# PEER REVIEW HISTORY

BMJ Open publishes all reviews undertaken for accepted manuscripts. Reviewers are asked to complete a checklist review form (see an example) and are provided with free text boxes to elaborate on their assessment. These free text comments are reproduced below. Some articles will have been accepted based in part or entirely on reviews undertaken for other BMJ Group journals. These will be reproduced where possible.

## ARTICLE DETAILS

| TITLE (PROVISIONAL) | On the time spent preparing grant proposals: an observational study of Australian researchers |
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| AUTHORS | Herbert, Danielle; Barnett, Adrian; Clarke, Philip; Graves, Nicholas |

## VERSION 1 - REVIEW

| REVIEWER | Fogelholm, Mikael<br>University of Helsinki |
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| REVIEW RETURNED | 15-Mar-2013 |

| THE STUDY | I did not clearly understand if the questionnaire was sent to all researchers in the proposal, or only to the PI (principal investigator).<br><br>The reason for asking the respondents to indicate their desired level of reliability was unclear for me. |
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| RESULTS & CONCLUSIONS | The discussion uses a hypothetical curve on accuracy of awarding the best proposals. Although this is interesting, this part of discussion is not directly linked to the research data. |
| GENERAL COMMENTS | The scientific research on grant peer review is scarce and therefore this manuscript is welcome. The authors have assessed the researchers' time needed to complete a large (80—120 pages) grant application for the NHMRC. Although high time consumption is expected, the result is nevertheless almost shocking.<br><br>The external validity of this study is likely to be quite restricted, perhaps only applicable for proposals with similar structure and length than those requested by NHMRC. However, the results could make other grant agencies interested in doing similar kind of research. Personally I have severe difficulties in understanding the reason for an almost 100 page proposal for normal national grants. The situation may be different in, e.g., grants of the EU's framework program, in which all applicants are multinational consortia with typically 10 to 15 partners.<br><br>I have a couple of comments/requests needed for clarification:<br><br>Line 94: several overseas agencies use full proposals (e.g. Academy of Finland, RANNIS in Iceland, Swedish Research Council, etc.), but in in these agencies the length of the proposal is typically 10 to 20 pages. (This is a comment only)<br><br>Line 129: I did not clearly understand if the questionnaire was sent to all researchers in the proposal, or only to the PI (principal investigator).<br><br>Line 130—141: the reason for asking the respondents to indicate their desired level of reliability was unclear for me. Why is this information important? The reliability was (unfortunately) not studied. |

Line 156: Why do you need to assume in the equation that writing a resubmitted proposal takes less time compared with a new proposal? I understood you asked estimation for the time consumed, regardless of whether it was a new or resubmitted proposal.

Line 207: It would be interesting to know the proportion of PI's time use vs. other researchers.

Lines 275—298 and Fig. 2: The hypothetical curve and the discussion are interesting. However, the impression here is that to a certain extent the more information is requested (i.e. the longer the proposal is), the better the reliability (accuracy?) of evaluation. But doesn't this neglect the peer review process itself? Research has shown that at least the reliability of evaluation can be improved by increasing the number of reviewers per proposal.

Table 1: Number of publications, H-index etc. could also be used as an indication of researcher's experience. Was this considered? The data are available.

| REVIEWER | Director, professor Thomas Sinkjaer<br>Danish National Research Foundation<br>Copenhagen, Denmark |
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| REVIEW RETURNED | 17-Apr-2013 |

| THE STUDY | No patients involved in the study! |
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| GENERAL COMMENTS | This is an important paper putting numbers on the cost of writing grant applications to NHMRC in Australia. The time spend for the researchers applying NHRMRC is huge. Excellent suggestions are proposed in the manuscript to reduce these costs. |

## VERSION 1 – AUTHOR RESPONSE

Reviewer A: Prof. Mikael Fogelholm, University of Helsinki, Finland

Comment A1
Line 94: several overseas agencies use full proposals (e.g. Academy of Finland, RANNIS in Iceland, Swedish Research Council, etc.), but in these agencies the length of the proposal is typically 10 to 20 pages. (This is a comment only).
• Response: This is an interesting comment and shows that other funding schemes have proposals that are far shorter than the 80 to 120 pages required for the Australian funding scheme investigated in this paper.

Comment A2
Line 129: I did not clearly understand if the questionnaire was sent to all researchers in the proposal, or only to the PI (principal investigator).
• Response: An invitation to complete the questionnaire was sent to the research office of each institution for distribution to all researchers (lines 115–119):
We attempted to contact the lead researchers of every proposal by contacting the offices of research of every Australian university and research institute… Willing researchers completed a short online survey from March to May 2012.

Comment A3

Lines 130—141: the reason for asking the respondents to indicate their desired level of reliability was unclear for me. Why is this information important? The reliability was (unfortunately) not studied.

