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The Role of Supplementary Material in Journal Articles: Surveys of Authors, Reviewers and Readers

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ABSTRACT

Objective: Many journals permit authors to submit supplementary material (SM) for publication alongside the article. We explore the value, use and role of SM in journal articles from the perspectives of authors, peer reviewers and readers.

Design and Setting: We conducted online surveys (November-December 2016) of recent corresponding authors and peer reviewers at 17 BMJ Publishing Group journals in a range of specialties.

Participants: Participants were asked to respond to one of three surveys: as authors, peer reviewers, or readers.

Results: We received 2,872/20,340 (14%) responses: authors 819/6892 (12%), peer reviewers 1142/6682 (17%), and readers 911/6766 (14%).

Most authors submitted (711/819, 87%) and 80% (724/911) of readers reported reading SM with their last article, while 95% (1086/1142) of reviewers reported seeing SM sometimes. Additional tables of data were the commonest type of SM submitted or seen (authors: 74%; reviewers: 89%; readers: 67%). A majority in each sample indicated additional tables were most useful to readers (61-77%); 20-36% and 3-4% indicated they were most useful to peer reviewers and journal editors, respectively. Checklists and reporting guidelines showed the opposite trend: higher proportions of each group regarded these as most useful to journal editors. All three groups favoured the publication of additional tables and figures on the journal's website (80-83%), with <4% of each group reporting these need not be made available. Only 16-23% of each group said that raw study data should be available on the journal's website, while 24-33% said that these materials should not be made available anywhere.

Conclusions: Authors, peer reviewers and readers agree that at least some forms of supplementary material are useful. They favour access to supplementary tables and figures over reporting checklists or raw data. Journals should consider the roles, resource costs and strategic placement of supplementary materials to ensure optimal usage and minimize waste.

Strengths and limitations of this study

1. Our large sample from a diverse group of active international authors and reviewers from 17 different journals provide evidence for stakeholder views on supplementary materials within peer reviewed literature.
2. The response rate is comparable to response rates for other electronic surveys of researchers.
3. Participants were asked to respond in the assigned role/perspective of a reader, peer reviewer or author, although these are not mutually exclusive categories, as academics often engages in all three roles.

BACKGROUND

Many journals allow or require authors to submit supplementary material along with their manuscript. These materials might help in deciding about the publication of the article (such as completed checklists for reporting guidelines) or provide additional information for readers who wish to delve deeper into the findings, replicate the research or use it for secondary analysis The materials might also help improve access in the context of initiatives such as the FAIR (Findability, Accessibility, Interoperability and Reusability) Data Principles with the automatic finding and use of scientific data,[1] and the wish to facilitate automation in the systematic review process.[2]

The volume of supplementary materials is accelerating in step with research complexity and multidisciplinary alliances. Scientific journals report challenges in keeping up, citing reviewer fatigue, publishing delays, bloated publishing repositories and confusion, as it is not unusual for articles that occupy 5-7 pages in the journal to present with over 140 pages of supplementary data.[3] These materials might provide additional results from a study or the detail needed for replication of an experiment. Some journals refuse the materials as excessive, whilst others allow "reasonable use" which each journal defines individually.[3-6] This is set within the backdrop of an increasing demand for research transparency through the sharing of all findings and corresponding data.[7] Any policy established by journal editors will have implications for readers, editors, reviewers and the general public.

Clinicians and researchers struggle to keep up with reading the literature. Bastian et al[8] reported the production of seventy-five trials and eleven systematic reviews per day and ask "*how will we ever keep up?*" nearly a decade ago, and volumes have continued to increase since then. That challenge excluded the mention of burgeoning supplementary material

complete with incompatible file systems, bandwidth restrictions, and broken weblinks.[9] The increasing volume of supplementary materials submitted to journals puts more pressure on journal editors and unpaid peer reviewers to retrieve relevant information from multiple sources.[3-5] There is concern that the excessive volume of supplementary materials can influence decisions made during peer review and skew the integrity of the scientific record.[10] A recent study of research manuscripts submitted to three journals *JAMA* , *JAMA Internal Medicine* (*JIM*) and *JAMA Pediatrics* (*JPED*) found that manuscripts with supplements were more likely to be peer reviewed and accepted than those without supplements.[11] The requirements and practices of journals around supplementary materials varies[12-13] and the expectations of peer reviewers in terms of supplementary material are often not made clear in journal guidance to reviewers.[10] For example, in some journals it is explicitly stated that supplementary material will not be peer reviewed, whereas in others, only a lack of typesetting on the supplementary material is mentioned. This lack of homogeneity in approach forces authors, reviewers and readers to assume various degrees of prioritisation and importance to supplementary material when including, reading or using them to replicate the research.

The use of supplementary materials during and after submission and publication is patchy,[14] and its perceived value to stakeholders involved in producing, assessing and using it is unclear. We did a survey to help resolve these uncertainties and to investigate the role of supplementary material in journal articles from the perspective of authors, peer reviewers, and readers.

METHODS

This survey is registered at ClinicalTrials.gov ID: NCT02961036. The research was reviewed by, and received ethics clearance through, the University of Oxford Central University Research Ethics Committee MS-IDREC-C1-2013-174.

Sampling

Journal Sampling

Participants were drawn from a sample of 17 of BMJ Publishing Group's journals, with a spread of Impact Factors, that each have a website and publish supplementary material. The journals are listed in Appendix 1.

Participant sampling

We sampled corresponding authors of full length original research submissions to one of the 17 journals in 2013 and peer reviewers who had completed a review of a research submission for one of the journals in 2014. Data for each journal were put in an Excel file and SS removed duplicates from within each journal subsample. For example, if there were more than 2 authors with the same name and email address, the duplicates were removed using Excel after which duplicates across author / reviewer samples were removed. Potential participants were also excluded if they had previously opted out of receiving BMJ communications or had participated in a BMJ research survey within the previous 6 months.

Two thirds of the authors were then randomly assigned to receive the Author Survey, two thirds of the peer reviewers were randomly assigned to receive the Reviewer Survey and one third of each sample was randomised to receive the Reader Survey with the assumption that all participants are likely to be readers of journal articles.

Questionnaire administration

The surveys were developed by the researchers and piloted with 45 volunteers to check for ambiguous questions. The surveys were revised based on this feedback before launching.

Participants were sent an email invitation in November 2016 to complete an online survey administered using SurveyMonkey and non-respondents were sent up to two reminders to complete the survey. Participants were asked to complete the survey from the perspective of their allocated role to provide information about their use of specific types of supplementary material (study protocol, data collection or extraction forms, data tables and figures, completed reporting guideline checklists and flow diagrams, interview transcripts, and raw study data). Survey questions asked who the material is most useful to; the expected use of materials by authors, reviewers and readers; the preferred option for accessing supplementary material; and if and where supplementary material should be published. The questions and response categories for each of the survey instruments are contained in Appendices 2-4.

Statistical Analysis

Data were exported into Excel, cleaned and anonymised prior to analysis. All statistical analyses were conducted in SPSS v22. Descriptive and summary statistics of interval scale variables were calculated using mean and standard deviation (or median and inter-quartile range for skewed data), and categorical data as frequency and percentages. Data have been reported from the individual perspective of the author, reader and reviewer, as well as the aggregated overall perspective.

Public Research Involvement

Members of the public, readers, editors and peer reviewers were invited to contribute to survey question formation, and edit questions for readability and usefulness.

RESULTS

Respondent characteristics

The survey was sent by email to 20,340 people. We received 2,872 (14%) responses (819 [12%] from authors, 1142 [17%] from peer reviewers, and 911 [14%] from those responding as readers), see Table 1. The numbers of years as an active researcher was comparable across respondents with a mean of 4.4 years (SD 1.96) for authors, 4.6 years (SD 1.98) for readers and 5.3 years (SD 2.89 years) for reviewers. The approximate number of research papers reported as published by respondents were a median of 46 overall (36 for authors, 41 for readers, 51 for reviewers, which are statistically different across the groups at the 5% level: independent samples Kruskal-Wallis test $P<0.001$) but with a spread of experience given an inter-quartile range of 81 research papers. More than 87% of respondents read articles in medical journals either frequently or very frequently. Respondents are from an international sample, with authors from 65 countries, reviewers from 57 and readers from 53 countries.

Table 1: Characteristics of Respondents

	Authors	Readers	Reviewers	Overall
Number (%) of sample	819 (28.5)	911 (31.7)	1142 (39.8)	2872 (100)
Mean (SD) number of years as an active researcher	4.4 (1.96)	4.6 (1.98)	5.3 (2.89)	4.8 (2.41)
Approximate number of research papers published as author/co-author - median (IQR)	36 (68.5)	41 (75)	51 (77)	46 (81)
Number (%) on how frequently they read articles in medical journals				
Very frequently	377 (46.0)	462 (54.2)	628 (55.0)	1467 (51.1)
Frequently	337 (41.1)	331 (38.8)	383 (33.5)	1051 (36.6)
Occasionally	58 (7.1)	58 (6.4)	55 (4.8)	171 (6.0)
Rarely	3 (0.4)	1 (0.1)	7 (0.6)	11 (0.4)
Never	1 (0.1)	1 (0.1)	2 (0.2)	4 (0.1)

SD: Standard deviation

IQR: Inter-quartile range

Respondent's interaction with supplementary material

When recalling what supplementary material was contained in their last article submitted, authors most frequently stated including additional tables of data (74%) or additional figures (57%) followed by checklists for relevant reporting guidelines (39%). Readers recalled reading additional tables of data (67%) or additional figures (53%) followed by study protocol (23%). Over 80% of reviewers recalled sometimes or often the use of additional figures and tables of data in articles they peer reviewed, in contrast to more than 80% reporting rarely seeing raw study data or interview transcripts (See Appendix 5).

Preferred option for accessing supplementary material

Overall (n=2,872) respondents' preferred option for accessing tables of data and additional figures were as supplementary files alongside the article (60% and 59% respectively), while 50% chose this as their preferred option for data collection, and completed checklists for relevant reporting guidelines. In contrast, 40% of respondents preferred interview transcripts and raw study data not to be made available. (See Figure 1 for overall data and Appendix 6 for responses by group).

The open-text responses to accessing supplementary materials also showed common sentiment across readers, reviewers and authors; as illustrated by this selected quote *"It depends on the type of research and my purpose for accessing it. If I am only reading for enjoyment or for an overview of the topic I seldom look at supplementary materials but to replicate the research or to further verify the authors findings or methods, the supplementary materials provide nuances the paper does not."*

Who the material is most useful to

Figure 2 depicts the overall views of who each type of supplementary material is most useful to, from the total of 2,872 respondents. Additional tables of data and additional figures are deemed to be most useful to readers (>65%), while the study protocol and data collection/extraction forms are deemed most useful to peer reviewers (>40%), in contrast to the completed checklists which are deemed most relevant to journal editors (40%).

Table 2 (and Appendix 7) further stratifies these opinions per group allocation, which reveals similar trends to those given overall. For instance, additional tables of data are regarded as most useful to readers (58-72%) by all groups (authors, reviewers and readers), while

checklists are perceived as more useful to journal editors or peer reviewers rather than readers (36-45% versus 12-16%).

Table 2: Author, Reviewer, and Reader Perspectives on the Value of Additional Tables of Data, Completed Checklists for Reporting Guidelines and Raw Study Data by Group[a,b]

Group	No./Total No. (%) Most useful to		
	To Journal Editors	To Peer Reviewers	To Readers
Additional tables of data			
Authors	29/819 (4)	187/819 (23)	564/819 (69)
Reviewers	32/1142 (3)	384/1142 (34)	662/1142 (58)
Readers	25/911 (3)	172/911 (19)	659/911 (72)
Overall	68/2872 (3)	743/2872 (26)	1885/2872 (66)
Completed checklists for reporting guidelines			
Authors	365/819 (45)	291/819 (36)	96/819 (12)
Reviewers	453/1142 (40)	414/1142 (36)	186/1142 (16)
Readers	340/911 (37)	394/911 (43)	117/911 (13)
Overall	1158/2872 (40)	1099/2872 (38)	399/2872 (14)
Raw study data			
Authors	120/819 (15)	309/819 (38)	276/819 (34)
Reviewers	207/1142 (18)	767/1142 (35)	385/1142 (34)
Readers	119/911 (13)	387/911 (42)	283/911 (31)
Overall	446/2872 (16)	1093/2872 (38)	944/2872 (33)

[a] Percentages do not sum to 100% across each row because some respondents did not answer every question

[b] A table showing the responses for *all* types of supplementary material is given in our Supplementary material

If and where supplementary material should be published

Figure 3 depicts the overall views on where (each type of) supplementary material should be published, be this on the website alongside the article, on another website, available directly from the authors, or that it does not need to be available. The responses are not mutually exclusive, but more than 81% prefer to see additional tables of data and figures on a website along with the article. In contrast, interview transcripts (37%) and raw study data (39%) were preferred as being available by contacting the article's corresponding author, with a further 30% and 27% respondents indicating these materials did not need to be made available, respectively. Other forms of supplementary material, for example checklists, were perceived variably with responses of either availability on the website along with the article (45%) or of no need to be available (23%). Appendix 8 shows the responses stratified by group, following a similar trend.

In the open-text responses, there were multiple requests for inclusion and publication of replicable software codes, dynamic models with the modelling results, statistical models, videos and models for imaging and genetics while others saw no need for supplementary materials stating that the responsibility of the authors was to deliver clear and concise reporting that would fit within the given word limits of a paper. An important consideration noted by some respondents was that some data were restricted and could not be shared without compromising the identities of participants particularly in data linkage sets. Respondents stressed the need for improved navigation both of the site to access the materials and of the materials themselves in terms of labelling, ordering and readability. It was suggested that supplementary materials be downloadable as one zipped file.

Expected use of materials by authors, reviewers and readers

Almost half the authors who responded expect that peer reviewers should routinely read all supplementary material. But on asking reviewers what they do with supplementary material, 8-16% ignored completed checklists, flow diagrams, interview transcripts and raw study data, with 11-26% saying it depended on the manuscript. We found that only additional tables of data and additional figures were being routinely read entirely, at ~60%, with other categories <36%. In response to the question about what they usually do with supplementary materials, no more than 27% of readers responded that they read all of any type of supplementary material routinely, with 30-40% ignoring completed checklists, flow diagrams, interview transcripts and raw study data (see Appendicles 9-11).

DISCUSSION

Our survey shows that the opinions of producers and users of supplementary material vary more on the need for access to different types of this material than on how it should be made available. For example, authors, reviewers and readers all expressed a preference for additional tables over completed reporting checklists or raw data, but differed on who would find them most useful.

Strengths and weaknesses of the study

Our response rate of 14% is typical of current response rates for electronic surveys to researchers. but still allowed us to achieve a large sample, with nearly 3,000 responses from a diverse group of international authors and reviewers from 17 different journals. As such, we make a substantial contribution to the evidence on stakeholder views on the value of supplementary materials within the peer reviewed literature. Participants were asked to

respond in the assigned role/perspective of a reader, peer reviewer or author, and these are not mutually exclusive categories, as academics often engages in all three roles.

Possible explanations and implications for clinicians and policymakers

A recurring theme in free-text comments from those who identified themselves as statisticians, policy makers, patients, teachers or clinicians was to qualify the usage of supplementary materials for the purpose for which they were accessed. For example, respondents note that as interested readers they might not access any supplementary materials but for analysis, replication, secondary research or teaching purposes they would want to be able to access supplementary materials. There were questions about how the use and placement on supplementary materials were decided "*A manuscript to be published should be able to stand on its own. Journals are making a mistake by making article word counts shorter, then having supplementary material. If more data are needed to understand the study, they should be in the article*"

What are journals doing in response to supplementary material?

Some journals e.g. *The Journal of Neuroscience,* have announced they will no longer allow authors to include supplemental material on submission and will not host supplemental material on its website. Instead, authors were given the option of including a footnote with a URL directing readers to the supplementary material on a website maintained by the authors and a short description of what this includes.[4] However, it seems that this position was untenable and the journal now decides on a case by case basis. The journal *Cell* followed a similar pathway.[3] However, we found little support from our respondents for including a weblink within the published paper, which was also suggested by Pop and Salzberg as a possible solution for improving the utility of published scientific articles.[6] Although journals and researchers may feel a social responsibility to make data publicly and

permanently available,[14] they often lack the necessary tools or collaborators to build and maintain persistent repositories. Others argue that the supplementary material needs to be better structured to avoid computational errors and to enable machine reading particularly in the fields of genomics, neuroscience, chemistry and other basic sciences.[15] Pop and Salzberg also proposed that specific sections of the supplementary material should be directly hyper-linked within the text of the article to improve the utility of published scientific articles and to increase the likelihood that this material is adequately peer reviewed.[6]]

Unanswered questions and future research

Some respondents to our survey expressed a preference in open-text comments for standardised, well organised materials that could be combined into a single zip file for downloading or offered as a persistent link. However, others commented that data protection standards and ethical oversight might not be explicitly extended to making supplementary materials publicly available. These concerns were not direct1y addressed within the survey questions and so it is not known how representative or widespread these opinions might be. However, the views expressed could be the target of further investigation. It may also be worth investigating the relationship between the value of the material and the cost of production and publication to researchers should journals take on the responsibility for the state of supplementary materials in terms of perpetual availability, typesetting and compatibility. Journal software is presently ill equipped to handle files formats for complex supplementary materials such as software model algorithms and additional databases. The necessary improvements might lead to higher article processing or subscription fees and this might push those with no or limited funding away from this science and reduce research transparency, innovation, the replication of new findings and effective and equitable knowledge transfer.[16]

CONCLUSIONS

Our findings provide evidence that should help journals, researchers and funders to consider the roles, costs, and benefits of supplementary materials. The findings highlight, for example, a greater desire amongst users of research to have access to information that has already been analysed or summarised by the original researchers, rather than their raw material. It may be helpful for journals to expand file types to allow storage of, and access to a variety of file types, including multi-media, computer models and working software prototypes. Our survey should also add impetus to calls to improve the quality of reporting and the use of reporting guidelines,[17-18] and we hope that it will stimulate greater emphasis on the need for evaluation of the impact of all initiatives intended to improve the quality of health research and the decisions that will subsequently be based upon this literature.

DECLARATIONS

Ethics approval and consent to participate

The research was reviewed by, and received ethics clearance through, the University of Oxford Central University Research Ethics Committee MS-IDREC-C1-2013-174.

Consent for publication

Not applicable

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Conflict of Interest Disclosures

AP is the Patient Editor (Research and Evaluation) at *The BMJ*, and SS is a full time employee of *The BMJ*. MC reports involvement in many clinical trials and systematic reviews and has prepared and used supplementary material widely. He seeks funding for these trials and reviews, as well as for research into methodology, including dissemination and accessibility. HM has no conflicts of interest.

Authors' contributions

AP, SS, and MC designed the study and drafted the questionnaires. AP drafted the protocol with input from SS and MC. SS extracted the samples of authors and reviewers from the journals' manuscript tracking systems and managed the surveys on SurveyMonkey. MC randomised participants to their allocated roles. HM analysed the anonymised data. All authors interpreted the results, wrote this manuscript and approved its final version.

Availability of data and materials

The datasets used and analysed during the current study are available from the corresponding author on reasonable request.

