were merged into *Reporting* based on the steering committee decision. The item *Reporting* was defined as "the reviewer should comment if the reporting of the study is clear, complete and transparent enough

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The items *Timeliness* and *Knowledgeability* were not included in the final version of the tool. Survey participants suggested that *Timeliness* was not "*directly tied to review quality*" because "*some of the best reviews come in past the deadline*". Furthermore, the steering committee agreed that the item *Knowledgeability* was generally difficult to assess, because it implied that anyone using the tool would have enough competence to evaluate the reviewer's knowledge and expertise. Five new items suggested by survey participants (*Data availability and software, Study protocol, Study conclusions, Study limitations* and *Relevant literature*) were finally included in the tool.

The ARCADIA tool

The ARCADIA (Assessment of **R**eview reports with a Checklist Available to e**DI**tors and Authors) tool was finally developed. The tool is a checklist that includes five domains and 14 items (Table 4). Brief explanations of the items included in the five domains are provided in Supplementary file 7.

Discussion

This study resulted in a checklist of items to assess the quality of peer review reports in biomedical research. The checklist constitutes the first evidence-based tool that has been systematically developed to assess the quality of peer review reports.

The checklist is simple, applicable to any biomedical field, and consists of five domains covering 14 items, each of which is phrased as a question. Each item should be ticked as yes, no or not applicable (NA). An item could be checked NA if it is not covered in the study (e.g., there are no data, software or other materials attached to the manuscript) and/or the peer reviewer is not qualified to comment on that specific aspect (e.g., statistical methods). The ARCADIA tool has several strengths. It is the first tool ever developed based on an exhaustive review of the literature [6] and on empirical data from a large sample of both biomedical editors and authors. Further, it is the only tool that clearly defines the quality of peer review reports, as its definition was based on the perspectives of 446 authors and editors.

To develop the tool, we recruited a large sample of biomedical editors and authors with varying experience and backgrounds. We found the percentage of female participants who took part in the survey to be quite low (129/399, 32.3%). This is in line with evidence showing that gender equity in

academic medicine careers remains far behind [18]. Moreover, we recruited corresponding authors (who are usually first authors) from the top 30 biomedical journals. Evidence also shows that women are underrepresented as first authors among biomedical journals with high impact factors [19].

The present study also has some limitations. The survey questionnaire included some open-ended questions, which allowed participants to voluntarily express their opinions. However, we were not able to inquire further to clarify and verify some information provided by the study's participants. Therefore, the interpretation of some information could be affected by the perception of the three investigators who conducted the qualitative analysis. Additionally, since participants could comment voluntarily on the importance and wording of each item, the number of comments among items differed greatly. Furthermore, the majority of editors (132/165, 80%) who took part in the survey were from Europe. This result may be due to the recruitment strategy we used to identify biomedical editors. Although we also utilized a snowballing strategy, we mainly contacted editors through European biomedical journals. Finally, the present study reports on the first version of the ARCADIA tool, which has not yet been validated.

Implications

The tool is a general checklist available to all biomedical editors and authors. It could be regularly used by editors to evaluate the reviewers' work, and it can also be used as an outcome when evaluating interventions in order to improve the peer review process.

Conclusions

ARCADIA is the first checklist that has been systematically developed to assess the quality of peer review reports. It is based on the perspectives of a large and heterogeneous sample of biomedical editors and authors. Our plans for future work are to validate the ARCADIA tool.

Abbreviations: ARCADIA: Assessment of Review reports with a Checklist Available to eDItors and Authors; EASE: European Association of Science Editors; EQUATOR: Enhancing the Quality and Transparency of Health Research; MiRoR: Methods in Research on Research; NA: Not Applicable; PC1: First principal component; PCA: Principal component analysis; RG: Reporting guidelines

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Tables

Table 1. The 20 items to assess peer review report quality included in the survey

Labels	Items to assess PR report quality
Relevance	The reviewer comments on the relevance of the study
Originality	The reviewer comments on the originality of the study
Interpretation results	The reviewer comments on the interpretation of study results
Strengths and weaknesses	The reviewer comments on the general strengths and weaknesses of the study
(general) Strengths and weaknesses	The reviewer comments on the strengths and weaknesses of the study methods
(methods) Statistical methods	The reviewer comments on the appropriateness of the statistical methods
Methodological quality	The reviewer comments on the methodological quality (internal validity) of study
Applicability and external validity	The reviewer comments on the applicability and external validity of the sturesults
Presentation and organization	The reviewer comments on the presentation and organization of the manuscript
Adherence to RG	The reviewer comments on the adherence of the manuscript to the report guidelines
Structure of reviewer's comms.	The reviewer's comments are structured and organized
Clarity	The reviewer's comments are clear and easy to read
Constructiveness	The reviewer's comments are constructive
Detail/Thoroughness	The reviewer's comments are detailed and thorough
Objectivity	The reviewer's comments are objective
Fairness	The reviewer's comments are fair
Support by evidence	The reviewer's comments are evidence based
Knowledgeability	The reviewer knows and understands correctly the content of the manuscript
Tone	The reviewer uses a courteous tone
Timeliness	The reviewer completes the peer review report on time

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Table 2. Survey participants' characteristics

Characteristics	Editors N=198	Authors N=248	Total N=446
Gender	N=169	N=230	N=399
Woman	46 (27.2%)	83 (36.1%)	129 (32.3%)
Man	121 (71.6%)	142 (61.7%)	263 (65.9%)
Other	2 (1.2%)	5 (2.2%)	7 (1.8%)
Age	N=156	N=220	N=376
<40	32 (20.5%)	71 (32.3%)	103 (27.4%)
41-50	29 (18.6%)	59 (26.8%)	88 (23.4%)
51-60	52 (33.3%)	37 (16.8%)	89 (23.7%)
>60	43 (27.6%)	53 (24.1%)	96 (25.5%)
Education	N=169	N=230	N=399
Bachelor Degree	4 (2.4%)	3 (1.3%)	7 (1.8%)
Master Degree	11 (6.5%)	20 (8.7%)	31 (7.8%)
PhD	107 (63.3%)	118 (51.3%)	225 (56.4%)
M.D. or equivalent	34 (20.1%)	76 (33.0%)	110 (27.6%)
Prefer not to answer	2 (1.2%)	1 (0.4%)	3 (0.8%)
Other	11 (6.5%)	12 (5.2%)	23 (5.8%)
Location journal/institution	N=165	N=224	N=389
Europe	132 (80.0%)	87 (38.8%)	219 (56.3%)
North America	23 (13.9%)	95 (42.4%)	118 (30.3%)
South America	2 (1.2%)	5 (2.2%)	7 (1.8%)
Africa	1 (0.6%)	1 (0.4%)	2 (0.5%)
Asia	3 (1.8%)	11 (4.9%)	14 (3.6%)
Australia	4 (2.4%)	25 (11.2%)	29 (7.5%)
Number of years of experience	N=165	N=224	N=389
<5 years	74 (44.8%)	36 (16.1%)	110 (28.3%)
6-10 years	46 (27.9%)	51 (22.8%)	97 (24.9%)
11-15 years	27 (16.4%)	34 (15.2%)	61 (15.7%)
16-20 years	7 (4.2%)	19 (8.5%)	26 (6.7%)
>20 years	11 (6.7%)	84 (37.5%)	95 (24.4%)

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Table 3. Survey participants' comments on the importance and/or wording of the 20 items to assess peer review report quality

Themes	Definition	Codes	Examples
Dependencies	Theme including codes on how the importance of an item depends on different factors (e.g., type of study, paper quality, type of journal, etc.)	Dependency on the type of study (n=34)	Depends on type of study. For systematic reviews of course fundamental. For other studies this will be more and more important for easier comparisons between studies and for quality improvement. It makes our work easier if the authors also compliant also improve
	0,000	Dependency on the paper quality (n=20)	This depends on the quality of the manuscript. Sometimes the quality is so low that a reviewer can highlight one or two major methodological flaws which are sufficient to reject.
		Dependency on the type of journal (n=19)	This depends on the journal's criteria
		Dependency on the author's claim and impact of the study (n=7)	this depends on the claims made
Importance	Theme including codes on the importance (or not) of an item.	Importance of the item (n=43)	This is absolutely key to the interpretation of the study Unfortunately most reviewers, in my field, do not fully understand curree (and correct) methods.
		Importance of replication and conformation study (n=18)	Not always important to b original study as some are trying to duplicate finding from previous studies.
		Importance of perceptions, opinions and experience (n=14)	But some comments will inevitably be opinion, regarding emphasis, value writing style
		Importance of a high quality review rather than on time review (n=13)	Better to have a late high quality report than a moderate quality report o time.
Improvements	Theme including codes on how an item is useful for both authors and editors in the peer review process.	Useful for authors and editors (n=21)	It's important to make it easy for the editor and authors to understand the review, and for authors to respond.
		Improving the manuscript (n=9)	Important when it will her improve the quality of the

			communication. Not necessary when it flows well.
		Avoiding exaggeration and misinterpretation (n=8)	This is an area where the reviewer may have a valuable role in tempering an author's enthusiasm, hubris or bias.
Item	Theme including codes on the characteristics of an item.	Related to other item (n=43)	Yes, but it is confusing to separate this from the general strength and weaknesses. The question should be if the reviewer thinks that the message co (potentially) answer the research question.
	0	Subjective item (n=22)	Too subjective! What is relevant to one person of field could be totally not- relevant to another
		Requirement (n=9)	But it's an ethical requirement, and helps improve everyone's experience.
Reviewer	Theme including codes on the expertise and characteristics of a peer reviewer.	Reviewer's expertise (n=148)	Some reviewers know abo methods and some about content. It would be idea to always have both, but that is often not the case.
		Impossibility to be totally objective (n=35)	100% objectivity doesn't exist
		Reviewer as an extra unpaid job (n=10)	for the most part, reviews are done on a voluntary basis
Responsibility	Theme including codes on the editor and/or author's responsibility to assess an item.	Editor's responsibility (n=48)	In my experience this is usually picked up by the Editors and Associate Editors rather than the reviewers.
		Joint responsibility (n=24)	I think this is the role of the editors as well as the reviewers.
		Author's responsibility (n=6)	Authors should already be doing this
Structure and content	Theme including codes on the structure and content of a peer review report.	Straight to the critical points (n=14)	Sometimes a succinct review is still helpful, if it cuts straight to the critica points. For example, if it clear that a manuscript he major flaws, then a review

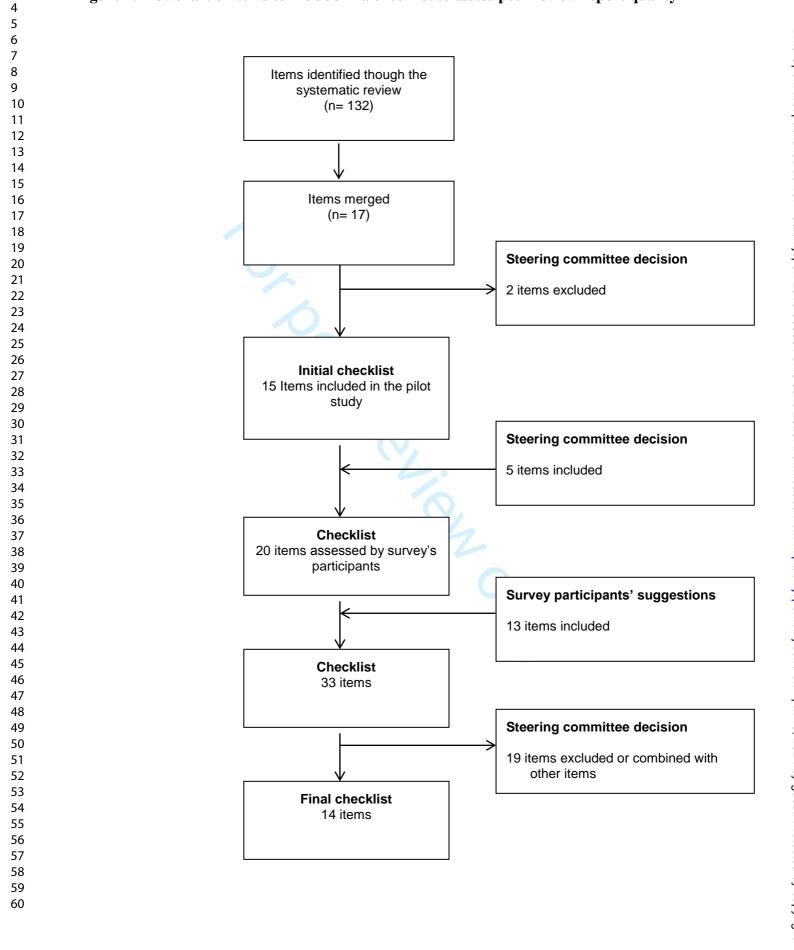
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1 2				
3 4 5 6 7 8				that points out those flaws clearly and dispassionately would be very helpful. It would not necessarily need to delve into the finer details.
9 10 11 12			Unnecessary to provide evidence to each comment (n=10)	I don't think reviewers need to cite something for every point that they make.
13 14			Declaration of COI (n=8)	Peer reviewers should disclose COI.
15 16 17			Standard structure of a review (n=7)	I would suggest providing a template to reviewers.
18 19 20 21 22 23 24		0	Not necessary for all reviews (n=6)	Reviews come in all lengths and vary in detail. It is helpful to have some reviewers provide detailed information but not necessary that all do so.
25 26 27 28 29 30 31 32 33 34 35	Wording	Theme including codes on how to improve the wording of an item.	Wording of the item (n=110)	Rather than "The reviewer's comments are evidence- based" I would suggest that the category should be: "The reviewer distinguishes between comments that are supported by evidence (and provides suitable citations) and those based on opinion or experience"
36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60				
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Table 4. The ARCADIA tool

Importance	the contribution of the study to scientific knowledge?	□ YES
of the study	the contribution of the study to scientific knowledge.	\square NO
·		
-	whether the relevant literature was accurately reviewed?	
		🗆 NA
Robustness	the soundness of the study methods (e.g., study design, outcomes, risk of bias)?	□ YES
of the study		\Box NO
methods		\Box NA
	the suitability of the statistical methods?	\Box YES
		\Box NO
		\Box NA
Interpretation	whether the study conclusions answer the research question(s) and correctly summarize	□ YES
and discussion	the study results?	□ NO
of the study results		\Box NA
	whether the study limitations are acknowledged?	□ YES
		□ NO
		□ NA
-	the applicability and generalizability (external validity) of the study results?	□ YES
		□ NO
		□ NA
Reporting and	whether any major deviations from the study protocol are reported?	□ YES
transparency of the manuscript		\Box NO
ine manuscript		□ NA
	whether the completeness of the reporting allows study reproducibility, by verifying the	\Box YES
	adherence of the manuscript to the corresponding RG?	
		□ NA
-	the presentation (e.g., quality of the written language, tables, figures, etc.) and	□ YES
	organization of the manuscript?	\Box NO
		□ NA
	the availability of study data and material and whether the software works as indicated?	□ YES
		□ NO
		□ NA
Were the peer re	eviewer's comments	
Characteristics	clear?	□ YES
of peer		□ NO
reviewer's	constructive?	□ YES
comments		□ NO
	objective and, if opportune, supported by evidence?	□ YES
		□ NO

NA=Not applicable

Figure 1. Flowchart of items to include in a checklist to assess peer review report quality





Welcome to the survey!

 Although the peer-review process plays a key role in research dissemination, only limited research has been conducted so far in this field.

The objective of this survey is to investigate the perspectives of biomedical editors and authors towards the **quality of peer-review reports**. We hope this work will help us to develop a new tool to assess the quality of a peer review report in biomedical research.

Knowing your expertise, we would be very grateful if you could answer a few questions and share your opinion. The survey will take approximately **10 minutes** to complete. Your participation in this study is completely voluntary. If you decide to participate, all your answers will be de-identified and stored in a secured repository at Universitat Politècnica de Catalunya, Barcelona-Tech (Spain). The de-identified data from this study will be shared on Zenodo repository. In case you opt out of sharing your data, you will still be able to participate in the study.

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If you have any questions about this study or your rights as a participant, you may contact by email Cecilia Superchi, <u>cecilia.superchi@upc.edu</u> or Darko Hren, <u>dhren@ffst.hr</u>

Do you agree to take part in the study?

Yes, I agree

No, I do not agree

Do you agree to share your de-identified data?
Yes, I agree
No, I do not agree
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Importance of the items to assess peer-review report quality

The following items have been identified in a systematic review as possible quality components of a peer-review report.

We are interested to know your opinion on the importance of these items, particularly whether the item should be included in a new tool assessing the quality of a peer-review report.

Please rate the IMPORTANCE of each item in assessing the quality of a peer-review report from 1 (not important) to 5 (very important).

We expect that for some items it will not be easy for you to make a clear decision about the importance of the item. In those cases we still invite you to offer your rating but you can elaborate on your decision. Furthermore we invite you to suggest potential improvements in wording of the items.

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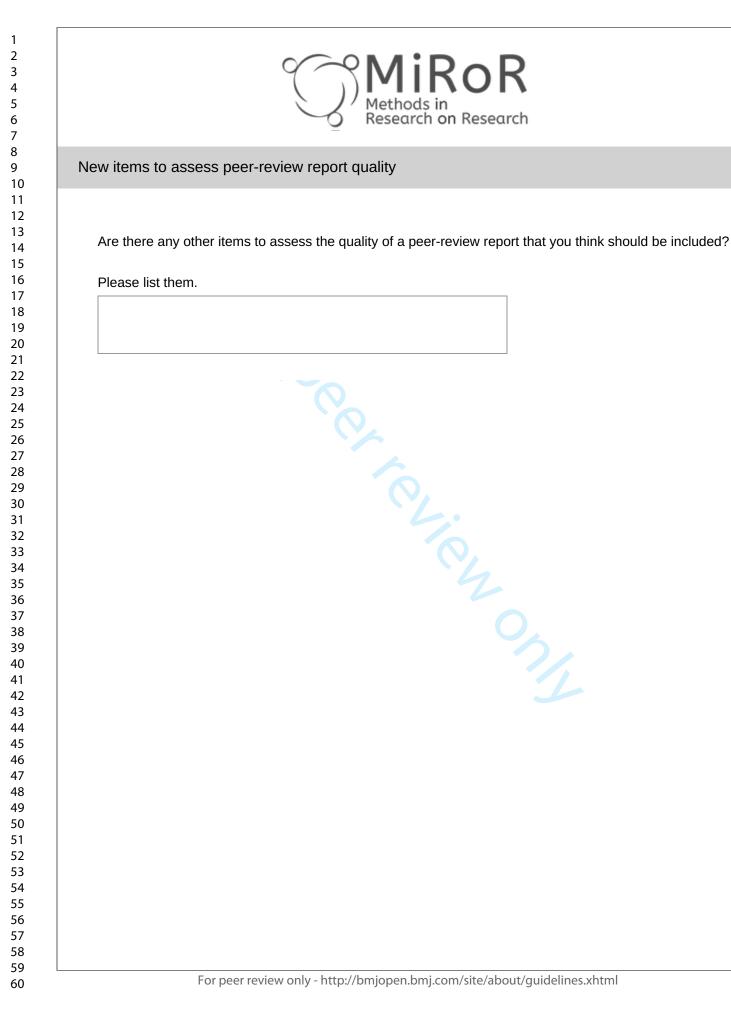
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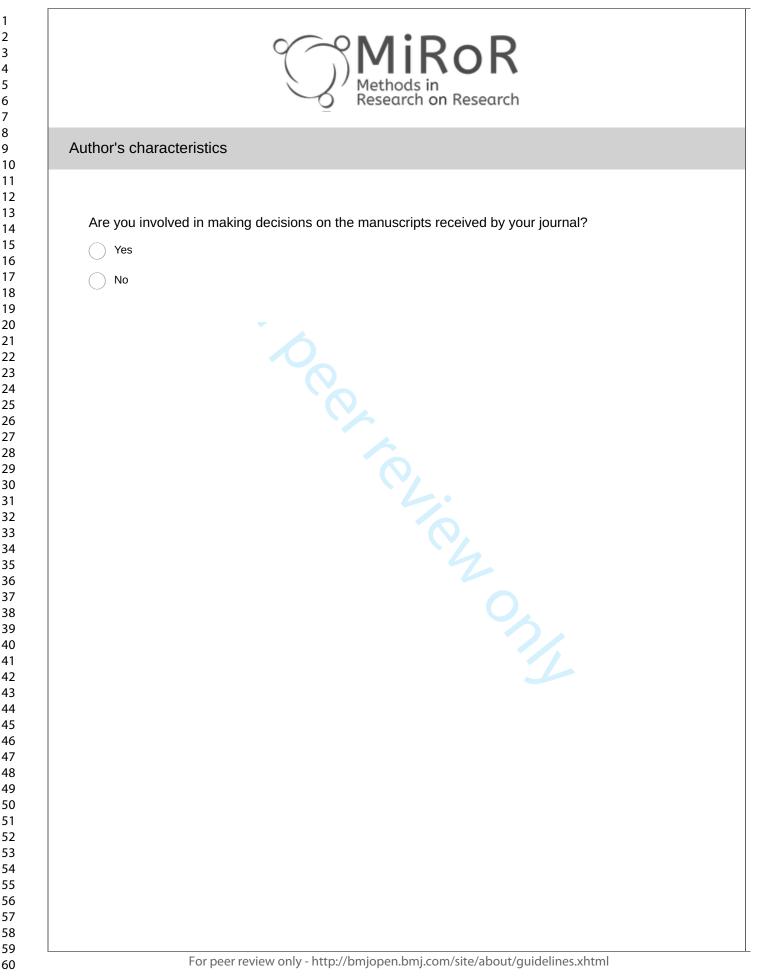
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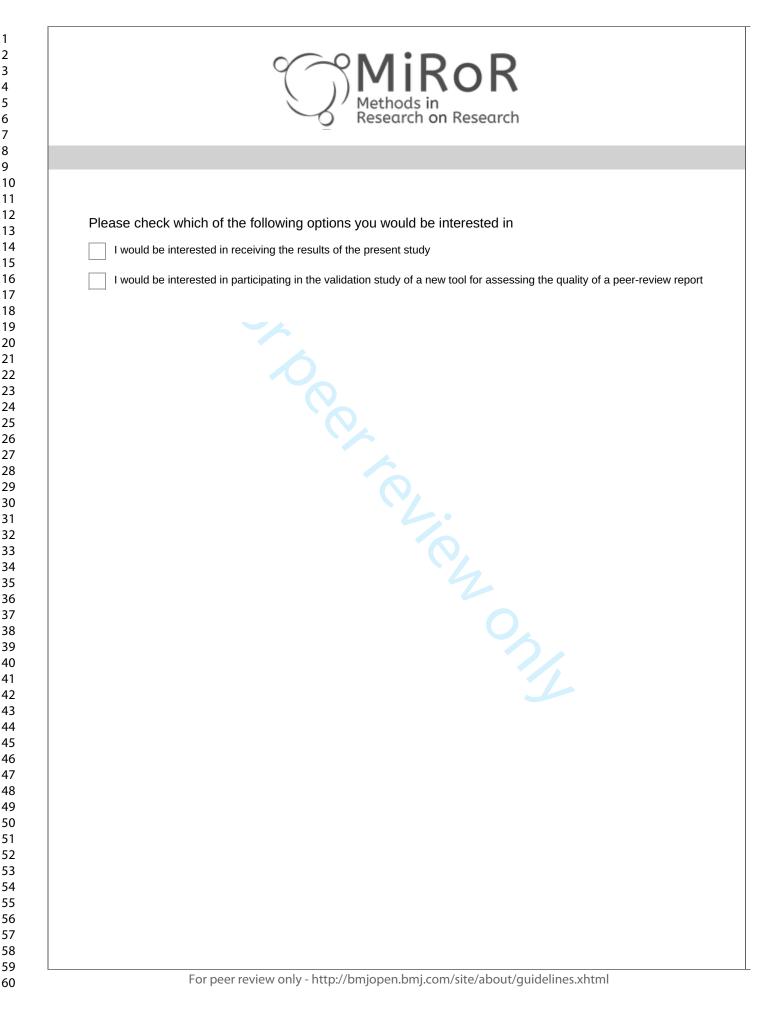
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What is your gender?	
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Male	
Prefer not to answer	
Other (please specify)	
What is your age?	
What is the highest level of education obtained?	
Bachelor Degree MD or equivalent	ıt
Master Degree Prefer not to ans	swer
PhD PhD	
Other (please specify)	_

thor's characteristics	
What is your job title at your institution	on?
Researcher	Associate Professor
Assistant Professor	Professor
Other (please specify)	
What type of institution are you affilia	ated at?
Private University	
Public University	
Research Centre	
Other (please specify)	
Where is the institution located?	
Europe	Africa
North America	Asia
South America	Australia
How long have you been publishing	scientific papers?
<5 years	16-20 years
6-10 years	>20 years
11-15 years	





Please write dow	n your name and email address. Your data will be EXCLUSIVELY used for the
which you have p	reviously chosen.
Name	
Email Address	



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Aren't you a biomedical editor? Please take part in the survey for**biomedical authors** following this link: <u>https://www.surveymonkey.com/r/REPORT_QUALITY_AUTHORS</u>

Do you agree to take part in the study?

Yes, I agree

No, I do not agree

Do you agree to share your de-identified data?

Yes, I agree

No, I do not agree

efinition of peer-	review report quality	
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O No		
Partially		
Please add your cor	ments and ideas on how to improve the definition	



Importance of the items to assess peer-review report quality

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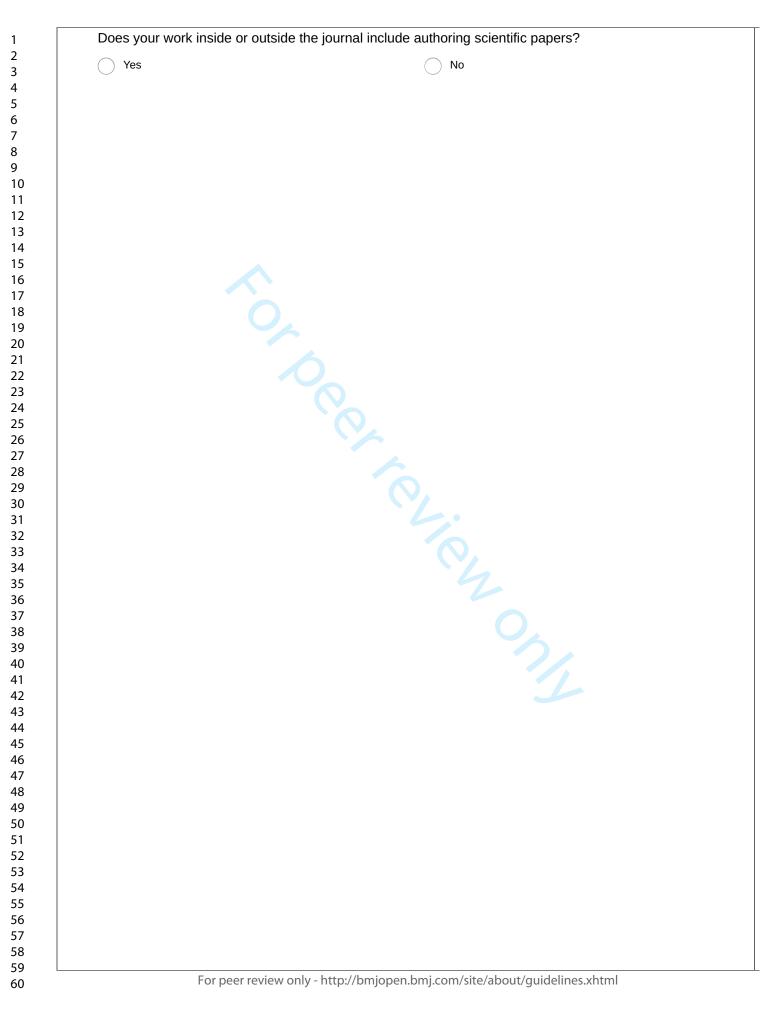
For peer review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml

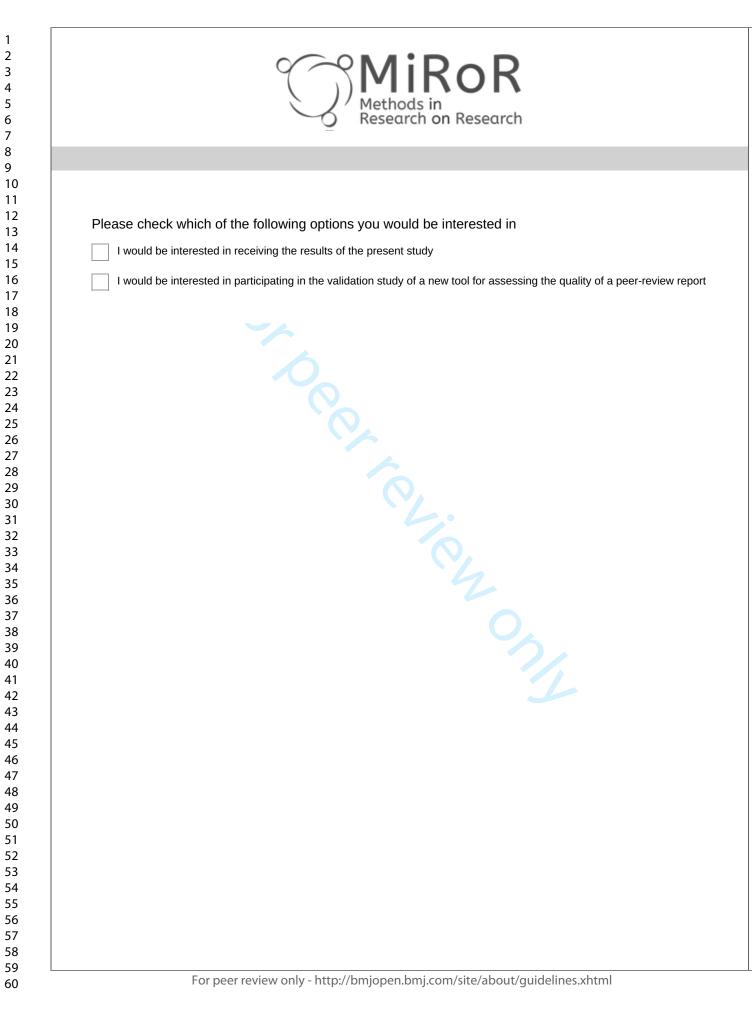
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PhD		
Other ((please specify)	

Page 48	of	1	27
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itor's characteristics	
What is your job title at your journal?	
Editor in chief	Section editor
Associate editor	Deputy editor
Academic editor	
Other (please specify)	
Yes	on the manuscripts received by your journal?
 Yes No At what type of journal do you current General Journal 	
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Please write dow	n your name and email address. Your data will be EXCLUSIVELY used for the
which you have p Name	previously chosen.
Email Address	

Supplementary file 2. Invitation email for corresponding authors and biomedical editors From: Cc: To: Subject: Academic Survey on Peer Review Dear researcher, As corresponding author of the article recently published in [CUSTOM 1], we would like to invite you to participate in an academic survey. The objective of this survey is to investigate the perspectives of biomedical editors and authors on the quality of peer-review reports. We hope this work will help us to develop a new tool to assess the quality of a peer-review report in biomedical research. The survey will take approximately 10 minutes to complete. Participation in this study is completely voluntary and you may withdraw at any time.

This study is part of the **Methods in Research on Research** (MiRoR) project, a joint doctoral training programme in the field of clinical research funded by the European Union's Horizon 2020 Research and Innovation Programme under the Marie Sklodowska-Curie grant agreement No 676207 <u>http://miror-ejd.eu/</u>

We would be very grateful if you would take the time to complete our survey. Your insights as an author are essential to us.

If you have any questions, comments or queries please do not hesitate to contact us at <u>cecilia.superchi@upc.edu</u> or <u>dhren@ffst.hr</u>

We kindly thank you for your time, attention, and cooperation.