• Response: Our aim with this question was to gather the opinions of researchers about their expectations of reliability between two panels reviewing the same applications. The result that researchers were willing to accept a wide range in variability was used to make the salient point that researchers do not except a perfect system.

Comment A4

Line 156: Why do you need to assume in the equation that writing a resubmitted proposal takes less time compared with a new proposal? I understood you asked estimation for the time consumed, regardless of whether it was a new or resubmitted proposal.

• Response: We did not assume that resubmitted proposals would take less time than new proposals, but we did assume that they would have a different average completion time. The data showed that the average time for resubmitted proposals was shorter than full proposals. We have revised the following two sentences:

Line 126: …time they spent (in days), and whether the proposal was new or a resubmission.

Line 151: This equation recognises that resubmitted proposals usually take less time than new proposals

Comment A5

Line 207: It would be interesting to know the proportion of PI's time use vs. other researchers.

• Response: The proportion of time spent by the lead researcher versus the other researchers has been added to the results section (line 204-205):

Lead researchers spent an average of 27 and 21 workings days per new and resubmitted proposals, respectively, with the remaining time spent by other researchers.

Comment A6

Lines 275—298 and Fig. 2: The hypothetical curve and the discussion are interesting. However, the impression here is that to a certain extent the more information is requested (i.e. the longer the proposal is), the better the reliability (accuracy?) of evaluation. But doesn't this neglect the peer review process itself? Research has shown that at least the reliability of evaluation can be improved by increasing the number of reviewers per proposal.

• Response: The left-most point of Figure 2 starts from collecting no information. Accuracy is likely to increase starting from this low baseline, but then there will come a point where more information has no extra value and the accuracy begins to decrease because of information overload. We are aware of the statistical papers showing that the variance in funding scores (or ranks) can be reduced by increasing the number of reviewers, for example the following paper that estimated 384 reviewers per proposal: Kaplan D, Lacetera N, Kaplan C. Sample size and precision in NIH peer review. PLoS One 2008; 3: e2761. However, whilst these statistical calculations are interesting they ignore the impact on the process of reading hundreds of reviewers' reports which would cause information overload.

Comment A7

Table 1: Number of publications, H-index etc. could also be used as an indication of researcher's experience. Was this considered? The data are available.

• Response: Our respondents did not provide any identifying information to maintain their anonymity. We asked for their academic level so as to estimate the salary costs for their working days spent preparing their proposals.

Reviewer B : Director, Professor Thomas Sinkjaer, Danish National Research Foundation, Copenhagen, Denmark

Comment B1
Line 76: How much increased available funding?
• Response: We have revised the introduction to focus on the increase in the number of applicants from 2003 to 2012 because the focus of the study is the time spent by researchers to prepare their proposals. The NHMRC provides the amount of funding awarded for each successful proposal, but the amount of funding requested in the original budget for all proposals is not publicly available.
Line 75-77: Application numbers have steadily risen over time making the process more competitive; there were 1,881 proposals in 2003 and 3,727 in 2012, a 98% increase. For Australian researchers, this increase in proposal numbers has led to declining success rates and budget cuts for successful proposals.

Comment B2
Line 87: Do the review panel also take into account the response from the applicant to the two reviews?
• Response: Yes the panel does also see the responses and we have added this to the paper (lines 85–86).
…considering reports from two panel spokespersons and the applicants' responses to the reviewers' reports…

Comment B3
Line 105-108: This sentence doesn't add much.
• Response: The reference to Professor Brian Schmidt highlights the current issue in Australia of time spent preparing proposals for the two major funding bodies (NHMRC and ARC).

Comment B4
Line 204: This equals 6.5 weeks per application!
• Response: Based on a five-day working week, our finding of an average of 34 working days per proposal equals 6.8 weeks. We prefer to use days and years as the key time periods.

Comment B5
Line 240: ...historically low?
• Response: "Low" is a subjective word, and success rates of 20–25% are comparatively high compared with other schemes.

Comment B6
Line 241: Not clear how this argument justify that time spend is "wasted with no ...benefit". The argument is however better justified after line 244.
• Response: We have revised the end of the sentence to include the justification (line 236-237): …is wasted with no immediate benefit due to the failure to obtain funding.

Comment B7
Line 291-295: These are very important observations that all funding bodies should be aware of.
• Response: We agree and hope that our research will instigate real change.

Comment B8
Line 319: The Danish National Research Foundation (DNRF) request EoI of no more than 5 pages (excluding CVs) and full proposals of no more than 15 pages. Approximately 20-30% of EoIs are invited to submit a full proposal. The success rate for those invited to do a full proposal is 30-40%.

• Response: We can see how EoIs would save time and have included EOIs as an alternative system in the discussion.

## VERSION 2 – REVIEW

| REVIEWER | Fogelholm, Mikael<br>University of Helsinki |
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| REVIEW RETURNED | 23-Apr-2013 |

| THE STUDY | I don't think he last no needes any explanations. |
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| GENERAL COMMENTS | I am satisfied with the responses and the revised version. |