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FIGURE LEGENDS

Figure 1: Overall views of preferred option for providing/reading/receiving supplementary material (n=2,872)

Figure 2: Overall views on who each type of supplementary material are most useful to (n=2,872)

Figure 3: Overall views on where supplementary material should be published (n=2,872)

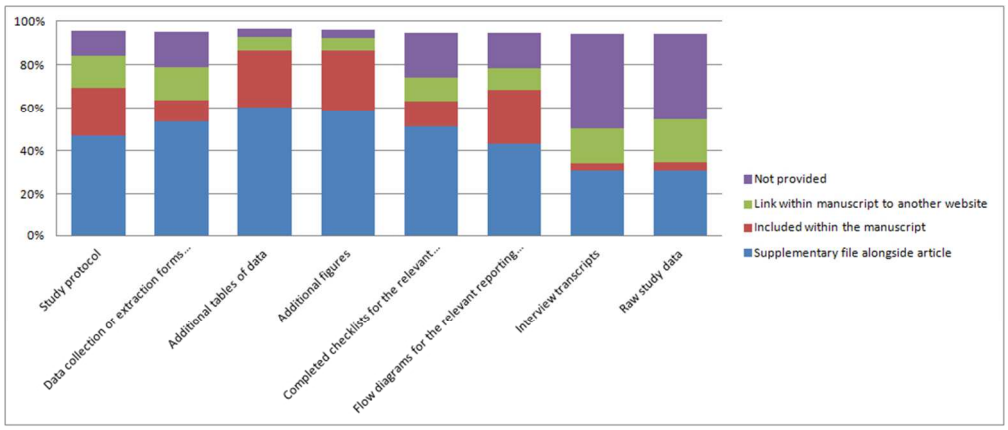


Figure 1: Overall views of preferred option for providing/reading/receiving supplementary material (n=2,872)

82x34mm (300 x 300 DPI)

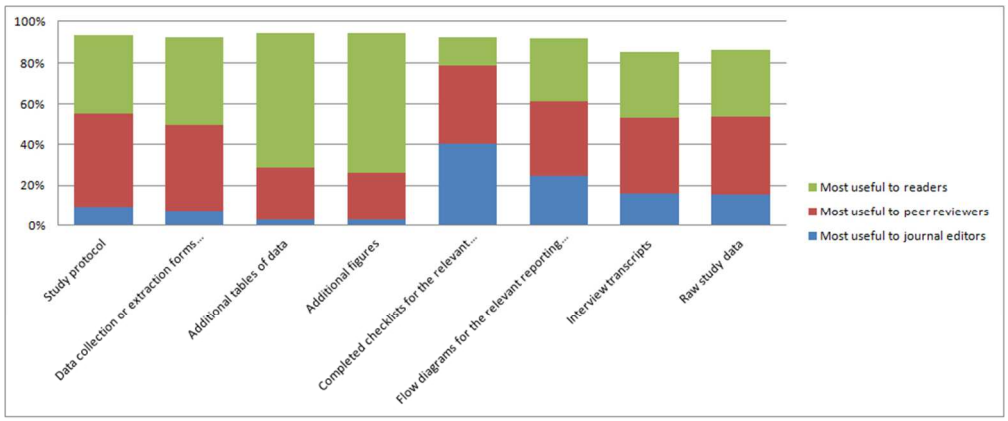


Figure 2: Overall views on who each type of supplementary material are most useful to (n=2,872)

81x33mm (300 x 300 DPI)

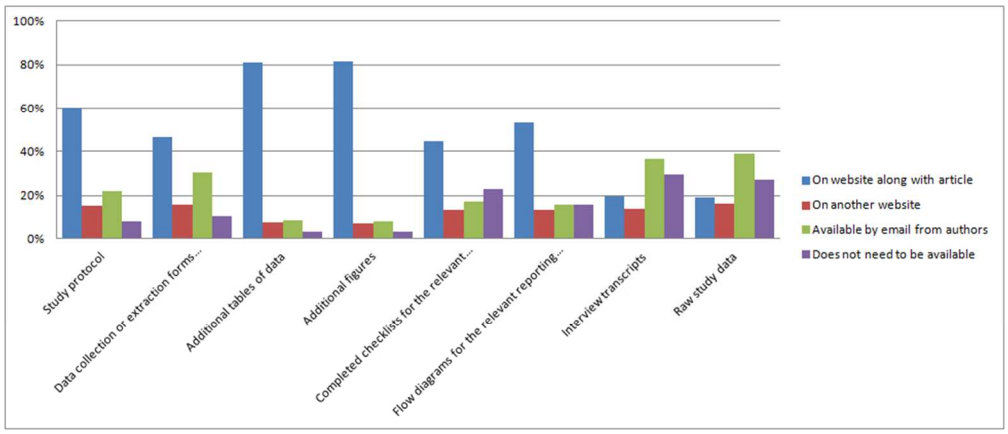


Figure 3: Overall views on where supplementary material should be published (n=2,872)

82x35mm (300 x 300 DPI)

Appendix 1: Participating journals

Journal	2015 Impact Factor *	Number of respondents
Archives of Disease in Childhood	3.231	194
Acupuncture in Medicine	1.592	31
BMJ Open	2.562	637
British Journal of Sports Medicine	6.724	107
BMJ Quality & Safety	4.996	60
Emergency Medicine Journal	1.836	78
Gut	14.921	158
Heart	5.693	161
Journal of Epidemiology & Community Health	3.865	139
Journal of Medical Genetics	5.65	35
Journal of Neuro Interventional Surgery	2.959	20
Journal of Neurology, Neurosurgery, & Psychiatry	6.431	212
Occupational and Environmental Medicine	3.745	85
Sexually Transmitted Infections	3.015	41
The BMJ	19.697	715
Thorax	8.121	144
Tobacco Control	6.321	55
Total	**-**	**2872**

* From Thomson Reuter's Journal Citation Reports 2016.

Appendix 2: Author survey instrument

1. Which of the following types of supplementary material did you submit with your last manuscript (to any journal)?

	Yes	No	Cannot remember	Not applicable
Study protocol				
Data collection or extraction forms (including questionnaires, interview topic guides, etc)				
Additional tables of data				
Additional figures				
Completed checklists for the relevant reporting guidelines (e.g. CONSORT, STROBE, PRISMA, STARD, etc.)				
Flow diagrams for the relevant reporting guideline				
Interview transcripts				
Raw study data				

Other (please specify): _____

2. Thinking about the last manuscript you submitted, how much of a burden was it to prepare and upload the supplementary material for submission?

□ Not at all burdensome
□ A little bit burdensome
□ Somewhat burdensome
□ Very burdensome
□ Extremely burdensome

3. Which is your preferred option for providing the following types of supplementary material?

	To provide it as a supplementary file	To include it in the main text of the manuscript	To include it as a link within the manuscript to another website (eg your own website)	To not provide it
Study protocol				
Data collection or extraction forms (including questionnaires, interview topic guides, etc)				
Additional tables of data				
Additional figures				
Completed checklists for the relevant reporting guidelines (e.g. CONSORT, STROBE, PRISMA, STARD, etc.)				
Flow diagrams for the relevant reporting guideline				
Interview transcripts				
Raw study data				

Other (please specify): _____

4. From the perspective of an author, who is the following supplementary material most useful to?

	Journal editors	Peer reviewers	Readers
Study protocol			
Data collection or extraction forms (including questionnaires, interview topic guides, etc.)			
Additional tables of data			
Additional figures			
Completed checklists for the relevant reporting guidelines (e.g. CONSORT, STROBE, PRISMA, STARD, etc.)			
Flow diagrams for the relevant reporting guideline			
Interview transcripts			
Raw study data			

Other (please specify): _____

5. What do you expect editors, reviewers and readers to do with the supplementary material?

	Read all of it routinely	Read some of it	Ignore it	It depends on the manuscript
Journal editors				
Peer reviewers				
Readers				

Others (please specify): _____

6. From the perspective of an author, what should happen to the following supplementary material when an article is published? (You may tick more than one box on each line).

	It should be published on the journal's website along with the article	It should be published on another website	It should be available by email from the authors	It doesn't need to be available
Study protocol				
Data collection or extraction forms (including questionnaires, interview topic guides, etc.)				
Additional tables of data				
Additional figures				
Completed checklists for the relevant reporting guidelines (e.g. CONSORT, STROBE, PRISMA, STARD, etc.)				
Flow diagrams for the relevant reporting guideline				
Interview transcripts				
Raw study data				

Other (please specify): _____

7. Please provide any additional comments you have about the submission or publication of supplementary material: _____

Finally, some questions about yourself

8. Approximately how many years have you been an active researcher? [Drop down list of numbers]

9. Approximately how many research papers have you had published in a peer reviewed journal as either an author or a coauthor? [Drop down list of numbers]

10. How frequently do you read articles in medical journals?

□ Very Frequently
□ Frequently
□ Occasionally
□ Rarely
□ Never

11. Would you like to receive a copy of the results of this study when it is complete?

□ Yes
□ No

Thank you for your help

Appendix 3: Reader survey instrument

1. Thinking of the last journal article you read did it include the following supplementary material?

	Yes	No	Cannot remember	Not applicable
Study protocol				
Data collection or extraction forms (including questionnaires, interview topic guides, etc)				
Additional tables of data				
Additional figures				
Completed checklists for the relevant reporting guidelines e.g. CONSORT, STROBE, PRISMA, STARD, etc.				
Flow diagrams for the relevant reporting guideline				
Interview transcripts				
Raw study data				

Other (please specify): _____

2. Which is your preferred option for reading the following types of supplementary material?

	As a supplementary file on the journal's website alongside the article	Included within the manuscript file	Included as a link within the manuscript to another website (e.g the author's own website)	It doesn't need to be published
Study protocol				
Data collection or extraction forms (including questionnaires, interview topic guides, etc)				
Additional tables of data				
Additional figures				
Completed checklists for the relevant reporting guidelines e.g. CONSORT, STROBE, PRISMA, STARD, etc				
Flow diagrams for the relevant reporting guideline				
Interview transcripts				
Raw study data				

Other (please specify): _____

3. From the perspective of a reader, who is the supplementary material most useful to?

	Journal Editors	Peer Reviewers	Readers
Study protocol			
Data collection or extraction forms (including questionnaires, interview topic guides, etc.)			
Additional tables of data			
Additional figures			
Completed checklists for the relevant reporting guidelines e.g. CONSORT, STROBE, PRISMA, STARD, etc.			
Flow diagrams for the relevant reporting guideline			
Interview transcripts			
Raw study data			

Other (please specify): _____

4. What do you think readers in general should do with the supplementary material?

	Read all of it routinely	Read some of it	Ignore it	It depends on the manuscript
Study protocol				
Data collection or extraction forms (including questionnaires, interview topic guides, etc.)				
Additional tables of data				
Additional figures				
Completed checklists for the relevant reporting guidelines e.g. CONSORT, STROBE, PRISMA, STARD, etc.				
Flow diagrams for the relevant reporting guideline				
Interview transcripts				
Raw study data				

Other (please specify): _____

5. As a reader, what do you usually do with the supplementary material?

	Read all of it routinely	Read some of it	Ignore it	It depends on the manuscript
Study protocol				
Data collection or extraction forms (including questionnaires, interview topic guides, etc.)				
Additional tables of data				
Additional figures				
Completed checklists for the relevant reporting guidelines e.g. CONSORT, STROBE, PRISMA, STARD, etc.				
Flow diagrams for the relevant reporting guideline				
Interview transcripts				
Raw study data				

Other (please specify): _____

6. From the perspective of a reader, what should happen to the following supplementary material when an article is published? (You may tick more than one box on each line).

	It should be published on the journal's website along with the article	It should be published on another website	It should be available by email from the authors	It doesn't need to be available
Study protocol				
Data collection or extraction forms (including questionnaires, interview topic guides, etc.)				
Additional tables of data				
Additional figures				
Completed checklists for the relevant reporting guidelines e.g. CONSORT, STROBE, PRISMA, STARD, etc.				
Flow diagrams for the relevant reporting guideline				
Interview transcripts				
Raw study data				

Other (please specify): _____

7. In general, how often do you think supplementary material adds value to a research paper?

	Never	Almost never	Sometimes	Almost every time	Every time
Study protocol					
Data collection or extraction forms (including questionnaires, interview topic guides, etc.)					
Additional tables of data					
Additional figures					
Completed checklists for the relevant reporting guidelines e.g. CONSORT, STROBE, PRISMA, STARD, etc.					
Flow diagrams for the relevant reporting guideline					
Interview transcripts					
Raw study data					

Other (please specify): _____

8. Please provide any additional comments you have about the submission or publication of supplementary material:

_____

Finally, some questions about yourself

9. Approximately how many years have you been an active researcher? [Drop down list of numbers]

10. Approximately how many research papers have you had published in a peer reviewed journal as either an author or a coauthor? [Drop down list of numbers]

11. How frequently do you read articles in medical journals?

□ Very Frequently
□ Frequently
□ Occasionally
□ Rarely
□ Never

12. Would you like to receive a copy of the results of this study when it is complete?

□ Yes
□ No

Thank you for your help

Appendix 4: Reviewer survey instrument

1. How frequently do articles that you peer review have the following supplementary material accompanying the manuscript?

	Never	Almost never	Sometimes	Almost every time	Every time	Not applicable
Study protocol						
Data collection or extraction forms (including questionnaires interview topic guides, etc)						
Additional tables of data						
Additional figures						
Completed checklists for the relevant reporting guidelines e.g. CONSORT, STROBE, PRISMA, STARD, etc						
Flow diagrams for the relevant reporting guideline						
Interview transcripts						
Raw study data						

Other (please specify): _____

2. How often is the following supplementary material useful in assisting you in the peer review of manuscripts?

	Never	Almost never	Sometimes	Almost every time	Every time	Not applicable / not received this material
Study protocol						
Data collection or extraction forms (including questionnaires, interview topic guides, etc.)						
Additional tables of data						
Additional figures						
Completed checklists for the relevant reporting guidelines e.g. CONSORT, STROBE, PRISMA, STARD, etc.						
Flow diagrams for the relevant reporting guideline						
Interview transcripts						
Raw study data						

Other (please specify): _____

3. Which is your preferred option for receiving the following types of supplementary material?

	As a supplementary file	Included within the main text of the manuscript	Included as a link within the manuscript to another website (e.g the author's own website)	Would prefer not to receive it
Study protocol				
Data collection or extraction forms (including questionnaires, interview topic guides, etc.)				
Additional tables of data				
Additional figures				
Completed checklists for the relevant reporting guidelines e.g. CONSORT, STROBE, PRISMA, STARD, etc.				
Flow diagrams for the relevant reporting guideline				
Interview transcripts				
Raw study data				

Other (please specify): _____

4. From the perspective of a peer reviewer, who is the supplementary material most useful to?

	Journal editors	Peer reviewers	Readers
Study protocol			
Data collection or extraction forms (including questionnaires, interview topic guides, etc.)			
Additional tables of data			
Additional figures			
Completed checklists for the relevant reporting guidelines e.g. CONSORT, STROBE, PRISMA, STARD, etc.			
Flow diagrams for the relevant reporting guideline			
Interview transcripts			
Raw study data			

Other (please specify): _____

5.What do you think journal editors expect peer reviewers to do with this supplementary material?

	Read all of it routinely	Read some of it	Ignore it	It depends on the manuscript
Study protocol				
Data collection or extraction forms (including questionnaires, interview topic guides, etc.)				
Additional tables of data				
Additional figures				
Completed checklists for the relevant reporting guidelines e.g. CONSORT, STROBE, PRISMA, STARD, etc.				
Flow diagrams for the relevant reporting guideline				
Interview transcripts				
Raw study data				

Other (please specify): _____

6. What do you think peer reviewers should do with the supplementary material?

	Read all of it routinely	Read some of it	Ignore it	It depends on the manuscript
Study protocol				
Data collection or extraction forms (including questionnaires, interview topic guides, etc.)				
Additional tables of data				
Additional figures				
Completed checklists for the relevant reporting guidelines e.g. CONSORT, STROBE, PRISMA, STARD, etc.				
Flow diagrams for the relevant reporting guideline				
Interview transcripts				
Raw study data				

Other (please specify):_____

7. When peer reviewing, what do you do with the supplementary material?

	Read all of it routinely	Read some of it	Ignore it	It depends on the manuscript	Not applicable
Study protocol					
Data collection or extraction forms (including questionnaires, interview topic guides, etc.)					
Additional tables of data					
Additional figures					
Completed checklists for the relevant reporting guidelines e.g. CONSORT, STROBE, PRISMA, STARD, etc.					
Flow diagrams for the relevant reporting guideline					
Interview transcripts					
Raw study data					

Other (please specify): _____

8. From the perspective of a peer reviewer, what should happen to the following supplementary material when an article is published? (You may tick more than one box on each line).

	It should be published on the journal's website along with the article	It should be published on another website	It should be available by email from the authors	It doesn't need to be available
Study protocol				
Data collection or extraction forms (including questionnaires, interview topic guides, etc)				
Additional tables of data				
Additional figures				
Completed checklists for the relevant reporting guidelines e.g. CONSORT, STROBE, PRISMA, STARD, etc.				
Flow diagrams for the relevant reporting guideline				
Interview transcripts				
Raw study data				

Other (please specify): _____

9. Please provide any additional comments you have about the submission or publication of supplementary material: _____

Finally, some questions about yourself

10. Approximately how many years have you been an active researcher? [Drop down list of numbers]

11. Approximately how many research papers have you had published in a peer reviewed journal as either an author or a coauthor? [Drop down list of numbers]

12. How frequently do you read articles in medical journals?

□ Very Frequently
□ Frequently
□ Occasionally
□ Rarely
□ Never

13. Would you like to receive a copy of the results of this study when it is complete?

□ Yes
□ No

Thank you for your help

Appendix 5: Characteristics of respondents' interaction with supplementary material N (%)

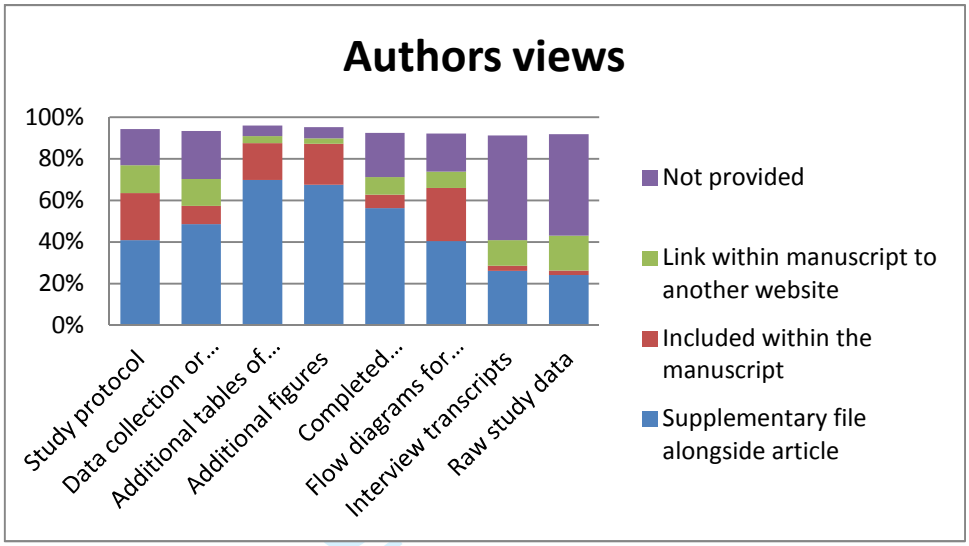
	Authors		Readers		Reviewers		
Did the last article that you read /submitted contain:	Yes	No*	Yes	No*	Rare	Sometimes	Often**
(a) study protocol	165 (20)	497 (61)	211 (23)	544 (60)	695 (61)	316 (28)	104 (9)
(b) data collection or extraction forms (including questionnaires, interview topic guides, etc)	184 (23)	469 (57)	151 (17)	548 (64)	638 (56)	403 (35)	69 (6)
(c) additional tables of data	604 (74)	161 (20)	608 (67)	207 (23)	121 (11)	619 (54)	392 (34)
(d) additional figures	470 (57)	256 (31)	486 (53)	298 (33)	184 (16)	600 (53)	338 (30)
(e) completed checklists for the relevant reporting guidelines	323 (39)	341 (42)	181 (20)	502 (55)	502 (44)	439 (38)	158 (14)
(f) flow diagrams for the relevant reporting guideline[a]	175 (21)	458 (56)	202 (22)	506 (56)	505 (44)	448 (39)	147 (13)
(g) interview transcripts	20 (2)	524 (64)	26 (3)	658 (72)	956 (84)	77 (7)	12 (1)
(h) raw study data	83 (10)	547 (67)	64 (7)	697 (77)	966 (85)	116 (10)	18 (2)