Sincerely,

Cecilia Superchi, PhD Student at Universitat Politècnica de Catalunya & Université Paris Descartes Darko Hren, PhD, Prof. at University of Split José Antonio Gonzalez, PhD, Prof. at Universitat Politècnica de Catalunya Isabelle Boutron, MD, PhD, Prof. at Université Paris Descartes

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From: Cc:	
To:	
Subjec	t: Academic Survey on Peer Review
Dear []	Name] [Surname],
As [CU	JSTOM 1] at [CUSTOM 2], we would like to invite you to participate in an academic survey on peer review
review	jective of this survey is to investigate the perspectives of biomedical editors and authors on the quality of reports . We hope this work will help us to develop a new tool to assess the quality of a peer-review replical research.
	rvey will take approximately 10 minutes to complete . Participation in this study is completely voluntar by withdraw at any time.
	e also encouraged to forward the link of the survey to your colleagues who may be interested in participat dy <u>https://www.surveymonkey.com/r/REPORT_QUALITY_EDITORS</u>
the fiel	udy is part of the Methods in Research on Research (MiRoR) project, a joint doctoral training program d of clinical research funded by the European Union's Horizon 2020 Research and Innovation Programme rie Sklodowska-Curie grant agreement No 676207 <u>http://miror-ejd.eu/</u>
	uld be very grateful if you would take the time to complete our survey. Your insights as a biomedical edito al to us.
	have any questions, comments or queries, please do not hesitate to contact us at <u>cecilia.superchi@upc.edu</u> o
We that	nk you kindly for your time, attention, and cooperation.
Sincere	sly,
Darko José A	a Superchi, PhD Student at Universitat Politècnica de Catalunya & Université Paris Descartes Hren, PhD, Prof. at University of Split ntonio Gonzalez, PhD, Prof. at Universitat Politècnica de Catalunya e Boutron, MD, PhD, Prof. at Université Paris Descartes

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Supplementary file 3. Top 30-biomedical journals with the highest impact factors

Full Journal Title**	IF
New England Journal Of Medicine*	79.3
Lancet*	53.3
JAMA-Journal Of The American Medical Association	47.7
BMJ-British Medical Journal*	23.3
JAMA Internal Medicine	20.0
Annals Of Internal Medicine	19.4
Nature Reviews Disease Primers	16.1
Journal Of Cachexia Sarcopenia And Muscle	12.5
Plos Medicine	11.7
Bmc Medicine*	9.1
Mayo Clinic Proceedings*	7.2
Cochrane Database Of Systematic Reviews	6.8
Journal Of Internal Medicine	6.8
Canadian Medical Association Journal*	6.2
Journal Of Clinical Medicine [*]	5.6
American Journal Of Medicine [*]	5.1
Translational Research [*]	4.9
Annals Of Family Medicine*	4.5
Medical Journal Of Australia [*]	4.2
American Journal Of Preventive Medicine*	4.1
Amyloid-Journal Of Protein Folding Disorders	4.0
Journal Of General Internal Medicine*	4.0
Deutsches Arzteblatt International	3.9
Palliative Medicine	3.8
Preventive Medicine*	3.5
British Medical Bulletin	3.4
European Journal Of Internal Medicine*	3.3
British Journal Of General Practice*	3.3
Journal Of Pain And Symptom Management*	3.2
Qjm-An International Journal Of Medicine	3.2

* Journal reporting the corresponding author in the PubMed abstract. **Source: InCites Journal Citation Reports 2017 under the category "Medicine, general and internal".

Characteristics	Editors N=165
Journal Role	
Editor-in-Chief	50 (30.3%)
Associate Editor	63 (38.2%)
Academic Editor	7 (4.2%)
Section Editor	6 (3.6%)
Deputy Editor	12 (7.3%)
Other	27 (16.4%)
(e.g. Statistical Editor, Patient Editor)	
Involvement in making decisions on the manuscr	pt
Yes	144 (87.3%)
No	21 (12.7%)
Type of Journal General Journal	
General Journal	39 (23.6%)
Specialty Journal	126 (76.4%)
Journal location	
Europe	132 (80.0%)
North America	23 (13.9%)
South America	2 (1.2%)
Africa	1 (0.6%)
Asia	3 (1.8%)
Australia	4 (2.4%)
Number of years of experience as editor	
<5 years	74 (44.8%)
6-10 years	46 (27.9%)
11-15 years	27 (16.4%)
16-20 years	7 (4.2%)
>20 years	11 (6.7%)
Authorship of scientific papers	
Yes	141 (85.5%)
No	24 (14.5%)

Characteristics	Authors
Occuration	N=224
Occupation	(2) (20, 10())
Professor	63 (28.1%)
Associate Professor	31 (13.8%)
Assistant Professor	34 (15.2%)
Researcher	47 (21.0%)
Other (e.g. Lecturer, Postdoc, PhD)	49 (21.9%)
Type of Institution	
Public University	134 (59.8%)
Private University	33 (14.7%)
Research Centre	17 (7.6%)
Other (e.g. Hospital)	40 (17.9%)
Institution location	
Europe	87 (38.8%)
North America	95 (42.4%)
South America	5 (2.2%)
Africa	1 (0.4%)
Asia	11 (4.9%)
Australia	25 (11.2%)
Number of years of experience as author	
<5 years	36 (16.1%)
6-10 years	51 (22.8%)
11-15 years	34 (15.2%)
16-20 years	19 (8.5%)
>20 years	84 (37.5%)
Employment as biomedical editor	
Yes	63 (28.1%)
No	161 (71.9%)
Involvement in making decisions on the manuscript	
Yes	56 (88.9%)
No	7 (11.1%)

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 Supplementary file 5. Codebooks
 Supplementary file 5. Codebooks
 The first codebook is about the suggestions made by survey participants on how to improve the definition of peer review report quality we provided.

The second codebook is about the comments made by survey participants on importance and/or wording of each item (n=20).

The third codebook is about the identification of new items to assess peer review report quality by survey participants.

Codebook 1. Suggestions on how to improve the definition of peer review report quality

Suggestions on how to improve the definition of peer review report quality $(n=87)$							
Theme	Definition	Code	Sub-code	Example 3			
Assessment of different aspects	Statements on the different aspects of a	Accuracy of the study	NA	Also helps ensure the accuracy of the content (at least in part) $\frac{3}{9}$			
of a study	study that should be discussed in a peer review report	Originality of the study	NA	Should include recognition of what has already been done well where possible			
	Relevance of the study	NA	Consider adding "the quality and value of the submitted manuscript." Or perhaps "quality and impgct." The point is that some submitted work is high quality, but still for useful because it is just repeating prior work or answering an $i \neq relevant$ question				
		Reproducibility of the study	NA	The definition could broadly glso take into account issues of reproducibility			
		Research integrity of the study	NA	The definition should also inquide something about identifying plagiarism and conflict of intquests			
		Robustness of the study	NA	Not necessarily to improve the quality as that may be a secondary outcome. The peer review is to evaluate the scientific robustness of the research			
				copyright.			

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				or of the cost of	
		Soundness of the study	NA	Also - the extent to which the	peport critically assesses the soundness
		Strengths and weaknesses of the study	NA		which the review accurately and clearly ions of the study but I don't disagree
		Structure of the manuscript	NA		ort may also identify the potential for a revised into an impactful form
		Study methodology and statistics of the study	NA	and testing of clear scientific	degree of innovation, and the statemen hypothesis, should be addressed in a al issues and methodologies should be
		Validity/trustworthiness of the study	NA	What about the validity and the validity	ustworthiness of the findings?
Consideration of journal's policy	Statements on the consideration of the journal's policy in writing a peer review report	NA	NA		port takes into account journal policies helping authors provide the best versio
Irrelevant and ambiguous comments	Irrelevant and ambiguous comments for improving the provided definition of peer review report quality	NA	NA	There is usually more than on	2
Quality as a vague concept	Statements on the difficulty to define "quality"	Dependency on the type of journal and study	NA	I would add at the end "bas article submitted"	ed on a rubric specific to the type of
		Quality of research and quality of reporting	NA	scientific validity (the extent conclusions supported etc.) A which the study is described	want aspects of quality could include which the methods are adequate, the D/OR reproducibility (the extent to sufficient detail that it could be quality of the scientific study and the

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				latter is a quality of the text $\frac{6}{2}$
Reviewer's expertise	Statements on how the quality of a peer review report is related to the level of expertise of a reviewer	NA	NA	The quality of the peer reviewalso depends on how well the rev has understood the manuscript and the reviewer's level of exper the topic
Reviewer's comments characteristics	Statements on the different characteristics of a peer review report	Clarity of the comments	NA	<i>I think the definition should is</i> <i>expressed themselves clearly</i> <i>and unambiguously</i>
		Constructiveness of the comments	NA	Perhaps this is implied in the proposed definition, but you could mention that a high-quality per review includes constructive cr that is, not just an identification of flaws but suggestions for remedies
		Fairness and impartiality of the comments	NA	Add: 'is unbiased and competently-conducted'
		Understanding correctly the content of the manuscript	NA	The quality of the peer review also depends on how well the rev has understood the manuscript
Role of external parties	Statements on the role of external parties in assessing the quality of a peer review report	NA	NA	External parties should also a role
Scope of the peer review process	Statements on the scope of the peer review process	Different facets	NA	Peer review has many facets e
r		Ensuring accessibility to the readers	NA	[] and the accessibility to readers
		Ensuring quality of science	NA	<i>I would like to insist on the rate of peer-review to ensure the qui the science presented in the manuscript</i>
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		Evaluating rather than improving	NA		b the scientific robustness of the research
		Independence	NA	This definition does not capture review process	se the necessary independence of the peo
		Related to decision making	NA		tors' decisions can always override pee editor's appraisal of a paper should hav ers appraisal
		Transparency and critical appraisal	NA		nsparency and critical appraisal. Peer ditorial decisions. Editorial decisions review
		Validation of the research	NA	Peer review also helps to val the report also needs to do th	date the research before publication, so s to be effective
		Variable process	61.	Peer review can be very varia quality of papers. At its work	ble; at its best it really improves the it is bullying and partial
Timeliness of peer review process	Statements on the consideration of timeliness in defining the quality of a peer review report	NA	NA	Timeliness should be include	, less than 2 weeks is ideal
Usefulness of the peer review report	Statements on the usefulness of a peer review report for authors	Useful for authors	Improving manuscript quality	It should be aimed at helping work.	The authors improve the quality of their
1	and editors		More effective communication of research	research publication, by expandence(s) for it and thus she limitations that need to be rec definition if you could work the communication, which can be effective, clearer communication	s to effective communication through sing the author's work to the potential wing where readers stumble or identify ggnized. I think it would improve the something about effective distinct from quality per se. More on promotes more learning from the mplementation. Also, quality should

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				probably be judged in terms of the purpose of the study; a delivery system study for example mug provide more information on cont order to be useful than does acclassical randomized trial such as pharmaceutical.
		Useful for editors	Filtering studies	Also, 1) a check on poor research,
			Thermy studies	No. 1 a check on poor roses ch, O.
		Or	Decision to enhance the readership and citations	helps editors to make a fair $d_{\mathbf{B}}d$ informed decision that will enhance readership and citations of the journal
		D _e	Enabling fair decision	I agree that they are primaries good to the extent that they help e "Fairness' is important, but enabling 'informed' and 'rigorous' decisions matter too.
			Leading to incorrect decision	Implies that the reviewer is making sensible suggestions, which not be the case (and which are editor may not pick up on). E.g., a statistical reviewer commenting (incorrectly) on statistical method and the editor is unaware if the comments are relevant/correct. The review could help the editor make a decision but it could be an incorrect decision.
			Same weight for editors and reviewers appraisal	This definition implies that eartors' decisions can always overria reviewers' appraisals. But areditor's appraisal of a paper show equal weight to a peer reviewer's appraisal. This top down system allow for bias.
		Useful for both editors and authors	NA	The point you suggest to help BOTH editor AND authors is a key element. When I ask for revision I provide new insights or sugges to improve the quality and a $\frac{2}{9}$
Wording of the definition	Statements on how to improve the definition of the peer review report quality	Disagreement with the use of fair	NA	This seems reasonable but I would leave out the word "fair" as I assume that editors always and to make fair decisions!
	·		·	copyright.

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		Relevand (n = 56)		n 8 June	
Theme Author's responsibility	Definition Statements on the author's responsibility to discuss the relevance of the study in the manuscript	Code NA	Sub-code NA	2020. Downloaded from http://bmjopen.bmj.com/ on April 19, 2024 by guest. P	Example Relevance should be discussed by the authors and ultimately i decided by readers. I would expect reviewers to comment of the author's discussion on the relevance, and only exceptionally come with considerations of his own
Contribution to the knowledge	Statements on the importance of the study as contribution to the scientific knowledge	NA	NA	ttp://bmjopen	Relevance is important in the context of both the contributio to the knowledge base
Dependency on the type of journal	Statements on how biomedical journals differently evaluate relevance of a study based on their own criteria	NA	NA	.bmj.com/ on A	Relevance also depends on the scope of the journal, and that an editorial decision, opinion the reviewer is not so importat
Editor's responsibility	Statements on the editor's responsibility to evaluate the relevance of the study	NA	NA	April 19, 202	This is largely an editorial decision
Influencing editor's decision	Statements on how the relevance of a study can influence an editorial decision	NA	NA	4 by guest.	This is very helpful for the Editor to make a decision on the manuscript
Readers as final judges	Statements on how readers are the final judges of the relevance of a study	NA	NA	Protected by copyright	Relevance should be discussed by the authors and ultimately decided by readers

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Related to other items	Statements on the link of the item with other items	NA	NA	5604 on 8 Ju	I took this to be the same question as the earlier one on applicability
Reviewer's expertise	Statements on how the assessment of the relevance of a study depends on reviewer's expertise	NA	NA	une 2020. Downloaded from http://bmjc	Not important if you are a statistical reviewer, of a clinical article, without knowing the clinical area. BUT otherwise VERY IMPORTANT for clinical reviewers
Subjective item	Statements on the subjective interpretation of the term "relevance"	External validity	NA	ed from http://bmjc	Another aspect of relevance might relate to external validity or generalizability e.g., a lab study that does not have relevance to the real world
		Future impact	NA	ppen.bmj	Relevance may lie in the future, not in the present
		Novelty	NA	com/ on April 19	There are various aspects of "relevance" i.e., it might not be a significant contribution to the literature because the findings are not at all novel
Wording of the item	Statements on how to improve the wording of the item	NA	NA	, 2024 by	Relevance to the broader field, or to general society?
				guest. Protected by copyright.	
	For peer review only	- http://bmjopen.bmj.com/	′site/about/guidelines.xht	-	

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Originality (n= 56)							
Theme	Definition	Code	Sub-code				
Dependency on the type of journal	Statements on how biomedical journals differently evaluate the originality of a study based on their own criteria and policy	NA	NA	Depends on the journal policy. More important when the reader is the client, less important when the author is the client			
Editor's responsibility	Statements on the editor's responsibility to evaluate the originality of the study	NA	NA	CompositionExampleDepends on the journal policy. More important when the reader is the client, less important when the author is the clientDownloadMany journals mainly open which have different editorial policies now-a-days do not ask reviewers' to judge the originality. This is losing importance in open access eraNot always important to be original study as some are trying to duplicate findings from previous studiesThis is only slightly important in that - once a study has been conductedI find that important. The twentieth me too study is not relevant for the knowledge fieldFor our journal, this is very important, although I think for some others with a pay-for- publication model they place less importance on e.g. novelty			
Importance of replication and confirmatory study	Statements on the importance of conducting replication and confirmatory studies	NA	NA	Not always important to be original study as some are trying to duplicate findings from previous studies			
Importance of the item	Statements on the importance of the item in assessing the quality of peer review report	Slightly important item	NA	On Pril This is only slightly important in that - once a study has been conducted			
		Important item	NA	No.I find that important. The twentieth me too study is not relevant for the knowledge field90			
Open access vs. subscription journal	Statements on how open access journals and subscription journals assess differently the originality of a study	NA	NA	For our journal, this is very important, although I think for some others with a pay-for- publication model they place less importance on e.g. novelty			

Page 65 of 127			BMJ Open		66/bmjop
1 2 3					en-2019-03
4 5 6 7 8 9 10	Reviewer's expertise	Statements on how the assessment of the item depends on reviewer's expertise	Reviewer as not the best judge	NA	6/bmjopen-2019-035 80 Not all reviewers will necessarily be familiar with the literature in a particular area and may not be able to comment on originality of the study
11 12 13 14 15	Wording of the item	Statements on how to improve the wording of the item and better define it	Impact rather than originality	NA	Some less original studies can still be of significant value, so I prefer comments on impact to comments on originality
16 17 18 19 20 21 22		De	Originality as novelty	NA	The Editor is usually aware of this, particularly Editors of journals with high impact factors, who are very keen to publish manuscripts reporting original/novel findings
23 24 25 26			Originality as what the study adds	NA	I would prefer to think of this in terms of whether it really adds to our knowledge
27 28 29 30 31					April 19, 2024 by gues
32 33 34 35 36					. .
37 38 39 40 41					Protected by copyright.
42 43 44 45		For peer review only	- http://bmjopen.bmj.com/site/ab	oout/guidelines.xhtml	

BMJ Open				
	6/bmjopen-2019-035604 on 8			
Sub-code	3 Ju	Example		
NA	ne	This is an area where the reviewer may have a valuable role in tempering an author's enthusiasm, hubris or bias		
NA	2020. Downloaded from http://bmjo	Interpretation of the findings should be judged by its coherence with findings and study limitations and strengths, and by its coherence with literature		
NA	open.bmj.co	A judgement on the new contribution to knowledge		
NA	m/ on April 19, 2024	Interpretation of the results is crucial- it determines the message that is sent out. It is very important that reviewers pay attention to this interpretation		
NA	by gues	These are useless for the reade		
NA		As long as the results are crystal clear the authors can take some liberties in the discussion. As long as it is clea what is speculative		
_	NA	/ /		

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		BMJ Open		bmjo	
				6/bmjopen-2019-035602	
				5602	
Objective interpretation	Statements on the importance of the objectivity of the study's interpretation	NA	NA	on 8 June	As long as it is an objective interpretation without any confirmation bias
Related to other items	Statements on the link of the item with other items	NA	NA	2020.	See comments on methods above
Related to study flaws	Statements on the importance of commenting on the item especially if there are major errors in the manuscript	NA		ownloaded from h	This is important if there are any major flaws or if an alternative explanation for findings should be considere
Related to study implications	Statements on the importance of commenting on the item for generating new hypothesis to test	NA	NA	Downloaded from http://bmjopen.bmj.com/ on April	To me, this is the most important issue, for the point papers is to generate new hypotheses to test. Unfortunately, in my field, editors often want to see the facts, but are wary about interpretations, probably abo long-winded speculation in t past
Reviewer's expertise	Statements on how the assessment of the item depends on reviewer's expertise	Statistics expertise	NA	19, 2024 by gues	If the reviewer is experienced statics can make a good interpretation of the results
Rushed interpretation as common problem	Statements on the poor interpretation of the study's results as common problem	NA	NA	y guest. Protected by copyright.	Discussion is the most important part of the manuscript. And sometimes i a bit rushed by authors
Scope of the PR process	Statements on the scope of the peer review process	Assisting editors to understand results	NA	ted by	Editors aren't technical expe in every field. The PR proces

		BMJ Open		6/bmjoper	F
				n-2019-03	
				5604 on 8 Ju	is therefore important is assisting editors understanding the significance of results
Subjective item	Statements on the subjective interpretation of the term "interpretation of the results"	NA	NA	ne 2020. D	All results are open to a variety of interpretations
Wording of the item	Statements on how to improve the wording of the item and better define it	NA	NA	ownloaded from http://bm	The reviewer must comment on the discussion section, of which the interpretation is a part. But other elements (comparison with existing research etc.) is also important. I would replace 'interpretation' with 'discussion'
			en 01	6/bmjopen-2019-035604 on 8 June 2020. Downloaded from http://bmjopen.bmj.com/ on April 19, 2024 by gues	
				est. Protected by copyright.	
	For peer review only	- http://bmjopen.bmj.com/	/site/about/guidelines.xhtml		

				9-035	
	St	rengths and weaknesses (general) (n= 21))	6/bmjopen-2019-035604 on 8	
Theme	Definition	Code	Sub-code	Ju	Example
Author's responsibility	Statements on the author's responsibility to discuss the strengths and weaknesses of the study in the manuscript	NA	NA	ne 2020. Dowr	The paper should, the review only should if the paper is missing something important
Important when manuscript is overly long	Statements on the importance of the item when the manuscript is overly long	NA	NA	nloaded f	Important when a manuscript is overly long
Specificity of the comments	Statements on the importance of the specificity of the comments	NA	NA	rom http	Specificity is more important
Related to other items	Statements on the link of the item with other items	NA	NA	loaded from http://bmjopen.bmj.cr	This is repeated above for methods. So these two components overlap. Howeve I mark this as important
Related to the study	Statements on the importance of commenting on the strengths and weaknesses of the study's aims and study's flaws	Related to study aims	NA	om/ on April 19, 2024 by guest. Protectec	I think this needs to be specifically related back to clear study aims and objective (perhaps this is a separate category? If not I think it should be). Even a beautiful study design with great validi and statistics is rubbish if it doesn't allow you to answer your research questions! I always look to see if the analyses and interpretation address the goals of the study

		BMJ Open		6/bmjope	
				6/bmjopen-2019-035604 on	
		Related to study flaws	NA	5604 on a	This is important where there are issues
Reviewer's expertise	Statements on how the assessment of the item depends on reviewer's expertise	NA	NA	8 June 2020. D	Provided that the reviewer had the methodological skills to comment on methodological strengths and weaknesses.
Taking into account reader's perspective	Statements on the importance of taking into account the reader's perspective by peer reviewers	NA	NA	ownloaded fror	Peer reviewers should take the reader perspective and ensure the manuscript is well balanced on these
Including S&W in the general comments	Statements on including strengths and weaknesses in the general comments	NA	NA	n http://bmj	These should be clearly identified in the general comments
Useful for editors	Statements on the importance of the item for editors for making an editorial choice	To make a decision	NA	open.bmj.cc	Important for deciding to accept or reject a manuscript
				Downloaded from http://bmjopen.bmj.com/ on April 19, 2024 by guest. Protected by copyright.	

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			- 1.)	19-0356	
	51	trengths and weaknesses (meth (n= 29)	(O a S)	04 on 8	
Theme	Definition	Code	Sub-code		Example
Author's responsibility	Statements on author's responsibility to evaluate the item	NA	NA	ne 2020. Do	Authors should already be doing this
Dependency on the methods quality	Statements on the importance of the item in relation to the quality of the methods of the study	NA	NA	ownloaded fror	This really depends. If the methods are spurious, of course, this needs to be indicated
Dependency on the type of journal and study	Statements on how the assessment of the item depends on the type of journal and study	NA	NA	h http://bmjc	Methods are very important j our journal
Focusing on the weaknesses	Statements on the importance of the item especially focusing on the weaknesses of the study	NA	NA	pen.bmj.co	Important, especially the weaknesses, where there is a obvious need
Importance of the item	Statements on the importance of the item in assessing the quality of peer review report	Very important item	NA	June 2020. Downloaded from http://bmjqpen.bmj.com/ on April 19, 2024 by gues	This is absolutely key to the interpretation of the study. Unfortunately most reviewer, in my field, do not fully understand current (and correct) methods
Related to other items	Statements on the link of the item with other items	NA	NA	by guest. Protected by copyright.	Yes, but it is confusing to separate this from the general strength and weaknesses. The question should be if the reviewer thinks that the message can (potentially) answer the research question

		BMJ Open		6/bmjope	
				n-2019-035	
Reviewers' expertise	Statements on how the assessment of the item depends on reviewer's expertise	NA	NA	6/bmjopen-2019-035604 on 8 June 2020. Dow	Providing the reviewer is suitably qualified to comment on the methods. In my experience, far too many reviewers comment on aspects of the Methods for which they are able to confidently comment on
Subjective item	Statements on the subjective interpretation of the term "strengths and weakness (methods)"	To give indication on own stance	NA	nloaded from h	As long as the reviewer gives some indication of his/her own stance in determining strength and weakness
Commenting on the transparency of methods used	Statements on the importance of commenting on the transparency of the methods used by the peer reviewers	NA	NA	http://bmjopen.bmj.com/ on	Authors should already be doing this. Is it necessary for reviewers to also state this, or is it redundant? Reviewers could comment on whether the authors have been transparent about the strengths and limitations
Usefulness	Statements on the usefulness of the item for both editors and authors	Useful for authors	NA	April 19, 2024 by gues	For the author if the strengths and weaknesses are not properly addressed in the paper
		Useful for editors	NA	24 by gi	This is important for the editor to make a decision
Wording of the item	Statements on how to improve the wording of the item	NA	NA	uest. Protected by copyright.	Appropriateness of methods (based on question) may be more importantunless there is a problem, then strengths and weaknesses becomes important
				copyright.	

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		BMJ Open Statistical methods		6/bmjopen-2019-035604 an 8	
		(n=115)		Jur	
Theme	Definition	Code	Sub-code	ne 2	Example
Dependency on the type of study	Statements on how the assessment of the item depends on the type of study	NA	NA	2020. Downloaded from http://bmjopen.bmj.com/ on	For some articles (e.g. RCTs, meta-analyses, and observational studies) assessment of the statistical methods is important. For oth types of articles (reviews, commentaries, editorials) this is of less importance
Editor's responsibility	Statements on the editor's responsibility to determine the necessity of a statistical review	Employment of statistical assessors by journals	Statistics sub-editor	o://bmjop	Journal needs to engage a statistics sub-editor for that
	for a study	No familiarity with some methods	NA	en.bmj.com/ o	Sometimes editor may not be a familiar with certain statistica methods which makes it more difficult to do this
		Statistical support to the reviewers by journals	NA	n April 19	Journal editors should provide statistical support to reviewer.
		To determine the necessity of statistical review by journals	NA	2024 by guest. Protected by copyright.	But I think that a lot (?) of reviewers are not sufficiently capable to do so. It might be more appropriate that the editor determines the necessity of statistical review and explicitly asks the reviewer if he/she is capable to do so

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	BMJ Open			i/bmjop	
				pen-2019-03	
No consensus on appropriateness of statistical methods	Statements on no consensus on the appropriateness of methods by peer reviewers	Variety of appropriate methods	NA	6/bmjopen-2019-035504 on 8 June	Often there are multiple "appropriate" methods. It is important to use one of the appropriate methods
Optional component of quality	Statements on the item as option component of the quality	NA	NA	2020. Dow	This should be an optional or "where relevant" component the quality
Related to other item	Statements on the link of the item with other items	NA	NA	nloaded from h	This belongs to assessing the methods. Should not be a separate item because there is qualitative research
Reviewers' expertise	Statements on how the assessment of the item depends on reviewer's expertise	At least one reviewer	NA	http://bmjope	At least one of the reviewers should have reasonable statistical knowledge
		Content expertise	NA	n.bmj.com/	Many reviewers may be subje matter experts but not necessarily experts in statistic
		General methods reviewer		2020. Downloaded from http://bmjopen.bmj.com/ on April 19, 2024 by guest. F	This applies to the methods in general, whether or not they are statistical. I think at least one reviewer needs to comme on methods, but not every reviewer. Articles may not use statistics but an expert on the methods should review the article
		Inappropriate advice	NA	Protected by copyright.	Non-statisticians should not b encouraged to comment on th statistical methods
				copyright.	

6/bmjopen-2019-035β04 on 8 June 2020. Downloaded from http://bmjopen.bmj NA Statistical reviewer should do Statistical reviewer this Commenting on own statistical NA In my view, the reviewer should *be required to state whether or* expertise not she/he has the expertise to evaluate the statistical methods properly Commenting on the use of Statements on the importance to And the use of stat. methods NA NA comment of the appropriate use statistical methods (some methods are used of the statistical methods by *incorrectly by authors)* authors Wording of the item We get a lot of qualitative work Statements on how to improve NA NA Lon Ar the wording of the item so the key to this question is the appropriateness of the methods and then specifics based on type of methods com/ on April 19, 2024 by guest. Protected by copyright

BMJ Open

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Methodological quality (n= 32)							
Theme	Definition	Code	Sub-code		Example		
Dependency on the type of study	Statements on how the assessment of the item depends on the type of study	NA	NA	ne 2020. Do	Where applicable it is important		
General comments	General statements	NA	NA	June 2020. Downloaded from http://bmjopen.b	But in any case, I think internat validity is very important if a study is claiming that there is a relation between two variables it should be on solid ground to do so		
Importance of the item	Statements on the importance of the item in assessing the quality of peer review report	Very important item	NA	://bmjopen.t	In my opinion this is the most important item		
Focusing more on methods than results	Statements on the importance of commenting on the methods	NA	NA	mj.com/ on April	In my opinion this is the most important item. I think a reviewer should primarily focus on methods rather than results		
Related to other items	Statements on the link of the item with other items	NA	NA	19, 2024 by guest. Protected by copyright	I did not understand the difference between this question and the question "The reviewer comments on the strengths and weaknesses of study methods"		
Reporting of the study	Statements on the importance of good reporting for study reproducibility	NA	NA	rotected by c	A description should be sufficient to repeat the study with a high likelihood to end up with the same results		

		BMJ Open		i/bmjope	
				6/bmjopen-2019-035604	
Reviewer's expertise	Statements on how the assessment of the item depends on reviewer's expertise	Acknowledgement lack expertise	NA	on 8 June 2020. They Downloaded from that	lly yes. However g wers are also we e limits of their ow rtise. It is better fo wers to acknowle lack expertise in a particular aspect odology (this is C odology (this is C odology (this is C expected to be a erything) rather t apt to critique som is outside of their e of knowledge
		At least one reviewer	NA	At le expe	ast one reviewer rtise in methods s w the study
		Technical vs. clinical expertise	NA	mi. When com might might techn on (met. Ap and b	n selecting review t choose some for nical expertise hodology, statistic others for clinical rtise/experience
Making sure results are not biased	Statements on the importance of the study for making sure the study results are not biased	NA	NA	No Cruc	ial to make sure t ts are not biased
Wording of the item	Statements on the wording of the item and how to improve it	Broad item	NA	est "Met Protect statis	hodological qual d term that could truct validity and stical validity as v nal validity
				copyright.	
	For peer review only	y - http://bmjopen.bmj.com/site/abo	out/guidelines.xhtml		

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44 45

		BMJ Open		6/bmjopen-2019-035604 c	
	F	Applicability and external validi (n= 37)	ty	n 8 Jun	
Theme	Definition	Code	Sub-code		Example
Author's responsibility	Statements on the responsibility of authors to comment on the applicability and external validity of the study providing sufficient information to the readers	NA	NA	2020. Downloaded fro	The paper should, not necessarily the reviewer
Dependency on the practice of the reader	Statements on the difficulty to judge the importance of the item because it depends on the practice of the readers	NA	NA	m http://bmjopen.bmj.com	Difficult as would depend on the context of practice of the reader
Dependency on the type of study	Statements on how the assessment of the item depends on the type of study	NA	NA	en.bmj.com	It depends on the specific topic of the study
Editor's responsibility	Statements on the editor's responsibility to evaluate the item	NA	NA	on April 19, 2	This is more 'scope, which is for the editor to decide. But help from a reviewer is appreciated
Helping the editor to understand reproducibility of the study	Statements on the importance of the item to decide if a study can be reproduced	NA	NA	024 by guest.	This is important when reporting novel findings as it helps the Editor to decide if the results can be reproduced by another group
Importance of the item	Statements on the importance of the item in assessing the quality of peer review report	Less important item	NA	Protected by copyright.	This is of lesser importance. There should be sufficient information included for any

		BMJ Open		mjope	
				6/bmjopen-2019-035604 on	
				5604 on 8	readers to come to this conclusion themselves
Related to other items	Statements on the link of the item with other items	NA	NA	June	Similar to my answer abo interpretation
Related to the paper	Statements on the claims made in the paper by the authors and impact of the study	Future research	NA	20 <u>2</u> 0. Dowr	Applicability might lie in future, not in the present
		Impact	NA	nloaded from h	This is important only in relation to the claims mad the paper about the impac implications of a study
		Related to the claim & content of the paper	NA	:tp://bmjd	This depends on the clain made
Reviewer's expertise	Statements on how the assessment of the item depends on reviewer's expertise	Technical vs. clinical expertise	NA	pen.bmj.com/ on Ap	When selecting reviewers might choose some for technical expertise (methodology, statistics en and others for clinical expertise/experience
Reviewers' comments characteristics	Statements on the different characteristics of a peer review report	Baring reviewers' opinion	NA	ril 19, 2024 by gu	This may be one area of the review where the reviewed bring a personal opinion bare. Does the reviewer the this is a useful paper?
		Evidence based comments	NA	est. Protected by	Peer reviewers should pro citations (evidence) for th assessment. Simply saying the results are not applico their practice is not enoug
				by copyright.	