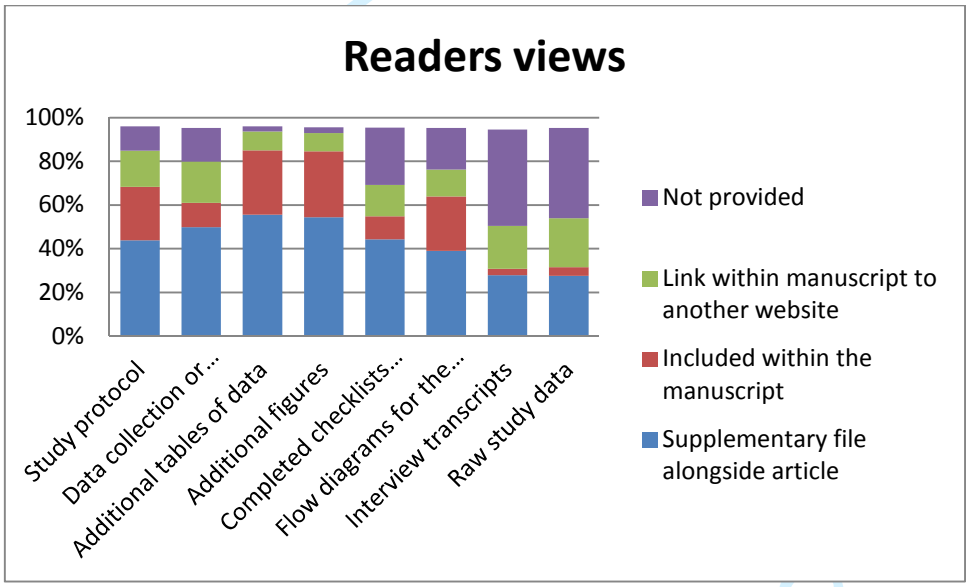
* Numbers do not sum to 100% due to missing data

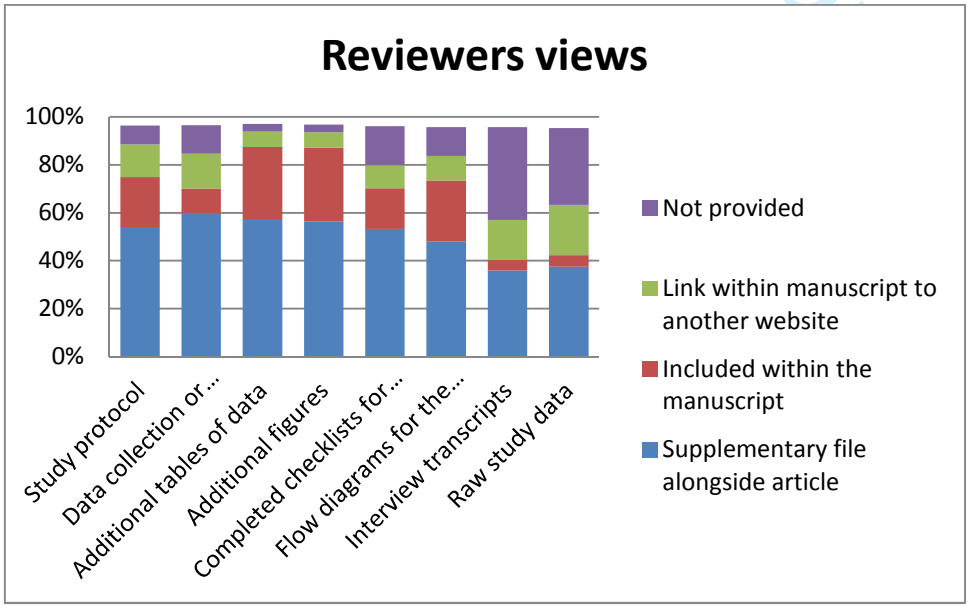
** Categories define as: Rare = "*never*" / "*almost never*", Sometimes= "*sometimes*", and Often = "*almost every time*" / "*every time*"

[a] (e.g. CONSORT, STROBE, PRISMA, STARD, etc.)

Appendix 6: Preferred option for providing/reading/receiving supplementary material by each group







(a) Views Overall (n=2872)

Supplementary Material	Supplementary file alongside article	Included within the manuscript	Link within manuscript to another website	Not provided
(a) study protocol	1352 (47.1%)	646 (22.5%)	414 (14.4%)	336 (11.7%)
(b) data collection or extraction forms (including questionnaires, interview topic guides, etc)	1536 (53.5%)	291 (10.1%)	442 (15.4%)	465 (16.2%)
(c) additional tables of data	1728 (60.2%)	761 (26.5%)	180 (6.3%)	100 (3.5%)
(d) additional figures	1693 (58.9%)	787 (27.4%)	170 (5.9%)	105 (3.7%)
(e) completed checklists for the relevant reporting guidelines (e.g. CONSORT, STROBE, PRISMA, STARD, etc.)	1473 (51.3%)	343 (11.9%)	309 (10.8%)	599 (20.9%)
(f) flow diagrams for the relevant reporting guideline	1235 (43.0%)	726 (25.3%)	293 (10.2%)	461 (16.1%)
(g) interview transcripts	878 (30.6%)	97 (3.4%)	470 (16.4%)	1255 (43.7%)
(h) raw study data	878 (30.6%)	108 (3.8%)	581 (20.2%)	1141 (39.7%)

* Numbers do not sum to 100% due to missing data

(b) Views of Authors (n=819)

Supplementary Material	(i)Supplementary file alongside article	(ii) Included within the manuscript	(iii) Link within manuscript to another website	(iv) Not provided
(a) study protocol	335 (40.9%)	185 (22.6%)	109 (13.3%)	143 (17.5%)
(b) data collection or extraction forms (including questionnaires, interview topic guides, etc)	397 (48.5%)	73 (8.9%)	105 (12.8%)	189 (23.1%)
(c) additional tables of data	571 (69.7%)	145 (17.7%)	28 (3.4%)	42 (5.1%)
(d) additional figures	553 (67.5%)	161 (19.7%)	22 (2.7%)	43 (5.3%)
(e) completed checklists for the relevant reporting guidelines (e.g. CONSORT, STROBE, PRISMA, STARD, etc.)	460 (56.2%)	54 (6.6%)	69 (8.4%)	174 (21.2%)
(f) flow diagrams for the relevant reporting guideline	331 (40.4%)	209 (25.5%)	64 (7.8%)	150 (18.3%)
(g) interview transcripts	214 (26.1%)	20 (2.4%)	100 (12.2%)	413 (50.4%)
(h) raw study data	197 (24.1%)	18 (2.2%)	137 (16.7%)	400 (48.8%)

* Numbers do not sum to 100% due to missing data

(c) Views of Readers (n=911)

Supplementary Material	(i)Supplementary file alongside article	(ii)Included within the manuscript	(iii) Link within manuscript to another website	(iv)Not provided
(a) study protocol	399 (43.8%)	224 (24.6%)	150 (16.5%)	102 (11.2%)
(b) data collection or extraction forms (including questionnaires, interview topic guides, etc)	454 (49.8%)	102 (11.2%)	172 (18.9%)	140 (15.4%)
(c) additional tables of data	506 (55.5%)	268 (29.4%)	79 (8.7%)	22 (2.4%)
(d) additional figures	496 (54.4%)	275 (30.2%)	75 (8.2%)	25 (2.7%)
(e) completed checklists for the relevant reporting guidelines (e.g. CONSORT, STROBE, PRISMA, STARD, etc.)	404 (44.3%)	96 (10.5%)	131 (14.4%)	238 (26.1%)
(f) flow diagrams for the relevant reporting guideline	355 (39.0%)	227 (24.9%)	113 (12.4%)	173 (19.0%)
(g) interview transcripts	254 (27.9%)	27 (3.0%)	179 (19.6%)	401 (44.0%)
(h) raw study data	252 (27.7%)	36 (4.0%)	204 (22.4%)	376 (41.3%)

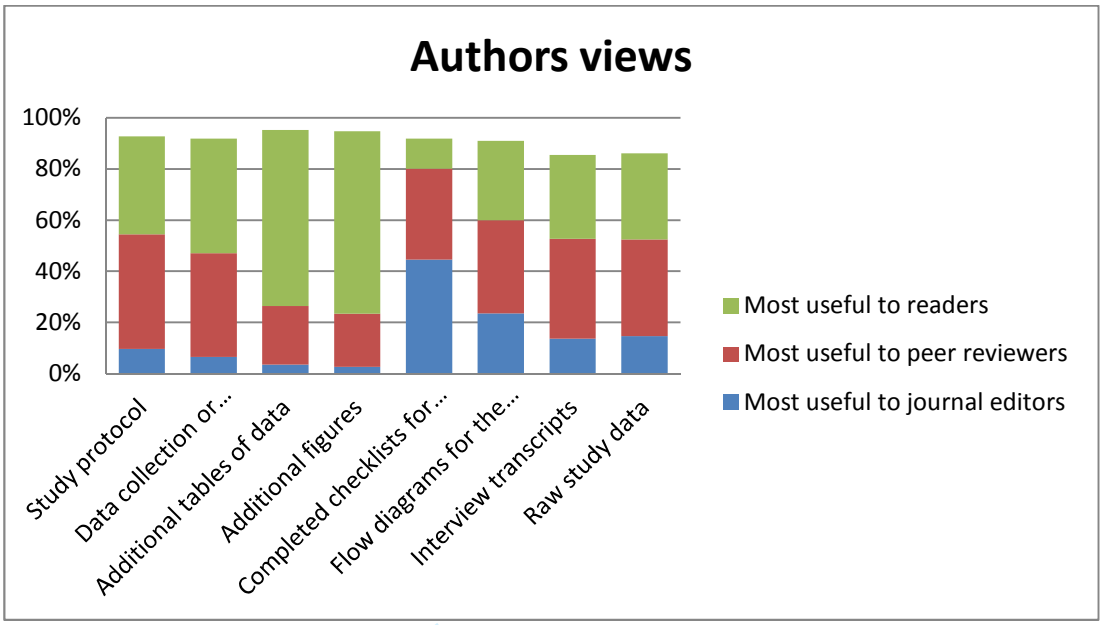
* Numbers do not sum to 100% due to missing data

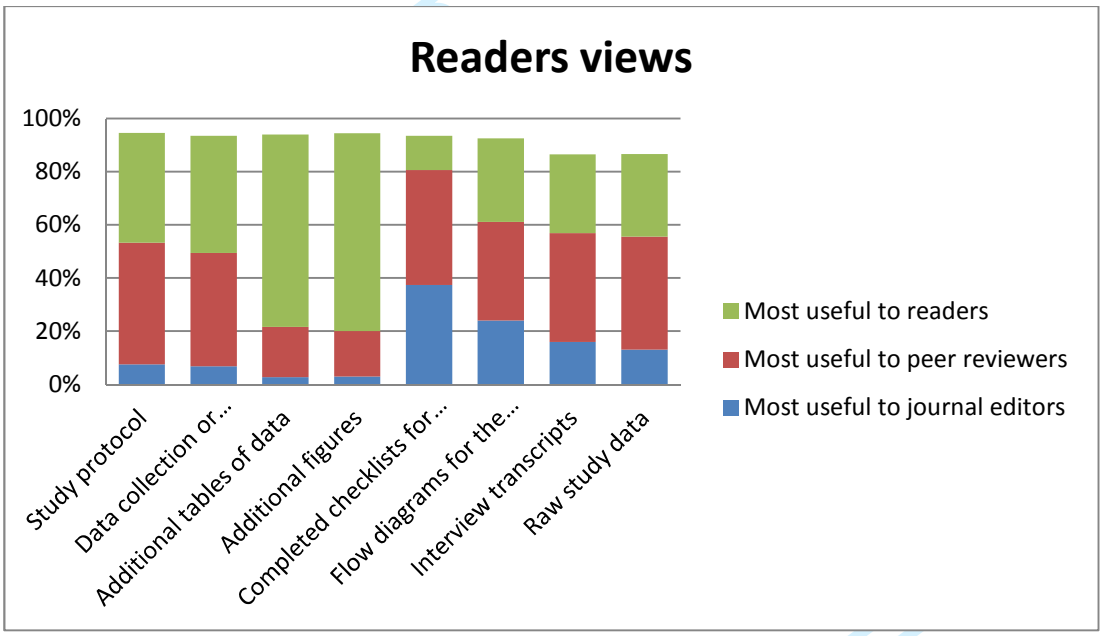
(d) Views of Reviewers (n=1142)

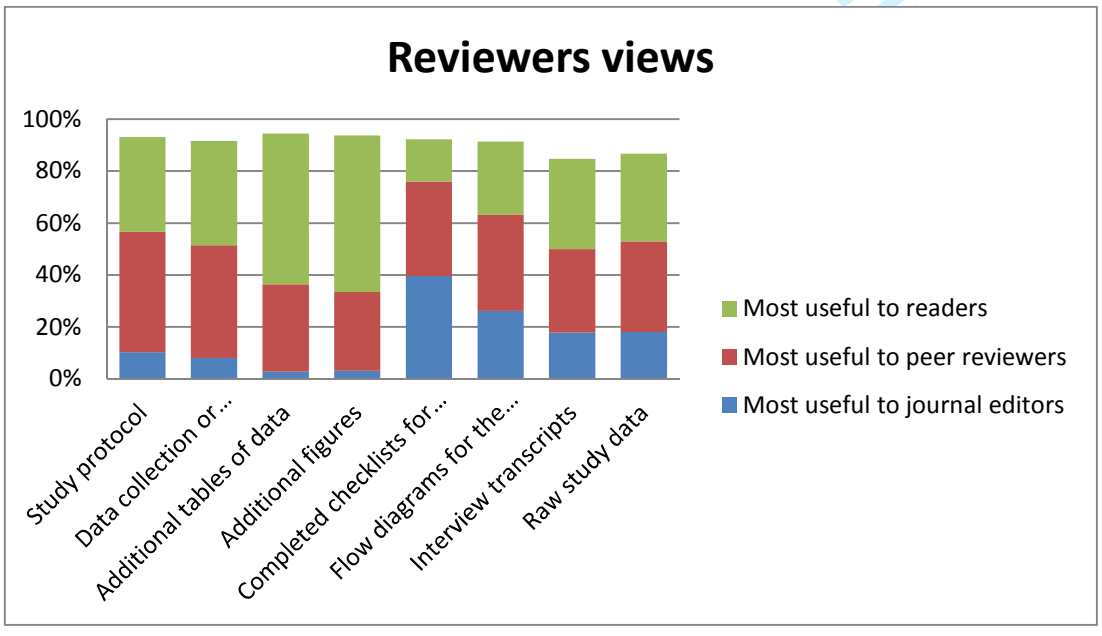
Supplementary Material	(i)Supplementary file alongside article	(ii)Included within the manuscript	(iii)Link within manuscript to another website	(iv)Not provided
(a) study protocol	618 (54.1%)	237 (20.8%)	155 (13.6%)	91 (8.0%)
(b) data collection or extraction forms (including questionnaires, interview topic guides, etc)	685 (60.0%)	116 (10.2%)	165 (14.4%)	136 (11.9%)
(c) additional tables of data	651 (57.0%)	348 (30.5%)	73 (6.4%)	36 (3.2%)
(d) additional figures	644 (56.4%)	351 (30.7%)	73 (6.4%)	37 (3.2%)
(e) completed checklists for the relevant reporting guidelines (e.g. CONSORT, STROBE, PRISMA, STARD, etc.)	609 (53.3%)	193 (16.9%)	109 (9.5%)	187 (16.4%)
(f) flow diagrams for the relevant reporting guideline	549 (48.1%)	290 (25.4%)	116 (10.2%)	138 (12.1%)
(g) interview transcripts	410 (35.9%)	50 (4.4%)	191 (16.7%)	441 (38.6%)
(h) raw study data	429 (37.6%)	54 (4.7%)	240 (21.0%)	365 (32.0%)

* Numbers do not sum to 100% due to missing data

Appendix 7: Who supplementary materials is most useful to







(a) Views Overall (n=2872)

	Most useful to journal editors	Most useful to peer reviewers	Most useful to readers
(a) study protocol	266 (9.3%)	1312 (45.7%)	1105 (38.5%)
(b) data collection or extraction forms (including questionnaires, interview topic guides, etc)	208 (7.2%)	1214 (42.3%)	1227 (42.7%)
(c) additional tables of data	86 (3.0%)	743 (25.9%)	1885 (65.6%)
(d) additional figures	85 (3.0%)	672 (23.4%)	1949 (67.9%)
(e) completed checklists for the relevant reporting guidelines (e.g. CONSORT, STROBE, PRISMA, STARD, etc.)	1158 (40.3%)	1099 (38.3%)	399 (13.9%)
(f) flow diagrams for the relevant reporting guideline	711 (24.8%)	1060 (36.9%)	860 (29.9%)
(g) interview transcripts	461 (16.1%)	1059 (36.9%)	935 (32.6%)
(h) raw study data	446 (15.5%)	1093 (38.1%)	944 (32.9%)

* Numbers do not sum to 100% due to missing data

(b) Views of Authors (n=819)

	Most useful to journal editors	Most useful to peer reviewers	Most useful to readers
(a) study protocol	79 (9.6%)	367 (44.8%)	313 (38.2%)
(b) data collection or extraction forms (including questionnaires, interview topic guides, etc)	54 (6.6%)	331 (40.4%)	367 (44.8%)
(c) additional tables of data	29 (3.5%)	187 (22.8%)	564 (68.9%)
(d) additional figures	22 (2.7%)	170 (20.8%)	584 (71.3%)
(e) completed checklists for the relevant reporting guidelines (e.g. CONSORT, STROBE, PRISMA, STARD, etc.)	365 (44.6%)	291 (35.5%)	96 (11.7%)
(f) flow diagrams for the relevant reporting guideline	193 (23.6%)	298 (36.4%)	254 (31.0%)
(g) interview transcripts	112 (13.7%)	320 (39.1%)	268 (32.7%)
(h) raw study data	120 (14.7%)	309 (37.7%)	276 (33.7%)

* Numbers do not sum to 100% due to missing data

(c) Views of Readers (n=911)

	Most useful to journal editors	Most useful to peer reviewers	Most useful to readers
(a) study protocol	69 (7.6%)	416 (45.7%)	376 (41.3%)
(b) data collection or extraction forms (including questionnaires, interview topic guides, etc)	62 (6.8%)	388 (42.6%)	401 (44.0%)
(c) additional tables of data	25 (2.7%)	172 (18.9%)	659 (72.3%)
(d) additional figures	27 (3.0%)	156 (17.1%)	677 (74.3%)
(e) completed checklists for the relevant reporting guidelines (e.g. CONSORT, STROBE, PRISMA, STARD, etc.)	340 (37.3%)	394 (43.2%)	117 (12.8%)
(f) flow diagrams for the relevant reporting guideline	219 (24.0%)	338 (37.1%)	286 (31.4%)
(g) interview transcripts	145 (15.9%)	373 (40.9%)	270 (29.6%)
(h) raw study data	119 (13.1%)	387 (42.5%)	283 (31.1%)

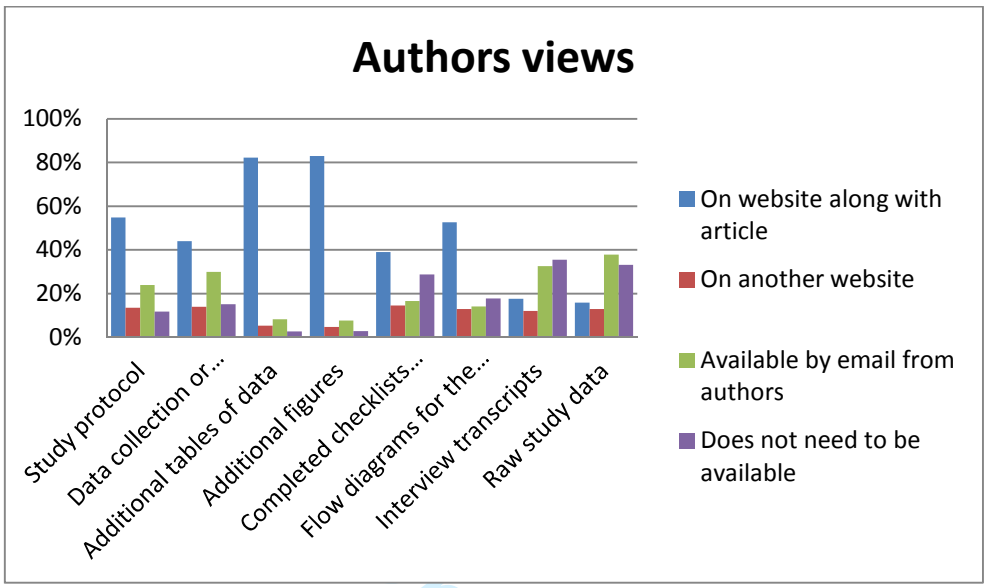
* Numbers do not sum to 100% due to missing data

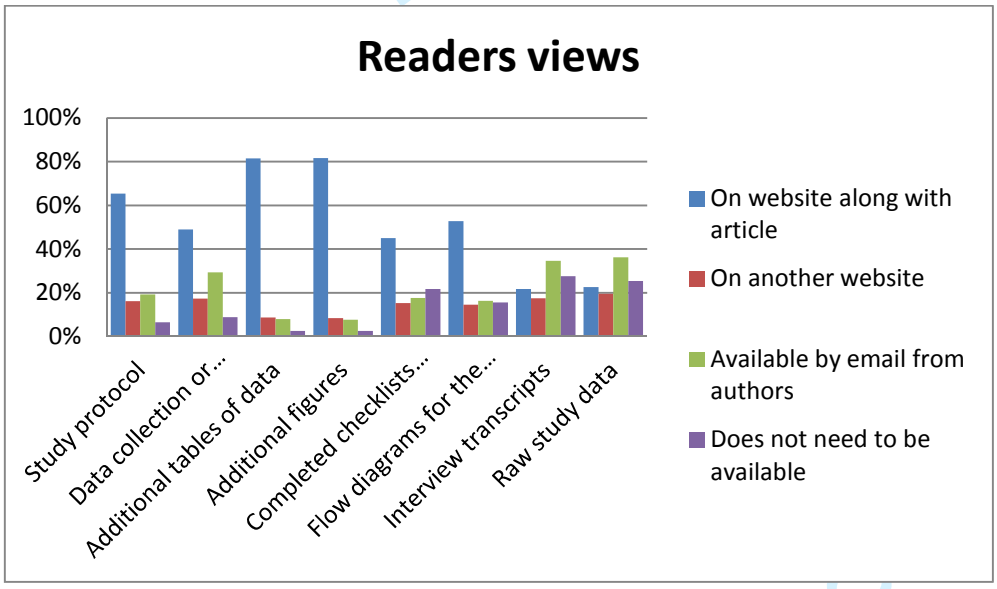
(d) Views of Reviewers (n=1142)

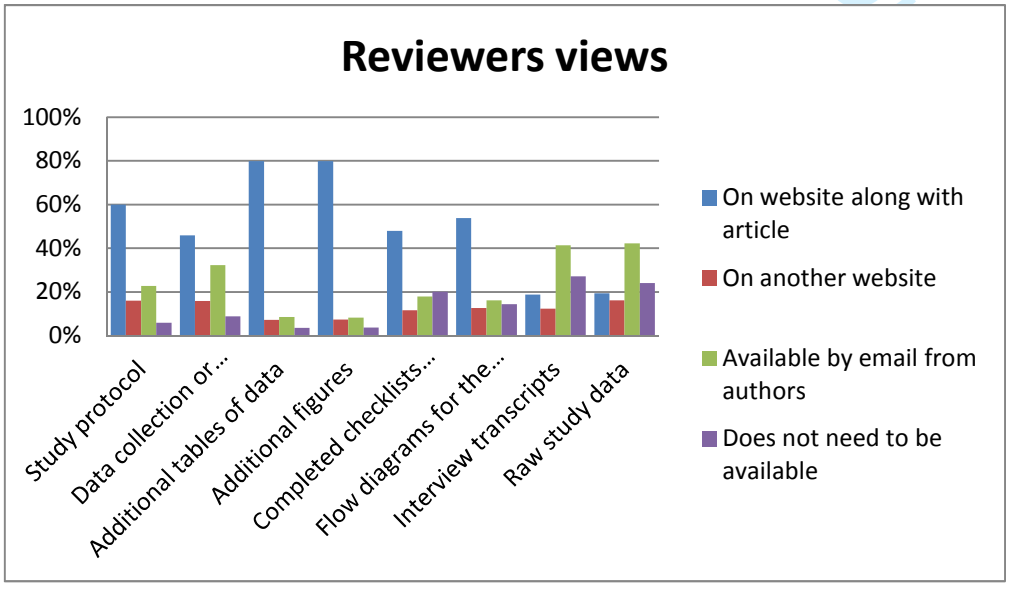
	Most useful to journal editors	Most useful to peer reviewers	Most useful to readers
(a) study protocol	118 (10.3%)	529 (46.3%)	416 (36.4%)
(b) data collection or extraction forms (including questionnaires, interview topic guides, etc)	92 (8.1%)	495 (43.3%)	459 (40.2%)
(c) additional tables of data	32 (2.8%)	384 (33.6%)	662 (58.0%)
(d) additional figures	36 (3.2%)	346 (30.3%)	688 (60.2%)
(e) completed checklists for the relevant reporting guidelines (e.g. CONSORT, STROBE, PRISMA, STARD, etc.)	453 (39.7%)	414 (36.3%)	186 (16.3%)
(f) flow diagrams for the relevant reporting guideline	299 (26.2%)	424 (37.1%)	320 (28.0%)
(g) interview transcripts	204 (17.9%)	366 (32.0%)	397 (34.8%)
(h) raw study data	207 (18.1%)	767 (34.8%)	385 (33.7%)

* Numbers do not sum to 100% due to missing data

Appendix 8: Where supplementary material should be published







(a) Views Overall (n=3872)

	On website along with article*	On another website*	Available by email from authors*	Does not need to be available *
(a) study protocol	1729 (60.2%)	442 (15.4%)	631 (22.0%)	223 (7.8%)
(b) data collection or extraction forms (including questionnaires, interview topic guides, etc)	1331 (46.3%)	455 (15.8%)	881 (30.7%)	305 (10.6%)
(c) additional tables of data	2328 (81.1%)	206 (7.2%)	239 (8.3%)	86 (3.0%)
(d) additional figures	2335 (81.3%)	200 (7.0%)	228 (7.9%)	88 (3.1%)
(e) completed checklists for the relevant reporting guidelines (e.g. CONSORT, STROBE, PRISMA, STARD, etc.)	1277 (44.5%)	391 (13.6%)	501 (17.4%)	664 (23.1%)
(f) flow diagrams for the relevant reporting guideline	1526 (53.1%)	383 (13.3%)	450 (15.7%)	452 (15.7%)
(g) interview transcripts	558 (19.4%)	400 (13.9%)	1054 (36.7%)	852 (29.7%)
(h) raw study data	557 (19.4%)	468 (16.3%)	1123 (39.1%)	779 (27.1%)

** Answers are not mutually exclusive*

(b) Views of Authors (n=819)

	On website along with article	On another website	Available by email from authors	Does not need to be available
(a) study protocol	449 (54.8%)	111 (13.6%)	196 (23.9%)	97 (11.8%)
(b) data collection or extraction forms (including questionnaires, interview topic guides, etc)	360 (44.0%)	115 (14.0%)	245 (29.9%)	124 (15.1%)
(c) additional tables of data	674 (82.3%)	44 (5.4%)	68 (8.3%)	22 (2.7%)
(d) additional figures	679 (82.9%)	39 (4.8%)	63 (7.7%)	23 (2.8%)
(e) completed checklists for the relevant reporting guidelines (e.g. CONSORT, STROBE, PRISMA, STARD, etc.)	319 (38.9%)	119 (14.5%)	136 (16.6%)	236 (28.8%)
(f) flow diagrams for the relevant reporting guideline	431 (52.6%)	106 (12.9%)	116 (14.2%)	146 (17.8%)
(g) interview transcripts	145 (17.7%)	99 (12.1%)	267 (32.6%)	291 (35.5%)
(h) raw study data	130 (15.9%)	106 (12.9%)	310 (37.9%)	272 (33.2%)

* Answers are not mutually exclusive

(c) Views of Readers (n=911)

	On website along with article	On another website	Available by email from authors	Does not need to be available
(a) study protocol	596 (65.4%)	148 (16.2%)	175 (19.2%)	59 (6.5%)
(b) data collection or extraction forms (including questionnaires, interview topic guides, etc)	446 (49.0%)	158 (17.3%)	268 (29.4%)	80 (8.8%)
(c) additional tables of data	742 (81.4%)	79 (8.7%)	73 (8.0%)	23 (2.5%)
(d) additional figures	744 (81.7%)	77 (8.5%)	70 (7.7%)	23 (2.5%)
(e) completed checklists for the relevant reporting guidelines (e.g. CONSORT, STROBE, PRISMA, STARD, etc.)	410 (45.0%)	139 (15.3%)	161 (17.7%)	198 (21.7%)
(f) flow diagrams for the relevant reporting guideline	481 (52.8%)	133 (14.6%)	149 (16.4%)	142 (15.6%)
(g) interview transcripts	198 (21.7%)	160 (17.6%)	315 (34.6%)	251 (27.6%)
(h) raw study data	206 (22.6%)	178 (19.5%)	330 (36.2%)	232 (25.5%)

* Answers are not mutually exclusive

(d) Views of Reviewers (n=1142)

	On website along with article	On another website	Available by email from authors	Does not need to be available
(a) study protocol	684 (59.9%)	183 (16.0%)	260 (22.8%)	67 (5.9%)
(b) data collection or extraction forms (including questionnaires, interview topic guides, etc)	525 (46.0%)	182 (15.9%)	368 (32.2%)	101 (8.8%)
(c) additional tables of data	912 (79.9%)	83 (7.3%)	98 (8.6%)	41 (3.6%)
(d) additional figures	912 (79.9%)	84 (7.4%)	95 (8.3%)	42 (3.7%)
(e) completed checklists for the relevant reporting guidelines (e.g. CONSORT, STROBE, PRISMA, STARD, etc.)	548 (48.0%)	133 (11.6%)	204 (17.9%)	230 (20.1%)
(f) flow diagrams for the relevant reporting guideline	614 (53.8%)	144 (12.6%)	185 (16.2%)	164 (14.4%)
(g) interview transcripts	215 (18.8%)	141 (12.3%)	472 (41.3%)	310 (27.1%)
(h) raw study data	221 (19.4%)	184 (16.1%)	483 (42.3%)	275 (24.1%)

* Answers are not mutually exclusive

Appendix 9: Authors' views on what the expect journal editors, peer reviewers and readers to do with supplementary materials N(%)

	Read all of it routinely	Read some of it	Ignore it	It depends on the manuscript
Journal Editors	178 (22)	289 (35)	58 (7)	258 (32)
Peer Reviewers	395 (48)	253 (31)	13 (2)	122 (15)
Readers	60 (7)	355 (43)	47 (6)	322 (39)

Appendix 10: Readers' persceptive on whatshould be done with supplementary materials

What do you think readers in general should do with supplementary materials? N(%)

	Read all of it routinely	Read some of it	Ignore it	It depends on the manuscript
(a) study protocol	160 (18)	208 (23)	47 (5)	450 (49)
(b) data collection or extraction forms (including questionnaires, interview topic guides, etc)	81 (9)	244 (27)	90 (10)	441 (48)
(c) additional tables of data	224 (25)	335 (37)	25 (3)	280 (31)
(d) additional figures	237 (26)	322 (35)	23 (3)	280 (31)
(e) completed checklists for the relevant reporting guidelines (e.g. CONSORT, STROBE, PRISMA, STARD, etc.)	75 (8)	150 (17)	246 (27)	382 (42)
(f) flow diagrams for the relevant reporting guideline	156 (17)	210 (23)	161 (18)	328 (36)
(g) interview transcripts	14 (2)	133 (15)	244 (27)	455 (50)
(h) raw study data	17 (2)	116 (13)	199 (22)	510 (56)

As a reader, what do you usually do with the supplementary material? N(%)

	Read all of it routinely	Read some of it	Ignore it	It depends on the manuscript
(a) study protocol	150 (17)	303 (33)	112 (12)	290 (32)
(b) data collection or extraction forms (including questionnaires, interview topic guides, etc)	79 (9)	286 (31)	174 (19)	316 (35)
(c) additional tables of data	229 (25)	356 (39)	53 (6)	222 (24)
(d) additional figures	243 (27)	352 (39)	48 (5)	219 (24)
(e) completed checklists for the relevant reporting guidelines (e.g. CONSORT, STROBE, PRISMA, STARD, etc.)	74 (8)	136 (15)	369 (41)	270 (30)
(f) flow diagrams for the relevant reporting guideline	157 (17)	179 (20)	275 (30)	239 (26)
(g) interview transcripts	15 (2)	114 (13)	384 (42)	319 (35)
(h) raw study data	23 (3)	107 (12)	308 (34)	394 (43)

Appendix 11: Reviewers' perspective of what peer reviewers do , should do and are expected to do with supplementary materials

What do you think journal editors expect peer reviewers to do with this supplementary material? N(%)

	Read all of it routinely	Read some of it	Ignore it	It depends on the manuscript
(a) study protocol	426 (37)	304 (27)	15 (1)	328 (29)
(b) data collection or extraction forms (including questionnaires, interview topic guides, etc)	272 (24)	377 (33)	46 (4)	373 (33)
(c) additional tables of data	669 (59)	226 (20)	12 (1)	171 (15)
(d) additional figures	684 (60)	204 (18)	12 (1)	176 (15)
(e) completed checklists for the relevant reporting guidelines (e.g. CONSORT, STROBE, PRISMA, STARD, etc.)	463 (41)	238 (21)	99 (9)	264 (23)
(f) flow diagrams for the relevant reporting guideline	490 (43)	227 (20)	79 (7)	267 (23)
(g) interview transcripts	133 (12)	235 (21)	193 (17)	497 (44)
(h) raw study data	135 (12)	210 (18)	180 (16)	527 (46)

What do you think peer reviewers should do with the supplementary material? N (%)

	Read all of it routinely	Read some of it	Ignore it	It depends on the manuscript
(a) study protocol	468 (41)	297 (26)	23 (2)	280 (25)
(b) data collection or extraction forms (including questionnaires, interview topic guides, etc)	287 (25)	372 (33)	49 (4)	356 (31)
(c) additional tables of data	688 (60)	208 (18)	15 (1)	161 (14)
(d) additional figures	695 (60.9%)	197 (17)	16 (1)	161 (14)
(e) completed checklists for the relevant reporting guidelines (e.g. CONSORT, STROBE, PRISMA, STARD, etc.)	433 (38)	225 (20)	117 (10)	286 (25)
(f) flow diagrams for the relevant reporting guideline	463 (41)	219 (19)	94 (8)	286 (25)
(g) interview transcripts	116 (10)	214 (19)	198 (17)	530 (46)
(h) raw study data	135 (12)	191 (17)	175 (15)	549 (48)

When peer reviewing, what do you do with the supplementary material? N (%)

	Read all of it routinely	Read some of it	Ignore it	It depends on the manuscript	Not applicable
(a) study protocol	400 (35)	303 (27)	27 (2)	187 (16)	146 (13)
(b) data collection or extraction forms (including questionnaires, interview topic guides, etc)	262 (23)	336 (29)	72 (6)	265 (23)	127 (11)
(c) additional tables of data	672 (59)	227 (20)	17 (2)	127 (11)	25 (2)
(d) additional figures	686 (60)	210 (18)	16 (1)	127 (11)	30 (3)
(e) completed checklists for the relevant reporting guidelines (e.g. CONSORT, STROBE, PRISMA, STARD, etc.)	367 (32)	238 (21)	145 (13)	197 (17)	116 (10)
(f) flow diagrams for the relevant reporting guideline	416 (36)	221 (19)	90 (8)	220 (19)	114 (10)
(g) interview transcripts	81 (7)	147 (13)	178 (16)	260 (23)	391 (34)
(h) raw study data	105 (9)	146 (13)	161 (14)	294 (26)	345 (30)

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The Role of Supplementary Material in Biomedical Journal Articles: Surveys of Authors, Reviewers and Readers

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The Role of Supplementary Material in Biomedical Journal Articles: Surveys of Authors, Reviewers and Readers

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ABSTRACT

Objective: Many journals permit authors to submit supplementary material for publication alongside the article. We explore the value, use, and role of this material in biomedical journal articles from the perspectives of authors, peer reviewers and readers.

Design and Setting: We conducted online surveys (November-December 2016) of corresponding authors and peer reviewers at 17 BMJ Publishing Group journals in a range of specialities.

Participants: Participants were asked to respond to one of three surveys: as authors, peer reviewers, or readers.

Results: We received 2872/20,340 (14%) responses: authors 819/6892 (12%), peer reviewers 1142/6682 (17%), and readers 911/6766 (14%).

Most authors submitted (711/819, 87%) and 80% (724/911) of readers reported reading supplementary material with their last article, while 95% (1086/1142) of reviewers reported seeing these materials sometimes. Additional data tables were the most common supplementary material reported (authors: 74%; reviewers: 89%; readers: 67%). A majority in each group indicated additional tables were most useful to readers (61-77%); 20-36% and 3-4% indicated they were most useful to peer reviewers and journal editors, respectively. Checklists and reporting guidelines showed the opposite: higher proportions of each group regarded these as most useful to journal editors. All three groups favoured the publication of additional tables and figures on the journal's website (80-83%), with <4% of each group responding that these do not need to be available. Approximately one fifth (16-23%) responded that raw study data should be available on the journal's website, while 24-33% said that these materials should not be made available anywhere.

Conclusions: Authors, peer reviewers and readers agree that supplementary material are useful. Supplementary tables and figures were favoured over reporting checklists or raw data for reading but not for study replication. Journals should consider the roles, resource costs and strategic placement of supplementary materials to ensure optimal usage and minimise waste.

Strengths and limitations of this study

1. Our large sample from a diverse group of active international authors and reviewers from 17 different journals provide evidence for stakeholder views on supplementary materials within the biomedical literature.
2. The response rate is comparable to response rates for other electronic surveys of researchers.
3. Participants were asked to respond in the assigned role/perspective of a reader, peer reviewer or author, although these are not mutually exclusive categories, as academics often engage in all three activities.

BACKGROUND

Many journals allow or require authors to submit supplementary material along with their manuscript. These materials might help in deciding about the publication of the article (such as completed checklists for reporting guidelines) or provide additional information for readers who wish to delve deeper into the findings, replicate the research or use it for secondary analysis. The materials might also help improve access in the context of initiatives such as the FAIR (Findability, Accessibility, Interoperability and Reusability) Data Principles for the automatic finding and use of scientific data,[1] and the wish to facilitate automation in the systematic review process.[2]

The volume of supplementary materials is accelerating in step with research complexity and multidisciplinary alliances. For example, Schriger et al. show the percentage of articles containing supplementary materials increasing from 7% in 2003 to 25% in 2009 with web-only supplementary materials doubling in the same time period.[3] Scientific journals report challenges in keeping up, citing reviewer fatigue, publishing delays, bloated publishing repositories and confusion, as it is not unusual for articles that occupy 5-7 pages in the journal to present with over 140 pages of supplementary data or for systematic reviews or trial reports to include several hundred pages of information that would be needed to replicate, but not to report the findings of the research.[4-7] Supplementary materials might provide additional results from a study or the detail needed to replicate the methods or present formulas, statistical models, intervention details, or algorithms. Some journals refuse the materials as excessive, whilst others allow "reasonable use" which each journal defines individually.[4-7] This is set within the backdrop of an increasing demand for research transparency through the sharing of all findings and corresponding data.[8] Although standards for supplementary materials were suggested in 2012 by the National Information

Standards Organization (NISO) and the National Federation of Advanced Information Services (NFAIS),[9] the concerns of medical journals were not specifically considered and any policy adopted by medical journal editors will have implications for readers, editors, reviewers and the general public.