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		BMJ Open		86/bmjop	
				en-2019-03	
		Tempering authors' enthusiasm	NA	6/bmjopen-2019-035604 on 8 June 2020	Similar to my answer about interpretation: this is an area where the reviewer may have a valuable role in tempering an author's enthusiasm, hubris or bias
Subjective item	Statements on the subjective interpretation of the term "applicability and external validity"	NA	NA		This can be very subjective and misleading
Wording of the item	Statements on how to improve the wording of the item	NA	NA	from http://bmjc	Applicability and external validity are two concepts, so this item is double-barrelled in not valid
		evie		Downloaded from http://bmjopen.bmj.com/ on April 19, 2024 by guest. Protected by copyright.	
	For peer review only	- http://bmjopen.bmj.com/site/ab	oout/guidelines.xhtml		

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				6/bmjopen-2019-035	
		Presentation and organization (n= 45)		55004 on t	
Theme	Definition	Code	Sub-code	Example	
Dependency on the type of journal (and its policy)	Statements on how biomedical journals differently evaluate the item based on their own criteria	Presence of copy editors in the journal	NA	Depends Depends journals editors	a bit on w
	^r or	Taking into account the average reader of the journal	NA	The revie 00 account t 00 of the jour	wer needs he "averaz rnal - will ıd the pap
General comments	General statements	NA	NA	Peer revi exercise,	ew is not c but clarity ibility are
Useful for editors	Statements on the usefulness of the item for editors	NA	NA	Because i importan 80 seen it be	the readab t to those fore. Espe hen a hand think.
Importance of the item	Statements on the importance of the item in assessing the quality of peer review report	Less important item	NA	ril This is le. as long a a reader make use requires presentat is really b	ss importa s the conte should be of the pap nore effor ion and or pad, then is l
		Presentation more important than organization	NA	C Presentation C Presentation C C Organization	

	BMJ Open		
			n-2019-03
Statements on the importance of the item to improve the quality of the manuscript	Clear recommendations	NA	Yes, but in a way that provides the authors with clear recommendations on how to make improvements. Design flaws cannot always be addressed after the study, but issues with presentation and organization of the manuscript can
D _E	Communication	NA	Important when it will help improve the quality of the communication. Not necessary when it flows well
	Readability		
Statements on the importance of not making useless comments	NA	NA	Important because this impacts readabilityImportant when it will help improve the quality of the communication. Not necessary when it flows well.
Statements on peer reviewers focusing on minutiae	NA	NA	Some reviewers focus on formatting minutiae
Statements on the link of the item with reporting guidelines	NA	NA	I find reviewer comments on the presentation and organization of the manuscript moderately important if the manuscript follows a check list (e.g. STROBE) and/or standard formatting, and if is easy to understand and follow
	of the item to improve the quality of the manuscript Statements on the importance of not making useless comments Statements on peer reviewers focusing on minutiae Statements on the link of the	Statements on the importance of the item to improve the quality of the manuscript Clear recommendations Communication Communication Statements on the importance of not making useless comments NA Statements on peer reviewers focusing on minutiae NA Statements on the link of the NA	Statements on the importance of the item to improve the quality of the manuscriptClear recommendationsNACommunicationNACommunicationNAReadabilityNAReadabilityNAStatements on the importance of not making useless commentsNAStatements on peer reviewers focusing on minutiaeNAStatements on the link of the item with reporting guidelinesNA

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1 2 3					en-2019-03	
4 5 6 7	Responsibility	Statements on editor, author or reviewer's responsibility to evaluate the item	Joint responsibility	NA	6/bmjopen-2019-035604 on 8 Ju	I think this is the role of the editors as well as the reviewers.
8 9 10			Editor's responsibility	NA	une 2020.	Editors and editorial staff have a stronger role here.
11 12 13 14 15 16 17 18 19		Forpe	Reviewer's responsibility	NA	. Downloaded from http://bmjopen.bmj	I regularly make notes as to whether a section is better placed elsewhere in the document, and on sentence structure, and use and misuse of citations. I think this is an obligation that reviewers have to the author and the journal
20 21 22 23	Subjective item	Statements on the subjective interpretation of the item	NA		mjopen.bmj	This is subjective and may vary between reviewers as log as general structure is preserved
23 24 25 26 27 28	Wording of the item	Statements on how to improve the wording of the item	NA	NA	com/ on April	The word "presentation" seems unclear. It could refer to the writing quality or to other factors
29 30 31 32				1	19, 2024 by gues	
33 34 35 36						
37 38 39 40 41					t. Protected by copyright.	
42 43 44		For peer review only	- http://bmjopen.bmj.com/site/ab	oout/guidelines.xhtml	ıt.	

BMJ Open				66/bmjo
				6/bmjopen-2019-035604 on
		Adherence to RG (n=73)		5604 0
	T (* */*			<u></u>
Theme Adherence to key points	Definition Statements on the importance that a manuscript adherences on the key elements of a checklist	Code NA	Sub-code NA	Example I think whether a manuscript adheres to a specific item on checklist is not that importan Adhering overall to the key elements needed to report is important If it is widely accepted reporting guidelines like the Consort Guidelines I think the is an important part of peer review Some reviewers are too much strict on that It would be great to have a consistent format and rubric follow to increase comparability of manuscript and distress authors Depends on type of study. Fo systematic reviews of course fundamental. For other studie this will be more and more
Part of the PR process	Statements on the importance of checking the adherence of reporting guideline as part of the peer review process	NA	NA	If it is widely accepted reporting guidelines like the Consort Guidelines I think the is an important part of peer review
Author's responsibility	Statements on the author's responsibility to follow reporting guidelines	Too demanding for authors	NA	Some reviewers are too much strict on that
Dependency on the type of journal	Statements on how the assessment of the item depends on the type of study	Consistent format	NA	It would be great to have a consistent format and rubric follow to increase comparability of manuscript and distress authors
Dependency on the type of study	Statements on how the assessment of the item depends on the type of study	NA	NA	Depends on type of study. Fo systematic reviews of course fundamental. For other studie this will be more and more important for easier comparisons between studies and for quality improvement. makes our work easier if the

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		BMJ Open		mjoper	
				6/bmjopen-2019-035604 on 8	
				5604 on 8	authors also compliance a improve
Editor's responsibility	Statements on the editor's responsibility to evaluate the item	Joint responsibility	NA	³ June 2020.	The editor can also take co this aspect
	4	Pre-review	NA		I believe this is the editor's pre-review
	i or pe	Reformatting articles	NA	Downloaded from http://bmjopen.bmj.co	We accept manuscripts that have been formatted for ot journals for peer review. C course we move towards acceptance they need to be reformatted
General comments	General statements	NA	NA	mjopen.bmj.co	Universal reporting guided like CONSORT, can be expected that all reviewers would know
Importance of the item	Statements on the importance of the item in assessing the quality of peer review report	Important item	00.	m∕ on April	Essential
Lack of awareness	Statements on the lack of complete awareness about reporting guidelines from respondents	NA	NA	19, 2024 by guest. Protected by copyright.	In my experience, reviewed know little about the repor guidelines of the journal fo which they are reviewing. think reviewers should alw be sent details of the key guidelines. Otherwise they make criticisms or suggest changes which are incompatible with the guid of the journal

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		BMJ Open		6/bmjopeı	
				6/bmjopen-2019-035604	
				604	
Providing reporting guidelines	Statements on providing reporting guidelines to reviewers	NA	NA	on 8 June	The reviewer should receive t reporting guidelines applicab to the manuscript under revie
Reviewer's responsibility	Statements on the reviewer's responsibility to check if the manuscript adherences to reporting guideline	Less reviewer's responsibility	NA	2020. Dowr	I see that this is less the reviewer's responsibility to be honest
	pe	Making easier for reviewers	NA	June 2020. Downloaded from http://bmjopen.bmj.com/ on April 19,	Important for improving standards in reporting, but th should be made as easy for th reviewer as possible, because otherwise it can be too arduo
		Discussion of the study's issues	NA	//bmjopen.bmj.co	Pointing out where the manuscript does not respect to guidelines is useful, but more important is discussing the issues themselves
		Tedious for reviewers	NA	m/ on April 19, 20	When doing reviews, it is qui tedious to have to relate to difference reporting and formatting guidelines of particular journals
Getting an accurate review	Statements on how reporting guidelines help delivering an accurate review	NA	NA	2024 by guest. Protected by copyright.	That always irritating when authors do not follow the recommendations oto authors starting from pagination which helps for delivering an accurate reviewing

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1 2 3					n-2019-03	
4 5 6 7 8	Unclear responsibility	Statements on the unclear responsibility of checking for the adherence of the manuscript to reporting guideline	NA	NA	6/bmjopen-2019-035604 on 8 June 2020. Downloaded from h	I am not sure whether this is the peer reviewers' or the editor's responsibility
9 10 11 12 13	Utility of reporting guidelines	Statements on the uncertain utility of reporting guidelines	NA	NA	2020. Downlo	I'm not convinced that reporting guidelines make that much difference, but they are certainly better than nothing
14 15 16 17	Wording of the item	Statements on how to improve the wording of the item	Meaning of reporting guidelines	NA	aded from h	I simply do not know what this means. Which reporting guidelines?
18 19 20 21 22			Meaning of reporting guidennes		tp://bmjopen.bmj.com/ on April 19, 2024 by gues	
23 24 25 26 27					j.com/ on Apri	
28 29 30 31					l 19, 2024 by	
32 33 34 35					es	
36 37 38 39					. Protected by copyright.	
40 41 42 43 44		For peer review only	- http://bmjopen.bmj.com/site/ab	oout/guidelines.xhtml	yright.	

		BMJ Open		6/bmiopen-2019-035604 on
				0 19-0356
	X	Structure of reviewer's comments (n= 33)		04 on 8
Theme	Definition	Code		
Content and completeness are more important	Statements on the more importance of review's content and completeness	NA	NA	Completeness is more important than how structured
Definition of structured and organized	Statements on how to define the item	NA	NA	Example Completeness is more important than how structured important than how structured comments (e.g. on style) followed by structured comments (line by line or section by section) Again - somewhat dependent of the structure of the manuscrip that is being peer-reviewed Peer review is not an editorial exercise, but clarity and reproducibility are part of good science.
Dependency on the structure of the manuscript	Statements on the importance of the item in relation to the structure of the manuscript	NA	NA	Again - somewhat dependent of the structure of the manuscrip that is being peer-reviewed
General comments	General statements	NA	NA	Peer review is not an editoria exercise, but clarity and reproducibility are part of goo science.
Useful for both authors and editors	Statements on the importance of the item in helping authors and editors	Making easier to answer	NA	Makes it easier for the author responding
Importance of the item	Statements on the importance of the item in assessing the quality of peer review report	Not so important	:	It helps, but I'm not sure this iimportant enough to beassessed. Should covarystrongly with othercharacteristics of the review
Not related to meaningful content	Statements on the no relationship between a well- structured review and meaningful review's content	NA	NA	Detection Makes it easier to respond to but doesn't mean the review content is more or less by meaningful

7		BMJ Open		3/bmjopen
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Related to other item	Statements on the link of the item with other items	NA	NA	on Makes it easier to resp ∞ comments if they are concentration of the
Review reorganized by editors	Statements on the reorganization of a review by editors	NA	NA	No. It is up to the editor to the referee comments of concrete recommendate demands on the author needed.
Reviewer as unpaid extra job	Statements on the voluntary job of reviewers	NA	NA	from http://bmionecologicalization/from http://bmio
Standard structure of a review	Statements on the necessity to have a standard structure for reviews	Different perspective	NA	Organised according t perspectiveone perso structure is another's c
		More difficult for reviewers	NA	ComBut the more you set existStandards for a reviewStandards for a reviewMore difficult you makPortingSomething to aim for, bSomething to aim for, b </td
Time consuming to reorganize the review	Statements on the time lost in reorganizing the reviewer's comments	NA	NA	20 4 Otherwise time is lost if by to reorganize and under guess
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	For peer review only	- http://bmjopen.bmj.com/site/ab	out/guidelines.xhtml	

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BMJ Open				
			2019-035	
		Clarity (n= 26)		
Theme	Definition	Code	Sub-code	Example
Editors can make the comments clearer	Statements on editor's task to edit the reviewer's comments	NA	NA CONCE	Helpful but not essential since the editor can help make sense of them for authors
General comments	General statements	NA	Sub-code Sub-code NA NA NA NA NA NA NA NA	Peer review is not an editorial exercise, but clarity and reproducibility are part of goo science
Useful for authors and editors	Statements on the usefulness of a clear peer review report for both authors and editors	NA	NA	Otherwise neither the editor nor the authors can use the review appropriately
Importance of the item	Statements on the importance of the item in assessing the	Important item		
	quality of peer review report	Less important	NA	As long as the authors can understand the meaning, it is more important that the paper is clear
Not a marker of quality	Statements on not considering clarity as marker of quality	NA	NA NA NA	To me, although this is essential, it is more of an expectation of the review, rather than a marker of qualit
Reviewer as unpaid extra job	Statements on the voluntary job of reviewers	NA	NA Guest. Frotected by copyright.	

Page 91 of 127			BMJ Open		86/bmjopei	
1 2 3					6/bmjopen-2019-035604 on	
4 5 6 7	To avoid repeated cycles of PR	Statements on the importance of the item to avoid repeated cycles of PR	NA	NA	œ	Yes - to avoid repeated cycles of peer review
8 9 10 11 12	Useful for authors	Statements on the usefulness of the item for authors	Authors can ask for further clarity	NA	June 2020. Dow	It should be acceptable for authors to query reviewers' comments and ask for further clarity
13 14 15 16		^o r	Easy to respond	NA	nloaded fror	Makes it easier to respond to comments if they are clear and easy to read
17 18 19 20		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	Making sure the comments are intended	NA	n http://bmjc	It is necessary to improve the chances that the comments are taken as intended
21 22 23 24 25 26	Wording of the item	Statements on how to improve the wording of the item	Disagreement on the wording easy to read	NA	Downloaded from http://bmjqpen.bmj.com/ on	I think easy to understand may be a better way to say this. I'm not sure easy to read is as applicable in the age of the computer
20 27 28 29 30 31				only	April 19, 2024 by gues	
32 33 34 35						
36 37 38 39 40					t. Protected by copyright.	
41 42 43 44		For peer review only	- http://bmjopen.bmj.com/site/ab	oout/guidelines.xhtml	right.	

		BMJ Open	5/bmj	
			6/bmjopen-2019-035604 on	
		Constructiveness		
		(n=46)		
Theme	Definition	Code	Sub-code	
Clear guidance	Statements on the importance to give clear guidance on how to improve the manuscript	NA	NA e 2020. Downlo	Worth emphasising that they should, where appropriate, giv clear guidance on how paper might be improved and not be derogatory
Dependency on the paper quality	Statements on how the constructiveness of reviewer's comments depends on paper quality	NA	NA ded from nttp:	I suppose there will be some submissions which are so poo this will be difficult
Extent of the comments	Statements on the consideration to what extent reviewer`s comments could be addressed	NA	Sub-code Supervision NA 2020. Downloaded from http://open.bmj.com/ on April 19, 2024 NA And April 19, 2024 NA NA NA NA NA And April 19, 2024 NA NA NA NA	I think that reviewers should also consider to what extent their comments can be addressed. For example, if it's paper on a survey, it's not helpful for a reviewer to say that more people should be surveyed
General comments	General statements	NA	NA III 19, 2024 by	The worst reviews are the one where the reviewer just ramb on and does not provide something to respond to
Importance of destructive comments	Statements on the importance of destructive comments	NA		r ···· r ··· r ··· r ··· ··· ··· ··· ··
Importance of the item	Statements on the importance of the item in assessing the quality of peer review report	NA	NA totected by copyright.	I would rank this as the most important

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NA	6/bmjopen-2019-035 004 Constructiveness flags reviewer's interest in in the paper, so it is a main the likely value of their
NA	2020 The reviewers' commention 2020 important, however at the important, howeve
NA	They can be, but it's no mandatory. Some manu shouldn't be published
NA	It is not the reviewers', rewrite the paper or me authors. However com should always be respe
NA	It depends on the statusauthor. A beginner in aauthor. A beginner in aneeds encouragement asupport. An older expentaltalking rubbish deservedirect language
NA	Important, even if the recommendation is to r the authors will probab submit elsewhere, the c can be useful for them it to improve the paper
NA	Protect to improve the paper Content Unless manuscript real Content interest to readership, to by would not expect a revi Copyright. Copyright.
	NA

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				6/bmjopen-2019-035604 on	
					spend a lot of time essentially helping the authors
Related to other items	Statements on the link of the item with others	NA	NA	8 June 2(Hands in hands with being courteous
Sometimes difficult to be constructive	Statements on how comments are sometimes difficult to present in a constructive way	NA	NA	2020. Downloaded from http://bmjopen.bmj.co	I am not sure this reflects quality - valid concerns over methodology, results etc. are sometimes difficult to present a constructive way. Clearly being constructive is preferab though
Subjective term	Statements on the subjective interpretation of the term "constructiveness"	NA	NA	nttp://bmjope	I think this is a subjective terr
Usefulness for both authors and editors	Statements on how constructive comments are useful for both editors and authors	Useful for authors	NA	n.bmj.co	Directly linked to helping the author improve the manuscri
		Useful for editors	NA	m/ on April 19,	In case the review aims to support the editor to offer a revision, constructiveness of review is more relevant
Wording of the item	Statements on how to improve the wording of the item	NA	NA	2024 by gues	I want respectful and helpful. Sometimes that is different the "constructive."
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				Protected by copyright.	

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				6/bmjopen-2019-035604 on	
		Detail/Thoroughness		5604	
		(n = 62)		on	
Theme	Definition	Code	Sub-code	<u>8</u> ار	Example
Accommodating reviewer's comments	Statements on how authors accommodate reviewer's comments	NA	NA	June 2020. Downloaded from http://bmjopen.bmj.com/ on April 19, 2024 by gues	On the other hand, authors often spend a lot of time wi accommodating reviewer comments that were maybe that relevant to start with. S there is a limit to how detain and thorough is still helpfu the authors should have the right to reject some of the requests
Dependency on the paper quality	Statements on how detailed comments depends on the quality of the paper	Detailed when paper is inadequate	NA	://bmjopen.	Sometimes, where a paper clearly inadequate produci detailed report is necessary
Detailed but not useful review	Statements on how detailed comments are not always useful	NA	NA	tmj.com/ on A	They can be detailed but no usefulfor example, when t concentrate on grammar an spelling
For improving or rejecting the manuscript	Statements on the importance of detailed review to improve or reject a manuscript	NA	NA	pril 19, 2024 by guest. Protected by copyright.	Sometimes the length of the comments is greater than the length of the manuscript. Pureviewers should provide positive suggestions how the paper can be improved or rejected. The forma of the comments should be the sam as the format of the response e.g. what I propose and whe

		BMJ Open		/bmjop	
				6/bmjopen-2019-035604 on 8	
Importance of the item	Statements on the importance of the item in assessing the quality of peer review report	NA	NA	5604 on 8 J	Most important!
Inconsistency in length	Statements on how peer review report are inconsistent in length	NA	NA	une 2020. Dow	The most disconcerting thing about reviews is inconsistency when one is five pages long, th other five lines
Not always necessary	Statements on how detailed comments are not always necessary	NA	NA	nloaded	Ideally but not always necessarily
Providing a justification	Statements on the importance of providing a justification in the comments	NA	NA	June 2020. Downloaded from http://bmjopen.b	This is a pet peeve of mine. Some reviewers say things like "it has been demonstrated that this method of analysis is flawed" without providing a reference, for instance
Related to other items	Statements on the link of the item with others	NA	NA	mj.com/ on April 19, 2024 by gues	I would have thought clarity was a more important criteria then being detailed but agree about thoroughness
Reviewer as unpaid extra job	Statements on the voluntary job of reviewers	NA	NA	oril 19, 20	Reviewers' time is valuable
Straight to the critical points	Statements on the importance of succinct comments	Detecting fatal flaws	NA	024 by gues	Focusing on one major flaw is more important than recitating all the typos
		Excessive details	NA	t. Protected by copyright.	But they can be too detailed leading to a report that is too long overwhelming the author with too many requested revisions

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		Expectation from the authors	NA	on the most important is that the con the most important is the most important is the con the most important is the most important is the con the most important is the most important is the most important is the con the most important important is the most important imp
Wording of the item	Statements on how to improve the wording of the item	NA	NA	No. "detailed, thorough and clean O (or unambiguous)
		NA		loaded from http://bmjopen.bmj.com/ on April 19, 2024 by guest. Protected by copyright.

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		Objectivity		6/bmjopen-2019-035604 on	
		(n= 62)		8	
Theme Citing own work	Definition Statements on reviewers citing their own work in a peer review report	Code NA	Sub-code NA	June 2020. Dov	Example Please can reviewers not cita their own work. This usually means they have approached the paper with bias
Declaration of COI	Statements on the importance of reviewer's conflict of interest declaration	More important than be objective	NA	vnloaded from h	Declarations of competing interest and bias are more important than the claim to b objective
Dependency on the study type	Statements on how objective comments are related to the type of study	Related to study's quality	NA	http://bmjopen.bmj.com/	This is a fundamental princip that the comments should be disinterested (i.e. not driven the reviewer's self-interest) of this increases the chance of comments relating to the paper's quality
		Related to the novelty of the study	NA	June 2020. Downloaded from http://bmjopen.bmj.com/ on April 19, 2024 by gues	Moreover, reviewer's comme are strongly influenced by th reputation of the author and novelty of the idea. The less known the author and the mo novel the idea, the reviewer tends to be less objective
Editor's objectivity rather than reviewer's objectivity	Statements on the importance of objectivity from editors rather than peer reviewers	NA	NA	lest. Protected by copyright.	Editors are supposed to be objective, so reviewers can b opinionated if they wish

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1 2 3				n-2019-03	
4 5 6 7 8	Following a specific rubric	Statements on the importance to follow a specific rubric to guide comments by peer reviewers	NA	6/bmjopen-2019-035604 on 8 June 2020. Downloaded from http: NA NA NA	Reviewer should follow a specific rubric to guide comments and make revision manageable by author
9 10 11 12 13	General comments	General statements	NA	NA 2020. Downlo	This is one of the most critical elements of good peer review in my opinion but also one of the rarest things to find
14 15 16 17 18	Importance of the item	Statements on the importance of the item in assessing the quality of peer review report	NA	NA ed from http	This is a fundamental principle, that the comments should be disinterested (i.e. not driven by the reviewer's self-interest)
19 20	Impossibility to be total objective	Statements on the impossibility for reviewers to be totally objective	Comments are subjective by definition	NA bmjop	All reviews are subjective!
21 22 23 24 25 26 27 28			Desirable to express own opinion	Awareness of own experience	A better expectation is that reviewers come to the role aware of their own backgrounds, culture, experiences, research and views on the topic will affect their assessment of the research
29 30 31 32			Reminding reviewers to be objective	NA 2024 by gu	As far as possible - reminding reviewers to be as objective as possible would be a good start
33 34 35 36 37 38			Subjective comments are helpful for both editors and authors	NA NA NA	I think there are subjective comments that are still valuable to the authors and editors. For example, if the reviewer finds a section of the manuscript to be unclear, this is there subjective
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				opinion but can still help the authors re-assess and potentially improve that portion of the manuscript
Justification of the comments	Statements on the importance of substantiating the comments by peer reviewers	NA	NA	It is important that the reviews substantiates comments, and that the authors are able to respond in case of revising their manuscript, to the reviewer's comments
Recruiting additional reviewers	Statements on recruitment of additional peer reviewers when the reviews are not objective	NA	NA	When peer reviewers recommend citing own papers or clearly favour one treatmen over the others, editors should recruit additional peer reviewers
Related to authors' reputation	Statements on how peer reviewers are influenced by author's reputation	NA	NA	2020It is important that the review substantiates comments, and that the authors are able to respond in case of revising their manuscript, to the reviewer's comments2020When peer reviewers recommend citing own papers or clearly favour one treatment over the others, editors should recruit additional peer reviewers2021Moreover, reviewer's comment reviewers2022Moreover, reviewer's comment reviewers2023Moreover, reviewer's comment reviewers2024Goes along with a courteous tone2024Goes along with a courteous tone
Related to other item	Statements on the link of the item with others	NA	NA	Goes along with a courteous tone
Reviewer's expertise	Statements on how the assessment of the item depends on reviewer's expertise	NA		Every reviewer will always have their own perspective based on their expertise It would be very difficult to define this
Wording of the item	Statements on how to improve the wording of the item	Unclear item	Difficult to define	It would be very difficult to define this

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	Fairness (n= 55)			on 8 June	
Theme	Definition	Code	Sub-code	e2	Example
Biases are unavoidable	Statements on how reviewer's biases are unavoidable	NA	NA	2020. Downloaded from	Reviewer biases are a reality, but one should (where possible) recognize them and phrase criticism in that light
Editor's responsibility	Statements on the editor's responsibility to be fair	NA	NA	ed from h	Fairness is the editor's responsibility to judge
Fair depends on author's characteristics	Statements on how the reviewer's comments are influenced by author's characteristics	NA	NA	.ttp://bmjopen.	It is well known that reviewer comments are not fair in term of the location, ethnicity and gender of the authors
Importance of the item	Statements on the importance of the item in assessing the quality of peer review report	NA	NA	bmj.com/ or	Fairness is extremely important
Importance to back up opinions	Statements on the importance of backing up opinions by peer reviewers	NA	NA	1 April 19, 2024	Crucial that a reviewer backs up their opinion with evidenc from the paper/published literature
Justification based on the paper quality	Statements on how justification of reviewers is based on the quality of the paper	NA	NA	4 by guest. Protected by copyright.	As per above, the reviewers comments must be justified based on the quality of the article rather than on their personal views
Recognizing COI	Statements on recognition of reviewer's conflict of interest	NA	NA	ded by	More specifically, Editors should identify if the referee

		BMJ Open		86/bmjop	
				en-2019-03	
				6/bmjopen-2019-035604 on 8 June 2020. Downloaded from http://bmjopen.bmj.com/ on April 19,	has potential conflict of interest especially if he/she can have a conflict of interest working on the same field or topics. We all know such
Related to other items	Statements on the link of the item with others	NA	NA)20. Dow	<i>Objective, evidence-based, fair etc. are highly correlated</i>
Reviewers' perspectives	Statements on the importance of having peer reviewers with different perspective	NA	NA	mloaded from h	We often seek reviewers with different perspectives, so the entire editorial review team is constructed to be fair
Subjective item	Statements on the subjective interpretation of the term "fairness"	NA	NA	http://bmjope	Fair, of course, is subjective
Wording of the item	Statements on how to improve the wording of the item	Simplistic way to assess quality	NA	n.bmj.com/	Donald Trump sees the world in terms of fair or unfair. I think this is too simple a view
		Unclear item	Difficult to define	on Ap	How do you define 'fair'?
			Difficult to measure	oril 19, 20	How would you measure "fairness" of a review?
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7	Theme	Definition
8	Context dependency	Statements on how the
9		importance of item depends on
10		the context
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15	Dependency on the type of study	Statements on how comments
17	Dependency on the type of study	supports by evidence depends
18		on the type of study
19		
20	Editor's responsibility	Statements on the editor's
21	1 5	responsibility to determine if
22		reviewer's comments are
23		relevant or not
24		
25	Especially for supporting	Statements on the importance
26	criticism	of supporting criticism using
27		evidence
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31	Helpful when there are	Statements on the particular
32	disagreements	importance of the item
33	ansagreements	especially when there are
34		disagreements
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37	Importance of perceptions,	Statements on the importance
38	opinions and experiences	of perceptions, opinions and
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43		For peer review only
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				6/bmjopen-2019-035604 on	
		Support by evidence		00	
		(n= 69)		1 on	
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neme	Definition	Code	Sub-code	Jun	Example
ontext dependency	Statements on how the importance of item depends on the context	NA	NA	ne 2020. Downloaded f	Completely depends on the context; sometimes common sense can suffice but other times evidence-based critiques are necessary to show authors and editors why something needs changing
ependency on the type of study	Statements on how comments supports by evidence depends on the type of study	NA	NA	rom http://b	Depends on the type of study
litor's responsibility	Statements on the editor's responsibility to determine if reviewer's comments are relevant or not	NA	NA	rom http://bmjopen.bmj.co	It is the editor's role to determine whether they are relevant or not
pecially for supporting ticism	Statements on the importance of supporting criticism using evidence	NA	NA	m/ on April 19, 2024 by gues	Comments, especially criticisms, should be supported by citations wherever possible; subjective criticism ("I prefer such and such a method") is not constructive
elpful when there are sagreements	Statements on the particular importance of the item especially when there are disagreements	NA	NA	. →	Particularly if authors objections are rooted in disagreements with their own opinions or collaborators opinions
portance of perceptions, inions and experiences	Statements on the importance of perceptions, opinions and	Especially for too innovative manuscript	NA	ed by c	The exceptions are when the manuscript is too innovative or
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	experience of a reviewer in assessing a paper			gro gro kno iden bre imp	undbreaking. In these case, weledge and expertise to ntify a possible major akthrough is of utmost portance
Importance of the item	Statements on the importance of the item in assessing the quality of peer review report	Important item	NA	Downloaded seed are wro opin bas what rev	ry important. As an author l a frequent reviewer I have n reviewer comments which anything from completely ong to simple statements of nion without any evidence- e. But in my experience, at I would regard as quality iews, up to date and urate, are exceptionally e
		Not important item	NA	Do Do Cita So, imp	you mean that they offer utions for their comments? If that's probably not portant
More information needed by authors	Statements on the necessity to get more information by authors	NA	NA	April Son bas info	netimes comments may be red on a hunch and more prmation from authors may needed
Unnecessary to provide evidence to each comments	Statements on how it is unnecessary to provide evidence for each comment	NA	:	+	on't think reviewers need to e something for every point t they make
Related to other items	Statements on the link of the item with others	NA	NA	If y rev	ou mean, is it an objective iew, then it is important
	·	·		Protected by convriable	

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				6/bmjopen-2019-035604 on	
Reviewer's expertise	Statements on how the assessment of the item depends on reviewer's expertise	NA	NA	35604 on 8 Ju	Based on the reviewer's knowledge and experience
Selecting use of evidence	Statements on providing the use of no selective evidence	NA	NA	une 2020.	Provided the use of evidence not selective
Difficulty of backing up all comments	Statements on the difficulty of backing up each comments	NA	NA	. Downloaded from h	Wild claims may need back u but it is unrealistic to expect reviewers to back up everyth they say. A quicker system fo raising and addressing queri would be a better response
Wording of the item	Statements on how to improve the wording of the item	Difficult to measure	NA	http://bmjc	But I'm not sure how you jud this
		Providing citations	NA	open.bmj	Do you mean that they offer citations for their comments
		Unclear item	NA	j.com/	I don't really understand
				pn April 19, 2024 by guest. Protected by copyright.	
	For peer review only -	http://bmjopen.bmj.com/site/ab	oout/quidelines.xhtml	-	

 $\begin{array}{c} 11\\ 12\\ 13\\ 14\\ 15\\ 16\\ 17\\ 18\\ 19\\ 20\\ 21\\ 22\\ 23\\ 24\\ 25\\ 26\\ 27\\ 28\\ 29\\ 30\\ 31\\ 32\\ 33\\ 34\\ 5\\ 36\\ 37\\ 38\\ 39\\ 40\\ 41\\ 42\\ 43\\ 44\\ 45\\ 46\\ \end{array}$

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6/bmjopen-2019-035604 on			
<u> </u>			
∞ ⊆ Example	Sub-code	Definition	Theme
CurrentExample00Although this is very import it can create a conflict of interest as the authors and reviewers may be involved 	NA	Statements on possible conflicts of interest between peer reviewers and authors	CoI between reviewers and authors
Reviewers should be able commit time and effort to process and be held accountable to the commi	NA	General statements	General comments
Obviously this is a key requirement	NA	Statements on the importance of the item in assessing the quality of peer review report	Importance of the item
On Peer reviewers should ha Understanding of research methodology as well	NA	Statements on the link of the item with others	Related to other items
Failures in this can be ab whether the authors have communicated their work clearly	NA	Statements on editor or author's responsibility to evaluate the item	Responsibility
They have to try to unders it - but sometimes they do This is where the editor m cast a critical eye to ensu	NA		
	NA		

127		BMJ Open		5/bmjo	
				6/bmjopen-2019-035604 on 8	
				5604 on a	reviewer has grasped the essence of the article.
Review as guide for editors	Statements on how a review is a guidance for editors		NA	B June 2020. Downloaded from http://bmjope	Extremely important. Nothi more annoying to an author than realising the reviewer not fully read the paper. Al- crucial if the review is to provide fair guidance for editors
Reviewer as disadvantaged position	Statements on how the peer reviews is often in a disadvantaged position	erto	NA	ed from http://bmjop	The reviewer is often at a disadvantage as he/she is g limited information on whice make a decision on whether accept or reject the offer to review
Reviewer as unpaid extra job	Statements on the voluntary job of reviewers	Via.	NA	an.bmj.co	Yes, but see issue above ab late night reviewing
Reviewers as readers proxy	Statements on how the reviewer acts as a proxy for the reader		NA	m/ on April 19,	The peer reviewer acts as a proxy for the reader, so a b understanding of the manuscript's content is important
Reviewers' expertise	Statements on different reviewer's expertise	Assessment reviewers' expertise	NA	2024 by guest. Protected	This is very important. I've thought that one of the revia criteria should be self-ratin of the reviewer's expertise i the substantive and methodological aspects of t article
				by copyright.	