Clinicians and researchers struggle to keep up with reading the literature. Nearly a decade ago, Bastian et al. reported the publication of seventy-five trials and eleven systematic reviews per day and asked "*how will we ever keep up?*".[10] The numbers have continued to increase since then and the challenges have been compounded by the burgeoning supplementary material and problems with incompatible file systems, bandwidth restrictions, and broken weblinks.[11] The increasing volume of supplementary materials submitted to journals puts more pressure on journal editors and peer reviewers to retrieve relevant information from multiple sources.[7] Schaffer et al [12] make recommendations on how access to supplementary material can be improved. There is concern that the excessive volume of supplementary materials can influence decisions made during peer review and skew the integrity of the scientific record.[6] A recent study of research manuscripts submitted to *JAMA*, *JAMA Internal Medicine* (*JIM*) and *JAMA Pediatrics* (*JPED*) found that manuscripts with supplements were more likely to be peer reviewed and accepted than those without supplements.[13] The requirements and practices of journals around supplementary materials vary[12,14] and journals' expectations of peer reviewers in terms of supplementary material are often not made clear in guidance to reviewers.[6] For example, some journals explicitly state that supplementary material will not be peer reviewed, while others only mention that it will not be typeset. This variety of approaches forces authors, reviewers and readers to place different degrees of prioritisation and importance on supplementary material when including, reading or using them.

The use of supplementary materials during and after submission and publication is patchy, and the perceived value to stakeholders of the work involved in producing, assessing and using them is unclear.[13, 15] We conducted a survey to help resolve these uncertainties and to investigate the role of supplementary material in biomedical journal articles from the perspective of authors, peer reviewers, and readers.

METHODS

This survey is registered at ClinicalTrials.gov ID: NCT02961036. The research was reviewed by, and received ethics clearance through, the University of Oxford Central University Research Ethics Committee (MS-IDREC-C1-2013-174).

Sampling

Journal Sampling

Participants were drawn from a sample of 17 of BMJ Publishing Group's biomedical journals (Appendix 1). Journals varied in size and Impact Factor but each has a website and publishes supplementary material.

Participant sampling

One author (SS) downloaded contact details of all corresponding authors who submitted a full length original research submission to one of the 17 journals in 2013 and all peer reviewers who had completed a review of a research submission for one of the journals in 2014 from the journal manuscript tracking systems. She used Microsoft Excel to remove duplicates from within each journal subsample and then across author / reviewer samples for all journals based on the person's email address. We sent each sampled email address an

invitation to just one of the three surveys, but it is possible some duplicates remained if an individual had more than one email address in the manuscript tracking systems. We excluded potential participants if they had previously opted out of receiving BMJ communications or had participated in a BMJ research survey within the previous 6 months.

Two thirds of the authors were randomly assigned to receive the Author Survey, two thirds of the peer reviewers were randomly assigned to receive the Reviewer Survey and one third of each sample was randomised to receive the Reader Survey, under the assumption that all participants were likely to be readers of journal articles.

Questionnaire administration

The surveys were developed by the researchers and piloted with 45 volunteers to check for ambiguous questions. The surveys were revised based on this feedback before launching.

Participants were sent an email invitation in November 2016 to complete an online survey administered using SurveyMonkey. Non-respondents were sent up to two reminders. Participants were asked to complete the survey from the perspective of their allocated role to provide information about their use of specific types of supplementary material (study protocol, data collection or extraction forms, data tables and figures, completed reporting guideline checklists and flow diagrams, interview transcripts, and raw study data). Survey questions asked who the material is most useful to; the expected use of materials by authors, reviewers and readers; the preferred option for accessing supplementary material; and if and where supplementary material should be published. The questions and response categories for each of the survey instruments are shown in Appendices 2-4.

Statistical Analysis

Data were exported into Excel, cleaned and anonymised prior to analysis. All statistical analyses were conducted in SPSS v22. Descriptive and summary statistics of interval scale variables were calculated using mean and standard deviation (or median and inter-quartile range for skewed data), and categorical data as frequency and percentages. Data have been reported from the individual perspectives of authors, readers and reviewers, as well as the aggregated overall perspective.

Public and patient involvement

Forty-five volunteers piloted the surveys and shared valuable feedback to make the questions clear and unambiguous. These volunteers were community members, physicians, researchers, patients, and teachers.

RESULTS

Appendix 5 shows which questions in the surveys pertain to our findings presented below and in the Tables and Appendices.

Respondent characteristics

We sent the survey by email to 20,340 people and received 2872 (14%) responses (819 [12%] from authors, 1142 [17%] from peer reviewers, and 911 [14%] from those responding as readers), see Table 1. The numbers of years as an active researcher was comparable across respondents with a mean of 4.4 years (SD 1.96) for authors, 4.6 years (SD 1.98) for readers and 5.3 years (SD 2.89) for reviewers. The approximate number of research papers reported as published by respondents were a median of 46 overall (36 for authors, 41 for readers, 51 for reviewers, which are statistically different across the groups: independent samples

Kruskal-Wallis test P<0.001) but with a spread of experience (inter-quartile range: 81 research papers). More than 87% of respondents read articles in medical journals either frequently or very frequently. Respondents are from an international sample, with authors from 65 countries, reviewers from 57 and readers from 53 countries.

Table 1: Characteristics of Respondents

	Authors	Readers	Reviewers	Overall
Number (%) of sample	819 (28.5)	911 (31.7)	1142 (39.8)	2872 (100)
Mean (SD) number of years as an active researcher	4.4 (1.96)	4.6 (1.98)	5.3 (2.89)	4.8 (2.41)
Approximate number of research papers published as author or co-author - median (IQR)	36 (68.5)	41 (75)	51 (77)	46 (81)
Number (%) on how frequently they read articles in medical journals				
Very frequently	377 (46.0)	462 (54.2)	628 (55.0)	1467 (51.1)
Frequently	337 (41.1)	331 (38.8)	383 (33.5)	1051 (36.6)
Occasionally	58 (7.1)	58 (6.4)	55 (4.8)	171 (6.0)
Rarely	3 (0.4)	1 (0.1)	7 (0.6)	11 (0.4)
Never	1 (0.1)	1 (0.1)	2 (0.2)	4 (0.1)

SD: Standard deviation; IQR: Inter-quartile range

Respondent's interaction with supplementary material

When recalling what supplementary material was contained in their last article submitted, authors stated including additional tables of data (74%) or additional figures (57%) most frequently, followed by checklists for relevant reporting guidelines (39%). Readers recalled reading additional tables of data (67%) or additional figures (53%), followed by study protocol (23%). Over 80% of reviewers recalled the use of additional figures and tables of data in articles they peer reviewed sometimes or often, in contrast to more than 80% reporting rarely seeing raw study data or interview transcripts (Appendix 6).

Preferred option for accessing supplementary material

Overall (n=2872) respondents' preferred option for accessing tables of data and additional figures were as supplementary files alongside the article (60% and 59% respectively), while 50% chose this as their preferred option for data collection forms and completed checklists for relevant reporting guidelines. In contrast, 40% of respondents preferred that interview transcripts and raw study data would not be made available. (See Figure 1 for overall data and Appendix 7 for responses by group).

The open-text responses to accessing supplementary materials also showed common sentiment across readers, reviewers and authors; as illustrated by this quote *"It depends on the type of research and my purpose for accessing it. If I am only reading for enjoyment or for an overview of the topic I seldom look at supplementary materials but to replicate the research or to further verify the authors findings or methods, the supplementary materials provide nuances the paper does not."*

Who the material is most useful to

Figure 2 shows the overall views of who each type of supplementary material is most useful to, from the total of 2872 respondents. Additional tables of data and additional figures were deemed to be most useful to readers (>65%), while the study protocol and data collection/extraction forms were deemed most useful to peer reviewers (>40%), in contrast to the completed checklists which were deemed most relevant to journal editors (40%).

Table 2 (and Appendix 8) further stratifies these opinions by allocated group, which reveals similar trends to those given overall. For instance, additional tables of data were regarded as most useful to readers (58-72%) by all groups (authors, reviewers and readers), while

checklists were perceived as more useful to journal editors or peer reviewers rather than readers (36-45% versus 12-16%).

Table 2: Author, Reviewer, and Reader Perspectives on the Value of Additional Tables of Data, Completed Checklists for Reporting Guidelines and Raw Study Data by Group[a,b]

Group	No./Total No. (%) Most useful to		
	To Journal Editors	To Peer Reviewers	To Readers
Additional tables of data			
Authors	29/819 (4)	187/819 (23)	564/819 (69)
Reviewers	32/1142 (3)	384/1142 (34)	662/1142 (58)
Readers	25/911 (3)	172/911 (19)	659/911 (72)
Overall	68/2872 (3)	743/2872 (26)	1885/2872 (66)
Completed checklists for reporting guidelines			
Authors	365/819 (45)	291/819 (36)	96/819 (12)
Reviewers	453/1142 (40)	414/1142 (36)	186/1142 (16)
Readers	340/911 (37)	394/911 (43)	117/911 (13)
Overall	1158/2872 (40)	1099/2872 (38)	399/2872 (14)
Raw study data			
Authors	120/819 (15)	309/819 (38)	276/819 (34)
Reviewers	207/1142 (18)	767/1142 (35)	385/1142 (34)
Readers	119/911 (13)	387/911 (42)	283/911 (31)
Overall	446/2872 (16)	1093/2872 (38)	944/2872 (33)

[a] Percentages do not sum to 100% across each row because some respondents did not answer every question

[b] A table showing the responses for *all* types of supplementary material is given in our Supplementary material

If and where supplementary material should be published

Figure 3 depicts the overall views on where (each type of) supplementary material should be published, be this on the website alongside the article, on another website, available directly

from the authors, or that it does not need to be available. The responses are not mutually exclusive, but more than 81% preferred to see additional tables of data and figures on a website along with the article. In contrast, respondents preferred interview transcripts (37%) and raw study data (39%) to be available by contacting the article's corresponding author, with a further 30% and 27% respondents indicating these materials did not need to be made available, respectively. Other forms of supplementary material, for example checklists, were perceived variably with responses of either availability on the website along with the article (45%) or of no need to be available (23%). Appendix 9 shows that the responses were similar by group.

In the open-text responses, there were multiple requests for inclusion and publication of replicable software codes, dynamic models with the modelling results, statistical models, videos and models for imaging and genetics while others saw no need for supplementary materials stating that the responsibility of the authors was to deliver clear and concise reporting that would fit within the given word limits of a paper. An important consideration noted by some respondents was that some data were restricted and could not be shared without compromising the identities of participants particularly in data linkage sets. Respondents stressed the need for improved navigation both of the website to access the materials and of the materials themselves in terms of labelling, ordering and readability. It was suggested that supplementary materials for an article should be downloadable as a single zipped file.

Expected use of materials by authors, reviewers and readers

Almost half the authors who responded expect that peer reviewers should routinely read all supplementary material. But on asking reviewers what they do with supplementary material, 8-16% ignored completed checklists, flow diagrams, interview transcripts and raw study data, with 11-26% saying it depended on the manuscript. We found that only additional tables of data and additional figures were being routinely read entirely, at approximately 60%, with other categories below 36%. In response to the question about what they usually do with supplementary materials, no more than 27% of readers responded that they routinely read all of any type of supplementary material, with 30-40% ignoring completed checklists, flow diagrams, interview transcripts and raw study data (see Appendices 10-12).

DISCUSSION

In general, authors, reviewers, and readers expressed a preference for supplementary material that provided additional tables over completed reporting checklists or raw data when reading research articles. This may highlight a greater desire amongst these users of research to have access to information that has been analysed or summarised by the original researchers. A recurring theme in free-text comments was how the importance and value of supplementary materials depended on the purpose for which they were accessed. For example, respondents noted that as interested readers they might not access any supplementary materials but that they would want to be able to access supplementary materials for analysis, replication, secondary research, or teaching purposes. The respondents also expressed concerns about data accessibility, security and the persistence of all data, as well as concerns about protecting the trustworthiness and viability of permissions for raw data (particularly when made available to third parties). Considering these findings, our survey adds impetus to calls to improve the quality of reporting, the use of reporting guidelines,[15-17] and the evaluation of

the impact of initiatives intended to improve the quality of the literature and decisions based upon it. The survey also revealed uncertainty about the use and placement of supplementary materials, as illustrated by the following representative open text comment:

"*A manuscript to be published should be able to stand on its own. Journals are making a mistake by making article word counts shorter, then having supplementary material. If more data are needed to understand the study, they should be in the article"*

In 2009-2011, the journals *Cell*, *The Journal of Neuroscience,* and *Science* announced that they would not allow authors to include supplemental material on submission or host supplemental material on their websites. Instead, authors were given the option of including a URL to direct readers to the supplementary material on a website maintained by the authors, along with a short description of the supplementary material.[4][5][18] However, we found little support from our respondents for including a weblink within the published paper or for requesting supplementary material directly from investigators by email. Although journals and researchers may feel a social responsibility to make data publicly and permanently available,[18] they often lack the necessary tools or collaborators to build and maintain persistent repositories. Private web pages and email are not persistent over time and may be vulnerable to corruption. Hofner and colleagues recommend the use of recognised repositories where DOIs are supplied as good practice for data preservation and to preserve the options to replicate the findings.[19] There is considerable debate over how to make research more transparent and reproducible.[20] As supplementary material often contains content that helps make research more reproducible, it is important for it to be accessible in the long term to help improve research efficiency. Others argue that the supplementary material needs to be better structured to avoid computational errors and to enable machine reading, particularly in the fields of genomics, neuroscience, chemistry and other basic

sciences.[21] Pop and Salzberg proposed that specific sections of the supplementary material should be directly hyper-linked within the text of the article to improve the utility of published scientific articles and to increase the likelihood that this material is adequately peer reviewed.[6]

Study Limitations

Our response rate of 14% is typical of current response rates for electronic surveys to researchers,[22] but still allowed us to achieve a large sample, with nearly 3000 responses from a diverse group of international authors and reviewers from 17 biomedical journals. As such, our findings make a substantial contribution to the evidence on stakeholder views on the value of supplementary materials within the peer reviewed biomedical literature. Participants were asked to respond in the assigned role/perspective of a reader, peer reviewer or author, and these are not mutually exclusive categories, as academics often engage in all three activities. Participants gave general perceptions and were not asked to report on specific cases or the purpose of accessing the article and this may have influenced responses.

Remaining uncertainties and future research

Some respondents expressed a preference in open-text comments for standardised, well organised supplementary materials that could be combined into a single zipped file for downloading or offered as a persistent link. However, others commented that data protection standards and ethical oversight might not be explicitly extended to making supplementary materials publicly available. These concerns were not directly addressed within the survey questions and so it is not known how representative or widespread these opinions might be. However, the views expressed could be the target of further investigation. It may also be worth investigating the relationship between the value of supplementary material and the cost of production and publication to researchers should journals take on the responsibility for the

state of supplementary materials in terms of perpetual availability, typesetting and compatibility.

CONCLUSIONS

Our findings provide evidence that should help journals, researchers and funders to consider the roles, costs, and benefits of supplementary materials. The findings highlight, for example, a greater desire amongst users of research to have access to information that has already been analysed or summarised by the original researchers, rather than their raw material. It may be helpful for journals to expand file types to allow storage of, and access to a variety of file types, including multi-media, computer models and working software prototypes. Our survey should also add impetus to calls to improve the quality of reporting and the use of reporting guidelines,[15-17] and we hope that it will stimulate greater emphasis on the need for evaluation of the impact of all initiatives intended to improve the quality of health research and the decisions that will subsequently be based upon this literature.

DECLARATIONS

Ethics approval and consent to participate

The research was reviewed by, and received ethics clearance through, the University of Oxford Central University Research Ethics Committee (MS-IDREC-C1-2013-174).

Consent for publication

Not applicable.

Funding and role of the funder

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Conflict of Interest Disclosures

AP is the Patient Editor (Research and Evaluation) at *The BMJ*, and SS is a full-time employee of *The BMJ*. MC reports involvement in many clinical trials and systematic reviews and has prepared and used supplementary material widely. He seeks funding for these trials and reviews, as well as for research into methodology, including dissemination and accessibility. HM has no conflicts of interest.

Authors' contributions

AP, SS, and MC designed the study and drafted the questionnaires. AP drafted the protocol with input from SS and MC. SS extracted the samples of authors and reviewers from the journals' manuscript tracking systems and managed the surveys on SurveyMonkey. MC randomised participants to their allocated roles. HM analysed the anonymised data. All authors interpreted the results, wrote this manuscript and approved its final version.

Availability of data and materials

The datasets used and analysed during the current study are available from the corresponding author on reasonable request.

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FIGURE LEGENDS

Figure 1: Overall views of preferred option for providing/reading/receiving supplementary material (n=2872)

Figure 2: Overall views on who each type of supplementary material are most useful to (n=2872)

Figure 3: Overall views on where supplementary material should be published (n=2872)

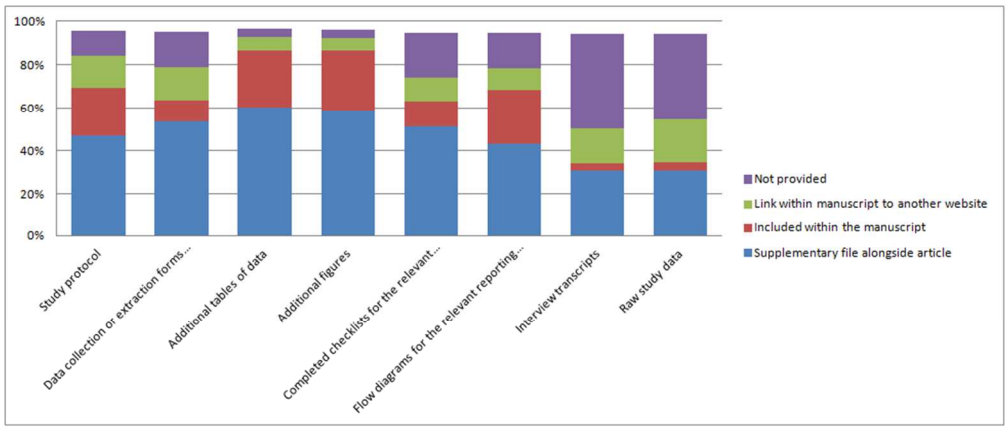

Figure 1: Overall views of preferred option for providing/reading/receiving supplementary material (n=2872)

82x34mm (300 x 300 DPI)

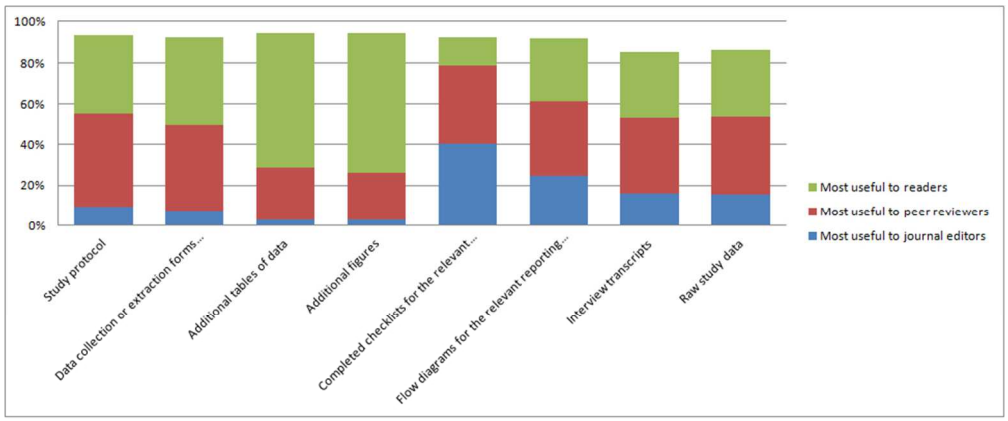

Figure 2: Overall views on who each type of supplementary material are most useful to (n=2872)

81x33mm (300 x 300 DPI)

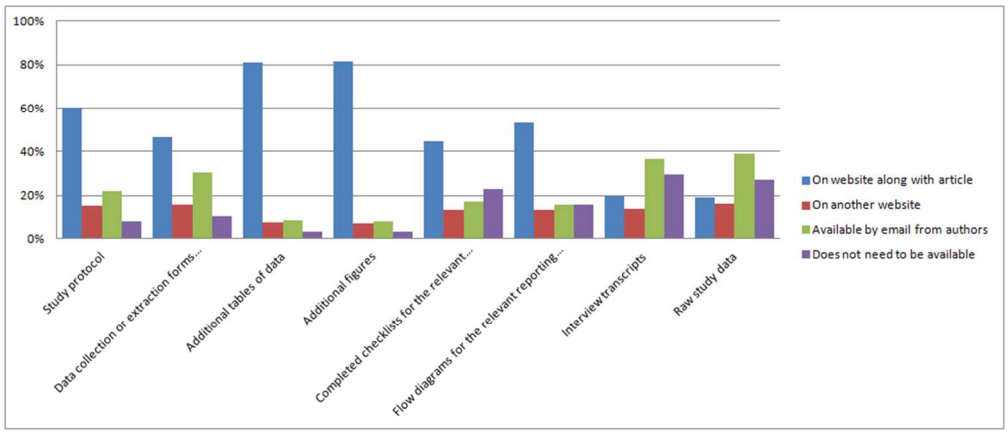

Figure 3: Overall views on where supplementary material should be published (n=2872)

82x35mm (300 x 300 DPI)

Appendix 1: Participating journals

Journal	2015 Impact Factor *	Number of respondents
Archives of Disease in Childhood	3.231	194
Acupuncture in Medicine	1.592	31
BMJ Open	2.562	637
British Journal of Sports Medicine	6.724	107
BMJ Quality & Safety	4.996	60
Emergency Medicine Journal	1.836	78
Gut	14.921	158
Heart	5.693	161
Journal of Epidemiology & Community Health	3.865	139
Journal of Medical Genetics	5.65	35
Journal of Neuro Interventional Surgery	2.959	20
Journal of Neurology, Neurosurgery, & Psychiatry	6.431	212
Occupational and Environmental Medicine	3.745	85
Sexually Transmitted Infections	3.015	41
The BMJ	19.697	715
Thorax	8.121	144
Tobacco Control	6.321	55
Total	**-**	**2872**

* From Thomson Reuter's Journal Citation Reports 2016.