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				6/bmjopen-2019-035604 on	
		Declaration of competence by reviewers	NA	8	Reviewers should declare thei competence in the subject of th manuscript
	4	More reviewers	NA	June 2020. Downloaded from http://bmjopen.b	Some reviewers know about methods and some about content. It would be ideal to always have both, but that is often not the case
	D _C	Understanding also research methodology	NA	baded from	Peer reviewers should have understanding of research methodology as well.
Wording of the item	Statements on how to improve the wording of the item	Confusing item	NA	http://bmjopen.l	I found this question confusing Are you asking if the reviewer is competent to evaluate the content of the manuscript?
		Difficult to assess	NA	mj.com/ on April 19, 2024 by gues	Not sure how you would know if the reviewer knows and understands correctly the content of the manuscript
		Disagreement with the wording	NA	ril 19, 2024	"Knows" and "understands" are distinct concepts and should not be combined here
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9	Better quality rather the time
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31	General comments
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36	Golden rule
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		BMJ Open		6/bmjopen-2019-035604 on	
				-2019-035	
		Timeliness (n= 49)		504 on 8	
Theme	Definition	Code	Sub-code		Example
Better quality rather than on time	Statements on how a high quality review is more important than an on-time review	NA	NA	ne 2020. Dow	But it is better to wait a while and have a high-quality review than to receive a quick, superficial and/or unfair review.
Depends on the delay	Statements on how the importance of the item depends on the type of delay	NA	NA	nloaded fror	A few additional days of delay is not a major issue, while months of delay are
Dependency on the type of journal	Statements on how biomedical journals differently evaluate the item	NA	NA	n http://bmjo	Less important for pre-prints or F1000Research
Difficult for editors	Statements on how long delay can cause difficulties to the editor	NA	NA	pen.bmj.co	Difficult for the editor if the delay is too long (or, worse, need to find another reviewer)
Feasible and flexible deadlines	Statements on the importance to provide reasonable deadlines	Tendency to give short deadlines	NA	June 2020. Downloaded from http://bmjqpen.bmj.com/ on April 19, 2024 by gues	Important, but there seems to be a trend among the editors to get reviews done in shorter amounts of time. Reminders are very helpful, but also some flexibility
General comments	General statements	NA	NA	÷	The peer review process needs to be helpful for getting quality research into the public domain in a timely manner. It should not be a road block
Golden rule	Statements on how to be on time is the golden rule	NA	NA	Protected by popyright.	It's the Golden Rule - it's just polite to be on time! Do as you would be done by etc.

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		BMJ Open		/bmjop	
				6/bmjopen-2019-035604	
Importance of the item	Statements on the importance of the item in assessing the quality of peer review report	Important item	NA	604 on 8 June	Very important for us as we try to provide a rapid response to the outcome of papers
Journal´s reputation rather than good science	Statements on how the journal's reputation is more important than good science	NA	NA	2020. Downloaded from http://bmjopen.bmj.com/ on April 19,	Far too many editors now are asking for reviews to be complete in too little time. This is being done for the good of the journal's reputation, not for the good of science
More time does not mean more quality	Statements on how giving more time does not means having more quality	NA	NA	from http://b	Increasing time for revision doesn't add anything to the quality
Nor related to the quality of PR process	Statements on how the item is not related to the quality of the entire peer review process	NA	NA	mjopen.bmj.com/ or	Again not sure this contributes directly to the quality of the pee review process but is important in terms of ensuring that publication timetables can be adhered to
Orthogonal factors to review quality	Statements on orthogonal factors to review quality	NA	NA	April 19, 2024	Availability, timeliness, reliability (reviewing when says will review) are orthogonal to review quality.
Related to reviewer's professionalism	Statements on how to be on time is related to reviewer's professionalism	NA	NA	by guest.	This is more on the professionalism of the reviewer rather than the quality of the review
Reviewer as extra unpaid job	Statements on the voluntary job of reviewers	Demanding work	NA	Protected by copyright.	There are heavy demands on ou time. I find to carry out a qualit review on a paper which needs

Page 111 of 12	7		BMJ Open		86/bmjop	
1 2 3					en-2019-03	
4 5 6 7 8					6/bmjopen-2019-035604 on 8 June	expert reviewing to achieve the two aims laid out initially, that it takes a minimum of half a day, and often a day to do a good job
9 10 11 12		4	Difficult to find reviewers	NA	2020. Dowr	We are all busy! biggest issue is finding someone to say yes in first place
13 14 15 16 17 18 19 20		ror pe	Little delay	NA	2020. Downloaded from http://bmjopen.bmj	On time is pretty important but a little delay really is not a problem. I'm speaking as a journal editor I always have plenty to do so a week delay is probably fine and will not cause authors too much pain
21 22			Reasonable time for the reviewer	NA	open.bm	But are the deadlines reasonable?
23 24 25 26 27	Scope of the peer review	Statements on the scope of the peer review process	NA	NA	icom/ on April	Of course, with the caveat that peer review is voluntary and usually being fitted in around other work activities
28 29 30 31	Time given by the journal	Statements on how journals give different deadlines	NA	NA	19, 2024 by	Depends on how much time the journal gives. 2 weeks is not enough!
32 33 34 35 36	Wording of the item	Statements on how to improve the wording of the item	Unclear item	NA	guest.	Important to define what "on time" means. For example, is one day late a problem? Or a week late if the authors tell you?
37 38 39 40 41 42					Protected by copyright.	

BMJ Open			ò/bmj		
				6/bmjopen-2019-035604 on	
		Tone (n= 40)			
Theme	Definition	Code	Sub-code	<u>8</u> ار	Example
Academia as though environment	Statements on the aggressiveness and competition in academia	NA	NA	June 2020. Downloaded from http://bmjqpen.bmj.com/	There is enough competition and aggressiveness in academia without having to receive reviews which are rude or condescending.
Dependency on the author's work	Statements on how the tone used by reviewers depends on the author's work	NA	NA	aded from h	Depends on the author, and how much rubbish is being put forward
Dependency on the paper quality	Statements on how the tone depends on paper quality	NA	NA	itp://bmjo	And how much rubbish is being put forward
Editor's responsibility	Statements on the editor's responsibility to tone down the peer review reports	Removal comments by editors	NA		Editor can tone down or ed out obnoxious comments, bu it is better not to have to do this
Golden rule	Statements on how to use a courteous tone is the golden rule	NA	NA	on April 19,	Golden Rule again. Hiding rudeness behind anonymity odious
Hiding behind anonymity	Statements on how peer reviewers use anonymity to hide rudeness	NA	NA	2024 by guest. Prot	All too often, peer reviewers use the anonymity of the review process as an excuse to be rude and scathing in a way they would be unlikely adopt in person
Impact of a rude review	Statements on how rude reviews can impact authors	NA	NA	t. Protected by copyright.	And if authors receive discourteous comments, this really does 'sour' the proce

7		BMJ Open		ıjope	
				6/bmjopen-2019-035604 on	
				5604 on 8	and put people off, espective new researchers
Importance of the item	Statements on the importance of the item in assessing the quality of peer review report	Important item	NA	8 June 2020. Downloaded from h	This is important. Espector to keep his/her nerves we looking at the first revise version and notice that a revision is not answerin queries and comments! Should also provide author the keys to improve the and answer politely to referees
Not always a necessary requirement	Statements on how courteous tone is not always a necessary requirement	NA	NA	http://bmjopen.bmj.co	This is nice, but not tota necessary
Related to cultural differences	Statements on how courteous tone is culturally bound	NA	NA	an.bmj.cc	<i>I think this is important, courtesy is culturally bo</i>
Related to other items	Statements on the link of the item with others	NA	NA	om/ on April 19,	This relates to constructiveness, above
Requirement	Statements on the requirement to use a courteous tone in a peer review report	NA	NA	oril 19, 2024 by	But it's an ethical requirement, and helps improve everyone's experience
Review quality is important than courteous tone	Statements on how an higher quality review is more important than a courteous review	NA	NA	guest.	Would you rather be tree by skilled, but rude, surg or by a courteous flop?
Useful for authors	Statements on the usefulness of the item for the authors	NA	NA	Protected by copyright.	The reviewer's aim shou to give comments that m the next version of the

BMJ Open			P	
			n-2019-03	
			004 on 8 J	manuscript better (whether or not it is accepted for that specific journal)
Wording of the item	Statements on how to improve the wording of the item	Difficult to define	NA 62020.	It is impossible to define 'courteous' so I doubt that this is operationalisable
	Or h		fwnloaded f	
		er reviev	6/bmjopen-2019-035504 on 8 June 2020. Downloaded from http://bmjopen.bmj.com/ on April 19, 2024 by gues	
			njopen.bmj:	
			com/ on Apr	
			ii 19, 2024 t	
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Codebook 3. Identificatio	n of new items to assess pee	er review report quality lentification of new items to assess p	eer review report quality	
		(n=152)		
Theme	Definition	Code	Sub-code NO	Example
Characteristics of reviewer's comments	Statements on the characteristics of the comments made by a peer reviewer	Clarity	Clarity of the expected changes	Being clear about the change they want to see (vs. vague comments about weaknesses what would most strengthen)
		Peer -	Clarity of the language	The peer review report should be comprehensive and written clearly. It should not be ambiguous.
		Constructiveness	NA NA	Constructive attitude should include orientation and suggestion to authors to improve the manuscript.
		Detailed	NA April 19, 2024	Specific details for concerns and suggestions for improvement are the keys for me. I need substantive concerns.
		Evidence-based	NA by gues	A good peer-review report also includes references
		Fairness/Unbiased	NA Protected by copyright.	The comments should not onl be fair, but also unbiased.
		Specificity	NA e	<i>I think that the challenge is</i> <i>that the comments are contex</i>

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		BMJ Open		illand	
				n-2019-03	
				6/bmiopen-2019-035804 on 8 June 2020	specific. Reviews are helpful when they identify something that is a challenge or something that can be done better. These rely upon the context.
	6	Structure of the peer review report	Additional comment editor		Provides additional comment to the editor that provides context to the reviewer's assessment.
		Deer review	Explicit recommenda	fram http://bmiopen.bmi.com/	The reviewer makes an explicit recommendation about what decision to make- i.e., "reject", "revise and re- review", "accept", etc.
		erien	Initial summary	5	The reviewer should begin he report with a short synthesis the study (goals and main results)
			Length of comments-	April 19, 2024 by quest	Length, very short peer review reports make me suspicious that they have even read the paper in enough detail. E.g. I once received a peer review "report" that had a single sentence along the lines of: "Good methods and results".
		Tone	NA	Protec	Candid
Related to peer review process	General statements on the peer review process	Anonymity _PR process type	NA		Reviewers and authors should be anonymous on both sides
				Protected by copyright	

Page 117 of 127	BMJ Open	66/bmjope	
1 2 3		6/bmjopen-2019-035	
4 5 6 7 8 9 10 11 12 13	Dependency on the type of journal	NA on 8 June 2020. Downlo	Reviewers should understand the nature of the journal that the manuscript had been submitted to - and should be prepared to state if he / she thinks the paper is not appropriate or relevant to that journal's readership.
13 14 15 16 17 18 19 20 21 22 23 24 25 26 27	Disclosure of reviewer's COI	NA on 8 June 2020. Downloaded from http://bmjopen.bmj.com/ on Ap	Conflict of interest. We often can tell that the journal has sent our paper to a reviewer who will not be objective in their review, and sometimes even when we've asked the editor to not use a particular reviewer. Editors have an obligation to insure a fair review, and often they do not. In these instances, the outcome is a foregone conclusion
28 29 30 31 32 33		Requests motivated by reviewer's COI 90 2024 by gg Reviewer's publication	The reviewer does not makerequests that seem to bemotivated by a competitiveattitude or a conflict ofinterest.Publication record of the
34 35 36 37 38	Editor's responsibility	Balanced and fair decision	reviewer Editor' decisions should also be balanced and fair, especially when reviewing are
39 40 41 42 43 44 45	For peer review only - http://bmjopen.bmj.com/site/al	bout/guidelines.xhtml	

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			019-035604 on 8	discordant Editors should also read papers
		Filtering reviews	June 20	<i>Editors need to protect authors from poor reviewers.</i>
6	High profit of scientific publishing industry	NA	20. Downloaded from	The scientific publishing industry makes very high profits, in fact it is the most profitable "legal business model" among all economic activities.
	Peer reviewers' training	NA	n http://bmjo	A good reviewer needs to be trained: should be important to organize courses
	Poor quality of the second review	NA	pen.bmj.co	Completion of a second revie after the first draft-this is ofte poorly done
	Quality scale	NA	m/ on April 19,	It might be helpful to conside one of the research quality ratings scales that are used is quantitative reviews.
	Review quality as usefulness to make an editor's decision	NA	8 June 2020. Downloaded from http://bmjqpen.bmj.com/ on April 19, 2024 by guest. Protected by copyright.	The quality of a peer-review report that an author receiver is partially determined by what the editors contribute to it before sending it to the author and how quickly they use it to make a decision. Too many don't send enough feedback, especially when tw

Page 119 of 127	7 BMJ Open				
1 2 3			oen-2019-03		
4 5 6 7 8 9 10 11 12			6/bmjopen-2019-035604 on 8 June 2020. Dow	This leads to three, four, or more back-and-forth "reviews" where reviewers are trapped in a cycle of disagreement and the editors won't make any significant contributions or a decision to resolve the disagreement.	
13 14 15 16 17 18 19	0	Reviewer as unpaid extra job	Downloaded from http://b	Reviewers are scientists that perform a professional service for the scientific publishing industry that in the vast majority of the cases is not paid.	
20 21 22 23		Reviewer's final choice	Difference between majo and minor revisions	or Always a grey area between Major revisions and Minor revisions that foxes a reviewer	
24 25 26 27 28 29		en	Explanation choice om/ on April 19, 20	If the reviewer makes a recommendation, e.g. accept or reject, they must provide a reason why. A review that just says "accept", "good work", is not a valid peer review.	
30 31 32 33 34 35 36		Reviewer's recognition	Professional evaluators b publishers b Guest Potect Rewards for reviewers	by Alternatively, publishers may turn to "professional evaluators", who they may find in consultancy firms (KPMG, McKinsey, etc.) and pay their fees	
37 38			Rewards for reviewe	Payment for the reviewers should be considered, and this	
39 40 41 42 43 44 45	For peer	review only - http://bmjopen.bmj.com/site/about	by copyright. t/guidelines.xhtml		

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			6/bmjopen-2019-035604 on	
			604 on 8	
	6	Saturation of the system	Professional evaluators publishers 2020. Downloaded from http://b	by So far reviewers are working "pro bono", and with the
		Scope of review	NA mjopen.bmj.com/ or	The number of items listed i. factor. If too many and in to minute detail, the article cou be suppressed by the sheer workload of trying to addres the comments
		Weighting reviewer's comments	NA April 19, 2024	It is important for the ae to weight reviewers comments some are rubbish and can be disregarded
Related to the study	Statements on different aspects of a study that should be commented in	About references	Suggesting relevant & references	Including references not
	a peer review report	Addressing study's aims	NA Protected by copyright.	
			copyright	

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2 3			e1-20 19-00	
4 5 5 7		Adherence to ethical guidelines	NA C	Comment on the study's adherence to ethical guidelines
8 9 10 11 12		Appendices	NA a	Use of supplemental material/appendices when appropriate (e.g., sensitivity analyses)
13	` O	Applicability of the study	NA G	And general applicability
14 15 16 17 18 19 20 21 22 23 24 25 26 27		Authors' contribution and acknowledgments	NA NA NA NA NA NA NA NA NA NA NA NA	Clearly articulate the role of every team member, and their contribution to the study. For evidence syntheses, require librarian involvement and give them authorship, the same with statisticians. Everyone in the team, without whose knowledge the study would not be possible, sound, or complete, should be acknowledged.
27 28 29		Context of the study		
30 31 32 33		Data availability and software	NA +	Referees check the data availability and if new software actually works
34 35 36		Data quality	- NTA	
37 38		Ensuring disclosure of COI	NA GO	Conflict of interests could be included
39 40 41 42 43	For por	r review only - http://bmjopen.bmj.com/site/abo	ut/quidelines vhtml	

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	6/bmjopen-2019-03560-	
Ensuring inclusion of data sharing statements	NA on 8 June	Reviewers should ensure data sharing statements are included
Ensuring language quality	NA 2020.	Comment on readability
Ethics	NA Downlo	Ethical considerations of research
Importance of methods	NA Downloaded from http://www.loaded.com/htt	Perhaps reviewing upto methods and evaluating the study that way is worth more consideration.
Literature is adequately reviewed	Most recent research mjopen.bmj NA on on April	Reviewer rating of whether The authors discuss the most recent relevant research on the topic
Originality	NA on	The added value of the study to what is already known.
Potential impact	NA April	Potential impact of study
Presentation (tables and figures)	NA 9, 2024 by NA 9, 2024 by	And appropriateness of accompanying visual aids (graphs, tables e.t.c.).
Publication study's protocol and deviation from it	NA NA NA	Whether a protocol was lodged in publication or on an independent site e.g. OSF and whether it matches the paper and if not, if reporting of deviations is transparent.
1	/ copyright.	I

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			6/bmjopen-2019-035	
	Relevance	NA	5604 0	relevance
	Replicability/Reprod	ucibility NA	on 8 June 2020. D	Whether the study can be replicated on current methods whether limitations are acknowledged (this was covered actually I think)
	Study conclusions	NA	ownloaded from	And finally if the conclusion answers the research question.
	Study introduction	NA	ed from h	If the in introduction leads to the research question
	Study limitations	NA	http://bmjq	Whether limitations are acknowledged
	Study theoretical fram	mework NA	ppen.bmj	Logic of the theoretical framework
	Study weaknesses	NA	.com/ on	<i>Reviewer comments on the limitations of the study</i>
	Suggestions for futur	re studies NA	April	Suggestions for future studies
Reviewer's expertise	Considering reviewe	r's expertise NA	19, 2024 by guest	I have experienced vastly different qualities of reviews, so I think that the reviewer's expertise in the area of the article needs to be considered.
	Focus on the points s	suggested by editor NA	t Protected I	Suggestions from editor re: which points/themes to focus on
i	i		by copyright.	

	BMJ Open	oor projection oor projection	Pa
	Knowing dimensions not assessed by reviewers		What the reviewer feels they cannot comment on (e.g. is outside their expertise)
	Rating or commenting on own level of expertise		The reviewer should state those aspects of the study for which they have limited knowledge
	Reviewer's type	NA NA NA NA NA NA NA NA NA	Items need to be tailored for whether the reviewer is a stats (methodology) reviewer or clinical expert
NA= not available	er rei		
		r. Protected by copyright.	
For peer	review only - http://bmjopen.bmj.com/site/abou		

New items	Example
1. Adherence to ethical guidelines	"Comment on the study's adherence to ethical guidelines"
2. Author's contribution and acknowledgements	"Clearly articulate the role of every team member, and their contribution to the study. Fo evidence syntheses, require librarian involvement and give them authorship, the same with statisticians. Everyone in the team, withou whose knowledge the study would not be possible, sound, or complete, should be acknowledged."
3. Data availability and software	"Referees check the data availability and if new software actually works"
4. Disclosure of COI	"Conflict of interests could be included"
5. Data sharing statements	"Reviewers should ensure data sharing statements are included"
6. Study protocol	"Whether a protocol was lodged in publication or on an independent site e.g., OSF and whethe it matches the paper and if not, if reporting of deviations is transparent."
7. Addressing study aims	"I think the 'does this study address its stated aims' issue that I raised in my earlier responses is very important"
8. Study introduction	<i>"If the in introduction leads to the research question"</i>
9. Study limitations	"Whether limitations are acknowledged"
10. Study conclusion	"And finally if the conclusion answers the research question."
11. Theoretical framework	"Logic of the theoretical framework"
12. Relevant literature	"Reviewer rating of whether The authors discuss the most recent relevant research on the topic"
13. Reproducibility	<i>"Whether the study can be replicated on currer methods"</i>

Supplementary file 6. New items suggested by survey participants

Supplementary file 7. Explanations of the items included in the ARCADIA tool

Domain 1: Importance of the study

Item 1.a Contribution

A study can contribute to scientific knowledge in many ways: it can be a novel or confirmatory study with little or great impact on society and/or the research community. The contribution of a study is therefore not only associated to its novelty. Studies also need to be replicated in order to verify the validity of their results. The peer reviewer should discuss the importance of the study's research question.

Item 1.b Relevant literature

The peer reviewer should check if the authors reviewed the relevant research related to the study's topic in order to situate the study within the context of the existing literature.

Domain 2: Robustness of the study methods

Item 2.a Study methods

The peer reviewer should evaluate the soundness of the study methods, such as the selection of the study design, assessment of the risk of bias, etc., to understand whether the methods were appropriate to the study's aims, as well as if they were properly used and reported.

Item 2.b Statistical methods

Data can be analysed in many ways, but the only appropriate statistical models are those that fit well with the study design and the characteristics of the variables. The peer reviewer with expertise in statistics should assess whether or not the study followed a suitable statistical procedure, as well as if they were correctly conducted and reported. A reviewer should clearly state if she/he is qualified to review the statistics of a study.

Domain 3: Interpretation and discussion of the study results

Item 3.a Study conclusions

The reviewer should verify if the conclusions answer the research question(s) and correctly summarize the study results.

 The reviewer should check if the weaknesses of the study are correctly identified and discussed in order to interpret the validity of the research.

Item 3.c Applicability and generalizability

The reviewer should comment on the applicability and generalizability of the study results. Applicability and generalizability are two underlying concepts of external validity [1]. The first concerns how "the results from a sample can be extended to the population from which the sample was drawn", while the second how "the inferences drawn from study participants can be used in the care of patients drawn from any populations" [1].

Domain 4: Reporting and transparency of the manuscript

Item 4.a Study protocol

Public access to study protocols is important to increase transparency and reduce waste of biomedical research. In the case of previous publication and/or inclusion as an additional file of a study protocol, the reviewer should verify that the major deviations from it are reported in the manuscript.

Item 4.b Reporting

The reviewer should comment if the reporting of the study is clear, complete and transparent enough for facilitating its reproducibility by verifying the adherence of the manuscript to the corresponding reporting guideline. The Enhancing the Quality and Transparency of Health Research (EQUATOR) Network provides a toolkit to be used during the peer review process for selecting the appropriate reporting guideline [2].

Item 4.c Presentation and organization

The reviewer should discuss the quality of the written language used in the manuscript, as well as of how the study results (tables, figures, etc.) are presented.

Item 4.d Data availability and software

When applicable, the reviewer should ensure that the study data and materials are available and the software work as indicated.

Domain 5: Characteristics of the reviewer's comments

Item 5.a Clarity

A peer review report should be clear, succinct and well organized in order to be understood correctly by editors and authors.

Item 5.b Constructiveness

A peer review report should contain constructive and polite comments that allow the authors to improve the quality of their work.

Item 5.c Objectivity

Comments provided in a peer review report should be as objective as possible and, if considered appropriate, include references to support the reviewer's statements.

References

1. Murad MH, Katabi A, Benkhadra R, Montori VM. External validity, generalisability, applicability and directness: a brief primer. BMJ Evid-Based Med. 2018;23(1):17–9.

2. EQUATOR Network. Welcome to our toolkit for peer reviewing health research! [Internet]. Available from: https://www.equator-network.org/toolkits/peer-reviewing-research/

BMJ Open

The development of ARCADIA: a tool for assessing the quality of peer review reports in biomedical research

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Secondary Subject Heading:	Research methods, Epidemiology
Keywords:	STATISTICS & RESEARCH METHODS, EPIDEMIOLOGY, PUBLIC HEALTH, Protocols & guidelines < HEALTH SERVICES ADMINISTRATION & MANAGEMENT
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The development of ARCADIA: a tool for assessing the quality of peer review reports in biomedical research

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Abstract

Objective: To develop a tool to assess the quality of peer review reports in biomedical research.

Methods: We conducted an online survey intended for biomedical editors and authors. The survey aimed to 1) determine if participants endorse the proposed definition of peer review report quality; 2) identify the most important items to include in the final version of the tool; and 3) identify any missing items. Participants rated on a 5-point scale whether an item should be included in the tool and they were also invited to comment on the importance and wording of each item. Principal component analysis (PCA) was performed to examine items redundancy and a general inductive approach was used for qualitative data analysis.

Results: A total of 446 biomedical editors and authors participated in the survey. Participants were mainly male (65.9%), middle-aged (mean=50.3, SD=13) and with PhD degrees (56.4%). The majority of participants (84%) agreed on the definition of peer review report quality we proposed. The 20 initial items included in the survey questionnaire were generally highly rated with a mean score ranging from 3.38 (SD=1.13) to 4.60 (SD=0.69) (scale 1 to 5). Participants suggested 13 items that were not included in the initial list of items. A steering committee composed of five members with different expertise discussed the selection of items to include in the final version of the tool. The final checklist includes 14 items encompassed in five domains (Importance of the study, Robustness of the study methods, Interpretation and discussion of the study results, Reporting and transparency of the manuscript, Characteristics of peer reviewer's comments).

Conclusion: ARCADIA tool could be used regularly by editors to evaluate the reviewers' work, and also as an outcome when evaluating interventions to improve the peer review process.

Words count: (abstract: 290, word limit: 300), (main text: 4015, word limit: 4000), 4 tables, 1 figure, 1 web application, 7 supplementary files

Keywords: Peer review, Report, Checklist, Quality control, Survey

Strengths and limitations of this study

- ARCADIA constitutes the first tool that has been systematically developed to assess the quality of peer review reports.
- Its development is based on an exhaustive review of the literature and on empirical data from a large and heterogeneous sample of both biomedical editors and authors.
- The majority of editors and authors were from Europe and North America, which may limit the generalizability of the results.
- ARCADIA has not yet been validated.

For peer review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml

Background

Editorial peer review stands as the gateway to scientific publication. The process was established to ensure that research papers are vetted by independent experts before they are published, although it is recently being increasingly questioned due to beliefs that it is flawed [1,2]. Despite efforts over the last 30 years to "make peer review scientific", its impact is still considered suboptimal [3].

Peer reviewers, who are the pivotal actors in this process, are requested to write a review report evaluating the submitted manuscript. A peer review report helps authors improve the quality of their manuscripts, and it also helps editors make an informed decision about the outcome of the manuscript. However, evidence shows that these peer review reports are often of poor quality [4,5].

Tools for assessing the quality of peer review reports have been proposed, of which we have conducted a systematic review and identified 24 tools: 23 scales and 1 checklist [6]. However, none reported any definition of peer review report quality, only one described the scale development, and 10 provided measures of reliability and validity. Further, the development and validation process resulted from a small consensus of people, and the concepts evaluated by these tools were quite heterogeneous.

In 2016, Bruce et al. published a review evaluating the impact of interventions to improve the quality of the peer review process [5]. The authors showed that it is essential to clarify the outcomes (such as, for example, the quality of peer review reports), which should be used in randomized controlled trials to evaluate these interventions.

A validated tool is direly needed to clearly define the quality of a peer review report in biomedical research. This tool could be used regularly by editors to evaluate the reviewers' work, and also as an outcome when evaluating interventions to improve the peer review process. In the present study, we report on the development of a new tool to assess peer review reports in biomedical research.

Methods

 The study was approved by the Research Committee of the Governing Council of the Universitat Politècnica de Catalunya, Barcelona Tech, Spain (Reference: EC 02, Date: 02/05/2018).

Steering committee

We formed a steering committee of five members (CS, DH, AR, IB and JAG), whose expertise include clinical epidemiology, biostatistics, social science and editorial peer review. The steering committee agreed on how to define peer review report quality; they agreed on the survey questionnaire based on the results of a previous systematic review [6]; they interpreted the results of the survey; and they agreed on the final version of the tool.

Defining the tool's objective

The tool aims to assess the quality of peer review reports in biomedical research. We defined the quality of a peer review report as "the extent to which a peer review report helps editors make a fair decision and authors improve the quality of the submitted manuscript".

Generating the items

A systematic review allowed the identification of 24 tools, aimed at assessing the quality of peer review reports [6]. We extracted 132 items from such tools. After removing the redundant items, we obtained 17 items. We then eliminated two items and incorporated five new ones that met our definition of peer review report quality, after piloting the survey questionnaire and discussing with the steering committee. Overall, 20 items were identified to assess peer review report quality (Table 1).

Survey

We conducted an online survey of editors and authors in order to: 1) determine if they endorse the proposed definition of peer review report quality; 2) identify the most important items to include in the final tool; and 3) identify any new items that should be included.

Survey questionnaire

The questionnaire was constructed using the online survey software SurveyMonkey [7]. It was structured into four main parts and included both open and multiple-choice questions. First, the participants were asked to agree ("yes/no/partially") on the definition we provided for peer review report quality. They were also invited to add any comments or ideas on how to improve the

definition. Second, they were asked to rate the importance of the 20 items for assessing the quality of peer review reports we identified. Their responses were based on a 1–5 Likert scale (1 being not important and 5 very important). In particular, we asked the participants if the item should be included in a tool for assessing the quality of peer review reports. Moreover, they were invited to comment on the importance and wording of each item. In order to eliminate the question order effect, the items appeared in random order for each respondent. Third, the participants were invited to suggest any additional items missing that they considered important for assessing the quality of peer review reports. Finally, the questionnaire included nine demographic questions related to sex, age, education level, job title, referring institution and job experience as biomedical editor and/or author. We developed two versions of the questionnaire because biomedical editors and authors were recruited differently, despite the fact that some of them could play both roles (see Supplementary file 1). The two versions were structured in the same way; they only differed in some questions related to the demographic characteristics. The questionnaire was piloted among six experienced scientific editors and authors, followed by a subsequent revision based on their feedback.

Participants and recruitment strategy

We targeted biomedical editors and authors using a purposive sampling approach to recruit a heterogeneous sample of information-rich cases [8].

Biomedical editors

By means of standardized email, we invited two groups of editors to participate in the survey: 586 biomedical editors from 43 journals in the BMJ Publishing group; and 478 editors from 235 journals identified in a previous cross-sectional bibliometric study [9] (see Supplementary file 2). The survey was also distributed to 27 editors from 48 journals in BMC (part of Springer Nature), using internal email, and to members of the European Association of Science Editors (EASE) through their newsletter. In the invitation email and newsletter, the editors were encouraged to forward the survey to colleagues who might be interested in issues related to peer review. This recruitment strategy, known as snowballing, allowed us to identify "information-rich key informants" among biomedical editors [8]. On the first page of the survey, participants were informed that the collected data would be anonymous, and they were further asked if they would agree to share their de-identified data in an open access repository. Two reminder emails were sent to non-respondents. Finally, the survey was promoted on Twitter and on the EASE blog [10] and Methods in Research on Research (MiRoR) [11] websites.

Authors

 Searching the top 30-biomedical journals with the highest impact factors, we identified 4396 corresponding authors of articles that reported original research and which were published in Medline between February 1 and October 31 2018 (see Supplementary file 3). We used the R package easyPubMed to extract the email contacts [12]. The corresponding authors received a standardized email that explained the purpose of the study and included a link to the survey (see Supplementary file 2). The first page of the survey informed participants that the data were collected anonymously and also asked if they would agree to share their de-identified data in an open access repository. Two reminder emails were sent to non-respondents.

We did not use a snowballing strategy to recruit authors. However, since the survey directed to biomedical editors was promoted on Twitter by different users who sometimes did not provide thorough instructions, we included in the first page of the survey, also the link to the questionnaire addressed to authors. This was done so that a researcher, who was not an editor and mistakenly opened the link to the survey questionnaire, was still able to participate to the study as biomedical author.

Data analysis

We described the demographic data in terms of frequencies and percentages. The importance of the 20 items to assess peer review report quality is described in means and proportions of editors or authors who rated the importance of the items from 1 to 5. The items were also sorted according to the mean raking of all participants and either editors or authors. We also calculated Pearson correlations among items. The calculations and graphical representations were all obtained using the statistical software R 3.5.0 [13].

Principal component analysis of quantitative data

We conducted a principal component analysis (PCA) to examine item redundancy among the 20 items to assess peer review report included in the survey. PCA is a multivariate statistical technique used to reduce the number of variables in a dataset to a smaller number of dimensions [14]. The new dimensions (or *principal components*) are mutually independent and are determined by choosing the directions that explain the most variation in the data. The first principal component (PC1) accounts for the largest possible variance in the data, and each succeeding PC accounts for decreasing amounts of the remaining. This exploratory analysis helps reveal simple underlying structures in complex datasets. We performed PCA using the R package FactoMineR [15].

Inductive content analysis of qualitative data

We used a general inductive approach for qualitative data analysis. In particular, we followed the five steps of inductive analysis proposed by David R. Thomas: 1) Preparation of raw data files; 2) Close reading of text; 3) Creation of codes; 4) Overlapping coding and uncoded text; 5) Continuing revision and refinement of themes system [16]. In the third phase, two investigators (CS and DB) created independently the initial codes from the responses of the first 100 participants for each open-ended question. In order to ensure consistency and credibility, the initial codes were discussed with a third investigator (DH) and a codebook was developed and was used for analysing the remaining responses. In case new codes were successively created from the remaining responses, the emerging codes were added to the codebook and applied to entire dataset. Two investigators (CS and DH) reviewed and refined the codebook and further clustered the codes into major themes. We used the software NVivo V.12 for data management and analysis [17].

Selecting items

The steering committee reviewed all items and, ultimately, drafted and refined the final version of the tool. Based on the participants' qualitative and quantitative answers, redundant items were combined, existing items were modified and/or expanded on, and new items proposed by survey participants were added.

Patient or public involvement

Patients and members of the public were not involved in the study.

Results

Participants

Between November 7 2018 and February 4 2019, 198 biomedical editors and 248 authors completed the survey. Of the 1134-biomedical editors and 3633 corresponding authors invited via email, 89 (7.8%) and 238 (6.5%) completed the survey, respectively. In addition, 109 editors and 10 authors completed the survey using the web link.

Participants were mainly male (263/399, 65.9%) with a PhD degree (225/399, 56.4%), and their ages were equally distributed across ranges (mean=50.3, SD=13). They were mainly located in Europe (219/389, 56.3%) and North America (118/389, 30.3%). More than half of the editors had work experience of more than 5 years (91/165, 55.2%), while over one-third of the authors had

work experience of more than 20 years (84/224, 37.5%) (see Table 2). Editors were mainly associate editors (63/165, 38.2%) and editors in chief (50/165, 30.3%), primarily involved in making decisions on the submitted manuscripts (144/165, 87.3%). Most of them worked in specialty journals (126/165, 76.4%) and they were used to contribute as authors in scientific papers (141/165, 85.5%). The corresponding authors were mainly professors (63/224, 28.1%), but also PhD students, postdocs or lecturers (49/224, 21.9%) or researchers (47/224, 21%). The majority of them worked in public universities (134/224, 59.8%) and they were not employed as editor (161/224, 71.9%) in biomedical journals. Among those who also work as biomedical editors (63/224, 28.1%), 88.9% of them are involved in making decision on the manuscript (Supplementary file 4).

Definition of peer review report quality

Overall 84% (362/431) participants, precisely 85% (160/188) editors and 83% (202/243) authors, agreed on the definition of peer review report quality that we provided in the survey. The definition was slightly modified to take into account participants comments (Supplementary file 5). The quality of a peer review report is now defined as "the extent to which a peer review report helps, first, editors make an informed and unbiased decision about the manuscripts' outcome and, second, authors improve the quality of the submitted manuscript".

Quantitative results

We created a web application that is publicly available at <u>https://www-eio.upc.edu/redir/ReportQuality</u>. Through the application, the readers can easily access and explore the quantitative results of the survey.

Rating the importance of items

The items were generally highly rated, with a mean score ranging from 3.38 (SD=1.13) to 4.60 (SD=0.69). All the items were scored 4 or 5 by >50% of the participants (see web application). The three items rated as the most important were: 1) *Knowledgeability*; 2) *Methodological quality*; and 3) *Fairness*. The three least important items were: 1) *Originality*, 2) *Presentation and organization*; and 3) *Adherence to RG*.

A peer review report aims to help authors improve their submitted manuscripts and assist editors in taking editorial decisions. Due to this dual objective, we compared editors' and authors' mean

scores in order to investigate whether any difference is found in their perceptions regarding the importance of the 20 items that assess peer review report quality. We found little discrepancy in the mean scores between biomedical editors and authors, with only two items indicating any difference: 1) *Timeliness* and 2) *Detail/Thoroughness*. The *Timeliness* of the peer review report was considered more important to authors than to editors (respectively, in the 12th and 16th rank positions). Meanwhile, editors rated the *Detail/Thoroughness* of the reviewer's comments higher than did authors (respectively, in the 11th and 16th rank positions).

Correlations among items

Overall, we found relatively weak positive correlations among items. The largest positive correlations were found between *Relevance* and *Originality*, and between *Fairness* and *Objectivity* (r = 0.55 and 0.43, respectively).

Principal Component Analysis

The first principal component (PC1) accounted for 22.1% of data variability. The next two dimensions (PC2 and PC3) accounted for 38.5% of the cumulative variability and contributed gradually, that is, they increased at only small increments. PC1 was positively correlated to all items (or variables), and it showed correlations higher than 0.4 —which is the figure commonly used as a threshold reference for factor loadings — for 16 out of 20 items (see web application). These results illustrate that the data variance was not concentrated in a few components but distributed across all of them; hence, reducing the number of items is not recommended, since this would imply an important loss of data information.

The study of the supplementary variables did not reveal any differences between authors and editors in terms of items rating. However, we found that female participants above the age of 55 years old generally provided higher rating for the items, compared to younger male participants.

Qualitative results

Comments on importance and/or wording of items

Out of 446 survey participants, 267 (59.9 %) made at least one comment on the importance and/or wording of the items. Based on the initial coding of the comments, we were able to identify eight general themes that they addressed: Peer reviewer; Wording; Importance; Dependency; Responsibility; Item; Structure and content; and Improvement. Table 3 reports the eight themes

together with their definition and the most frequent codes (n>5), with example quotes. The entire codebook is found in Supplementary file 5.

New items

Participants suggested 13 items that were not included in the initial list of items. These items are listed in Supplementary file 6. The entire codebook is found in Supplementary file 5.

Steering committee meeting

The steering committee met on the 19/07/2019 to discuss the selection of items to include in the final version of the tool. Their decisions were based on the participants' quantitative and qualitative answers. The flow of the items is summarized in Figure 1.

The items *Relevance* and *Originality* were merged into a new item named *Contribution* (of the study). This decision was based on the high positive correlation found between the two items (0.55) and on the participants' opinions. Furthermore, participants suggested in their comments that the item *Relevance* was "*highly subjective*", because "*each reviewer's decision on relevance reflects* what is relevant to them, which may not reflect relevance to the journal". They also believed that the *Originality* of a study is not always an important aspect for comments in a peer review report, because some manuscripts "*are trying to duplicate findings from previous studies*". They therefore suggested reformulating the two items by asking the reviewer what the study "*adds to our knowledge*".

The steering committee decided to include the item *Interpretation of results* as a domain of the tool instead of a single item, changing the name into *Interpretation and discussion of the study results*. This decision resulted from the addition of two new items (*Conclusions* and *Limitations*), based on the suggestions of survey participants. The domain *Interpretation and discussion of the study results* now encompasses three items: 1) *Study conclusions*; 2) *Study limitations and* 3) *Applicability and generalizability*.

Overall, survey participants believed that the items *Strengths and weaknesses (general)* and *Strengths and weaknesses (methods)* were "confusing to separate". Additionally, the steering committee agreed that *Strengths and weaknesses (methods) and Methodological quality* were also redundant; thus, it was ultimately decided to merge the three items into a new item named *Study methods*.

The items *Objectivity* and *Fairness* were merged because of both the moderate correlation between them (0.43) and the participants' opinions. Participants suggested that the total objectivity of the reviewer's comments is not possible because "*all decisions contain some personal biases and subjectivity*" and they also believed that the term fairness was "*very subjective*" and difficult to define. Additionally, the steering committee agreed to also combine these two items into *Supported by evidence*. The committee finally decided to merge all three items into *Objectivity*, and this was defined as "comments provided in a peer review report should be as objective as possible and, if considered appropriate, include references to support the reviewer's statements".

The steering committee agreed to merge *Structure of reviewer's comments* and *Clarity*, because participants considered both important for making the peer review report easy "to read for both editors and authors". Moreover, participants suggested that the *Detail/Thoroughness* of a peer review report was mostly associated with the quality of a manuscript, because in certain occasions a study can be so poorly conducted that "a reviewer can highlight one or two major methodological *flaws*" without conducting a detailed review. They therefore believed that a detailed report is not "always necessary" and instead preferred a succinct report that "cuts straight to the critical points". Taking into account the participants' opinions, the steering committee finally decided to include a single item named *Clarity*, which is defined as "a peer review report should be clear, succinct and well organized in order to be understood correctly by editors and authors".

The items *Tone* and *Constructiveness* were merged into *Constructiveness*, which is defined as "a peer review report should contain constructive and polite comments that allow the authors to improve the quality of their work". This decision was based on the participants' opinions that "*the comments should be polite and constructive*".

The item *Adherence to RG* and the new item *Reproducibility* suggested by survey participants were merged into *Reporting* based on the steering committee decision. The item *Reporting* was defined as "the reviewer should comment if the reporting of the study is clear, complete and transparent enough for facilitating its reproducibility by verifying the adherence of the manuscript to the corresponding reporting guideline."

The items *Timeliness* and *Knowledgeability* were not included in the final version of the tool. Survey participants suggested that *Timeliness* was not "*directly tied to review quality*" because *"some of the best reviews come in past the deadline"*. Furthermore, the steering committee agreed that the item *Knowledgeability* was generally difficult to assess, because it implied that anyone using the tool would have enough competence to evaluate the reviewer's knowledge and expertise. Five new items suggested by survey participants (*Data availability, Study protocol, Study conclusions, Study limitations* and *Relevant literature*) were finally included in the tool.

The ARCADIA tool

The ARCADIA (Assessment of Review reports with a Checklist Available to eDItors and Authors) tool was finally developed. The tool is a checklist that includes five domains and 14 items (Table 4). Brief explanations of the items included in the five domains are provided in Supplementary file 7.

Discussion

This study resulted in a checklist of items to assess the quality of peer review reports in biomedical research. The checklist constitutes the first tool that has been systematically developed to assess the quality of peer review reports.

The checklist is simple, applicable to any biomedical field, and consists of five domains covering 14 items, each of which is phrased as a question. Each item should be ticked as 'Yes' or 'No'. An item could be also checked 'NA' if it is not covered in the study (e.g., there are no data or other materials attached to the manuscript) and/or the peer reviewer is not qualified to comment on that specific aspect (e.g., statistical methods). The ARCADIA tool has several strengths. It is the first tool ever developed based on an exhaustive review of the literature [6] and on empirical data from a large sample of both biomedical editors and authors. Further, it is the only tool that clearly defines the quality of peer review reports, as its definition was based on the perspectives of 446 authors and editors.

To develop the tool, we recruited a large sample of biomedical editors and authors with varying experience and backgrounds. We found the percentage of female participants who took part in the survey to be quite low (129/399, 32.3%). This is in line with evidence showing that gender equity in academic medicine careers remains far behind [18]. Moreover, we recruited corresponding authors (who are usually first authors) from the top 30 biomedical journals. Evidence also shows that

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women are underrepresented as first authors among biomedical journals with high impact factors [19].

Overall, we did not find any differences between authors and editors in terms of item rating by conducting PCA. Only two items, *Timeliness* and *Detail/thoroughness*, presented a difference according to the separate mean score rankings of authors and editors. Timeliness was considered more important for authors and this could be justified by the fact that authors are usually more interested in receiving decisions about their manuscript as soon as possible. Whereas, editors rated *detail/thoroughness* as more important to them, given thorough and detailed peer review reports help them make a better editorial decision on any given manuscript.

The present study also has some limitations. The survey questionnaire included some open-ended questions, which allowed participants to voluntarily express their opinions. However, we were not able to inquire further to clarify and verify some information provided by the study's participants. Therefore, the interpretation of some information could be affected by the perception of the three investigators who conducted the qualitative analysis. Additionally, since participants could comment voluntarily on the importance and wording of each item, the number of comments among items differed greatly. Furthermore, the majority of editors and authors were from Europe and North America, which may limit the generalizability of the results. This result may be due to the recruitment strategy we used, especially to identify biomedical editors. Although we also utilized a snowballing strategy, we mainly contacted editors through European biomedical journals. Finally, the present study reports on the first version of the ARCADIA tool, which has not yet been validated.

Implications

The tool is a general checklist available to all biomedical editors and authors. It could be regularly used by editors to evaluate the reviewers' work, and it can also be used as an outcome when evaluating interventions in order to improve the peer review process.

Conclusions

ARCADIA is the first checklist that has been systematically developed to assess the quality of peer review reports. It is based on the perspectives of a large and heterogeneous sample of biomedical editors and authors. Our plans for future work are to validate the ARCADIA tool.

Figure caption: Flowchart of items to include in a checklist to assess the quality of peer review reports

Abbreviations: ARCADIA: Assessment of Review reports with a Checklist Available to eDItors and Authors; EASE: European Association of Science Editors; EQUATOR: Enhancing the Quality and Transparency of Health Research; MiRoR: Methods in Research on Research; NA: Not Applicable; PC1: First principal component; PCA: Principal component analysis; RG: Reporting guidelines

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analysis and created the web application. CS, DB and DH conducted the qualitative analysis. CS, DH, AR, IB and JAG formed the steering committee. CS led the writing of the manuscript. IB and JAG led the supervision of the manuscript preparation. All authors provided detailed comments on earlier drafts and approved the final manuscript.

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Data availability statement: The dataset supporting the conclusions of the research reported in this paper will be available in the Zenodo repository in the Methods in Research on Research (MiRoR) community (<u>https://zenodo.org/communities/miror/?page=1&size=20</u>)

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Tables

Table 1. The 20 items to assess peer review report quality included in the survey

Labels	Items to assess PR report quality
Relevance	The reviewer comments on the relevance of the study
Originality	The reviewer comments on the originality of the study
Interpretation results	The reviewer comments on the interpretation of study results
Strengths and weaknesses	The reviewer comments on the general strengths and weaknesses of the study
(general) Strengths and weaknesses	The reviewer comments on the strengths and weaknesses of the study methods
(methods) Statistical methods	The reviewer comments on the appropriateness of the statistical methods
Methodological quality	The reviewer comments on the methodological quality (internal validity) of the study
Applicability and external validity	The reviewer comments on the applicability and external validity of the sturresults
Presentation and organization	The reviewer comments on the presentation and organization of the manuscript
Adherence to RG	The reviewer comments on the adherence of the manuscript to the reportinguidelines
Structure of reviewer's comms.	The reviewer's comments are structured and organized
Clarity	The reviewer's comments are clear and easy to read
Constructiveness	The reviewer's comments are constructive
Detail/Thoroughness	The reviewer's comments are detailed and thorough
Objectivity	The reviewer's comments are objective
Fairness	The reviewer's comments are fair
Support by evidence	The reviewer's comments are evidence based
Knowledgeability	The reviewer knows and understands correctly the content of the manuscript
Tone	The reviewer uses a courteous tone
Timeliness	The reviewer completes the peer review report on time

Table 2. S	Survey part	icipants' c	haracteristics
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Characteristics	Editors N=198	Authors N=248	Total N=446
Gender	N=169	N=230	N=399
Woman	46 (27.2%)	83 (36.1%)	129 (32.3%)
Man	121 (71.6%)	142 (61.7%)	263 (65.9%)
Other	2 (1.2%)	5 (2.2%)	7 (1.8%)
Age	N=156	N=220	N=376
<40	32 (20.5%)	71 (32.3%)	103 (27.4%)
41-50	29 (18.6%)	59 (26.8%)	88 (23.4%)
51-60	52 (33.3%)	37 (16.8%)	89 (23.7%)
>60	43 (27.6%)	53 (24.1%)	96 (25.5%)
Education	N=169	N=230	N=399
Bachelor Degree	4 (2.4%)	3 (1.3%)	7 (1.7%)
Master Degree	11 (6.5%)	20 (8.7%)	31 (7.8%)
PhD	107 (63.3%)	118 (51.3%)	225 (56.4%)
M.D. or equivalent	34 (20.1%)	76 (33.0%)	110 (27.6%)
Prefer not to answer	2 (1.2%)	1 (0.4%)	3 (0.7%)
Other	11 (6.5%)	12 (5.2%)	23 (5.8%)
Location journal/institution	N=165	N=224	N=389
Europe	132 (80.0%)	87 (38.8%)	219 (56.3%)
North America	23 (14.0%)	95 (42.4%)	118 (30.3%)
South America	2 (1.2%)	5 (2.2%)	7 (1.8%)
Africa	1 (0.6%)	1 (0.4%)	2 (0.5%)
Asia	3 (1.8%)	11 (5.0%)	14 (3.6%)
Australia	4 (2.4%)	25 (11.2%)	29 (7.5%)
Number of years of experience	N=165	N=224	N=389
<5 years	74 (44.8%)	36 (16.1%)	110 (28.3%)
6-10 years	46 (27.9%)	51 (22.7%)	97 (24.9%)
11-15 years	27 (16.4%)	34 (15.2%)	61 (15.7%)
16-20 years	7 (4.2%)	19 (8.5%)	26 (6.7%)
>20 years	11 (6.7%)	84 (37.5%)	95 (24.4%)

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Table 3. Survey participants' comments on the importance and/or wording of the 20 items to assess peer review report quality

Themes	Definition	Codes	Examples
Dependencies	Theme including codes on how the importance of an item depends on different factors (e.g., type of study, paper quality, type of journal, etc.)	Dependency on the type of study (n=34)	Depends on type of study. For systematic reviews of course fundamental. For other studies this will be more and more important for easier comparisons between studies and for quality improvement. It makes our work easier if the authors also compliance also improve
	or pe	Dependency on the paper quality (n=20)	This depends on the quality of the manuscript. Sometimes the quality is so low that a reviewer can highlight one or two major methodological flaws, which are sufficient to reject.
		Dependency on the type of journal (n=19)	This depends on the journal's criteria
		Dependency on the author's claim and impact of the study (n=7)	This depends on the claims made
Importance	Theme including codes on the importance (or not) of an item.	Importance of the item (n=43)	This is absolutely key to the interpretation of the study. Unfortunately most reviewers, in my field, do not fully understand current (and correct) methods.
		Importance of replication and conformation study (n=18)	Not always important to be original study as some are trying to duplicate findings from previous studies.
		Importance of perceptions, opinions and experience (n=14)	But some comments will inevitably be opinion, regarding emphasis, values, writing style
		Importance of a high quality review rather than on time review (n=13)	Better to have a late high quality report than a moderate quality report on time.
Improvements	Theme including codes on how an item is useful for both authors and editors in the peer review process.	Useful for authors and editors (n=21)	It's important to make it easy for the editor and authors to understand the review, and for authors to respond.
		Improving the manuscript (n=9)	Important when it will help improve the quality of the

			communication. Not necessary when it flows well.
		Avoiding exaggeration and misinterpretation (n=8)	This is an area where the reviewer may have a valuable role in tempering an author's enthusiasm, hubris or bias.
Item	Theme including codes on the characteristics of an item.	Related to other item (n=43)	Yes, but it is confusing to separate this from the general strength and weaknesses. The question should be if the reviewer thinks that the message ca (potentially) answer the research question.
	0	Subjective item (n=22)	Too subjective! What is relevant to one person of field could be totally not- relevant to another
	6	Requirement (n=9)	But it's an ethical requirement, and helps improve everyone's experience.
Reviewer	Theme including codes on the expertise and characteristics of a peer reviewer.	Reviewer's expertise (n=148)	Some reviewers know abo methods and some about content. It would be ideal always have both, but that often not the case.
		Impossibility to be totally objective (n=35)	100% objectivity doesn't exist
		Reviewer as an extra unpaid job (n=10)	For the most part, reviews are done on a voluntary basis
Responsibility	Theme including codes on the editor and/or author's responsibility to assess an item.	Editor's responsibility (n=48)	In my experience this is usually picked up by the Editors and Associate Editors rather than the reviewers.
		Joint responsibility (n=24)	I think this is the role of the editors as well as the reviewers.
		Author's responsibility (n=6)	Authors should already be doing this
Structure and content	Theme including codes on the structure and content of a peer review report.	Straight to the critical points (n=14)	Sometimes a succinct revisits is still helpful, if it cuts straight to the critical points. For example, if it is clear that a manuscript has major flaws, then a review

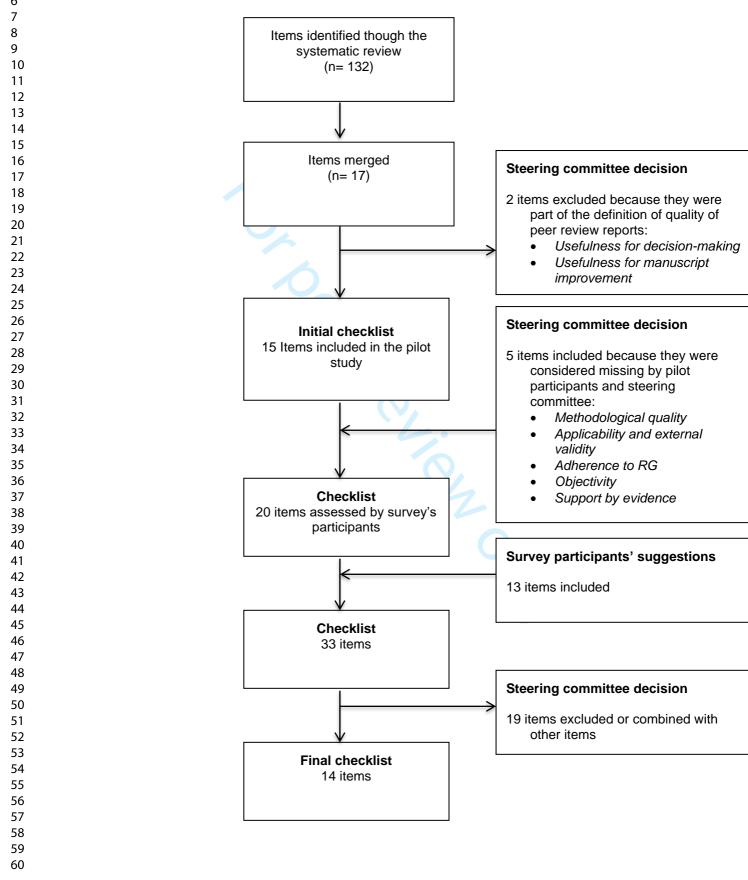
			that points out those flaws clearly and dispassionately would be very helpful. It would not necessarily need to delve into the finer details.
		Unnecessary to provide evidence to each comment (n=10)	I don't think reviewers need to cite something for every point that they make.
		Declaration of COI (n=8)	Peer reviewers should disclose COI.
		Standard structure of a review (n=7)	I would suggest providing a template to reviewers.
	0	Not necessary for all reviews (n=6)	Reviews come in all lengths and vary in detail. It is helpful to have some reviewers provide detailed information but not necessary that all do so.
Wording	Theme including codes on how to improve the wording of an item.	Wording of the item (n=110)	Rather than "The reviewer" comments are evidence- based" I would suggest that the category should be: "The reviewer distinguishes between comments that are supported by evidence (and provides suitable citations) and those based on opinion or experience"

Table 4. The ARCADIA tool

Importance	the contribution of the study to scientific knowledge?	
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	whether the relevant literature was accurately reviewed?	
		\Box NA
Robustness	the soundness of the study methods (e.g., study design, outcomes, risk of bias)?	□ YE
of the study methods		
methods		\Box NA
	the suitability of the statistical methods?	□ YE
		\square NC
		\Box NA
Interpretation	whether the study conclusions answer the research question(s) and correctly summarize	□ YE
and discussion	the study results?	\square NC
of the study results		\Box NA
	whether the study limitations are acknowledged?	
	the applicability and generalizability (external validity) of the study results?	□ YE
		\Box NA
Reporting and	whether any major deviations from the study protocol are reported?	□ YE
transparency of		
the manuscript		\Box NA
	whether the completeness of the reporting allows study reproducibility, by verifying the	□ YE
	adherence of the manuscript to the corresponding RG?	
		\Box NA
	the presentation (e.g., quality of the written language, tables, figures, etc.) and	
	organization of the manuscript?	
	the availability of study data and material?	
		\Box NA
Were the peer r	eviewer's comments	
Characteristics	clear?	
of peer		\Box NC
reviewer's	constructive?	□ YE
comments		\Box NC
	objective and, if opportune, supported by evidence?	□ YE

NA=Not applicable

Figure 1. Flowchart of items to include in a checklist to assess peer review report quality



Supplementary file 1. Survey questionnaires

1.1. Survey questionnaire for authors



Welcome to the survey!

Although the peer review process plays a key role in research dissemination, only limited research has been conducted so far in this field.

The objective of this survey is to investigate the perspectives of biomedical editors and authors towards the **quality of peer review reports**. We hope this work will help us to develop a new tool to assess the quality of a peer review report in biomedical research.

Knowing your expertise, we would be very grateful if you could answer a few questions and share your opinion. The survey will take approximately **10 minutes** to complete. Your participation in this study is completely voluntary. If you decide to participate, all your answers will be de-identified and stored in a secured repository at Universitat Politècnica de Catalunya, Barcelona-Tech (Spain). The de-identified data from this study will be shared on Zenodo repository. In case you opt out of sharing your data, you will still be able to participate in the study.

This survey has received ethics approval from the Research Ethics Committee of the Universitat Politècnica de Catalunya, Barcelona-Tech (Spain).

This study is part of the **Methods in Research on Research** (MiRoR) project, a joint doctoral training programme in the field of clinical research funded by Marie Skłodowska-Curie Action http://miror-ejd.eu/. The objective of MiRoR project is to train future generations of scientists in Research on Research, a new discipline aiming to promote research integrity increasing research value and reducing waste in health research.

This study is conducted by **Cecilia Superchi**, a PhD student at Universitat Politècnica de Catalunya, Barcelona-Tech and Université Paris Descartes, Sorbonne Paris Cité in collaboration with <u>Prof. Darko Hren</u> (University of Split), <u>Prof. José Antonio Gonzalez</u> (Universitat Politècnica de Catalunya) and <u>Prof. Isabelle Boutron</u> (Université Paris Descartes).

If you have any questions about this study or your rights as a participant, you may contact by email Cecilia Superchi, <u>cecilia.superchi@upc.edu</u> or Darko Hren, <u>dhren@ffst.hr</u>

Do you agree to take part in the study?

Yes, I agree

🕥 No, I do not agree

Do you agree to share your de-identified data?

Yes, I agree

No, I do not agree

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13	The quality of a peer review report could be defined as "to what extent the peer review report helps editors to make a fair decision and authors to improve the quality of the submitted manuscript"
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Importance of the items to assess peer review report quality

The following items have been identified in a systematic review as possible quality components of a peer review report.

We are interested to know your opinion on the importance of these items, particularly whether the item should be included in a new tool assessing the quality of a peer review report.

Please rate the IMPORTANCE of each item in assessing the quality of a peer review report from 1 (not important) to 5 (very important).

We expect that for some items it will not be easy for you to make a clear decision about the importance of the item. In those cases we still invite you to offer your rating but you can elaborate on your decision. Furthermore we invite you to suggest potential improvements in wording of the items.

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New items to assess peer review report quality

Are there any other items to assess the quality of a peer review report that you think should be

included?

Please list them.

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1.2. Survey questionnaire for biomedical editors

	Welcome to the survey!
Although the peer review process plays a key so far in this field.	role in research dissemination, only limited research has been co
	ne perspectives of biomedical editors and authors towards the q help us to develop a new tool to assess the quality of a peer revie
survey will take approximately 10 minutes to decide to participate, all your answers will be	ateful if you could answer a few questions and share your opin complete. Your participation in this study is completely voluntan de-identified and stored in a secured repository at Universitat Po e-identified data from this study will be shared on Zenodo repo still be able to participate in the study.
This survey has received ethics approval fr Catalunya, Barcelona-Tech (Spain).	om the Research Ethics Committee of the Universitat Politèd
field of clinical research funded by Marie Sk	on Research (MiRoR) project, a joint doctoral training programm lodowska-Curie Action <u>http://miror-ejd.eu/</u> . The objective of MiRol search on Research, a new discipline aiming to promote research in health research.
and Université Paris Descartes, Sorbonne Pa	a PhD student at Universitat Politècnica de Catalunya, Barcelo ris Cité in collaboration with <u>Prof. Darko Hren</u> (University of Sp de Catalunya) and <u>Prof. Isabelle Boutron</u> (Université Paris Desca
If you have any questions about this study or cecilia.superchi@upc.edu or Darko Hren, dhren	your rights as a participant, you may contact by email Cecilia S n@ffst.hr
Aren't you a biomedical editor? Please take par https://www.surveymonkey.com/r/REPORT_QU	rt in the survey for biomedical authors following this link: JALITY_AUTHORS
Do you agree to take part in the study?	Do you agree to share your de-identified data?
	Yes, I agree
Yes, I agree	



Definition of peer review report quality

The **quality of a peer review report** could be defined as "to what extent the peer review report helps editors to make a fair decision and authors to improve the quality of the submitted manuscript"

Do you agree with this definition?

\bigcirc	Yes
Ō	No
Ō	Partially

Please add your comments and ideas on how to improve the definition

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Importance of the items to assess peer review report quality

The following items have been identified in a systematic review as possible quality components of a peer review report.

We are interested to know your opinion on the importance of these items, particularly whether the item should be included in a new tool assessing the quality of a peer review report.

Please rate the IMPORTANCE of each item in assessing the quality of a peer review report from 1 (not important) to 5 (very important).

We expect that for some items it will not be easy for you to make a clear decision about the importance of the item. In those cases we still invite you to offer your rating but you can elaborate on your decision. Furthermore we invite you to suggest potential improvements in wording of the items.

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New items to assess peer review report quality

Are there any other items to assess the quality of a peer review report that you think should be

included?

Please list them.

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Editor's characteristics
What is your job title at your journal?
C Editor in chief
Associate editor
Academic editor
O Section editor
O Deputy editor
Other (please specify)
Are you involved in making decisions on the manuscripts received by your journal?
⊖ _{Yes}
No
At what type of journal do you currently working as editor?
O General Journal
O Specialty Journal

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12	Please check which of the following options you would be interested in
13 14	I would be interested in receiving the results of the present study I would be interested in participating in the validation study of a new tool for assessing the quality
15	of a peer-review report
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18	Please write down your name and email address. Your data will be EXCLUSIVELY used for
19 20	the option(s) which you have previously chosen.
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3	Supplementary file 2. Invitation email for corresponding authors and biomedical editors
4	Supplementary file 2. Invitation email for corresponding authors and bioinculcal cuttors
5	From:
6	Cc:
7	To:
8	Subject: Academic Survey on Peer Review
9	Subject. Academic Survey on Feel Review
10	Dear researcher,
11	
12	As corresponding author of the article recently published in [CUSTOM 1], we would like to invite you to participate in
13	an academic survey.
14	•
15	The objective of this survey is to investigate the perspectives of biomedical editors and authors on the quality of peer-
16	review reports. We hope this work will help us to develop a new tool to assess the quality of a peer-review report in
17	biomedical research.
18	
19	The survey will take approximately 10 minutes to complete. Participation in this study is completely voluntary and
20	you may withdraw at any time.
21	
22	This study is part of the Methods in Research on Research (MiRoR) project, a joint doctoral training programme in
23	the field of clinical research funded by the European Union's Horizon 2020 Research and Innovation Programme under
24	the Marie Sklodowska-Curie grant agreement No 676207 <u>http://miror-ejd.eu/</u>
25	We would be very grateful if you would take the time to complete our survey. Your insights as an author are essential
26	to us.
27	to us.
28	If you have any questions, comments or queries please do not hesitate to contact us at <u>cecilia.superchi@upc.edu</u> or
29	dhren@ffst.hr
30	
31	We kindly thank you for your time, attention, and cooperation.
32	
33	Sincerely,
34	
35	Cecilia Superchi, PhD Student at Universitat Politècnica de Catalunya & Université Paris Descartes
36	Darko Hren, PhD, Prof. at University of Split
37 38	José Antonio Gonzalez, PhD, Prof. at Universitat Politècnica de Catalunya
30 39	Isabelle Boutron, MD, PhD, Prof. at Université Paris Descartes
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From: Cc: To: Subject: Academic Survey on Peer Review Dear [Name] [Surname], As [CUSTOM 1] at [CUSTOM 2], we would like to invite you to participate in an academic survey on peer review. The objective of this survey is to investigate the perspectives of biomedical editors and authors on the quality of peerreview reports. We hope this work will help us to develop a new tool to assess the quality of a peer-review report in biomedical research. The survey will take approximately **10 minutes to complete**. Participation in this study is completely **voluntary** and you may withdraw at any time. You are also encouraged to forward the link of the survey to your colleagues who may be interested in participating in this study https://www.surveymonkey.com/r/REPORT_QUALITY_EDITORS This study is part of the Methods in Research on Research (MiRoR) project, a joint doctoral training programme in the field of clinical research funded by the European Union's Horizon 2020 Research and Innovation Programme under the Marie Sklodowska-Curie grant agreement No 676207 http://miror-ejd.eu/ We would be very grateful if you would take the time to complete our survey. Your insights as a biomedical editor are essential to us. If you have any questions, comments or queries, please do not hesitate to contact us at cecilia.superchi@upc.edu or dhren@ffst.hr We thank you kindly for your time, attention, and cooperation. Sincerely, Cecilia Superchi, PhD Student at Universitat Politècnica de Catalunya & Université Paris Descartes **Darko Hren**, PhD, Prof. at University of Split José Antonio Gonzalez, PhD, Prof. at Universitat Politècnica de Catalunya Isabelle Boutron, MD, PhD, Prof. at Université Paris Descartes

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Full Journal Title**	IF
New England Journal Of Medicine*	79.3
Lancet*	53.3
JAMA-Journal Of The American Medical Association	47.7
BMJ-British Medical Journal*	23.3
JAMA Internal Medicine	20.0
Annals Of Internal Medicine	19.4
Nature Reviews Disease Primers	16.1
Journal Of Cachexia Sarcopenia And Muscle	12.5
Plos Medicine	11.7
Bmc Medicine*	9.1
Mayo Clinic Proceedings*	7.2
Cochrane Database Of Systematic Reviews	6.8
Journal Of Internal Medicine	6.8
Canadian Medical Association Journal*	6.2
Journal Of Clinical Medicine*	5.6
American Journal Of Medicine*	5.1
Translational Research [*]	4.9
Annals Of Family Medicine*	4.5
Medical Journal Of Australia [*]	4.2
American Journal Of Preventive Medicine*	4.1
Amyloid-Journal Of Protein Folding Disorders	4.0
Journal Of General Internal Medicine [*]	4.0
Deutsches Arzteblatt International	3.9
Palliative Medicine	3.8
Preventive Medicine [*]	3.5
British Medical Bulletin	3.4
European Journal Of Internal Medicine*	3.3
British Journal Of General Practice [*]	3.3
Journal Of Pain And Symptom Management*	3.2
Qjm-An International Journal Of Medicine	3.2

Supplementary file 3. Top 30-biomedical journals with the highest impact factors

* Journal reporting the corresponding author in the PubMed abstract. **Source: InCites Journal Citation Reports 2017 under the category "Medicine, general and internal".