Reviewers' perceptions of supplementary materials survey

Welcome

Thank you for participating in this short collaborative research survey about the role of supplementary material in journal articles.

All responses will be treated confidentially.

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Reviewers' perceptions of supplementary materials survey

1. How frequently do articles that you peer review have the following supplementary material accompanying the manuscript?

	Never	Almost never	Sometimes	Almost every time	Every time	Not applicable
Study protocol	○	○	○	○	○	○
Data collection or extraction forms (including questionnaires, interview topic guides, etc)	○	○	○	○	○	○
Additional tables of data	○	○	○	○	○	○
Additional figures	○	○	○	○	○	○
Completed checklists for the relevant reporting guidelines (e.g. CONSORT, STROBE, PRISMA, STARD, etc.)	○	○	○	○	○	○
Flow diagrams for the relevant reporting guideline	○	○	○	○	○	○
Interview transcripts	○	○	○	○	○	○
Raw study data	○	○	○	○	○	○

Other (please specify)

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Reviewers' perceptions of supplementary materials survey

2. How often is the following supplementary material useful in assisting you in the peer review of manuscripts?

	Never	Almost never	Sometimes	Almost every time	Every time	Not applicable / not received this material
Study protocol	○	○	○	○	○	○
Data collection or extraction forms (including questionnaires, interview topic guides, etc)	○	○	○	○	○	○
Additional tables of data	○	○	○	○	○	○
Additional figures	○	○	○	○	○	○
Completed checklists for the relevant reporting guidelines (e.g. CONSORT, STROBE, PRISMA, STARD, etc.)	○	○	○	○	○	○
Flow diagrams for the relevant reporting guideline	○	○	○	○	○	○
Interview transcripts	○	○	○	○	○	○
Raw study data	○	○	○	○	○	○

Other (please specify)

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Reviewers' perceptions of supplementary materials survey

3. Which is your preferred option for receiving the following types of supplementary material?

	As a supplementary file	Included within the main text of the manuscript	Included as a link within the manuscript to another website (e.g. the author's own website)	Would prefer not to receive it
Study protocol	○	○	○	○
Data collection or extraction forms (including questionnaires, interview topic guides, etc)	○	○	○	○
Additional tables of data	○	○	○	○
Additional figures	○	○	○	○
Completed checklists for the relevant reporting guidelines (e.g. CONSORT, STROBE, PRISMA, STARD, etc.)	○	○	○	○
Flow diagrams for the relevant reporting guideline	○	○	○	○
Interview transcripts	○	○	○	○
Raw study data	○	○	○	○

Other (please specify)

Reviewers' perceptions of supplementary materials survey

4. From the perspective of a peer reviewer, who is the supplementary material most useful to?

	Journal editors	Peer reviewers	Readers
Study protocol	○	○	○
Data collection or extraction forms (including questionnaires, interview topic guides, etc)	○	○	○
Additional tables of data	○	○	○
Additional figures	○	○	○
Completed checklists for the relevant reporting guidelines (e.g. CONSORT, STROBE, PRISMA, STARD, etc.)	○	○	○
Flow diagrams for the relevant reporting guideline	○	○	○
Interview transcripts	○	○	○
Raw study data	○	○	○

Other (please specify)

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Reviewers' perceptions of supplementary materials survey

5. What do you think journal editors expect peer reviewers to do with this supplementary material?

	Read all of it routinely	Read some of it	Ignore it	It depends on the manuscript
Study protocol	○	○	○	○
Data collection or extraction forms (including questionnaires, interview topic guides, etc)	○	○	○	○
Additional tables of data	○	○	○	○
Additional figures	○	○	○	○
Completed checklists for the relevant reporting guidelines (e.g. CONSORT, STROBE, PRISMA, STARD, etc.)	○	○	○	○
Flow diagrams for the relevant reporting guideline	○	○	○	○
Interview transcripts	○	○	○	○
Raw study data	○	○	○	○

Other (please specify)

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Reviewers' perceptions of supplementary materials survey

6. What do you think peer reviewers should do with the supplementary material?

	Read all of it routinely	Read some of it	Ignore it	It depends on the manuscript
Study protocol	○	○	○	○
Data collection or extraction forms (including questionnaires, interview topic guides, etc)	○	○	○	○
Additional tables of data	○	○	○	○
Additional figures	○	○	○	○
Completed checklists for the relevant reporting guidelines (e.g. CONSORT, STROBE, PRISMA, STARD, etc.)	○	○	○	○
Flow diagrams for the relevant reporting guideline	○	○	○	○
Interview transcripts	○	○	○	○
Raw study data	○	○	○	○

Other (please specify)

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Reviewers' perceptions of supplementary materials survey

7. When peer reviewing, what do you do with the supplementary material?

	Read all of it routinely	Read some of it	Ignore it	It depends on the manuscript	Not applicable
Study protocol	○	○	○	○	○
Data collection or extraction forms (including questionnaires, interview topic guides, etc)	○	○	○	○	○
Additional tables of data	○	○	○	○	○
Additional figures	○	○	○	○	○
Completed checklists for the relevant reporting guidelines (e.g. CONSORT, STROBE, PRISMA, STARD, etc.)	○	○	○	○	○
Flow diagrams for the relevant reporting guideline	○	○	○	○	○
Interview transcripts	○	○	○	○	○
Raw study data	○	○	○	○	○

Other (please specify)

Reviewers' perceptions of supplementary materials survey

8. From the perspective of a peer reviewer, what should happen to the following supplementary material when an article is published? (You may tick more than one box on each line).

	It should be published on the journal's website along with the article	It should be published on another website	It should be available by email from the authors	It doesn't need to be available
Study protocol	☐	☐	☐	☐
Data collection or extraction forms (including questionnaires, interview topic guides, etc)	☐	☐	☐	☐
Additional tables of data	☐	☐	☐	☐
Additional figures	☐	☐	☐	☐
Completed checklists for the relevant reporting guidelines (e.g. CONSORT, STROBE, PRISMA, STARD, etc.)	☐	☐	☐	☐
Flow diagrams for the relevant reporting guideline	☐	☐	☐	☐
Interview transcripts	☐	☐	☐	☐
Raw study data	☐	☐	☐	☐

Other (please specify)

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Reviewers' perceptions of supplementary materials survey

9. Please provide any additional comments you have about the submission or publication of supplementary material:

Reviewers' perceptions of supplementary materials survey

Finally, a few questions about yourself

10. Approximately how many years have you been an active researcher?

Other (please specify)

11. Approximately how many research papers have you had published in a peer reviewed journal as either an author or a coauthor?

12. How frequently do you read articles in medical journals?

Very Frequently Frequently Occasionally Rarely Never

13. Would you like to receive a copy of the results of this study when it is complete?

Yes No

Reviewers' perceptions of supplementary materials survey

Thank you, please now submit your response

Please click on "**Submit**" below to send us your responses.

You do not need to inform us that you have completed the survey as your email address is tied to your survey response. All participants will automatically be entered into the prize draw. This link will be removed when we analyse the data.

Thank you for your help.

Readers' perceptions of supplementary materials survey

Welcome

Thank you for participating in this short collaborative research survey about the role of supplementary material in journal articles.

All responses will be treated confidentially.

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Readers' perceptions of supplementary materials survey

1. Thinking of the last journal article you read did it include the following supplementary material?

	Yes	No	Cannot remember	Not applicable
Study protocol	○	○	○	○
Data collection or extraction forms (including questionnaires, interview topic guides, etc)	○	○	○	○
Additional tables of data	○	○	○	○
Additional figures	○	○	○	○
Completed checklists for the relevant reporting guidelines (e.g. CONSORT, STROBE, PRISMA, STARD, etc.)	○	○	○	○
Flow diagrams for the relevant reporting guideline	○	○	○	○
Interview transcripts	○	○	○	○
Raw study data	○	○	○	○

Other (please specify)

Readers' perceptions of supplementary materials survey

2. Which is your preferred option for reading the following types of supplementary material?

	As a supplementary file on the journal's website alongside the article	Included within the manuscript file	Included as a link within the manuscript to another website (e.g. the author's own website)	It doesn't need to be published
Study protocol	○	○	○	○
Data collection or extraction forms (including questionnaires, interview topic guides, etc)	○	○	○	○
Additional tables of data	○	○	○	○
Additional figures	○	○	○	○
Completed checklists for the relevant reporting guidelines (e.g. CONSORT, STROBE, PRISMA, STARD, etc.)	○	○	○	○
Flow diagrams for the relevant reporting guideline	○	○	○	○
Interview transcripts	○	○	○	○
Raw study data	○	○	○	○

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Readers' perceptions of supplementary materials survey

3. From the perspective of a reader, who is the supplementary material most useful to?

	Journal editors	Peer reviewers	Readers
Study protocol	○	○	○
Data collection or extraction forms (including questionnaires, interview topic guides, etc)	○	○	○
Additional tables of data	○	○	○
Additional figures	○	○	○
Completed checklists for the relevant reporting guidelines (e.g. CONSORT, STROBE, PRISMA, STARD, etc.)	○	○	○
Flow diagrams for the relevant reporting guideline	○	○	○
Interview transcripts	○	○	○
Raw study data	○	○	○

Other (please specify)

Readers' perceptions of supplementary materials survey

4. What do you think readers in general should do with the supplementary material?

	Read all of it routinely	Read some of it	Ignore it	It depends on the manuscript
Study protocol	○	○	○	○
Data collection or extraction forms (including questionnaires, interview topic guides, etc)	○	○	○	○
Additional tables of data	○	○	○	○
Additional figures	○	○	○	○
Completed checklists for the relevant reporting guidelines (e.g. CONSORT, STROBE, PRISMA, STARD, etc.)	○	○	○	○
Flow diagrams for the relevant reporting guideline	○	○	○	○
Interview transcripts	○	○	○	○
Raw study data	○	○	○	○

Other (please specify)

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Readers' perceptions of supplementary materials survey

5. As a reader, what do you usually do with the supplementary material?

	Read all of it routinely	Read some of it	Ignore it	It depends on the manuscript
Study protocol	○	○	○	○
Data collection or extraction forms (including questionnaires, interview topic guides, etc)	○	○	○	○
Additional tables of data	○	○	○	○
Additional figures	○	○	○	○
Completed checklists for the relevant reporting guidelines (e.g. CONSORT, STROBE, PRISMA, STARD, etc.)	○	○	○	○
Flow diagrams for the relevant reporting guideline	○	○	○	○
Interview transcripts	○	○	○	○
Raw study data	○	○	○	○

Other (please specify)

Readers' perceptions of supplementary materials survey

6. From the perspective of a reader, what should happen to the following supplementary material when an article is published? (You may tick more than one box on each line).

	It should be published on the journal's website along with the article	It should be published on another website	It should be available by email from the authors	It doesn't need to be available
Study protocol	☐	☐	☐	☐
Data collection or extraction forms (including questionnaires, interview topic guides, etc)	☐	☐	☐	☐
Additional tables of data	☐	☐	☐	☐
Additional figures	☐	☐	☐	☐
Completed checklists for the relevant reporting guidelines (e.g. CONSORT, STROBE, PRISMA, STARD, etc.)	☐	☐	☐	☐
Flow diagrams for the relevant reporting guideline	☐	☐	☐	☐
Interview transcripts	☐	☐	☐	☐
Raw study data	☐	☐	☐	☐

Other (please specify)

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Readers' perceptions of supplementary materials survey

7. In general, how often do you think supplementary material adds value to a research paper?

	Never	Almost never	Sometimes	Almost every time	Every time
Study protocol	○	○	○	○	○
Data collection or extraction forms (including questionnaires, interview topic guides, etc)	○	○	○	○	○
Additional tables of data	○	○	○	○	○
Additional figures	○	○	○	○	○
Completed checklists for the relevant reporting guidelines (e.g. CONSORT, STROBE, PRISMA, STARD, etc.)	○	○	○	○	○
Flow diagrams for the relevant reporting guideline	○	○	○	○	○
Interview transcripts	○	○	○	○	○
Raw study data	○	○	○	○	○

Other (please specify)

Readers' perceptions of supplementary materials survey

8. Please provide any additional comments you have about the submission or publication of supplementary material:

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Readers' perceptions of supplementary materials survey

Finally, a few questions about yourself

9. Approximately how many years have you been an active researcher?

Other (please specify)

10. Approximately how many research papers have you had published in a peer reviewed journal as either an author or a coauthor?

11. How frequently do you read articles in medical journals?

Very Frequently Frequently Occasionally Rarely Never

12. Would you like to receive a copy of the results of this study when it is complete?

Yes No



Readers' perceptions of supplementary materials survey

Thank you, please now submit your response

Please click on "**Submit**" below to send us your responses.

You do not need to inform us that you have completed the survey as your email address is tied to your survey response. All participants will automatically be entered into the prize draw. This link will be removed when we analyse the data.

Thank you for your help.

Authors' perceptions of supplementary materials survey

Welcome

Thank you for participating in this short collaborative research survey about the role of supplementary material in journal articles.

All responses will be treated confidentially.

Authors' perceptions of supplementary materials survey

1. Which of the following types of supplementary material did you submit with your last manuscript (to any journal)?

	Yes	No	Cannot remember	Not applicable
Study protocol	○	○	○	○
Data collection or extraction forms (including questionnaires, interview topic guides, etc)	○	○	○	○
Additional tables of data	○	○	○	○
Additional figures	○	○	○	○
Completed checklists for the relevant reporting guidelines (e.g. CONSORT, STROBE, PRISMA, STARD, etc.)	○	○	○	○
Flow diagrams for the relevant reporting guideline	○	○	○	○
Interview transcripts	○	○	○	○
Raw study data	○	○	○	○

Other (please specify)

Authors' perceptions of supplementary materials survey

2. Thinking about the last manuscript you submitted, how much of a burden was it to prepare and upload the supplementary material for submission?

- ◯ Not at all burdensome
- ◯ A little bit burdensome
- ◯ Somewhat burdensome
- ◯ Very burdensome
- ◯ Extremely burdensome

Authors' perceptions of supplementary materials survey

3. Which is your preferred option for providing the following types of supplementary material?

	To provide it as a supplementary file	To include it in the main text of the manuscript	To include it as a link within the manuscript to another website (e.g. your own website)	To not provide it
Study protocol	○	○	○	○
Data collection or extraction forms (including questionnaires, interview topic guides, etc)	○	○	○	○
Additional tables of data	○	○	○	○
Additional figures	○	○	○	○
Completed checklists for the relevant reporting guidelines (e.g. CONSORT, STROBE, PRISMA, STARD, etc.)	○	○	○	○
Flow diagrams for the relevant reporting guideline	○	○	○	○
Interview transcripts	○	○	○	○
Raw study data	○	○	○	○

Other (please specify)

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Authors' perceptions of supplementary materials survey

4. From the perspective of an author, who is the following supplementary material most useful to?

	Journal editors	Peer reviewers	Readers
Study protocol	○	○	○
Data collection or extraction forms (including questionnaires, interview topic guides, etc)	○	○	○
Additional tables of data	○	○	○
Additional figures	○	○	○
Completed checklists for the relevant reporting guidelines (e.g. CONSORT, STROBE, PRISMA, STARD, etc.)	○	○	○
Flow diagrams for the relevant reporting guideline	○	○	○
Interview transcripts	○	○	○
Raw study data	○	○	○

Other (please specify)

Authors' perceptions of supplementary materials survey

5. What do you expect editors, reviewers and readers to do with the supplementary material?

	Read all of it routinely	Read some of it	Ignore it	It depends on the manuscript
Journal editors	○	○	○	○
Peer reviewers	○	○	○	○
Readers	○	○	○	○

Others (please specify)

BMJ Queen's University Belfast UNIVERSITY OF OXFORD

Authors' perceptions of supplementary materials survey

6. From the perspective of an author, what should happen to the following supplementary material when an article is published? (You may tick more than one box on each line).

	It should be published on the journal's website along with the article	It should be published on another website	It should be available by email from the authors	It doesn't need to be available
Study protocol	☐	☐	☐	☐
Data collection or extraction forms (including questionnaires, interview topic guides, etc)	☐	☐	☐	☐
Additional tables of data	☐	☐	☐	☐
Additional figures	☐	☐	☐	☐
Completed checklists for the relevant reporting guidelines (e.g. CONSORT, STROBE, PRISMA, STARD, etc.)	☐	☐	☐	☐
Flow diagrams for the relevant reporting guideline	☐	☐	☐	☐
Interview transcripts	☐	☐	☐	☐
Raw study data	☐	☐	☐	☐

Other (please specify)

Authors' perceptions of supplementary materials survey

7. Please provide any additional comments you have about the submission or publication of supplementary material:

BMJ Queen's University Belfast UNIVERSITY OF OXFORD

Authors' perceptions of supplementary materials survey

Finally, a few questions about yourself

8. Approximately how many years have you been an active researcher?

Other (please specify)

9. Approximately how many research papers have you had published in a peer reviewed journal as either an author or a coauthor?

10. How frequently do you read articles in medical journals?

Very Frequently Frequently Occasionally Rarely Never

11. Would you like to receive a copy of the results of this study when it is complete?

Yes No



Authors' perceptions of supplementary materials survey

Thank you, please now submit your response

Please click on "**Submit**" below to send us your responses.

You do not need to inform us that you have completed the survey as your email address is tied to your survey response. All participants will automatically be entered into the prize draw. This link will be removed when we analyse the data.

Thank you for your help.