Supplementary file 4. Complete participants characteristics

	Editors N=165
Journal Role	
Editor-in-Chief	50 (30.3%)
Associate Editor	63 (38.2%)
Academic Editor	7 (4.2%)
Section Editor	6 (3.6%)
Deputy Editor	12 (7.3%)
Other	27 (16.4%)
(e.g. Statistical Editor, Patient Editor)	
Involvement in making decisions or	the manuscript
Yes	144 (87.3%)
No	21 (12.7%)
Type of Journal	· · · /
General Journal	39 (23.6%)
Specialty Journal	126 (76.4%)
Authorship of scientific papers	
Yes	141 (85.5%)
No	24 (14.5%)

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Characteristics	Authors N=224
Occupation	
Professor	63 (28.1%)
Associate Professor	31 (13.8%)
Assistant Professor	34 (15.2%)
Researcher	47 (21.0%)
Other	49 (21.9%)
(e.g. Lecturer, Postdoc, PhD)	
Type of Institution	
Public University	134 (59.8%)
Private University	33 (14.7%)
Research Centre	17 (7.6%)
Other	40 (17.9%)
(e.g. Hospital)	
Employment as biomedical editor	
Yes	63 (28.1%)
No	161 (71.9%)
Involvement in making decisions on the	101 (11.270)
manuscript Yes	56 (88.9%)
No	7 (11.1%)

June 2020. Downloa

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 Description

 Supplementary file 5. Codebooks
 Supplementation of peer review report quality we provided.

The second codebook is about the comments made by survey participants on importance and/or wording of each item (n=20).

The third codebook is about the identification of new items to assess peer review report quality by survey participants.

Codebook 1. Suggestions on how to improve the definition of peer review report quality

Suggestions on how to improve the definition of peer review report quality (n= 87)						
Theme	Definition	Code	Sub-code	Example Difference Control Con		
Assessment of different aspects	Statements on the different aspects of a	Accuracy of the study	NA	Also helps ensure the accurate of the content (at least in part) $\frac{9}{9}$		
of a study	study that should be discussed in a peer review report	Originality of the study	NA	Should include recognition of what has already been done well where possible		
		Relevance of the study	NA	Consider adding "the quality and value of the submitted manuscript." Or perhaps "quality and impact." The point is that some submitted work is high quality, but still not useful because it is just repeating prior work or answering an irrelevant question $\vec{\varphi}$		
	Reproducibility of the study	NA	The definition could broadly glso take into account issues of reproducibility			
		Research integrity of the study	NA	The definition should also in aude something about identifying plagiarism and conflict of interests		
		Robustness of the study	NA	Not necessarily to improve $tl_{\mathbf{R}}^{\mathbf{R}}$ quality as that may be a secondary outcome. The peer review is $\mathbf{R}^{\mathbf{R}}$ evaluate the scientific robustness of the research		
				copyright.		

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		Soundness of the study	NA	Also - the extent to which the $extent for the sound o$
		Strengths and weaknesses of the study	NA	I would include the extent to which the review accurately and clea identifies weaknesses / limitations of the study but I don't disag with your definition
		Structure of the manuscript	NA	A high quality peer review report may also identify the potential for poorly structured paper to be severated into an impactful form $\mathbf{x}_{\mathbf{x}}$
		Study methodology and statistics of the study	NA	Aspects such as rigorous statstical analysis and sampling/experimental design degree of innovation, and the state and testing of clear scientific hypothesis, should be addressed in a peer-review. Also, the technigul issues and methodologies should targeted during the peer-review process
		Validity/trustworthiness of the study	NA	What about the validity and transformed to the findings?
journal's policy c j	Statements on the consideration of the journal's policy in writing a peer review report	NA	NA	A good quality peer-review report takes into account journal polic and publication criteria while helping authors provide the best ve of their work
ambiguous comments t	Irrelevant and ambiguous comments for improving the provided definition of peer review report quality	NA	NA	There is usually more than one report, so reportS 19, 2024
vague concept d	Statements on the difficulty to define "quality"	Dependency on the type of journal and study	NA	I would add at the end "based on a rubric specific to the type of article submitted"
		Quality of research and quality of reporting	NA	"Quality" is ambiguous. Relevant aspects of quality could include scientific validity (the extent which the methods are adequate, t conclusions supported etc.) AND/OR reproducibility (the extent to which the study is described sufficient detail that it could be reproduced). The former is a quality of the scientific study and the

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Reviewer´s expertise	Statements on how the quality of a peer review report is related to the level of expertise of a reviewer	NA	NA	The quality of the peer reviewalso depends on how well the review has understood the manuscript and the reviewer's level of expertion the topic	
Reviewer's comments characteristics	Statements on the different characteristics of a peer review report	Clarity of the comments	NA	I think the definition should is clude whether the reviewers have expressed themselves clearly and unambiguously	
	Constructiveness of the comments	NA	Perhaps this is implied in the proposed definition, but you could mention that a high-quality per review includes constructive crit that is, not just an identification of flaws but suggestions for remedies	icisr	
		Fairness and impartiality of the comments	NA	Add: 'is unbiased and competently-conducted'	
		Understanding correctly the content of the manuscript	NA	The quality of the peer review also depends on how well the review has understood the manuscript	wer
Role of external parties	Statements on the role of external parties in assessing the quality of a peer review report	NA	NA	External parties should also day a role	
Scope of the peer review process	Statements on the scope of the peer review process	Different facets	NA	Peer review has many facets	
of the peer review	·····	Ensuring accessibility to the readers	NA	[] and the accessibility to readers	
		Ensuring quality of science	NA	I would like to insist on the rate of peer-review to ensure the qual the science presented in the manuscript	ity c

	Evaluating rather than improving	NA	6/bmjopen-2019-035
		NA	
		1111	The peer review is to evaluate the scientific robustness of the rest \circ
	Independence	NA	This definition does not capture the necessary independence of the review process
	Related to decision making	NA	This definition implies that each tors' decisions can always overrid reviewers' appraisals. But are ditor's appraisal of a paper shoul equal weight to a peer reviewers appraisal
	Transparency and critical appraisal	NA	The focus of peer-review is transparency and critical appraisal. review scope is broader than ditorial decisions. Editorial decisi are a specific use case of peer review
	Validation of the research	NA	Peer review also helps to validate the research before publication the report also needs to do this to be effective
	Variable process	61.	Peer review can be very variable; at its best it really improves the quality of papers. At its wors it is bullying and partial
Statements on the consideration of timeliness in defining the quality of a peer review report	NA	NA	Timeliness should be included, less than 2 weeks is ideal
Statements on the usefulness of a peer review report for authors	Useful for authors	Improving manuscript quality	It should be aimed at helping the authors improve the quality of t work. \bigotimes_{R}^{N}
and editors		More effective communication of research	Peer review ideally contributes to effective communication throu research publication, by expering the author's work to the potent audience(s) for it and thus showing where readers stumble or ide limitations that need to be recognized. I think it would improve to definition if you could work in something about effective communication, which can be distinct from quality per se. More effective, clearer communication promotes more learning from the article and a stronger link to amplementation. Also, quality shoul of the something about effective should be the something and the something and the something from the article and a stronger link to amplementation. Also, quality should open the something about effective should be the something and the something and the something about effective something from the something and the something and the something about effective something from the something about effective something and the something and the something about effective something from the something and the something about effective something from the something and the something about effective something from the something and the something about effective something from the something and the something about effective something from the something about effective something from the something about effective something about
	onsideration of meliness in defining the uality of a peer review eport tatements on the sefulness of a peer eview report for authors	appraisal Validation of the research Variable process Itatements on the onsideration of meliness in defining the uality of a peer review eport Itatements on the sefulness of a peer eview report for authors	appraisalValidation of the researchValidation of the researchVariable processVariable processItatements on the onsideration of meliness in defining the uality of a peer review eportNANANANAItatements on the sefulness of a peer eview report for authorsUseful for authorsImproving manuscript qualityMore effective communication of

			BMJ Open		
				probably be judged in terms a system study for example muse	the purpose of the study; a delivery provide more information on context in classical randomized trial such as of a
		Useful for editors	Filtering studies	Also, 1) a check on poor rese	Brch,
		Or	Decision to enhance the readership and citations	helps editors to make a fair de readership and citations of the	d informed decision that will enhance th journal
		Peo	Enabling fair decision		good to the extent that they help editors abling 'informed' and 'rigorous'
			Leading to incorrect decision	not be the case (and which an statistical reviewer comment and the editor is unaware if the	aking sensible suggestions, which may editor may not pick up on). E.g., a non- gg (incorrectly) on statistical methods e comments are relevant/correct. The take a decision but it could be an
			Same weight for editors and reviewers appraisal	reviewers' appraisals. But ar	tors' decisions can always override peer Beditor's appraisal of a paper should hav Pr's appraisal. This top down system can
		Useful for both editors and authors	NA		BOTH editor AND authors is a key on I provide new insights or suggestions euracy of a paper.
Wording of the definition	Statements on how to improve the definition of the peer review report quality	Disagreement with the use of fair	NA	assume that editors always a	D
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Codebook 2. Comments on the i	mportance and/or wording of each	BMJ Open		6/bmjopen-2019-035604	
	mportance and/or wording or each	Relevance (n = 56)		04 on 8 J	
(T)L	D - 6		S-h h	une	
Theme Author's responsibility	Definition Statements on the author's responsibility to discuss the relevance of the study in the manuscript	Code NA	Sub-code NA	2020. Downloaded from http://bmjopen.bmj.com/ on April 19, 2024	ExampleRelevance should be discussedby the authors and ultimately isdecided by readers. I wouldexpect reviewers to comment onthe author's discussion on therelevance, and onlyexceptionally come withconsiderations of his own
Contribution to the knowledge	Statements on the importance of the study as contribution to the scientific knowledge	NA	NA	p://bmjopen.	Relevance is important in the context of both the contribution to the knowledge base
Dependency on the type of journal	Statements on how biomedical journals differently evaluate relevance of a study based on their own criteria	NA	NA	bmj.com/ on A	Relevance also depends on the scope of the journal, and that is an editorial decision, opinion o the reviewer is not so important
Editor's responsibility	Statements on the editor's responsibility to evaluate the relevance of the study	NA	NA	pril 19, 2024	This is largely an editorial decision
Influencing editor's decision	Statements on how the relevance of a study can influence an editorial decision	NA	NA	by guest.	This is very helpful for the Editor to make a decision on the manuscript
Readers as final judges	Statements on how readers are the final judges of the relevance of a study	NA	NA	Protected by copyright.	Relevance should be discussed by the authors and ultimately is decided by readers
				:opyright.	

Reviewer's expertiseStatements on how the assessment of the relevance of a study depends on reviewer's expertiseNANANANASubjective itemStatements on the subjective interpretation of the term "relevance"External validityNANANASubjective itemStatements on the subjective interpretation of the term "relevance"External validityNAAnother aspect of relevance might relate to external valid or generalizability e.g., al study that does not have relevance to the real worldFuture impactNANARelevance may lie in the future not in the presentNoveltyNAThere are various aspects of "relevance" i.e., it might be a significant contribution the literature because the findings are not at all novel		BMJ Open					
				n-2019-03			
	Related to other items		NA	NA 604 00 8 0 8 0 8	I took this to be the same question as the earlier one on applicability		
	Reviewer's expertise	assessment of the relevance of a study depends on reviewer's	NA	NA e 2020. Download	Not important if you are a statistical reviewer, of a clinical article, without knowing the clinical area. BU otherwise VERY IMPORTANT for clinical reviewers		
	Subjective item	interpretation of the term	External validity	NA from http://bmj	Another aspect of relevance might relate to external valida or generalizability e.g., a la study that does not have relevance to the real world		
			Future impact	NA Constant	Relevance may lie in the futur not in the present		
			Novelty	NA On April 19	There are various aspects of "relevance" i.e., it might no be a significant contribution t the literature because the findings are not at all novel		
	Wording of the item	Statements on how to improve the wording of the item	NA				
				tected by co			
by or				opyright.			
t. Protected by copyright.		For peer review only	- http://bmjopen.bmj.com/site/ab	out/guidelines.xhtml			

Definition	Originality (n= 56)		6/bmjopen-2019-035604	
Definition				
Definition			04 on 8	
	Code	Sub-code	3 Ju	Example
Statements on how biomedical journals differently evaluate the originality of a study based on their own criteria and policy	NA	NA	ne	Depends on the jo More important w reader is the clier important when th the client
Statements on the editor's responsibility to evaluate the originality of the study	NA	NA	aded from http://bmjo	Many journals ma which have differ policies now-a-da reviewers' to judg originality. This i importance in ope
Statements on the importance of conducting replication and confirmatory studies	NA	NA	pen.bmj.com/	Not always impor original study as trying to duplicat from previous stu
Statements on the importance of the item in assessing the quality of peer review report	Slightly important item	NA	on April 19,	This is only slight in that - once a st conducted
	Important item	NA	2024 by gu	I find that import twentieth me too relevant for the k
Statements on how open access journals and subscription journals assess differently the originality of a study	NA	NA	est. Protected by	For our journal, important, althou some others with publication mode less importance o
_	 their own criteria and policy Statements on the editor's responsibility to evaluate the originality of the study Statements on the importance of conducting replication and confirmatory studies Statements on the importance of the item in assessing the quality of peer review report Statements on how open access journals and subscription journals assess differently the 	their own criteria and policyStatements on the editor's responsibility to evaluate the originality of the studyNAStatements on the importance of conducting replication and confirmatory studiesNAStatements on the importance of the item in assessing the quality of peer review reportSlightly important itemStatements on how open access journals and subscription journals assess differently theNA	their own criteria and policyNAStatements on the editor's responsibility to evaluate the originality of the studyNANAStatements on the importance of conducting replication and confirmatory studiesNANAStatements on the importance of the item in assessing the quality of peer review reportSlightly important itemNAStatements on how open access journals and subscription journals assess differently theNANA	their own criteria and policyDescriptionStatements on the editor's responsibility to evaluate the originality of the studyNANAStatements on the importance of conducting replication and confirmatory studiesNANAStatements on the importance of the item in assessing the quality of peer review reportSlightly important itemNAImportant itemNANAPeriodStatements on the importance of the item in assessing the quality of peer review reportSlightly important itemNAStatements on how open accessNANAPeriodStatements on how open accessNANAPeriodStatements on how open accessNANAPeriodStatements on how open accessNANAPeriod

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		BMJ Open		5/bmjope	
				n-2019-03	
Reviewer's expertise	Statements on how the assessment of the item depends on reviewer's expertise	Reviewer as not the best judge	NA	6/bmjopen-2019-035604 on 8 June 2020.	Not all reviewers will necessarily be familiar with the literature in a particular area and may not be able to comment on originality of the study
Wording of the item	Statements on how to improve the wording of the item and better define it	Impact rather than originality	NA		Some less original studies can still be of significant value, so I prefer comments on impact to comments on originality
		Originality as novelty	NA	from http://bmjopen.	The Editor is usually aware of this, particularly Editors of journals with high impact factors, who are very keen to publish manuscripts reporting original/novel findings
		Originality as what the study adds	NA	bmj.com/ on	I would prefer to think of this in terms of whether it really adds to our knowledge
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				est. Protected by copyright.	
	For peer review only	- http://bmjopen.bmj.com/site/a	bout/guidelines.xhtml	rt.	

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			njop	
			en-2019-03	
	Interpretation of results (n= 33)		9	
Definition	Code	Sub-code		Example
Statements on the importance of the item to avoid exaggeration and misinterpretation of study's results	NA	NA	ne	This is an area where the reviewer may have a valua role in tempering an autho enthusiasm, hubris or bias
Statements on the importance that study's conclusions are supported by results, strengths and weaknesses and literature	NA	NA	aded from http://bmjo	Interpretation of the findin should be judged by its coherence with findings an study limitations and stren and by its coherence with literature
Statements on the importance of the study as contribution to the scientific knowledge	NA	NA	open.bmj.co	A judgement on the new contribution to knowledge
Statements on the importance of the item in assessing the quality of peer review report	Very important item	NA	m/ on April 19, 2024	Interpretation of the result crucial- it determines the message that is sent out. It very important that review pay attention to this interpretation
Statements on the uselessness of the item for the readers	NA	NA	by gues	These are useless for the re
Statements on the liberty of the authors to interpret study's results in the discussion section	NA	NA	t. Protected by copyright.	As long as the results are crystal clear the authors ca take some liberties in the discussion. As long as it is what is speculative
	Statements on the importance of the item to avoid exaggeration and misinterpretation of study's results Statements on the importance that study's conclusions are supported by results, strengths and weaknesses and literature Statements on the importance of the study as contribution to the scientific knowledge Statements on the importance of the item in assessing the quality of peer review report Statements on the uselessness of the item for the readers Statements on the liberty of the authors to interpret study's	DefinitionCodeStatements on the importance of the item to avoid exaggeration and misinterpretation of study's resultsNAStatements on the importance that study's conclusions are supported by results, strengths and weaknesses and literatureNAStatements on the importance of the study as contribution to the scientific knowledgeNAStatements on the importance of the item in assessing the quality of peer review reportNAStatements on the uselessness of the item for the readersNAStatements on the liberty of the authors to interpret study'sNA	Interpretation of results (n= 33) Definition Code Sub-code Statements on the importance of the item to avoid exaggeration and misinterpretation of study's results NA NA Statements on the importance that study's conclusions are supported by results, strengths and weaknesses and literature NA NA Statements on the importance of the study as contribution to the scientific knowledge NA NA Statements on the importance of the item in assessing the quality of peer review report Very important item NA Statements on the uselessness of the item for the readers NA NA	Interpretation of results (n= 33) Definition Code Sub-code Statements on the importance of the item to avoid exaggeration and misinterpretation of study's results NA NA Statements on the importance that study's conclusions are supported by results, strengths and weaknesses and literature NA NA Statements on the importance of the study as contribution to the scientific knowledge NA NA Statements on the importance of the item in assessing the quality of peer review report NA NA Statements on the uselessness of the item for the readers NA NA

		BMJ Open		i/bmjoj	
				6/bmjopen-2019-03560/	
Objective interpretation	Statements on the importance of the objectivity of the study's interpretation	NA	NA	504 on 8 June	As long as it is an objective interpretation without any confirmation bias
Related to other items	Statements on the link of the item with other items	NA	NA) 2020. D	See comments on methods above
Related to study flaws	Statements on the importance of commenting on the item especially if there are major errors in the manuscript	NA		ownloaded from h	This is important if there are any major flaws or if an alternative explanation for findings should be considered
Related to study implications	Statements on the importance of commenting on the item for generating new hypothesis to test	NA	NA	2020. Downloaded from http://bmjopen.bmj.com/ on April	To me, this is the most important issue, for the point of papers is to generate new hypotheses to test. Unfortunately, in my field, editors often want to see the facts, but are wary about interpretations, probably abou long-winded speculation in the past
Reviewer's expertise	Statements on how the assessment of the item depends on reviewer's expertise	Statistics expertise	NA	19, 2024 by gues	If the reviewer is experienced i statics can make a good interpretation of the results
Rushed interpretation as common problem	Statements on the poor interpretation of the study's results as common problem	NA	NA	/ guest. Protected by copyright.	Discussion is the most important part of the manuscript. And sometimes it i a bit rushed by authors
Scope of the PR process	Statements on the scope of the peer review process	Assisting editors to understand results	NA	ed by	Editors aren't technical experts in every field. The PR process

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					n-2019-03	
					5604 on 8 J	<i>is therefore important is</i> <i>assisting editors understanding</i> <i>the significance of results</i>
Sut	bjective item	Statements on the subjective interpretation of the term "interpretation of the results"	NA	NA	une 2020. D	All results are open to a variety of interpretations
Wo	ording of the item	Statements on how to improve the wording of the item and better define it	NA	NA	oownloaded from http://bn	The reviewer must comment on the discussion section, of which the interpretation is a part. But other elements (comparison with existing research etc.) is also important. I would replace 'interpretation' with 'discussion'
				ien ong	6/bmjopen-2019-035604 on 8 June 2020. Downloaded from http://bmjopen.bmj.com/ on April 19, 2024 by guest. Protected by copyright.	
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			6/bmjopen-2019-035504 on	
	St	rengths and weaknesses (general (n= 21)	l) 604 09 8	
Theme	Definition	Code		Example
Author's responsibility	Statements on the author's responsibility to discuss the strengths and weaknesses of the study in the manuscript	NA	NA ne 2020. Dow	The paper should, the reviewed only should if the paper is missing something important
Important when manuscript is overly long	Statements on the importance of the item when the manuscript is overly long	NA	NA Coaded	Important when a manuscript is overly long
Specificity of the comments	Statements on the importance of the specificity of the comments	NA	NA S	Specificity is more important
Related to other items	Statements on the link of the item with other items	NA	NA bmjopen.bmj.o	This is repeated above for methods. So these two components overlap. Howeve I mark this as important
Related to the study	Statements on the importance of commenting on the strengths and weaknesses of the study's aims and study's flaws	Related to study aims	Sub-code June 2020. Downloaded from http://bmjopen.bmj.cdm/ on April 19, 2024 by guest. Protected NA NA NA NA	I think this needs to be specifically related back to clear study aims and objectiv (perhaps this is a separate category? If not I think it should be). Even a beautiful study design with great valid and statistics is rubbish if it doesn't allow you to answer your research questions! I always look to see if the analyses and interpretation address the goals of the study

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		Related to study flaws	NA	604 on 8	This is important where the are issues
Reviewer's expertise	Statements on how the assessment of the item depends on reviewer's expertise	NA	NA	3 June 2020. D	Provided that the reviewe the methodological skills comment on methodologic strengths and weaknesses
Taking into account reader's perspective	Statements on the importance of taking into account the reader's perspective by peer reviewers	NA	NA	ownloaded fro	Peer reviewers should tak reader perspective and en the manuscript is well balanced on these
Including S&W in the general comments	Statements on including strengths and weaknesses in the general comments	NA	NA	m http://bmjc	These should be clearly identified in the general comments
Useful for editors	Statements on the importance of the item for editors for making an editorial choice	To make a decision	NA	open.bmj.cc	Important for deciding to accept or reject a manusc

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BMJ Open					
Si	trengths and weaknesses (metho (n= 29)	ods)	6/bmjopen-2019-035604 on		
Definition	Codo	Sub codo	00		
Statements on author's responsibility to evaluate the item	NA	NA	Authors should already be doing this		
Statements on the importance of the item in relation to the quality of the methods of the study	NA	NA	DModelThis really depends. If the methods are spurious, of course, this needs to be indicated		
Statements on how the assessment of the item depends on the type of journal and study	NA	NA	Methods are very important fo our journal		
Statements on the importance of the item especially focusing on the weaknesses of the study	NA	NA	Important, especially the weaknesses, where there is an obvious need		
Statements on the importance of the item in assessing the quality of peer review report	Very important item	NA	This is absolutely key to the interpretation of the study.Unfortunately most reviewers, in my field, do not fully understand current (and correct) methodsYes, but it is confusing to separate this from the general strength and weaknesses. The		
Statements on the link of the item with other items	NA	NA	by Yes, but it is confusing to separate this from the general strength and weaknesses. The question should be if the reviewer thinks that the message can (potentially) answer the research question		
-	Definition Statements on author's responsibility to evaluate the item Statements on the importance of the item in relation to the quality of the methods of the study Statements on how the assessment of the item depends on the type of journal and study Statements on the importance of the item especially focusing on the weaknesses of the study Statements on the importance of the item in assessing the quality of peer review report Statements on the importance of the item in assessing the quality of peer review report	Strengths and weaknesses (methors) Definition Code Statements on author's NA responsibility to evaluate the NA item NA Statements on the importance NA of the item in relation to the NA guality of the methods of the NA Statements on how the NA assessment of the item depends NA or the type of journal and study NA Statements on the importance NA of the item especially focusing NA Statements on the importance Very important item of the item in assessing the Very important item guality of peer review report NA	Strengths and weaknesses (methods) (n= 29) Definition Code Sub-code Statements on author's responsibility to evaluate the item NA NA Statements on the importance of the item in relation to the quality of the methods of the study NA NA Statements on how the assessment of the item depends on the type of journal and study NA NA Statements on the importance of the item especially focusing on the weaknesses of the study NA NA Statements on the importance of the item in assessing the quality of peer review report Very important item NA Statements on the link of the NA NA NA		

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			1-2019-03
Statements on how the assessment of the item depends on reviewer's expertise	NA	NA	66 Providing the reviewer 9035604 Providing the reviewer 904 suitably qualified to con 905 on the methods. In my 907 experience, far too man 908 reviewers comment on a 909 of the Methods for whice 900 are able to confidently of 901 on 902 As long as the reviewer 903 As long as the reviewer 904 on 905 Authors should already 906 doing this. Is it necessat 907 reviewers to also state t 908 about the strengths and 909 limitations
Statements on the subjective interpretation of the term "strengths and weakness (methods)"	To give indication on own stance	NA	As long as the reviewer de some indication of his/h stance in determining st and weakness
Statements on the importance of commenting on the transparency of the methods used by the peer reviewers	NA	NA	Authors should already doing this. Is it necessa reviewers to also state t is it redundant? Review could comment on whet authors have been trans about the strengths and limitations
Statements on the usefulness of the item for both editors and authors	Useful for authors	NA	AprilFor the author if the strand weaknesses are not9properly addressed in the
	Useful for editors	NA	22 24 54 55 56 57 57 57 57 57 57 57 57 57 57
Statements on how to improve the wording of the item	NA	NA	ue Appropriateness of meta St. (based on question) may more importantunless a problem, then strength weaknesses becomes im by copyright. Copyright.
_	assessment of the item depends on reviewer's expertiseStatements on the subjective interpretation of the term "strengths and weakness (methods)"Statements on the importance of commenting on the transparency of the methods used by the peer reviewersStatements on the usefulness of the item for both editors and authorsStatements on how to improve	Statements on how the assessment of the item depends on reviewer's expertiseNAStatements on the subjective interpretation of the term "strengths and weakness (methods)"To give indication on own stanceStatements on the importance of commenting on the transparency of the methods used by the peer reviewersNAStatements on the usefulness of the item for both editors and authorsUseful for authorsStatements on how to improveNA	Statements on how the assessment of the item depends on reviewer's expertiseNANAStatements on the subjective interpretation of the term "strengths and weakness (methods)"To give indication on own stanceNAStatements on the importance of commenting on the transparency of the methods used by the peer reviewersNANAStatements on the usefulness of the item for both editors and authorsUseful for authorsNAStatements on how to improveNANA

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		Statistical methods (n=115)		on 8 June	
Гћете	Definition	Code	Sub-code		Example
Dependency on the type of study	Statements on how the assessment of the item depends on the type of study	NA	NA	2020. Downloaded from http	For some articles (e.g. RCTs, meta-analyses, and observational studies) assessment of the statistical methods is important. For other types of articles (reviews, commentaries, editorials) this is of less importance
Editor's responsibility	Statements on the editor's responsibility to determine the necessity of a statistical review	Employment of statistical assessors by journals	Statistics sub-editor	://bmjop	Journal needs to engage a statistics sub-editor for that
	for a study	No familiarity with some methods	NA	://bmjopen.bmj.com/ or	Sometimes editor may not be a familiar with certain statistical methods which makes it more difficult to do this
		Statistical support to the reviewers by journals	NA	n April 19	Journal editors should provide statistical support to reviewers
		To determine the necessity of statistical review by journals	NA	2024 by guest. Protected by copyright.	But I think that a lot (?) of reviewers are not sufficiently capable to do so. It might be more appropriate that the editor determines the necessity of statistical review and explicitly asks the reviewer if he/she is capable to do so

4		BMJ Open		'bmjopen-	
				2019-0356	
No consensus on appropriateness of statistical methods	Statements on no consensus on the appropriateness of methods by peer reviewers	Variety of appropriate methods	NA	f on 8 June	Often there are multip "appropriate" method important to use one c appropriate methods
Optional component of quality	Statements on the item as option component of the quality	NA	NA	2020.	This should be an opti "where relevant" con the quality
Related to other item	Statements on the link of the item with other items	NA	NA	aded f	This belongs to assess methods. Should not b separate item because qualitative research
Reviewers' expertise	Statements on how the assessment of the item depends on reviewer's expertise	At least one reviewer	NA	ttp://br	At least one of the rev should have reasonab statistical knowledge
		Content expertise	NA	n.bmj.com/	Many reviewers may l matter experts but not necessarily experts in
		General methods reviewer	NA	April 19, 2024 by guest.	This applies to the me general, whether or no are statistical. I think one reviewer needs to on methods, but not ev reviewer. Articles may statistics but an exper methods should review article
		Inappropriate advice	NA	ect	Non-statisticians shou encouraged to comme statistical methods
	For poor residence of the	- http://bmjopen.bmj.com/site/ab	out/guidolines.ubt	ght.	

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				9-03	
		Statistical reviewer	NA	9-035604 on 8	Statistical reviewer should do this
		Commenting on own statistical expertise	NA	8 June 2020. Dow	In my view, the reviewer should be required to state whether or not she/he has the expertise to evaluate the statistical methods properly
Commenting on the use of statistical methods	Statements on the importance to comment of the appropriate use of the statistical methods by authors	NA	NA	mloaded from h	And the use of stat. methods (some methods are used incorrectly by authors)
Wording of the item	Statements on how to improve the wording of the item	NA	NA	ttp://bmjopen.bmj	We get a lot of qualitative work so the key to this question is the appropriateness of the methods and then specifics based on type of methods
			200J	June 2020. Downloaded from http://bmjopen.bmj com/ on April 19, 2024 by guest. Protected by copyright	
				. Protected by copyright.	
	For peer review only	- http://bmjopen.bmj.com/site/ab	oout/guidelines.xhtml		

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				6/bmjopen-2019-035604 on	
		Methodological quality		5604	
		(n = 32)		on 8	
Theme	Definition	Code	Sub-code		Example
Dependency on the type of study	Statements on how the assessment of the item depends on the type of study	NA	NA	June 2020. D	Where applicable it is important
General comments	General statements	NA	NA	Downloaded from http://bmjopen.b	But in any case, I think intervalidity is very important is study is claiming that there is relation between two variable it should be on solid ground do so
Importance of the item	Statements on the importance of the item in assessing the quality of peer review report	Very important item	NA	://bmjopen.t	In my opinion this is the mos important item
Focusing more on methods than results	Statements on the importance of commenting on the methods	NA	NA	mj.com/ on April	In my opinion this is the mos important item. I think a reviewer should primarily focus on methods rather than results
Related to other items	Statements on the link of the item with other items	NA	NA	19, 2024 by guest. F	I did not understand the difference between this question and the question "The reviewer comments on the strengths and weaknesses of study methods"
Reporting of the study	Statements on the importance of good reporting for study reproducibility	NA	NA	Protected by copyright.	A description should be sufficient to repeat the study with a high likelihood to end up with the same results

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				6/bmjopen-2019-035604	
Reviewer's expertise	Statements on how the assessment of the item depends on reviewer's expertise	Acknowledgement lack expertise		504 on 8 June 2020. Downloaded from http://bmjopen.bmj.com/ on April 19.	Ideally yes. However good reviewers are also well aware of the limits of their own expertise. It is better for reviewers to acknowledge that they lack expertise in relation to a particular aspect of the methodology (this is OK - no one is expected to be an expert in everything) rather than attempt to critique something that is outside of their own scope of knowledge
		At least one reviewer	NA	//bmjopen.l	At least one reviewer with expertise in methods should review the study
		Technical vs. clinical expertise	NA	mj.com/ on April 19	When selecting reviewers one might choose some for technical expertise (methodology, statistics etc.) and others for clinical expertise/experience
Making sure results are not biased	Statements on the importance of the study for making sure the study results are not biased	NA		, 2024 by gues	Crucial to make sure the results are not biased
Wording of the item	Statements on the wording of the item and how to improve it	Broad item		lest. Protected by copyright.	"Methodological quality" is a broad term that could apply to construct validity and statistical validity as well as internal validity
				copyright	

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	P	Applicability and external validity (n= 37)	y	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
Theme	Definition	Code		
Author´s responsibility	Statements on the responsibility of authors to comment on the applicability and external validity of the study providing sufficient information to the readers	NA	NA	Example 20. The paper should, not necessarily the reviewer 20. Dominant necessarily the reviewer 20. Difficult as would depend on the context of practice of the reader 20. Difficult of practice of the reader 20. It depends on the specific top of the study
Dependency on the practice of the reader	Statements on the difficulty to judge the importance of the item because it depends on the practice of the readers	NA	NA	Difficult as would depend on the context of practice of the reader
Dependency on the type of study	Statements on how the assessment of the item depends on the type of study	NA	NA	<i>It depends on the specific top</i> of the study
Editor's responsibility	Statements on the editor's responsibility to evaluate the item	NA		OGThis is more 'scope, which is for the editor to decide. But help from a reviewer is appreciated10This is important when reporting novel findings as it helps the Editor to decide if the results can be reproduced by
Helping the editor to understand reproducibility of the study	Statements on the importance of the item to decide if a study can be reproduced	NA		rt an ath an anarm
Importance of the item	Statements on the importance of the item in assessing the quality of peer review report	Less important item	NA	This is of lesser importance. There should be sufficient information included for any

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				6/bmjopen-2019-035604 on 8	
				5604 on {	readers to come to this conclusion themselves
Related to other items	Statements on the link of the item with other items	NA	NA		Similar to my answer about interpretation
Related to the paper	Statements on the claims made in the paper by the authors and impact of the study	Future research	NA	1 <u>2</u> 0. Dowr	Applicability might lie in the future, not in the present
		Impact	NA	loaded from h	This is important only in relation to the claims made in the paper about the impact an implications of a study
		Related to the claim & content of the paper	NA	http://bmjc	This depends on the claims made
Reviewer's expertise	Statements on how the assessment of the item depends on reviewer's expertise	Technical vs. clinical expertise	NA	June 2020. Downloaded from http://bmjqpen.bmj.com/ on April 19, 2024 by gues	When selecting reviewers one might choose some for technical expertise (methodology, statistics etc.) and others for clinical expertise/experience
Reviewers' comments characteristics	Statements on the different characteristics of a peer review report	Baring reviewers' opinion	NA	pril 19, 2024 by gu	This may be one area of the review where the reviewer ca bring a personal opinion to bare. Does the reviewer think this is a useful paper?
		Evidence based comments	NA	uest. Protected by copyright.	Peer reviewers should provid citations (evidence) for their assessment. Simply saying the the results are not applicable their practice is not enough

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					n-2019-03	
			Tempering authors' enthusiasm	NA	6/bmjopen-2019-035604 on 8 June 2020	Similar to my answer about interpretation: this is an area where the reviewer may have a valuable role in tempering an author's enthusiasm, hubris or bias
	Subjective item	Statements on the subjective interpretation of the term "applicability and external validity"	NA	NA		This can be very subjective and misleading
	Wording of the item	Statements on how to improve the wording of the item	NA	NA	from http://bmjo	Applicability and external validity are two concepts, so this item is double-barrelled in not valid
			evier		Downloaded from http://bmjopen.bmj.com/ on April 19, 2024 by guest. Protected by copyright.	
		For peer review only	- http://bmjopen.bmj.com/site/ab	out/guidelines.xhtml		

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Presentation and organization (n= 45) 9 %							
Theme	Definition	Code					
Dependency on the type of journal (and its policy)	Statements on how biomedical journals differently evaluate the item based on their own criteria	Presence of copy editors in the journal	Sub-codeLNAPNAPNAPNAPDD	Depends a bit on whether journals have good copy editors			
	^o r _b	Taking into account the average reader of the journal	NA NA from	The reviewer needs to take into account the "average reader" of the journal - will they understand the paper?			
General comments	General statements	NA	NA http://bmjope	Peer review is not an editorial exercise, but clarity and reproducibility are part of goo science			
Useful for editors	Statements on the usefulness of the item for editors	NA	NA bmj.com/ on Ap	Because the readability is important to those who've not seen it before. Especially helpful when a handling edito. is new, I think.			
Importance of the item	Statements on the importance of the item in assessing the quality of peer review report	Less important item	NA http://bmj.com/ on April 19, 2024 by guest. Protected by copyright NA NA NA NA	This is less important, because as long as the content is there a reader should be able to make use of the paper, even if requires more effort. But if the presentation and organisation is really bad, then it needs to addressed			
		Presentation more important than organization	NA cred by	Presentation is important organization is not			

Page 79 of 124			BMJ Open		86/bmjope	
1 2 3					n-2019-03	
4 5 6 7 8 9 10 11 12 13	Improving the manuscript	Statements on the importance of the item to improve the quality of the manuscript	Clear recommendations	NA	6/bmjopen-2019-035604 on 8 June 2020. Downloaded from http	Yes, but in a way that provides the authors with clear recommendations on how to make improvements. Design flaws cannot always be addressed after the study, but issues with presentation and organization of the manuscript can
14 15 16 17 18		ror pe	Communication	NA	paded from http	Important when it will help improve the quality of the communication. Not necessary when it flows well
19 20 21			Readability	NA	//bmjope	Important because this impacts readability
22 23 24 25 26	Not going into irrelevant comments	Statements on the importance of not making useless comments	NA	NA	n.bmj.com/ on	Important when it will help improve the quality of the communication. Not necessary when it flows well.
27 28	Formatting minutiae	Statements on peer reviewers focusing on minutiae	NA	NA	April 19,	Some reviewers focus on formatting minutiae
29 30 31 32 33 34 35 36 37	Related to reporting guidelines	Statements on the link of the item with reporting guidelines	NA	NA	2024 by guest.	I find reviewer comments on the presentation and organization of the manuscript moderately important if the manuscript follows a check list (e.g. STROBE) and/or standard formatting, and if is easy to understand and follow
38 39 40 41 42					Protected by copyright.	

		BMJ Open		6/bmjope	
				n-2019-03	
Responsibility	Statements on editor, author or reviewer's responsibility to evaluate the item	Joint responsibility	NA	5604 on 8 J	I think this is the role of the editors as well as the reviewers.
		Editor's responsibility	NA	une 2020	<i>Editors and editorial staff have a stronger role here.</i>
	Forpe	Reviewer´s responsibility	NA	6/bmjopen-2019-035604 on 8 June 2020. Downloaded from http://bmjopen.bmj com/ on April 19, 2024 by gues	I regularly make notes as to whether a section is better placed elsewhere in the document, and on sentence structure, and use and misuse of citations. I think this is an obligation that reviewers have to the author and the journal
Subjective item	Statements on the subjective interpretation of the item	NA		mjopen.bmj	This is subjective and may vary between reviewers as log as general structure is preserved
Wording of the item	Statements on how to improve the wording of the item	NA	NA	com/ on April	The word "presentation" seems unclear. It could refer to the writing quality or to other factors
			1	19, 2024 by gue	
				est. Protected by copyright.	
	For peer review only	- http://bmjopen.bmj.com/site/ab	oout/guidelines.xhtml		

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				9-03	
		Adherence to RG		560	
		(n= 73)			
Theme	Definition	Code	Sub-code	8 Ju	Example
Adherence to key points	Statements on the importance that a manuscript adherences on the key elements of a checklist	NA	NA	June 2020. Download	I think whether a manuscr adheres to a specific item checklist is not that import Adhering overall to the ke elements needed to report important
Part of the PR process	Statements on the importance of checking the adherence of reporting guideline as part of the peer review process	NA	NA	2020. Downloaded from http://bmjopen.bmj.com/ on April 19,	If it is widely accepted reporting guidelines like th Consort Guidelines I think is an important part of pee review
Author's responsibility	Statements on the author's responsibility to follow reporting guidelines	Too demanding for authors	NA	open.bmj.co	Some reviewers are too mu strict on that
Dependency on the type of journal	Statements on how the assessment of the item depends on the type of study	Consistent format	NA	m/ on April 19, 20	It would be great to have a consistent format and rubr follow to increase comparability of manuscri and distress authors
Dependency on the type of study	Statements on how the assessment of the item depends on the type of study	NA	NA	2024 by guest. Protected by copyright.	Depends on type of study. systematic reviews of cour- fundamental. For other stu- this will be more and more important for easier comparisons between stud- and for quality improveme makes our work easier if th

	BMJ Open		86/bmjop	
			oen-2019-03	
			5604 on 8	authors also compliance also improve
Statements on the editor's responsibility to evaluate the item	Joint responsibility	NA	3 June 20	The editor can also take care of this aspect
	Pre-review	NA)20. Dow	I believe this is the editor's job pre-review
i or pe	Reformatting articles	NA	nloaded from http://b	We accept manuscripts that have been formatted for other journals for peer review. Of course we move towards acceptance they need to be reformatted
General statements	NA	NA	mjopen.bmj.co	Universal reporting guidelines, like CONSORT, can be expected that all reviewers would know
Statements on the importance of the item in assessing the quality of peer review report	Important item	0.	m∕ on April	Essential
Statements on the lack of complete awareness about reporting guidelines from respondents	NA	NA	19, 2024 by guest. Protected by copyright.	In my experience, reviewers know little about the reporting guidelines of the journal for which they are reviewing. I think reviewers should always be sent details of the key guidelines. Otherwise they make criticisms or suggest changes which are incompatible with the guideline of the journal
	responsibility to evaluate the item General statements Statements on the importance of the item in assessing the quality of peer review report Statements on the lack of complete awareness about reporting guidelines from	Statements on the editor's responsibility to evaluate the item Joint responsibility Pre-review Pre-review Reformatting articles Reformatting articles General statements NA Statements on the importance of the item in assessing the quality of peer review report Important item Statements on the lack of complete awareness about reporting guidelines from NA	Statements on the editor's responsibility to evaluate the item Joint responsibility NA Pre-review NA Reformatting articles NA General statements NA NA NA Statements on the importance of the item in assessing the quality of peer review report Important item Important item Statements on the lack of complete awareness about reporting guidelines from NA NA	Statements on the editor's responsibility Joint responsibility NA Pre-review NA Downloaded from http://opensibility Pre-review NA Downloaded from http://opensibility Reformatting articles NA Downloaded from http://opensibility General statements NA NA Statements on the importance of the item in assessing the quality of peer review report Important item Statements on the lack of complete awareness about reporting guidelines from respondents NA

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Providing reporting guidelines	Statements on providing reporting guidelines to reviewers	NA	NA	5604 on 8 June	The reviewer should rec reporting guidelines app to the manuscript under
Reviewer's responsibility	Statements on the reviewer's responsibility to check if the manuscript adherences to reporting guideline	Less reviewer's responsibility	NA	∋ 2020. Dowr	I see that this is less the reviewer's responsibility honest
	p _e	Making easier for reviewers	NA	2020. Downloaded from http://bmjopen.bmj.co	Important for improving standards in reporting, l should be made as easy reviewer as possible, be otherwise it can be too a
		Discussion of the study's issues	NA	//bmjopen.bmj.co	Pointing out where the manuscript does not resp guidelines is useful, but important is discussing t issues themselves
		Tedious for reviewers	NA	m/ on April 19, 2024 by gues	When doing reviews, it i. tedious to have to relate difference reporting and formatting guidelines of particular journals
Getting an accurate review	Statements on how reporting guidelines help delivering an accurate review	NA	NA	. →	That always irritating we authors do not follow the recommendations oto au starting from pagination which helps for deliverin accurate reviewing
		·	·	Protected by copyright.	·

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Unclear responsibility	Statements on the unclear responsibility of checking for the adherence of the manuscript to reporting guideline	NA	NA	n-2019-035604 on 8 June	I am not sure whether this is the peer reviewers' or the editor's responsibility
Utility of reporting guidelines	Statements on the uncertain utility of reporting guidelines	NA	NA	e 2020. Downlo	I'm not convinced that reporting guidelines make that much difference, but they are certainly better than nothing
Wording of the item	Statements on how to improve the wording of the item	Meaning of reporting guidelines	NA	aded from h	I simply do not know what this means. Which reporting guidelines?
		ereviev		2020. Downloaded from http://bmjopen.bmj.com/ on April 19, 2024 by guest. Protected by copyright.	
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				6/bmjopen-2019-035604 on	
	la l	Structure of reviewer's comment	s	5604	
		(n= 33)		on 8	
Theme	Definition	Code	Sub-code	nr	Example
Content and completeness are more important	Statements on the more importance of review's content and completeness	NA	NA	ne 2020.	Completeness is more important than how structu
Definition of structured and organized	Statements on how to define the item	NA	NA	Downloaded from http://bmjcpen.bmj.com/	General comments (e.g. on style) followed by structure comments (line by line or section by section)
Dependency on the structure of the manuscript	Statements on the importance of the item in relation to the structure of the manuscript	NA	NA	n http://bmjc	Again - somewhat dependent the structure of the manusc that is being peer-reviewed
General comments	General statements	NA	NA	pen.bmj.com/	Peer review is not an editor exercise, but clarity and reproducibility are part of g science.
Useful for both authors and editors	Statements on the importance of the item in helping authors and editors	Making easier to answer	NA	on April 19,	Makes it easier for the auth responding
Importance of the item	Statements on the importance of the item in assessing the quality of peer review report	Not so important	NA	2024 by guest. P	It helps, but I'm not sure the important enough to be assessed. Should covary strongly with other characteristics of the review
Not related to meaningful content	Statements on the no relationship between a well- structured review and meaningful review's content	NA	NA	otected by copyright.	Makes it easier to respond but doesn't mean the review content is more or less meaningful

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Related to other item	Statements on the link of the item with other items	NA	NA	l on 8 June	Makes it easier to respond to comments if they are clear an easy to read
Review reorganized by editors	Statements on the reorganization of a review by editors	NA	NA	2020.	It is up to the editor to interp the referee comments and ma concrete recommendations of demands on the authors if needed.
Reviewer as unpaid extra job	Statements on the voluntary job of reviewers	NA	NA	ed from http://b	Semantic point, be careful about asking too much from unpaid and unrewarded reviewers
Standard structure of a review	Statements on the necessity to have a standard structure for reviews	Different perspective	NA	mjopen.bmj	Organised according to who perspectiveone person's structure is another's chaos?
		More difficult for reviewers	NA	Downloaded from http://bmjopen.bmj.com/ on April 19, 20	But the more you set exacting standards for a review, the more difficult you make it for reviewer. This is undoubtedly something to aim for, but reviewer time is an issue
Time consuming to reorganize the review	Statements on the time lost in reorganizing the reviewer's comments	NA	NA	2024 by guest	Otherwise time is lost in tryin to reorganize and understand what the reviewer means
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		Clarity (n= 26)	6/bmjopen-2019-035604 on	
Theme	Definition	Code		Example
Editors can make the comments clearer	Statements on editor's task to edit the reviewer's comments	NA	NA Pe 2020. D	Helpful but not essential since the editor can help make sense of them for authors
General comments	General statements	NA	Sub-code Ju NA ne 2020. Downloaded NA no	Peer review is not an editoria exercise, but clarity and reproducibility are part of goo science
Useful for authors and editors	Statements on the usefulness of a clear peer review report for both authors and editors	NA	NA http://bmjo	Otherwise neither the editor nor the authors can use the review appropriately
Importance of the item	Statements on the importance of the item in assessing the	Important item	NA Per	Clarity is important
	quality of peer review report	Less important	NA http://bmjcpen.bmj.com/ on April 19, 2024 by NA NA NA NA NA	As long as the authors can understand the meaning, it is more important that the paper is clear
Not a marker of quality	Statements on not considering clarity as marker of quality	NA	NA 19, 2024 by	To me, although this is essential, it is more of an expectation of the review, rather than a marker of quality
Reviewer as unpaid extra job	Statements on the voluntary job of reviewers	NA	NA guest. Protected by copyright	But also conscious that we're all writing reviews late at nig and so sometimes the ideal 'slips'

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				16/bmjopen-2019-035604 on	
To avoid repeated cycles of PR	Statements on the importance of the item to avoid repeated cycles of PR	NA		8	es - to avoid repeated cycles f peer review
Useful for authors	Statements on the usefulness of the item for authors	Authors can ask for further clarity	NA	2020. a	t should be acceptable for uthors to query reviewers' omments and ask for further larity
	· 0	Easy to respond	NA	nloaded from	lakes it easier to respond to omments if they are clear and asy to read
	106	Making sure the comments are intended	NA	http://bmi	t is necessary to improve the hances that the comments ar lken as intended
Wording of the item	Statements on how to improve the wording of the item	Disagreement on the wording easy to read	NA	ppen.bmi.com/ on	think easy to understand ma e a better way to say this. I'r ot sure easy to read is as pplicable in the age of the omputer
			on/	Downloaded from http://bmidpen.bmi.com/ on April 19, 2024 by gues	
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				6/bmjopen-2019-035604 on	
		Constructiveness (n=46)			
Theme	Definition	Code	Sub-code	<u>8</u> ار	Example
Clear guidance	Statements on the importance to give clear guidance on how to improve the manuscript	NA	NA	June 2020. Downlo	Worth emphasising that the should, where appropriate, clear guidance on how pap might be improved and not derogatory
Dependency on the paper quality	Statements on how the constructiveness of reviewer's comments depends on paper quality	NA	NA	aded from http:	I suppose there will be som submissions which are so p this will be difficult
Extent of the comments	Statements on the consideration to what extent reviewer's comments could be addressed	NA	NA	2020. Downloaded from http://bmjopen.bmj.com/ on April 19, 2024 by gues	I think that reviewers shoul also consider to what exten their comments can be addressed. For example, if paper on a survey, it's not helpful for a reviewer to sa that more people should be surveyed
General comments	General statements	NA	NA	pril 19, 2024 by	The worst reviews are the o where the reviewer just ran on and does not provide something to respond to
Importance of destructive comments	Statements on the importance of destructive comments	NA	NA	/ guest. P	Some bellicose reviews are pretty helpful
Importance of the item	Statements on the importance of the item in assessing the quality of peer review report	NA	NA	Protected by copyright.	I would rank this as the mo- important

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				en-2019-03
Marker of quality	Statements on constructiveness as a marker of quality	NA	NA	Constructiveness flags the reviewer's interest in improving the paper, so it is a marker of the likely value of their review
Negativity of the comments	Statements on the total negativity of reviewer's comments	NA	NA	The reviewers' comments are important, however at times, without any reasons the comments are totally negative
Not mandatory requirement	Statements on constructive comments as not a mandatory requirement	NA	NA	They can be, but it's not mandatory. Some manuscripts shouldn't be published
Not reviewers' responsibility	Statements on how reviewers should not rewrite the paper but be respectful	NA	NA	It is not the reviewers' job to rewrite the paper or mentor th authors. However comments should always be respectful
Related to author's experience	Statements on how constructive comments are related to the experience of authors	NA	NA .	Constructiveness flags the reviewer's interest in improvin the paper, so it is a marker of the likely value of their review 2020 The reviewers' comments are important, however at times, without any reasons the comments are totally negative 2020 They can be, but it's not mandatory. Some manuscripts shouldn't be published 2031 It is not the reviewers' job to rewrite the paper or mentor the authors. However comments should always be respectful 2040 It depends on the status of the author. A beginner in a field needs encouragement and support. An older expert who it talking rubbish deserves more direct language
Related to recommendation	Statements on how constructive comments are also useful if the manuscript is rejected	NA		Important, even if the recommendation is to reject:the authors will probably submit elsewhere, the commen can be useful for them in order to improve the paper
Related to the readership's interest	Statements on how constructive comments are related to the interest of readership	NA	NA	to improve the paper to improve the paper Unless manuscript really not of interest to readership, then I would not expect a reviewer to copyright.

24		BMJ Open		3/bmjope	
				6/bmjopen-2019-035604 on	
					spend a lot of time essention helping the authors
Related to other items	Statements on the link of the item with others	NA	NA	8 June 2(Hands in hands with being courteous
Sometimes difficult to be constructive	Statements on how comments are sometimes difficult to present in a constructive way	NA	NA	2020. Downloaded from h	I am not sure this reflects quality - valid concerns ov methodology, results etc. a sometimes difficult to prese a constructive way. Clearly being constructive is prefe though
Subjective term	Statements on the subjective interpretation of the term "constructiveness"	NA	NA	http://bmjope	I think this is a subjective t
Usefulness for both authors and editors	Statements on how constructive comments are useful for both editors and authors	Useful for authors	NA	en.bmj.co	Directly linked to helping author improve the manuse
		Useful for editors	NA	m/ on April 19	In case the review aims to support the editor to offer revision, constructiveness review is more relevant
Wording of the item	Statements on how to improve the wording of the item	NA	NA	, 2024 by gues	I want respectful and helpf Sometimes that is different "constructive."
				t. Protecte	
				Protected by copyright.	
	For peer review only	- http://bmjopen.bmj.com/site	e/about/guidelines.xhtm		

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Detail/Thoroughness (n= 62)						
Theme Accommodating reviewer's comments	Definition Statements on how authors accommodate reviewer's comments	Code NA	Sub-code NA	Example On the other hand, authors often spend a lot of time with accommodating reviewer comments that were maybe not that relevant to start with. So there is a limit to how detailed and thorough is still helpful and the authors should have the right to reject some of the requests Sometimes, where a paper is clearly inadequate producing a detailed report is necessary They can be detailed but not usefulfor example, when they concentrate on grammar and spelling Sometimes the length of the comments is greater than the length of the manuscript. Peer reviewers should provide positive suggestions how the paper can be improved or rejected. The forma of the comments should be the same as the format of the responses, e.g. what I propose and why		
Dependency on the paper quality	Statements on how detailed comments depends on the quality of the paper	Detailed when paper is inadequate	NA	Sometimes, where a paper is clearly inadequate producing a detailed report is necessary		
Detailed but not useful review	Statements on how detailed comments are not always useful	NA	NA	They can be detailed but not usefulfor example, when they concentrate on grammar and spelling		
For improving or rejecting the manuscript	Statements on the importance of detailed review to improve or reject a manuscript	NA	NA	DillSometimes the length of the comments is greater than the length of the manuscript. Peer reviewers should provide positive suggestions how the paper can be improved or rejected. The forma of the comments should be the same as the format of the responses, e.g. what I propose and why		

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4 5 6 7	Importance of the item	Statements on the importance of the item in assessing the quality of peer review report	NA	NA	5604 on 8 Ju	Most important!
8 9 10 11 12	Inconsistency in length	Statements on how peer review report are inconsistent in length	NA	NA	ne 2020. Dowr	The most disconcerting thing about reviews is inconsistency - when one is five pages long, the other five lines
13 14 15	Not always necessary	Statements on how detailed comments are not always necessary	NA	NA	nloaded f	Ideally but not always necessarily
16 17 18 19 20 21 22	Providing a justification	Statements on the importance of providing a justification in the comments	NA	NA	fom http://bmjopen.b	This is a pet peeve of mine. Some reviewers say things like "it has been demonstrated that this method of analysis is flawed" without providing a reference, for instance
23 24 25 26	Related to other items	Statements on the link of the item with others	NA	NA	mj.com/ on Ap	I would have thought clarity was a more important criteria then being detailed but agree about thoroughness
27 28 29	Reviewer as unpaid extra job	Statements on the voluntary job of reviewers	NA	NA	ril 19,	Reviewers' time is valuable
31 32 33	Straight to the critical points	Statements on the importance of succinct comments	Detecting fatal flaws	NA	2024 by guest	Focusing on one major flaw is more important than recitating all the typos
34 35 36 37 38			Excessive details	NA	. Protected by	But they can be too detailed leading to a report that is too long overwhelming the author with too many requested revisions
39 40 41 42					copyright.	

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		Expectation from the authors	NA	on 8 June 20 <u>2</u> 0.	the most important is that the reviewer clearly indicate what he/she is expecting from the authors
Wording of the item	Statements on how to improve the wording of the item	NA	NA	120. Dowr	"detailed, thorough and clear" (or unambiguous)
		NA		lloaded from http://bmjopen.bmj.com/ on April 19, 2024 by guest. Protected by copyright.	
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				6/bmjopen-2019-035604 on	
				9-0356	
		Objectivity (n= 62)		04 on 8	
Theme	Definition	Code	Sub-code		Example
Citing own work	Statements on reviewers citing their own work in a peer review report	NA	NA	ne 2020. Dow	Please can reviewers not c their own work. This usual means they have approach the paper with bias
Declaration of COI	Statements on the importance of reviewer's conflict of interest declaration	More important than be objective	NA	nloaded from h	Declarations of competing interest and bias are more important than the claim to objective
Dependency on the study type	Statements on how objective comments are related to the type of study	Related to study's quality	NA	June 2020. Downloaded from http://bmjopen.bmj.com/ on April 19, 2024 by gues	This is a fundamental print that the comments should l disinterested (i.e. not drive the reviewer's self-interest, this increases the chance of comments relating to the paper's quality
		Related to the novelty of the study	NA	on April 19, 2024 by gu	Moreover, reviewer's comp are strongly influenced by reputation of the author and novelty of the idea. The les known the author and the r novel the idea, the reviewe tends to be less objective
Editor's objectivity rather than reviewer's objectivity	Statements on the importance of objectivity from editors rather than peer reviewers	NA	NA	lest. Protected by copyright.	Editors are supposed to be objective, so reviewers can opinionated if they wish

		BMJ Open	6/bmjop	
			en-2019-03	
Following a specific rubric	Statements on the importance to follow a specific rubric to guide comments by peer reviewers	NA	6/bmjopen-2019-035604 on 8 June 2020. Downloaded from http NA NA NA NA	Reviewer should follow a specific rubric to guide comments and make revision manageable by author
General comments	General statements	NA	NA 2020. Downlo	This is one of the most critical elements of good peer review in my opinion but also one of the rarest things to find
Importance of the item	Statements on the importance of the item in assessing the quality of peer review report	NA	NA aded from http	This is a fundamental principle that the comments should be disinterested (i.e. not driven by the reviewer's self-interest)
Impossibility to be total objective	Statements on the impossibility for reviewers to be totally objective	Comments are subjective by definition	NA bmjop	All reviews are subjective!
		Desirable to express own opinion	Awareness of own experience	A better expectation is that reviewers come to the role aware of their own backgrounds, culture, experiences, research and views on the topic will affect their assessment of the research
		Reminding reviewers to be objective	NA 2024 by gues	As far as possible - reminding reviewers to be as objective as possible would be a good start
		Subjective comments are helpful for both editors and authors	NA NA NA	I think there are subjective comments that are still valuable to the authors and editors. For example, if the reviewer finds a section of the manuscript to be

For peer review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml

4		BMJ Open)/bmjo	
				pen-2019-03	
				6/bmjopen-2019-035604 on 8 June	opinion but can still help authors re-assess and potentially improve that p of the manuscript
Justification of the comments	Statements on the importance of substantiating the comments by peer reviewers	NA	NA	2020. Downloaded	It is important that the re substantiates comments, a that the authors are able respond in case of revisin their manuscript, to the reviewer's comments
Recruiting additional reviewers	Statements on recruitment of additional peer reviewers when the reviews are not objective	NA	NA	from http://bmjopen.t	When peer reviewers recommend citing own pa or clearly favour one trea over the others, editors sh recruit additional peer reviewers
Related to authors' reputation	Statements on how peer reviewers are influenced by author's reputation	NA	NA	mj.com/ on April 19,	Moreover, reviewer's com are strongly influenced by reputation of the author a novelty of the idea. The le known the author and the novel the idea, the review tends to be less objective
Related to other item	Statements on the link of the item with others	NA	NA	2024 by gues	Goes along with a courted tone
Reviewer's expertise	Statements on how the assessment of the item depends on reviewer's expertise	NA	NA	uest. Protected by copyright	Every reviewer will alway have their own perspectiv based on their expertise
Wording of the item	Statements on how to improve the wording of the item	Unclear item	Difficult to define	ted by	<i>It would be very difficult t define this</i>

		BMJ Open		6/bmjopen-2019-035604 c	
		Fairness (n= 55)		on 8 June	
Theme	Definition	Code	Sub-code		Example
Biases are unavoidable	Statements on how reviewer's biases are unavoidable	NA	NA	2020. Downloaded from	Reviewer biases are a reality, but one should (where possible) recognize them and phrase criticism in that light
Editor's responsibility	Statements on the editor's responsibility to be fair	NA	NA	ed from	Fairness is the editor's responsibility to judge
Fair depends on author's characteristics	Statements on how the reviewer's comments are influenced by author's characteristics	NA	NA	http://bmjopen.	It is well known that reviewers comments are not fair in terms of the location, ethnicity and gender of the authors
Importance of the item	Statements on the importance of the item in assessing the quality of peer review report	NA	NA	bmj.com/ or	Fairness is extremely important
Importance to back up opinions	Statements on the importance of backing up opinions by peer reviewers	NA	NA	1 April 19, 2024	Crucial that a reviewer backs up their opinion with evidence from the paper/published literature
Justification based on the paper quality	Statements on how justification of reviewers is based on the quality of the paper	NA	NA	4 by guest. Protected by copyright.	As per above, the reviewers comments must be justified based on the quality of the article rather than on their personal views
Recognizing COI	Statements on recognition of reviewer's conflict of interest	NA	NA	ted by	More specifically, Editors should identify if the referee

ge 99 of 124			BMJ Open		86/bmjo	
					pen-2019-03	
					6/bmjopen-2019-035604 on 8 June 2020.	has potential conflict of interest especially if he/she can have a conflict of interest working on the same field or topics. We all know such
-	Related to other items	Statements on the link of the item with others	NA			<i>Objective, evidence-based, fair etc. are highly correlated</i>
-	Reviewers' perspectives	Statements on the importance of having peer reviewers with different perspective	NA	NA	Downloaded from http://bmjopen.bmj.com/	We often seek reviewers with different perspectives, so the entire editorial review team is constructed to be fair
-	Subjective item	Statements on the subjective interpretation of the term "fairness"	NA	NA	http://bmjope	Fair, of course, is subjective
-	Wording of the item	Statements on how to improve the wording of the item	Simplistic way to assess quality	NA	n.bmj.com/	Donald Trump sees the world in terms of fair or unfair. I think this is too simple a view
			Unclear item	Difficult to define Difficult to measure	on April 19, 20	How do you define 'fair'? How would you measure "fairness" of a review?
					2024 by guest. F	
					t. Protected by copyright.	
					copyright.	