Appendix 5: Questions from surveys pertaining to summarises in Tables and Appendices

Information/question type	Authors survey	Readers survey	Reviewers survey	Table/Appendix where data is summarised
Journal				Appendix 1
Characteristics of respondents' interaction with supplementary material	1	1	1	Appendix 6
	2		2	not included
Preferred option for providing/reading/receiving supplementary material by each group	3	2	3	Appendix 7
Who supplementary materials is most useful to	4	3	4	Table 2, Appendix 7
Authors' views on what the expect journal editors, peer reviewers and readers to do with supplementary materials	5			Appendix 10
Readers' perceptive on what should be done with supplementary materials		4 &5		Appendix 11
Reviewers' perspective of what peer reviewers do , should do and are expected to do with supplementary materials			5, 6 & 7	Appendix 12
Where supplementary material should be published	6	6	8	Appendix 9
In general, how often do you think this adds value to a research paper?		7		not included
Please provide any additional comments you have about the submission or publication of supplementary material:	7	8	9	string, not included
Approximately how many years have you been an active researcher?	8	9	10	Table 1
Approximately how many research papers have you had published in a peer reviewed journal as either an author or a coauthor?	9	10	11	Table 1
How frequently do you read articles in medical journals?	10	11	12	Table 1
Would you like to receive a copy of the results of this study when it is complete?	11	12	13	Table 1

Appendix 6: Characteristics of respondents' interaction with supplementary material N (%)

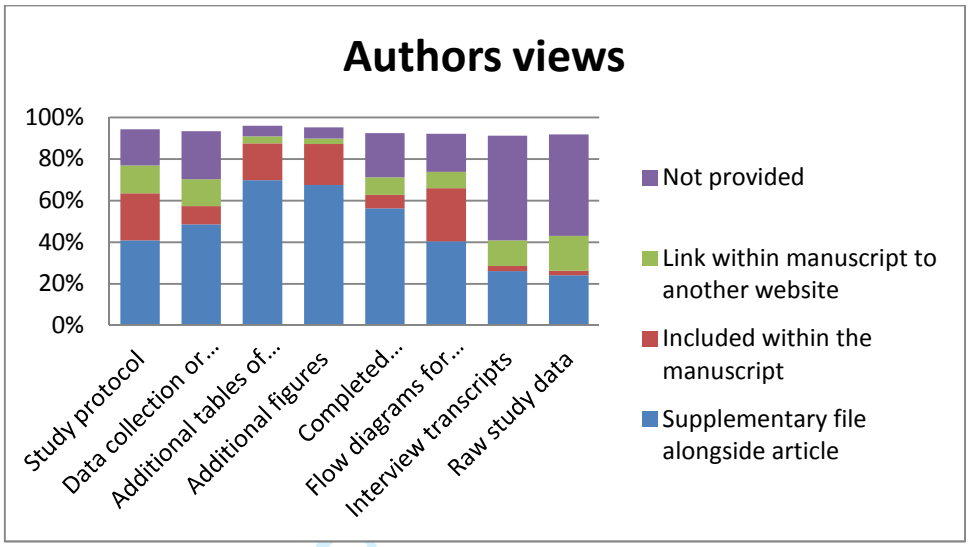
	Authors		Readers		Reviewers		
Did the last article that you read /submitted contain:	Yes	No*	Yes	No*	Rare	Sometimes	Often**
(a) study protocol	165 (20)	497 (61)	211 (23)	544 (60)	695 (61)	316 (28)	104 (9)
(b) data collection or extraction forms (including questionnaires, interview topic guides, etc)	184 (23)	469 (57)	151 (17)	548 (64)	638 (56)	403 (35)	69 (6)
(c) additional tables of data	604 (74)	161 (20)	608 (67)	207 (23)	121 (11)	619 (54)	392 (34)
(d) additional figures	470 (57)	256 (31)	486 (53)	298 (33)	184 (16)	600 (53)	338 (30)
(e) completed checklists for the relevant reporting guidelines	323 (39)	341 (42)	181 (20)	502 (55)	502 (44)	439 (38)	158 (14)
(f) flow diagrams for the relevant reporting guideline[a]	175 (21)	458 (56)	202 (22)	506 (56)	505 (44)	448 (39)	147 (13)
(g) interview transcripts	20 (2)	524 (64)	26 (3)	658 (72)	956 (84)	77 (7)	12 (1)
(h) raw study data	83 (10)	547 (67)	64 (7)	697 (77)	966 (85)	116 (10)	18 (2)

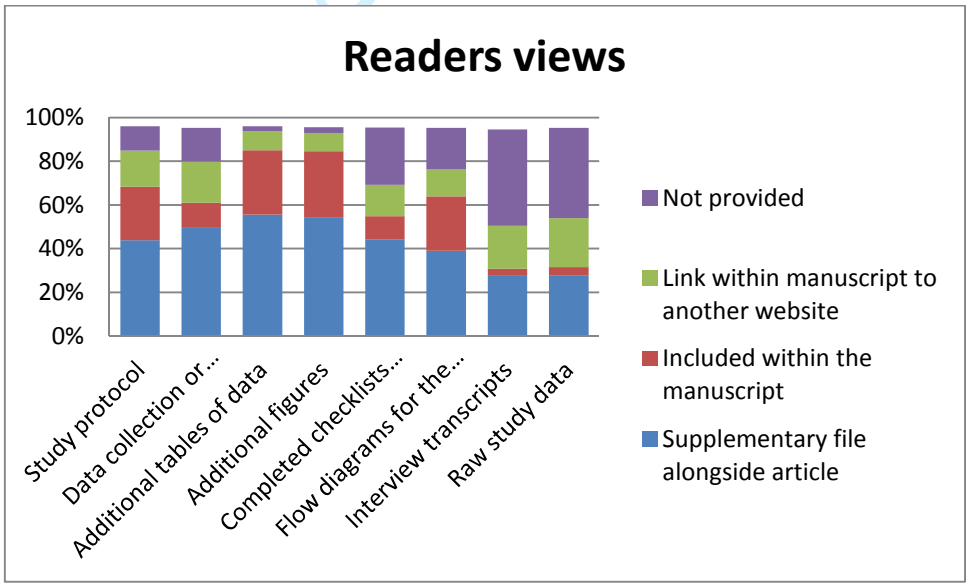
* Numbers do not sum to 100% due to missing data

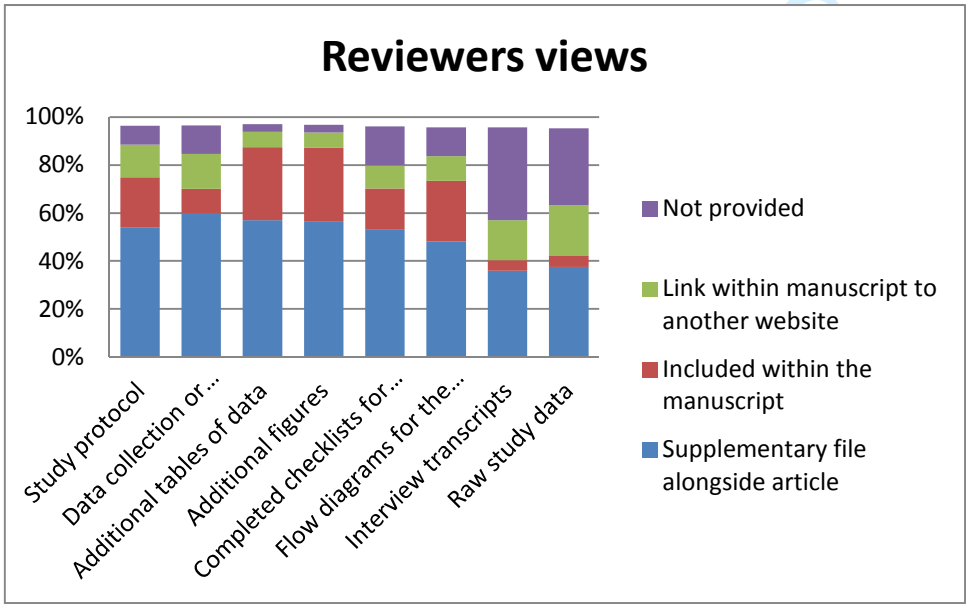
** Categories define as: Rare = "*never*" / "*almost never*", Sometimes= "*sometimes*", and Often = "*almost every time*" / "*every time*"

[a] (e.g. CONSORT, STROBE, PRISMA, STARD, etc.)

Appendix 7: Preferred option for providing/reading/receiving supplementary material by each group







Views Overall (n=2872)

Supplementary Material	Supplementary file alongside article	Included within the manuscript	Link within manuscript to another website	Not provided
(a) study protocol	1352 (47.1%)	646 (22.5%)	414 (14.4%)	336 (11.7%)
(b) data collection or extraction forms (including questionnaires, interview topic guides, etc)	1536 (53.5%)	291 (10.1%)	442 (15.4%)	465 (16.2%)
(c) additional tables of data	1728 (60.2%)	761 (26.5%)	180 (6.3%)	100 (3.5%)
(d) additional figures	1693 (58.9%)	787 (27.4%)	170 (5.9%)	105 (3.7%)
(e) completed checklists for the relevant reporting guidelines (e.g. CONSORT, STROBE, PRISMA, STARD, etc.)	1473 (51.3%)	343 (11.9%)	309 (10.8%)	599 (20.9%)
(f) flow diagrams for the relevant reporting guideline	1235 (43.0%)	726 (25.3%)	293 (10.2%)	461 (16.1%)
(g) interview transcripts	878 (30.6%)	97 (3.4%)	470 (16.4%)	1255 (43.7%)
(h) raw study data	878 (30.6%)	108 (3.8%)	581 (20.2%)	1141 (39.7%)

* Numbers do not sum to 100% due to missing data

Views of Authors (n=819)

Supplementary Material	Supplementary file alongside article	Included within the manuscript	Link within manuscript to another website	Not provided
(a) study protocol	335 (40.9%)	185 (22.6%)	109 (13.3%)	143 (17.5%)
(b) data collection or extraction forms (including questionnaires, interview topic guides, etc)	397 (48.5%)	73 (8.9%)	105 (12.8%)	189 (23.1%)
(c) additional tables of data	571 (69.7%)	145 (17.7%)	28 (3.4%)	42 (5.1%)
(d) additional figures	553 (67.5%)	161 (19.7%)	22 (2.7%)	43 (5.3%)
(e) completed checklists for the relevant reporting guidelines (e.g. CONSORT, STROBE, PRISMA, STARD, etc.)	460 (56.2%)	54 (6.6%)	69 (8.4%)	174 (21.2%)
(f) flow diagrams for the relevant reporting guideline	331 (40.4%)	209 (25.5%)	64 (7.8%)	150 (18.3%)
(g) interview transcripts	214 (26.1%)	20 (2.4%)	100 (12.2%)	413 (50.4%)
(h) raw study data	197 (24.1%)	18 (2.2%)	137 (16.7%)	400 (48.8%)

* Numbers do not sum to 100% due to missing data

Views of Readers (n=911)

Supplementary Material	Supplementary file alongside article	Included within the manuscript	Link within manuscript to another website	Not provided
(a) study protocol	399 (43.8%)	224 (24.6%)	150 (16.5%)	102 (11.2%)
(b) data collection or extraction forms (including questionnaires, interview topic guides, etc)	454 (49.8%)	102 (11.2%)	172 (18.9%)	140 (15.4%)
(c) additional tables of data	506 (55.5%)	268 (29.4%)	79 (8.7%)	22 (2.4%)
(d) additional figures	496 (54.4%)	275 (30.2%)	75 (8.2%)	25 (2.7%)
(e) completed checklists for the relevant reporting guidelines (e.g. CONSORT, STROBE, PRISMA, STARD, etc.)	404 (44.3%)	96 (10.5%)	131 (14.4%)	238 (26.1%)
(f) flow diagrams for the relevant reporting guideline	355 (39.0%)	227 (24.9%)	113 (12.4%)	173 (19.0%)
(g) interview transcripts	254 (27.9%)	27 (3.0%)	179 (19.6%)	401 (44.0%)
(h) raw study data	252 (27.7%)	36 (4.0%)	204 (22.4%)	376 (41.3%)

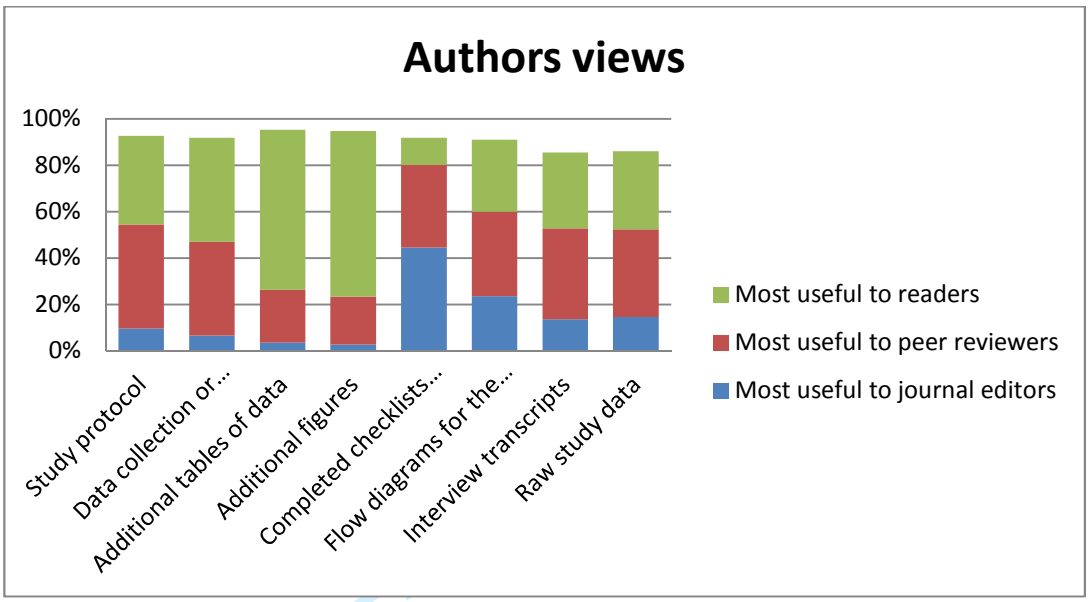
* Numbers do not sum to 100% due to missing data

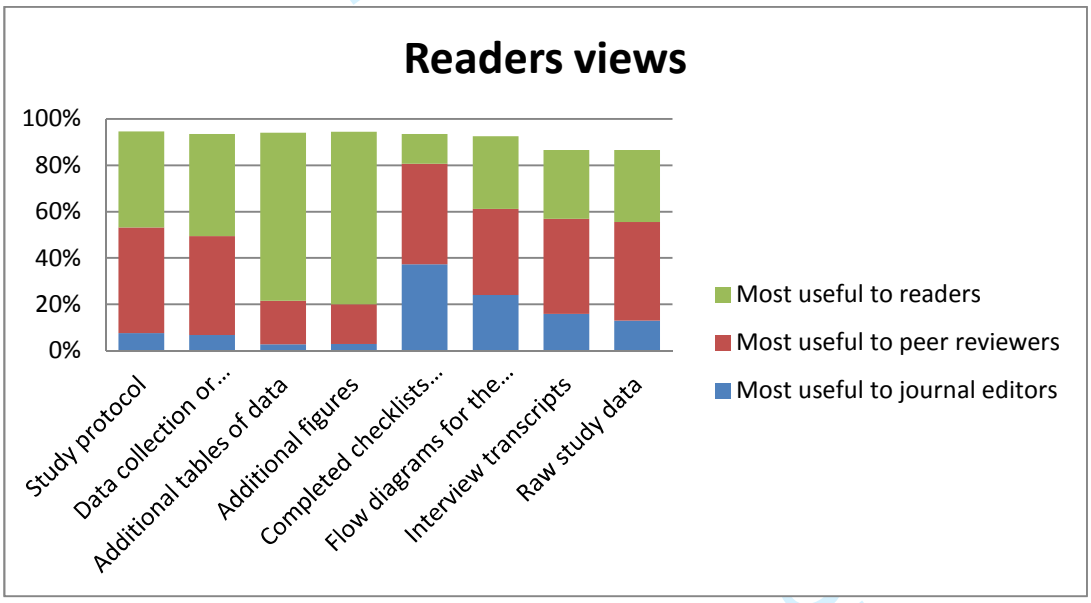
Views of Reviewers (n=1142)

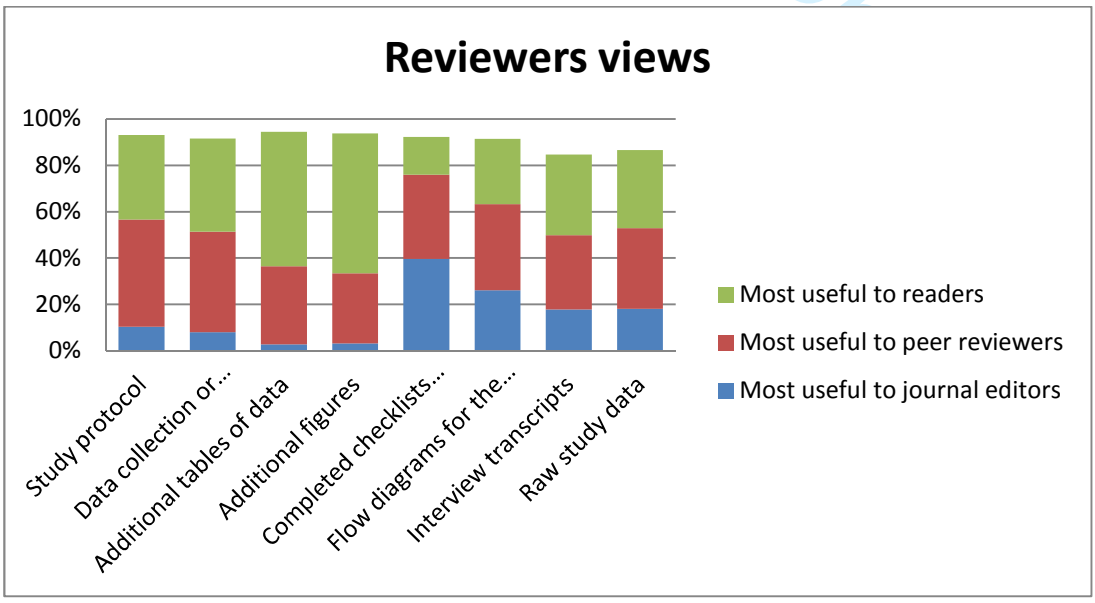
Supplementary Material	Supplementary file alongside article	Included within the manuscript	Link within manuscript to another website	Not provided
(a) study protocol	618 (54.1%)	237 (20.8%)	155 (13.6%)	91 (8.0%)
(b) data collection or extraction forms (including questionnaires, interview topic guides, etc)	685 (60.0%)	116 (10.2%)	165 (14.4%)	136 (11.9%)
(c) additional tables of data	651 (57.0%)	348 (30.5%)	73 (6.4%)	36 (3.2%)
(d) additional figures	644 (56.4%)	351 (30.7%)	73 (6.4%)	37 (3.2%)
(e) completed checklists for the relevant reporting guidelines (e.g. CONSORT, STROBE, PRISMA, STARD, etc.)	609 (53.3%)	193 (16.9%)	109 (9.5%)	187 (16.4%)
(f) flow diagrams for the relevant reporting guideline	549 (48.1%)	290 (25.4%)	116 (10.2%)	138 (12.1%)
(g) interview transcripts	410 (35.9%)	50 (4.4%)	191 (16.7%)	441 (38.6%)
(h) raw study data	429 (37.6%)	54 (4.7%)	240 (21.0%)	365 (32.0%)

* Numbers do not sum to 100% due to missing data

Appendix 8: Who supplementary materials is most useful to







Views Overall (n=2872)