BMJ Open					
				6/bmjopen-2019-035604 on	
		Support by evidence		000	
		(n= 69)			
Theme	Definition	Code	Sub-code	<u>8</u> ار	Example
Context dependency	Statements on how the importance of item depends on the context	NA	NA	June 2020. Downloaded f	Completely depends on the context; sometimes common sense can suffice but other times evidence-based critiques are necessary to show authors and editors why something needs changing
Dependency on the type of study	Statements on how comments supports by evidence depends on the type of study	NA	NA		Depends on the type of study
Editor's responsibility	Statements on the editor's responsibility to determine if reviewer's comments are relevant or not	NA	NA	rom http://bmjopen.bmj.co	It is the editor's role to determine whether they are relevant or not
Especially for supporting criticism	Statements on the importance of supporting criticism using evidence	NA	NA	m/ on April 19, 2024 by gues	Comments, especially criticisms, should be supported by citations wherever possible, subjective criticism ("I prefer such and such a method") is not constructive
Helpful when there are disagreements	Statements on the particular importance of the item especially when there are disagreements	NA	NA	t by guest. Protected by copyright.	Particularly if authors objections are rooted in disagreements with their own opinions or collaborators opinions
Importance of perceptions, opinions and experiences	Statements on the importance of perceptions, opinions and	Especially for too innovative manuscript	NA	ed by	The exceptions are when the manuscript is too innovative or

124		BMJ Open		86/bmjop	
				en-2019-03:	
	experience of a reviewer in assessing a paper			6/bmjopen-2019-035604 on 8 June 20	groundbreaking. In these case, knowledge and expertise to identify a possible major breakthrough is of utmost importance
Importance of the item	Statements on the importance of the item in assessing the quality of peer review report	Important item	NA	2020. Downloaded from http://bmjope	Very important. As an author and a frequent reviewer I have seen reviewer comments which are anything from completely wrong to simple statements of opinion without any evidence- base. But in my experience, what I would regard as quality reviews, up to date and accurate, are exceptionally rare
		Not important item	NA	n.bmj.com/ on	Do you mean that they offer citations for their comments? If so, that's probably not important
More information needed by authors	Statements on the necessity to get more information by authors	NA	NA	April 19, 2024	Sometimes comments may be based on a hunch and more information from authors may be needed
Unnecessary to provide evidence to each comments	Statements on how it is unnecessary to provide evidence for each comment	NA	NA	by guest.	I don't think reviewers need to cite something for every point that they make
Related to other items	Statements on the link of the item with others	NA	NA	rotected	If you mean, is it an objective review, then it is important
				Protected by copyright.	

		BMJ Open		6/bmjoper	
				-2019-03	
Reviewer's expertise	Statements on how the assessment of the item depends on reviewer's expertise	NA	NA	5604 on 8 J	Based on the reviewer's knowledge and experience
Selecting use of evidence	Statements on providing the use of no selective evidence	NA	NA	une 2020	Provided the use of evidence is not selective
Difficulty of backing up all comments	Statements on the difficulty of backing up each comments	NA	NA	6/bmjopen-2019-035604 on 8 June 2020. Downloaded from h	Wild claims may need back up but it is unrealistic to expect reviewers to back up everythin they say. A quicker system for raising and addressing queries would be a better response
Wording of the item	Statements on how to improve the wording of the item	Difficult to measure	NA	http://bmj	But I'm not sure how you judg this
		Providing citations	NA	open.bm	Do you mean that they offer citations for their comments?
		Unclear item	NA	j,com/	I don't really understand
				ttp://bmjopen.bmj.com/ pn April 19, 2024 by guest. Protec	
				t. Protected by copyright.	
	For peer review only -	http://bmjopen.bmj.com/site/ab	out/guidelines.xhtml		

24		BMJ Open		bmjope	
				6/bmjopen-2019-035604 on	
		Knowledgeability (n= 57)		5604 on 8	
Theme	Definition	Code	Sub-code		
CoI between reviewers and authors	Statements on possible conflicts of interest between peer reviewers and authors	NA	NA	DeAlthough2020it can creation2020interest asDoreviewersthe same fImage: the same f </td <td>this is very i ate a conflic s the authors may be invo field of resec result in a d r against the in the manu</td>	this is very i ate a conflic s the authors may be invo field of resec result in a d r against the in the manu
General comments	General statements	NA	NA	commit tir process an	s should be d ne and effor nd be held ple to the cor
Importance of the item	Statements on the importance of the item in assessing the quality of peer review report	Important item	NA		y this is a key ent
Related to other items	Statements on the link of the item with others	NA	NA	on Peer revie April understan methodolo	ewers should ading of rese ogy as well
Responsibility	Statements on editor or author's responsibility to evaluate the item	Author's responsibility	NA	whether the	n this can be he authors h cated their w
		Editor's responsibility	NA	Ofit - but sorOfThis is wh	e to try to un metimes they pere the edito tical eye to e
				y copyrigh	

	BMJ Open				
				16/bmjopen-2019-035604 on 8	
				5604 on 8	reviewer has grasped the essence of the article.
Review as guide for editors	Statements on how a review is a guidance for editors		NA	June 2020. Downloaded from http://bmjopen.bmj.com/ on April 19, 2024 by gues	Extremely important. Nothing more annoying to an author than realising the reviewer has not fully read the paper. Also crucial if the review is to provide fair guidance for editors
Reviewer as disadvantaged position	Statements on how the peer reviews is often in a disadvantaged position	erto	NA	ed from http://bmjop	The reviewer is often at a disadvantage as he/she is given limited information on which to make a decision on whether to accept or reject the offer to review
Reviewer as unpaid extra job	Statements on the voluntary job of reviewers	CVio.	NA	en.bmj.co	Yes, but see issue above about late night reviewing
Reviewers as readers proxy	Statements on how the reviewer acts as a proxy for the reader		NA	om/ on April 19, 20	The peer reviewer acts as a proxy for the reader, so a basic understanding of the manuscript's content is important
Reviewers' expertise	Statements on different reviewer´s expertise	Assessment reviewers' expertise	NA	. +	This is very important. I've long thought that one of the review criteria should be self-ratings of the reviewer's expertise in the substantive and methodological aspects of the article
				Protected by copyright.	

Page 105 of 124	4		BMJ Open		86/bmjop	
1 2 3					6/bmjopen-2019-035604 on	
4 5 6 7			Declaration of competence by reviewers	NA	5604 on 8 Ju	Reviewers should declare their competence in the subject of the manuscript
8 9 10 11 12 13		4	More reviewers	NA	lune 2020. Downloaded from h	Some reviewers know about methods and some about content. It would be ideal to always have both, but that is often not the case
14 15 16 17		D _C	Understanding also research methodology	NA	aded from h	Peer reviewers should have understanding of research methodology as well.
18 19 20 21 22	Wording of the item	Statements on how to improve the wording of the item	Confusing item	NA	http://bmjopen.b	I found this question confusing. Are you asking if the reviewer is competent to evaluate the content of the manuscript?
23 24 25 26 27			Difficult to assess	NA	mj.com/ on Ap	Not sure how you would know if the reviewer knows and understands correctly the content of the manuscript
27 28 29 30 31			Disagreement with the wording	NA	ril 19, 2024	"Knows" and "understands" are distinct concepts and should not be combined here
32 33 34 35					by guest. Pro	
36 37 38 39					t. Protected by copyright.	
40 41 42					opyright.	
43 44 45		For peer review only	- http://bmjopen.bmj.com/site/ak	oout/guidelines.xhtml		

		BMJ Open			
				56/bmjopen-2019-035604 on	
		Timeliness (n= 49)			
Theme	Definition	Code	Sub-code	<u>8</u> J	Example
Better quality rather than on Stime Stime	Statements on how a high quality review is more important than an on-time review	NA	NA	June 2020. Dow	But it is better to wait a while and have a high-quality review than to receive a quick, superficial and/or unfair review.
i	Statements on how the importance of the item depends on the type of delay	NA	NA	2020. Downloaded from http://bmjdpen.bmj.co	A few additional days of delay is not a major issue, while months of delay are
journal j	Statements on how biomedical journals differently evaluate the item	NA	NA	h http://bmjo	Less important for pre-prints or F1000Research
с	Statements on how long delay can cause difficulties to the editor	NA	NA	pen.bmj.co	Difficult for the editor if the delay is too long (or, worse, need to find another reviewer)
	Statements on the importance to provide reasonable deadlines	Tendency to give short deadlines		m/ on April 19, 2024 by gues	Important, but there seems to be a trend among the editors to get reviews done in shorter amounts of time. Reminders are very helpful, but also some flexibility
General comments C	General statements	NA		. +	The peer review process needs to be helpful for getting quality research into the public domain in a timely manner. It should not be a road block
	Statements on how to be on time is the golden rule	NA	NA	Protected by popyright	It's the Golden Rule - it's just polite to be on time! Do as you would be done by etc.

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	3/bmjop	
	6/bmjopen-2019-03560-	
NA	On 8	Very important for us as we to provide a rapid response the outcome of papers
NA	2020. Downloaded	Far too many editors now a asking for reviews to be complete in too little time. I is being done for the good a journal's reputation, not for good of science
NA	from http://b	Increasing time for revision doesn't add anything to the quality
NA	pen.bmj.co	Again not sure this contribu directly to the quality of the review process but is impor in terms of ensuring that publication timetables can adhered to
NA	April 19,	Availability, timeliness, reliability (reviewing when will review) are orthogonal review quality.
NA	guest.	This is more on the professionalism of the revie rather than the quality of th review
NA	ected by p	There are heavy demands o time. I find to carry out a qu review on a paper which ne
	NA	e.

		BMJ Open	-	
				ben-2019-03
				<i>expert reviewing to achieve the</i> <i>two aims laid out initially, that it</i> <i>takes a minimum of half a day,</i> <i>and often a day to do a good job</i>
	4	Difficult to find reviewers	NA	We are all busy! biggest issue is finding someone to say yes in first place
	'or pe	Little delay	NA	BothBut are the deadlines reasonable ?But are the deadlines reasonable ?Depends on how much time the journal gives. 2 weeks is not enough!
		Reasonable time for the reviewer	NA	But are the deadlines reasonable?
Scope of the peer review	Statements on the scope of the peer review process	NA	NA	Of course, with the caveat that peer review is voluntary and usually being fitted in around other work activities
Time given by the journal	Statements on how journals give different deadlines	NA	NA	Depends on how much time the journal gives. 2 weeks is not enough!
Wording of the item	Statements on how to improve the wording of the item	Unclear item		
				one day late a problem? Or a week late if the authors tell you?
			ú	riaht.

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				open	
				6/bmjopen-2019-035604 on	
				-0356	
		Tone (n= 40)		604 on 8	
Theme	Definition	Code	Sub-code		Example
Academia as though environment	Statements on the aggressiveness and competition in academia	NA	NA	June 2020. Downloaded from	There is enough competend and aggressiveness in academia without havin receive reviews which a rude or condescending.
Dependency on the author's work	Statements on how the tone used by reviewers depends on the author's work	NA	NA	aded from h	Depends on the author, how much rubbish is bei put forward
Dependency on the paper quality	Statements on how the tone depends on paper quality	NA	NA	http://bmjc	And how much rubbish to being put forward
Editor's responsibility	Statements on the editor's responsibility to tone down the peer review reports	Removal comments by editors	NA	http://bmjcpen.bmj.com/	Editor can tone down or out obnoxious comments it is better not to have to this
Golden rule	Statements on how to use a courteous tone is the golden rule	NA	NA O	on April 19,	Golden Rule again. Hidi rudeness behind anonyn odious
Hiding behind anonymity	Statements on how peer reviewers use anonymity to hide rudeness	NA	NA	2024 by guest. Prote	All too often, peer review use the anonymity of the review process as an exc to be rude and scathing way they would be unlike adopt in person
Impact of a rude review	Statements on how rude reviews can impact authors	NA	NA	Protected by copyright.	And if authors receive discourteous comments, really does 'sour' the pr

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		BMJ Open		/bmjop	
				6/bmjopen-2019-035604 on 8	
				5604 on 8	and put people off, especiall new researchers
Importance of the item	Statements on the importance of the item in assessing the quality of peer review report	Important item	NA	June 2020. Downloaded from http://bmjopen.bmj.com/ on April 19, 2024 by gues	This is important. Especially to keep his/her nerves when looking at the first revised version and notice that the revision is not answering the queries and comments! Should also provide authors the keys to improve the pape and answer politely to referees
Not always a necessary requirement	Statements on how courteous tone is not always a necessary requirement	NA	NA	http://bmjop	This is nice, but not totally necessary
Related to cultural differences	Statements on how courteous tone is culturally bound	NA	NA	en.bmj.cc	I think this is important, but courtesy is culturally bound
Related to other items	Statements on the link of the item with others	NA	NA	om/ on A	This relates to constructiveness, above
Requirement	Statements on the requirement to use a courteous tone in a peer review report	NA	NA	oril 19, 2024 by	But it's an ethical requirement, and helps improve everyone's experience
Review quality is important than courteous tone	Statements on how an higher quality review is more important than a courteous review	NA	NA	. 	Would you rather be treated by skilled, but rude, surgeon or by a courteous flop?
Useful for authors	Statements on the usefulness of the item for the authors	NA	NA	Protected by copyright	The reviewer's aim should b to give comments that make the next version of the

111 of 124		BMJ Open		3/bmjopen-2
				6/bmjopen-2019-035 004 manuscript better (whether or not it is accepted for that
Wording of the item	Statements on how to improve the wording of the item	Difficult to define	NA	00 specific journal) 01 0 02 It is impossible to define 02 'courteous' so I doubt that this
	Or			wnloaded 1
				from http://b
				wnloaded from http://bmjopen.bmj.com/ on April 19, 2024 by gues
				com/ on Apr
				ii 19, 2024 E
				uest.
				Protected by copyright
				sopyright.
	For peer review only	v - http://bmjopen.bmj.com	/site/about/guidelines.xhtml	

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Codebook 3. Identificatio	n of new items to assess peer	BMJ Open r review report quality		6/hmionen-2019-035604 c	
	Id	entification of new items to assess peer review re (n=152)	eport quality	5 00	
		(n-132)		. lune	
Theme	Definition	Code	Sub-code	2020	Example
Characteristics of reviewer's comments	Statements on the characteristics of the comments made by a peer reviewer	Clarity	Clarity of the expected changes	Downloaded	Being clear about the changes they want to see (vs. vague comments about weaknesses - what would most strengthen)
		Deer -	Clarity of the language	freim	The peer review report should be comprehensive and written clearly. It should not be ambiguous.
		Constructiveness	NA	http://hmibpen.hmi.com/	Constructive attitude should include orientation and suggestion to authors to improve the manuscript.
		Detailed		on Anril 19, 2024	Specific details for concerns and suggestions for improvement are the keys for me. I need substantive concerns.

Evidence-based

Fairness/Unbiased

Specificity

 NA

NA

NA

by guest

t. Protected by copyright.

A good peer-review report

The comments should not only

also includes references

be fair, but also unbiased.

I think that the challenge is

that the comments are context

124		BMJ Open	6/bmjop	
			ven-2019-03	
			6/bmjopen-2019-035604 on 8 June 2020.	specific. Reviews are help when they identify someth that is a challenge or something that can be don better. These rely upon the context.
	6	Structure of the peer review report	Additional comment the editor	Provides additional comm to the editor that provides context to the reviewer's assessment.
		Structure of the peer review report	Explicit recommendation	The reviewer makes an explicit recommendation about what decision to ma i.e., "reject", "revise and r review", "accept", etc.
		erier er	Initial summary	The reviewer should begin report with a short synthe the study (goals and main results)
			2024 by guest.	Length, very short peer re reports make me suspicion that they have even read th paper in enough detail. E. once received a peer revie "report" that had a single sentence along the lines oj "Good methods and result
		Tone	NA Q	Candid
Related to peer review process	General statements on the peer review process	Anonymity _PR process type	NA rotected by copyright.	Reviewers and authors sh be anonymous on both sid

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	BMJ Open	6/bmjo	
		6/bmjopen-2019-035604	
	Dependency on the type of journal	NA of	Reviewers should understand
		8 June 20	the nature of the journal that the manuscript had been submitted to - and should be prepared to state if he / she
		20. Downl	thinks the paper is not appropriate or relevant to that journal's readership.
	Disclosure of reviewer's COI	NA on & June 2020. NA ON & June 2020. Downloaded from http://bmjopen.bmj.com/ Second On Apprent Second S	Conflict of interest. We often can tell that the journal has sent our paper to a reviewer
	Per revien	http://bmjo	who will not be objective in their review, and sometimes even when we've asked the editor to not use a particular
	evia.	pen.bmj.o	reviewer. Editors have an obligation to insure a fair review, and often they do not. In these instances, the
	64	om/ on Ap	outcome is a foregone conclusion
		Requests motivated by reviewer's COI ق 2024 by 90	The reviewer does not make requests that seem to be motivated by a competitive attitude or a conflict of interest.
		Reviewer's publication	Publication record of the reviewer
	Editor's responsibility	Balanced and fair decision	Editor' decisions should also be balanced and fair, especially when reviewing are
		by copyright.	
For peer	r review only - http://bmjopen.bmj.com/site/abou		

Page 115 of 124	BMJ Open		6/bmjop	
1 2 3			6/bmjopen-2019-035604 on	
4 5 6			604 on 8	discordant Editors should also read papers
7 8 9		Filtering reviews		<i>Editors need to protect authors from poor reviewers.</i>
10 11 12 13 14 15 16	High profit of scientific publishing industry	NA	June 2020. Downloaded fron	The scientific publishing industry makes very high profits, in fact it is the most profitable "legal business model" among all economic activities.
17 18 19 20	Peer reviewers' training	NA	n http://bmjopen.bmj.co	A good reviewer needs to be trained: should be important to organize courses
21 22 23 24	Poor quality of the second review	NA		Completion of a second review after the first draft-this is often poorly done
25 26 27 28 29	Quality scale	NA	m/ on April 19,	It might be helpful to consider one of the research quality ratings scales that are used in quantitative reviews.
29 30 31 32 33 34 35 36 37 38 39	Review quality as usefulness to make an editor's decision	NA	2024 by guest. Protected by copyright.	The quality of a peer-review report that an author receives is partially determined by what the editors contribute to it before sending it to the author and how quickly they use it to make a decision. Too many don't send enough feedback, especially when two or more reviewers disagree.
40 41 42			opyright.	

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44 45

Reviewer as unpaid extra job NA Reviewers are scientists that perform a professional service of indigoreement. Reviewer's final choice Difference between ungior and main or revisions and Minor revisions on the vast majority of the cases is not paid. Reviewer's final choice Difference between ungior and minor revisions and Min		BMJ Open	6/bmjope	
Reviewer's final choice Difference between major and minor revisions Always a grey area between Major revisions and Minor revisions that foxes a reviewer Explanation choice If the reviewer makes a recommendation, e.g. accept or reject, they must provide a reason why. A review that just says "accept", "good work", is not a "aclip per review. Reviewer's recognition Professional evaluators by publishers Alternatively, publishers may true "professional evaluators", who they may find in consultancy firms (KPMG, McKinsey, etc.) and pay their fees Rewards for reviewes Payment for the reviewers			n-2019-03	
Reviewer's final choice Difference between major and minor revisions Always a grey area between Major revisions and Minor revisions that foxes a reviewer Explanation choice If the reviewer makes a recommendation, e.g. accept or reject, they must provide a reason why. A review that just says "accept", "good work", is not a valid peer review. Reviewer's recognition Professional evaluators by publishers Alternatively, publishers may tunto to "professional evaluators", who they may find in consultancy firms (KPMG, McKinsey, etc.) and pay their fees Rewards for reviewers Payment for the reviewers			5604 on 8 June 2020. Dow	more back-and-forth "reviews" where reviewers are trapped in a cycle of disagreement and the editors won't make any significant contributions or a decision to
Reviewer's final choice Difference between major and minor revisions Always a grey area between Major revisions and Minor revisions that foxes a reviewer Explanation choice If the reviewer makes a recommendation, e.g. accept or reject, they must provide a reason why. A review that just says "accept", "good work", is not a valid peer review. Reviewer's recognition Professional evaluators by publishers Alternatively, publishers may turu to "professional evaluators", who hey may find in consultancy firms (KPMG, McKinsey, etc.) and pay their fees Rewards for reviewes Payment for the reviewers		Reviewer as unpaid extra job	NA http://b	perform a professional service for the scientific publishing industry that in the vast majority of the cases is not
OperationOperationor reject, they must provide a reason why. A review that just says "accept", "good work", is not a valid peer review.Reviewer's recognitionProfessional evaluators by publishersAlternatively, publishers may turn to "professional evaluators", who they may find in consultancy firms (KPMG, McKinsey, etc.) and pay their feesRewards for reviewersPayment for the reviewers		Reviewer's final choice	Difference between major	
Reviewer's recognition Professional evaluators by publishers may turn to "professional evaluators", who they may find in consultancy firms Image: Construction of the professional evaluators of the publishers of the publi		64	on April 19,	recommendation, e.g. accept or reject, they must provide a reason why. A review that just says "accept", "good work", is
Rewards for reviewers Payment for the reviewers		Reviewer's recognition	Professional evaluators by publishers of the second	turn to "professional evaluators", who they may find in consultancy firms (KPMG, McKinsey, etc.) and
			Rewards for reviewers by copyright	Payment for the reviewers should be considered, and this
	For peer	r review only - http://bmjopen.bmj.com/site/abou	t/guidelines.xhtml	

of 124		BMJ Open	6/bmjope	
			6/bmjopen-2019-035504 on	
			5604 on	would also increase the quality of the evaluations
	6	Saturation of the system	Professional evaluators by publishers 0220. Downloaded from http://b NA 09	So far reviewers are wor "pro bono", and with the tremendous growth in th number of journals and t overall increase of the scientific activity worldw (think just of the soaring number of papers comin, China in recent years) th system is becoming satur and reviewers becoming up
		Scope of review	NA jopen.bmj.com/ or	The number of items liste factor. If too many and in minute detail, the article be suppressed by the she workload of trying to add the comments
		Weighting reviewer's comments	NA April 19, 2024	It is important for the ae weight reviewers comme some are rubbish and ca disregarded
Related to the stud	y Statements on different aspects of a study that should be commented in	About references	Suggesting relevant & references	Including references not known to the author
	a peer review report	Addressing study's aims	NA Protected by copyright.	I think the 'does this stua address its stated aims' i that I raised in my earlie responses is very importa
			copyright.	
	For pee	r review only - http://bmjopen.bmj.com/site/abou	ut/guidelines.xhtml	

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		n-2019-03	
	Adherence to ethical guidelines	NA 004 on 8 J	Comment on the study's adherence to ethical guidelines
	Appendices	NA e 2020. Dow	Use of supplemental material/appendices when appropriate (e.g., sensitivity analyses)
	Applicability of the study	NA load	And general applicability
	Authors' contribution and acknowledgments	P	Clearly articulate the role of every team member, and their contribution to the study. For evidence syntheses, require librarian involvement and give them authorship, the same with statisticians. Everyone in the team, without whose knowledge the study would not be possible, sound, or complete, should be acknowledged.
	Context of the study	NA ¹¹ 19, 2	Puts the study in appropriate context
	Data availability and software	NA NA by gues	Referees check the data availability and if new software actually works
	Data quality	- XTA	Quality of the data is most important
	Ensuring disclosure of COI	NA d by	Conflict of interests could be included
i		NA Protected by copyright.	i

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1 2 3				6/bmjopen-2019-035	
4 5 6 7 8		Ensuring inclusion of data sharing statements	NA	604 on 8 June	Reviewers should ensure data sharing statements are included
9 10		Ensuring language quality	NA	2020.	Comment on readability
11 12 13	4	Ethics	NA		Ethical considerations of research
14 15 16 17 18		Importance of methods	NA	Downloaded from http:	Perhaps reviewing upto methods and evaluating the study that way is worth more consideration.
19 20 21 22 23		Literature is adequately reviewed	Most recent researc	://bmjopen.bm	Reviewer rating of whether The authors discuss the most recent relevant research on the topic
24 25		Originality	NA	i.com/ on	The added value of the study to what is already known.
26 27		Potential impact	NA	April	Potential impact of study
28 29 30 31		Presentation (tables and figures)	NA	19, 2024 by	And appropriateness of accompanying visual aids (graphs, tables e.t.c.).
32 33 34 35 36 37 38		Publication study's protocol and deviation from it	NA	guest. Protected by	Whether a protocol was lodged in publication or on an independent site e.g. OSF and whether it matches the paper and if not, if reporting of deviations is transparent.
39 40 41 42				copyright.	

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Reviewer's expertise Considering reviewer's expertise NA Ma Ma <th></th> <th>Relevance</th> <th>NA</th> <th>019-035604 (</th> <th>relevance</th>		Relevance	NA	019-035604 (relevance
Study limitations NA Whether limitations are acknowledged Study theoretical framework NA Dogic of the theoretical framework Study weaknesses NA Particular framework Suggestions for future studies NA Particular framework Reviewer's expertise Considering reviewer's expertise NA Particular framework Focus on the points suggested by editor NA Particular framework Suggestions for method by editor NA Suggestions for method framework Focus on the points suggested by editor NA Particular framework		Replicability/Reproducibility	NA NA	on 8 June 2020. D	replicated on current methods whether limitations are acknowledged (this was
Study limitations NA Whether limitations are acknowledged Study theoretical framework NA Dogic of the theoretical framework Study weaknesses NA Reviewer comments on the limitations of the study Suggestions for future studies NA Suggestions for future studies Reviewer's expertise Considering reviewer's expertise NA Focus on the points suggested by editor NA Suggestions for meditor re: which points/themes to focus on		Study conclusions	NA	ownload	And finally if the conclusion answers the research question
Study limitations NA Whether limitations are acknowledged Study theoretical framework NA Dogic of the theoretical framework Study weaknesses NA Reviewer comments on the limitations of the study Suggestions for future studies NA Suggestions for future studies Reviewer's expertise Considering reviewer's expertise NA Focus on the points suggested by editor NA Suggestions for meditor re: which points/themes to focus on		Study introduction	NA	ed from h	If the in introduction leads to the research question
Suggestions for future studies NA Point Suggestions for future studies Reviewer's expertise Considering reviewer's expertise NA Point I have experienced vastly different qualities of reviews, so I think that the reviewer's expertise in the area of the article needs to be considered Focus on the points suggested by editor NA Point Suggestions from editor re: which points/themes to focus on		Study limitations	NA		
Suggestions for future studies NA Protected Suggestions for future studies Reviewer's expertise NA Protected I have experienced vastly different qualities of reviews, so I think that the reviewer's expertise Focus on the points suggested by editor NA Protected Suggestions from editor re: which points/themes to focus on		Study theoretical framework	NA	ppen.bmj	
Suggestions for future studies NA Point Suggestions for future studies Reviewer's expertise Considering reviewer's expertise NA Point I have experienced vastly different qualities of reviews, so I think that the reviewer's expertise in the area of the article needs to be considered Focus on the points suggested by editor NA Point Suggestions from editor re: which points/themes to focus on		Study weaknesses	NA	.com/ on	
Focus on the points suggested by editor NA P Suggestions from editor re: which points/themes to focus on		Suggestions for future studies	s NA	April	Suggestions for future studies
which points/themes to focus on	Reviewer's expertise	Considering reviewer's expen	rtise NA	19, 2024 by guest	<i>different qualities of reviews,</i> <i>so I think that the reviewer's</i>
		Focus on the points suggested	d by editor NA	Protected	which points/themes to focus

Page 121 of 124	BMJ Open	66/bmjop	
1 2 3			6/bmjopen-2019-035 What the reviewer feels they cannot comment on (e.g. is
4 5 6 7	Knowing dimensions not assessed by reviewer	s NA	What the reviewer feels they cannot comment on (e.g. is outside their expertise)
8 9 10 11 12	Rating or commenting on own level of expertis	se NA	The reviewer should stateThe reviewer should statethose aspects of the study forwhich they have limitedknowledge
12 13 14 15 16 17	Reviewer's type	NA	The reviewer should state those aspects of the study for which they have limited knowledge Items need to be tailored for whether the reviewer is a stats (methodology) reviewer or clinical expert
18 NA= 19 20 21	= not available		http://bmjopen
22 23 24 25 26			ttp://bmjopen.bmj.com/ on April 19, 2024 by gues
27 28 29 30			April 19, 2024
31 32 33 34 35			juest.
36 37 38 39			Protected by copyright.
40 41 42 43 44	For peer review only - http://bmjopen.bmj.com/site/ab		yright.
44 45 46			

New items	Example
1. Adherence to ethical guidelines	"Comment on the study's adherence to ethical guidelines"
2. Author's contribution and acknowledgements	"Clearly articulate the role of every team member, and their contribution to the study. For evidence syntheses, require librarian involvement and give them authorship, the same with statisticians. Everyone in the team, without whose knowledge the study would not be possible, sound, or complete, should be acknowledged."
3. Data availability	"Referees check the data availability and if new software actually works"
4. Disclosure of COI	"Conflict of interests could be included"
5. Data sharing statements	"Reviewers should ensure data sharing statements are included"
6. Study protocol	"Whether a protocol was lodged in publication or on an independent site e.g., OSF and whethe it matches the paper and if not, if reporting of deviations is transparent."
7. Addressing study aims	"I think the 'does this study address its stated aims' issue that I raised in my earlier responses is very important"
8. Study introduction	<i>"If the in introduction leads to the researd question"</i>
9. Study limitations	"Whether limitations are acknowledged"
10. Study conclusion	"And finally if the conclusion answers the research question."
11. Theoretical framework	"Logic of the theoretical framework"
12. Relevant literature	"Reviewer rating of whether The authors discuss the most recent relevant research on the topic"
13. Reproducibility	<i>"Whether the study can be replicated on curren methods"</i>

Supplementary file 6. New items suggested by survey participants

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Supplementary file 7. Explanations of the items included in the ARCADIA tool

Domain 1: Importance of the study

Item 1.a Contribution

A study can contribute to scientific knowledge in many ways: it can be a novel or confirmatory study with little or great impact on society and/or the research community. The contribution of a study is therefore not only associated to its novelty. Studies also need to be replicated in order to verify the validity of their results. The peer reviewer should discuss the importance of the study's research question.

Item 1.b Relevant literature

The peer reviewer should check if the authors reviewed the relevant research related to the study's topic in order to situate the study within the context of the existing literature.

Domain 2: Robustness of the study methods

Item 2.a Study methods

The peer reviewer should evaluate the soundness of the study methods, such as the selection of the study design, assessment of the risk of bias, etc., to understand whether the methods were appropriate to the study's aims, as well as if they were properly used and reported.

Item 2.b Statistical methods

Data can be analysed in many ways, but the only appropriate statistical models are those that fit well with the study design and the characteristics of the variables. The peer reviewer with expertise in statistics should assess whether or not the study followed a suitable statistical procedure, as well as if they were correctly conducted and reported.

Domain 3: Interpretation and discussion of the study results

Item 3.a Study conclusions

The reviewer should verify if the study conclusions answer the research question(s) and correctly summarize the study results.

Item 3.b Study limitations

The reviewer should check if the weaknesses of the study are correctly identified and discussed in order to interpret the validity of the research.

Item 3.c Applicability and generalizability

The reviewer should comment on the applicability and generalizability of the study results. Applicability and generalizability are two underlying concepts of external validity [1]. The first concerns how "the results from a sample can be extended to the population from which the sample was drawn", while the second how "the inferences drawn from study participants can be used in the care of patients drawn from any populations" [1].

Domain 4: Reporting and transparency of the manuscript

Item 4.a Study protocol

Public access to study protocols is important to increase transparency and reduce waste of biomedical research. In the case of previous publication and/or inclusion as an additional file of a study protocol, the reviewer should verify that the major deviations from it are reported in the manuscript.

Item 4.b Reporting

The reviewer should comment if the reporting of the study is clear, complete and transparent enough for facilitating its reproducibility by verifying the adherence of the manuscript to the corresponding reporting guideline. The Enhancing the Quality and Transparency of Health Research (EQUATOR) Network provides a toolkit to be used during the peer review process for selecting the appropriate reporting guideline [2].

Item 4.c Presentation and organization

The reviewer should discuss the quality of the written language used in the manuscript, as well as of how the study results are presented (tables, figures, etc.).

Item 4.d Data availability

When applicable, the reviewer should ensure that the data and materials (e.g., dataset, software codes), supported the results reported in the manuscript, are available.

Domain 5: Characteristics of the reviewer's comments

Item 5.a Clarity

A peer review report should be clear (meaning that readers can easily understand its content), succinct and well organized (following the manuscript sections and, when it is necessary, providing line and page numbers) in order to be understood correctly by editors and authors.

Item 5.b Constructiveness

A peer review report should contain constructive and polite comments that allow the authors to improve the quality of their work and editors to take a decision.

Item 5.c Objectivity

Comments provided in a peer review report should be as objective as possible and, if considered appropriate, include references to support the reviewer's statements.

References

1. Murad MH, Katabi A, Benkhadra R, Montori VM. External validity, generalisability, applicability and directness: a brief primer. BMJ Evid-Based Med. 2018;23(1):17–9.

2. EQUATOR Network. Welcome to our toolkit for peer reviewing health research! [Internet]. Available from: https://www.equator-network.org/toolkits/peer-reviewing-research/