	Most useful to journal editors	Most useful to peer reviewers	Most useful to readers
(a) study protocol	266 (9.3%)	1312 (45.7%)	1105 (38.5%)
(b) data collection or extraction forms (including questionnaires, interview topic guides, etc)	208 (7.2%)	1214 (42.3%)	1227 (42.7%)
(c) additional tables of data	86 (3.0%)	743 (25.9%)	1885 (65.6%)
(d) additional figures	85 (3.0%)	672 (23.4%)	1949 (67.9%)
(e) completed checklists for the relevant reporting guidelines (e.g. CONSORT, STROBE, PRISMA, STARD, etc.)	1158 (40.3%)	1099 (38.3%)	399 (13.9%)
(f) flow diagrams for the relevant reporting guideline	711 (24.8%)	1060 (36.9%)	860 (29.9%)
(g) interview transcripts	461 (16.1%)	1059 (36.9%)	935 (32.6%)
(h) raw study data	446 (15.5%)	1093 (38.1%)	944 (32.9%)

* Numbers do not sum to 100% due to missing data

Views of Authors (n=819)

	Most useful to journal editors	Most useful to peer reviewers	Most useful to readers
(a) study protocol	79 (9.6%)	367 (44.8%)	313 (38.2%)
(b) data collection or extraction forms (including questionnaires, interview topic guides, etc)	54 (6.6%)	331 (40.4%)	367 (44.8%)
(c) additional tables of data	29 (3.5%)	187 (22.8%)	564 (68.9%)
(d) additional figures	22 (2.7%)	170 (20.8%)	584 (71.3%)
(e) completed checklists for the relevant reporting guidelines (e.g. CONSORT, STROBE, PRISMA, STARD, etc.)	365 (44.6%)	291 (35.5%)	96 (11.7%)
(f) flow diagrams for the relevant reporting guideline	193 (23.6%)	298 (36.4%)	254 (31.0%)
(g) interview transcripts	112 (13.7%)	320 (39.1%)	268 (32.7%)
(h) raw study data	120 (14.7%)	309 (37.7%)	276 (33.7%)

* Numbers do not sum to 100% due to missing data

Views of Readers (n=911)

	Most useful to journal editors	Most useful to peer reviewers	Most useful to readers
(a) study protocol	69 (7.6%)	416 (45.7%)	376 (41.3%)
(b) data collection or extraction forms (including questionnaires, interview topic guides, etc)	62 (6.8%)	388 (42.6%)	401 (44.0%)
(c) additional tables of data	25 (2.7%)	172 (18.9%)	659 (72.3%)
(d) additional figures	27 (3.0%)	156 (17.1%)	677 (74.3%)
(e) completed checklists for the relevant reporting guidelines (e.g. CONSORT, STROBE, PRISMA, STARD, etc.)	340 (37.3%)	394 (43.2%)	117 (12.8%)
(f) flow diagrams for the relevant reporting guideline	219 (24.0%)	338 (37.1%)	286 (31.4%)
(g) interview transcripts	145 (15.9%)	373 (40.9%)	270 (29.6%)
(h) raw study data	119 (13.1%)	387 (42.5%)	283 (31.1%)

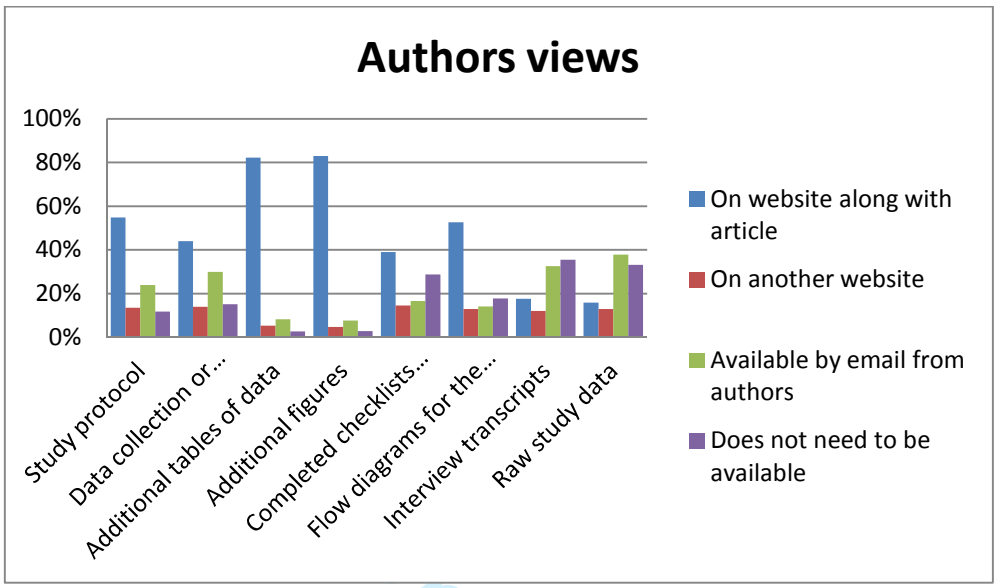
* Numbers do not sum to 100% due to missing data

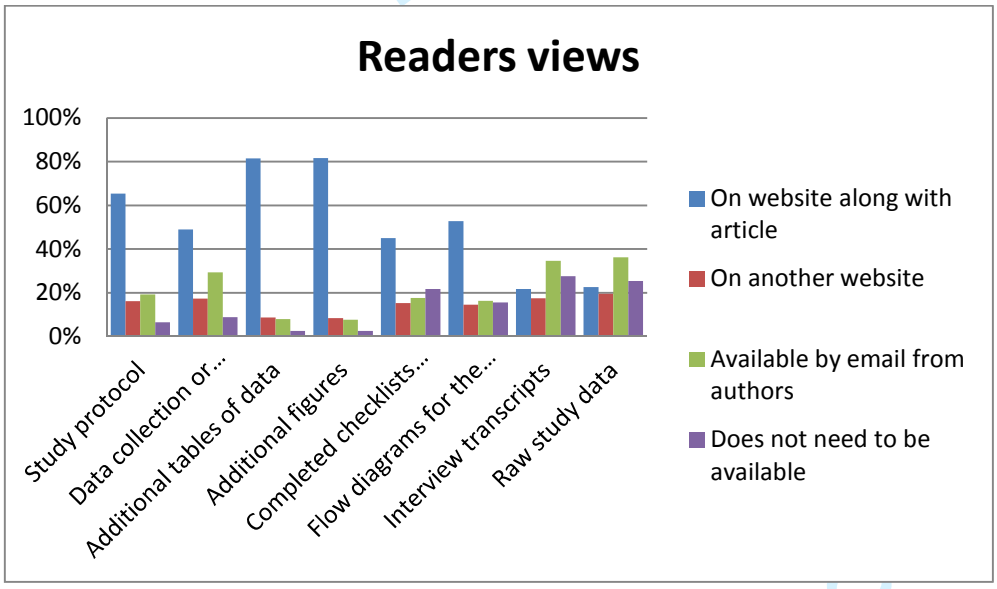
Views of Reviewers (n=1142)

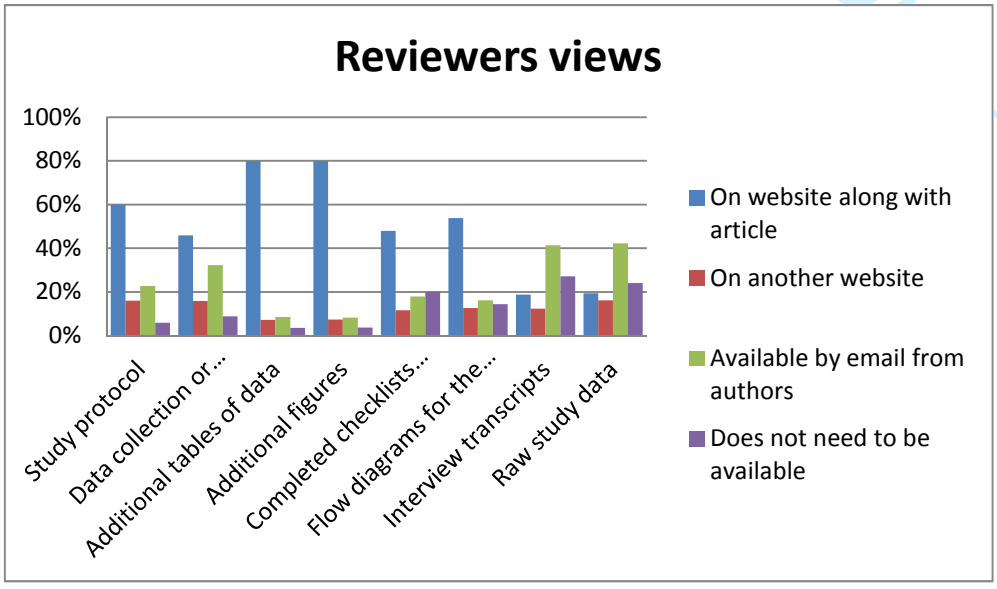
	Most useful to journal editors	Most useful to peer reviewers	Most useful to readers
(a) study protocol	118 (10.3%)	529 (46.3%)	416 (36.4%)
(b) data collection or extraction forms (including questionnaires, interview topic guides, etc)	92 (8.1%)	495 (43.3%)	459 (40.2%)
(c) additional tables of data	32 (2.8%)	384 (33.6%)	662 (58.0%)
(d) additional figures	36 (3.2%)	346 (30.3%)	688 (60.2%)
(e) completed checklists for the relevant reporting guidelines (e.g. CONSORT, STROBE, PRISMA, STARD, etc.)	453 (39.7%)	414 (36.3%)	186 (16.3%)
(f) flow diagrams for the relevant reporting guideline	299 (26.2%)	424 (37.1%)	320 (28.0%)
(g) interview transcripts	204 (17.9%)	366 (32.0%)	397 (34.8%)
(h) raw study data	207 (18.1%)	767 (34.8%)	385 (33.7%)

* Numbers do not sum to 100% due to missing data

Appendix 9: Where supplementary material should be published







Views Overall (n=2872)

	On website along with article*	On another website*	Available by email from authors*	Does not need to be available *
(a) study protocol	1729 (60.2%)	442 (15.4%)	631 (22.0%)	223 (7.8%)
(b) data collection or extraction forms (including questionnaires, interview topic guides, etc)	1331 (46.3%)	455 (15.8%)	881 (30.7%)	305 (10.6%)
(c) additional tables of data	2328 (81.1%)	206 (7.2%)	239 (8.3%)	86 (3.0%)
(d) additional figures	2335 (81.3%)	200 (7.0%)	228 (7.9%)	88 (3.1%)
(e) completed checklists for the relevant reporting guidelines (e.g. CONSORT, STROBE, PRISMA, STARD, etc.)	1277 (44.5%)	391 (13.6%)	501 (17.4%)	664 (23.1%)
(f) flow diagrams for the relevant reporting guideline	1526 (53.1%)	383 (13.3%)	450 (15.7%)	452 (15.7%)
(g) interview transcripts	558 (19.4%)	400 (13.9%)	1054 (36.7%)	852 (29.7%)
(h) raw study data	557 (19.4%)	468 (16.3%)	1123 (39.1%)	779 (27.1%)

** Answers are not mutually exclusive*

Views of Authors (n=819)

	On website along with article	On another website	Available by email from authors	Does not need to be available
(a) study protocol	449 (54.8%)	111 (13.6%)	196 (23.9%)	97 (11.8%)
(b) data collection or extraction forms (including questionnaires, interview topic guides, etc)	360 (44.0%)	115 (14.0%)	245 (29.9%)	124 (15.1%)
(c) additional tables of data	674 (82.3%)	44 (5.4%)	68 (8.3%)	22 (2.7%)
(d) additional figures	679 (82.9%)	39 (4.8%)	63 (7.7%)	23 (2.8%)
(e) completed checklists for the relevant reporting guidelines (e.g. CONSORT, STROBE, PRISMA, STARD, etc.)	319 (38.9%)	119 (14.5%)	136 (16.6%)	236 (28.8%)
(f) flow diagrams for the relevant reporting guideline	431 (52.6%)	106 (12.9%)	116 (14.2%)	146 (17.8%)
(g) interview transcripts	145 (17.7%)	99 (12.1%)	267 (32.6%)	291 (35.5%)
(h) raw study data	130 (15.9%)	106 (12.9%)	310 (37.9%)	272 (33.2%)

* Answers are not mutually exclusive

Views of Readers (n=911)

	On website along with article	On another website	Available by email from authors	Does not need to be available
(a) study protocol	596 (65.4%)	148 (16.2%)	175 (19.2%)	59 (6.5%)
(b) data collection or extraction forms (including questionnaires, interview topic guides, etc)	446 (49.0%)	158 (17.3%)	268 (29.4%)	80 (8.8%)
(c) additional tables of data	742 (81.4%)	79 (8.7%)	73 (8.0%)	23 (2.5%)
(d) additional figures	744 (81.7%)	77 (8.5%)	70 (7.7%)	23 (2.5%)
(e) completed checklists for the relevant reporting guidelines (e.g. CONSORT, STROBE, PRISMA, STARD, etc.)	410 (45.0%)	139 (15.3%)	161 (17.7%)	198 (21.7%)
(f) flow diagrams for the relevant reporting guideline	481 (52.8%)	133 (14.6%)	149 (16.4%)	142 (15.6%)
(g) interview transcripts	198 (21.7%)	160 (17.6%)	315 (34.6%)	251 (27.6%)
(h) raw study data	206 (22.6%)	178 (19.5%)	330 (36.2%)	232 (25.5%)

* Answers are not mutually exclusive

Views of Reviewers (n=1142)

	On website along with article	On another website	Available by email from authors	Does not need to be available
(a) study protocol	684 (59.9%)	183 (16.0%)	260 (22.8%)	67 (5.9%)
(b) data collection or extraction forms (including questionnaires, interview topic guides, etc)	525 (46.0%)	182 (15.9%)	368 (32.2%)	101 (8.8%)
(c) additional tables of data	912 (79.9%)	83 (7.3%)	98 (8.6%)	41 (3.6%)
(d) additional figures	912 (79.9%)	84 (7.4%)	95 (8.3%)	42 (3.7%)
(e) completed checklists for the relevant reporting guidelines (e.g. CONSORT, STROBE, PRISMA, STARD, etc.)	548 (48.0%)	133 (11.6%)	204 (17.9%)	230 (20.1%)
(f) flow diagrams for the relevant reporting guideline	614 (53.8%)	144 (12.6%)	185 (16.2%)	164 (14.4%)
(g) interview transcripts	215 (18.8%)	141 (12.3%)	472 (41.3%)	310 (27.1%)
(h) raw study data	221 (19.4%)	184 (16.1%)	483 (42.3%)	275 (24.1%)

* Answers are not mutually exclusive

Appendix 10: Authors' views on what the expect journal editors, peer reviewers and readers to do with supplementary materials N(%)

	Read all of it routinely	Read some of it	Ignore it	It depends on the manuscript
Journal Editors	178 (22)	289 (35)	58 (7)	258 (32)
Peer Reviewers	395 (48)	253 (31)	13 (2)	122 (15)
Readers	60 (7)	355 (43)	47 (6)	322 (39)

Appendix 11: Readers' persceptive on whatshould be done with supplementary materials

What do you think readers in general should do with supplementary materials? N(%)

	Read all of it routinely	Read some of it	Ignore it	It depends on the manuscript
(a) study protocol	160 (18)	208 (23)	47 (5)	450 (49)
(b) data collection or extraction forms (including questionnaires, interview topic guides, etc)	81 (9)	244 (27)	90 (10)	441 (48)
(c) additional tables of data	224 (25)	335 (37)	25 (3)	280 (31)
(d) additional figures	237 (26)	322 (35)	23 (3)	280 (31)
(e) completed checklists for the relevant reporting guidelines (e.g. CONSORT, STROBE, PRISMA, STARD, etc.)	75 (8)	150 (17)	246 (27)	382 (42)
(f) flow diagrams for the relevant reporting guideline	156 (17)	210 (23)	161 (18)	328 (36)
(g) interview transcripts	14 (2)	133 (15)	244 (27)	455 (50)
(h) raw study data	17 (2)	116 (13)	199 (22)	510 (56)

As a reader, what do you usually do with the supplementary material? N(%)

	Read all of it routinely	Read some of it	Ignore it	It depends on the manuscript
(a) study protocol	150 (17)	303 (33)	112 (12)	290 (32)
(b) data collection or extraction forms (including questionnaires, interview topic guides, etc)	79 (9)	286 (31)	174 (19)	316 (35)
(c) additional tables of data	229 (25)	356 (39)	53 (6)	222 (24)
(d) additional figures	243 (27)	352 (39)	48 (5)	219 (24)
(e) completed checklists for the relevant reporting guidelines (e.g. CONSORT, STROBE, PRISMA, STARD, etc.)	74 (8)	136 (15)	369 (41)	270 (30)
(f) flow diagrams for the relevant reporting guideline	157 (17)	179 (20)	275 (30)	239 (26)
(g) interview transcripts	15 (2)	114 (13)	384 (42)	319 (35)
(h) raw study data	23 (3)	107 (12)	308 (34)	394 (43)

Appendix 12: Reviewers' perspective of what peer reviewers do , should do and are expected to do with supplementary materials

What do you think journal editors expect peer reviewers to do with this supplementary material? N(%)

	Read all of it routinely	Read some of it	Ignore it	It depends on the manuscript
(a) study protocol	426 (37)	304 (27)	15 (1)	328 (29)
(b) data collection or extraction forms (including questionnaires, interview topic guides, etc)	272 (24)	377 (33)	46 (4)	373 (33)
(c) additional tables of data	669 (59)	226 (20)	12 (1)	171 (15)
(d) additional figures	684 (60)	204 (18)	12 (1)	176 (15)
(e) completed checklists for the relevant reporting guidelines (e.g. CONSORT, STROBE, PRISMA, STARD, etc.)	463 (41)	238 (21)	99 (9)	264 (23)
(f) flow diagrams for the relevant reporting guideline	490 (43)	227 (20)	79 (7)	267 (23)
(g) interview transcripts	133 (12)	235 (21)	193 (17)	497 (44)
(h) raw study data	135 (12)	210 (18)	180 (16)	527 (46)

What do you think peer reviewers should do with the supplementary material? N (%)

	Read all of it routinely	Read some of it	Ignore it	It depends on the manuscript
(a) study protocol	468 (41)	297 (26)	23 (2)	280 (25)
(b) data collection or extraction forms (including questionnaires, interview topic guides, etc)	287 (25)	372 (33)	49 (4)	356 (31)
(c) additional tables of data	688 (60)	208 (18)	15 (1)	161 (14)
(d) additional figures	695 (60.9%)	197 (17)	16 (1)	161 (14)
(e) completed checklists for the relevant reporting guidelines (e.g. CONSORT, STROBE, PRISMA, STARD, etc.)	433 (38)	225 (20)	117 (10)	286 (25)
(f) flow diagrams for the relevant reporting guideline	463 (41)	219 (19)	94 (8)	286 (25)
(g) interview transcripts	116 (10)	214 (19)	198 (17)	530 (46)
(h) raw study data	135 (12)	191 (17)	175 (15)	549 (48)

When peer reviewing, what do you do with the supplementary material? N (%)

	Read all of it routinely	Read some of it	Ignore it	It depends on the manuscript	Not applicable
(a) study protocol	400 (35)	303 (27)	27 (2)	187 (16)	146 (13)
(b) data collection or extraction forms (including questionnaires, interview topic guides, etc)	262 (23)	336 (29)	72 (6)	265 (23)	127 (11)
(c) additional tables of data	672 (59)	227 (20)	17 (2)	127 (11)	25 (2)
(d) additional figures	686 (60)	210 (18)	16 (1)	127 (11)	30 (3)
(e) completed checklists for the relevant reporting guidelines (e.g. CONSORT, STROBE, PRISMA, STARD, etc.)	367 (32)	238 (21)	145 (13)	197 (17)	116 (10)
(f) flow diagrams for the relevant reporting guideline	416 (36)	221 (19)	90 (8)	220 (19)	114 (10)
(g) interview transcripts	81 (7)	147 (13)	178 (16)	260 (23)	391 (34)
(h) raw study data	105 (9)	146 (13)	161 (14)	294 (26)	345 (30)