

## PEER REVIEW HISTORY

BMJ Open publishes all reviews undertaken for accepted manuscripts. Reviewers are asked to complete a checklist review form and are provided with free text boxes to elaborate on their assessment. These free text comments are reproduced below.

### ARTICLE DETAILS

#### Title (Provisional)

Biomedical Research Grant Resubmission: Rates and Factors Related to Success—  
A Scoping Review

#### Authors

Lasinsky, Anne M; Wrightson, James; Khan, Hassan; Moher, David; Kitchin, Vanessa; Khan, Karim; Ardern, Clare L.

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### VERSION 1 - REVIEW

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<b>Reviewer</b>	<b>1</b>
<b>Name</b>	<b>Morgan, Ben</b>
<b>Affiliation</b>	<b>National Institute for Health Research Central Commissioning Facility</b>
<b>Date</b>	<b>24-Jul-2024</b>
<b>COI</b>	<b>None</b>

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Is there more that could be discussed about actions or processes funders take which link resubmission prevalence with success rates. As someone working at a funder I'm aware of (unpublished data) which shows the introduction of more grant/review information, such as funding committee scores and overall ranking, reduced the overall resubmission prevalence but increased the resubmission success rates. If there's any data on what specific measures funders can take and what impact on resubmission prevalence and success these could have it would help the discussion.

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<b>Reviewer</b>	<b>2</b>
<b>Name</b>	<b>Qussini, Seba</b>
<b>Affiliation</b>	<b>Hamad Medical Corporation Medical Research Center</b>
<b>Date</b>	<b>29-Aug-2024</b>
<b>COI</b>	<b>None to declare.</b>

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The present project is a scoping review that aims to map evidence on resubmissions of biomedical grants. The topic is of interest and generally aligns with the scope of the journal. The methodology is comprehensive and clearly outlined. However, I have provided few minor comments below for the authors' consideration.

The introduction could benefit from incorporating more relevant literature on the topic, explain why demographics relate to resubmissions of biomedical grants, for instance. You might also further elaborate on the current funding landscape, success rates, hyper-competition, etc. Building on the existing evidence, you could better highlight the gap in the literature that this review aims to address, in order to capture readers' attention and underscore the need for this investigation.

Please ensure that statements in the introduction expressing strong opinions or judgments about the topic (such as "Most first-time biomedical research grant applications are not funded.") are substantiated with relevant references to enhance the credibility and support of the claims made.

Generally speaking, the distinctive nature of scoping reviews lies in their broad approach to mapping the existing literature in a research area. Consequently, the current objectives appear to be too specific relative to the overall aim and the results provided. I suggest revising the objectives and incorporating a broader research question that aligns more closely with the scope of the project.

The review of grey literature may have included more websites to ensure adequate coverage such as searching grey literature specialized databases (for example: GreySource, BASE & Grey Matters).

Please explicitly mention the selection criteria adopted in this scoping review and consider factors such as study design, funding agency type (e.g., charities vs. national funding bodies), first resubmissions, or any subsequent resubmissions.

Utilizing existing literature, please outline your outcome measures, such as success rates, reasons for rejection, changes made between submissions, or feedback provided by reviewers.

To further strengthen the discussion section, I recommend elaborating on the factors that increase the likelihood of success for resubmissions.

Scoping reviews are prone to several limitations, beyond the lack of risk of bias assessment. These limitations might include a lack of depth and selection bias, for example. I recommend that the authors further reflect on the limitations of their project.

Based on the results of this review, could you draw some insights that highlight the research still needed regarding biomedical grant resubmissions and the implications for grant policymaking?

## VERSION 1 - AUTHOR RESPONSE

Comment	Author Response
<p>Please revise the formatting of your abstract so that it includes the following sections: Objectives &gt;&gt; Design &gt;&gt; Data Sources &gt;&gt; Eligibility Criteria &gt;&gt; Data extraction and synthesis &gt;&gt; Results &gt;&gt; Conclusions.</p>	<p>The abstract has been revised to meet the journal's format.</p>
<p>The search is almost 2 years old now. Are you able to provide an update?</p>	<p>Thank you for flagging this issue. One strength of our search strategy was its depth and breadth, returning more than 17,000 individual records. The feasibility of conducting this robust search again is limited by the resource availability within our group. To rerun this search would further delay our ability to publish the findings. The discussion notes this issue as a limitation of the review. Our group remains active in the meta-research space, engaging in ongoing learning with colleagues from the Meta Research Innovation Center at Stanford University and collaborating with the Canadian Institutes for Health Research to improve meta-research efforts in Canada. Via our own professional activities, continuing education, and ongoing research activity in this space, we have not identified new work that would meet our study inclusion criteria since the search was completed.</p>
<p>Inspired by the work of the patient partnership strategy at The BMJ (<a href="https://www.bmj.com/campaign/patient-partnership">https://www.bmj.com/campaign/patient-partnership</a>), BMJ Open is encouraging active patient involvement in setting the research agenda. BMJ Open now require authors of all submissions to the journal to include a Patient and Public Involvement statement. The Patient and Public Involvement statement should be included as a sub-heading in the methods section of all manuscripts. It should provide a brief description of any patient involvement in study design or conduct of the study, as well as any plans to disseminate the results to study participants. If patients and or public were not involved then please state this.</p> <p>The Patient and Public Involvement statement should not contain details of participant recruitment, patient consent or ethics approval. This information should be included elsewhere in your methods section. Please see our blog for further information regarding PPI: <a href="http://blogs.bmj.com/bmjopen/2018/03/23/new-requirements-for-patient-and-public-involvement-statements-in-bmj-open/">http://blogs.bmj.com/bmjopen/2018/03/23/new-requirements-for-patient-and-public-involvement-statements-in-bmj-open/</a></p>	<p>We appreciate the BMJ Group's leadership in patient and public involvement (PPI), which is also a priority for our research group. This includes Dr. Khan's leadership at the Canadian Institutes of Health Research (<a href="https://cihr-irsc.gc.ca/e/27297.html">https://cihr-irsc.gc.ca/e/27297.html</a>), where he has convened a patient engagement research ambassador group; their work has been published in BMJ Open(1). The research described in this publication was not suitable for patient engagement and that is reflected in this statement added to our Methods:</p> <p><i>"Patient partners were not directly involved in the construction of the meta-research question, selection of the study design and outcome measures, or interpretation of the results."</i></p>
<p>Reviewer: 1 Dr. Ben Morgan, National Institute for Health Research Central Commissioning Facility</p>	
<p>Is there more that could be discussed about actions or processes funders take which link resubmission prevalence with success rates. As someone working at a funder I'm aware of (unpublished data) which shows the</p>	<p>Thank you for your thought-provoking comment. It is precisely these types of questions we and other meta-researchers hope to answer in the future with improved data sharing from large research funders. This type of research is now being undertaken by the Research on</p>

<p>introduction of more grant/review information, such as funding committee scores and overall ranking, reduced the overall resubmission prevalence but increased the resubmission success rates. If there's any data on what specific measures funders can take and what impact on resubmission prevalence and success these could have it would help the discussion.</p>	<p>Research Institute under their Funder Data Platform (<a href="https://researchonresearch.org/project/funder-data-platform/">https://researchonresearch.org/project/funder-data-platform/</a>). As you mention, the data required to answer these specific questions are unpublished.</p> <p>We agree that more data are required to guide funders' actions. We modified the discussion section of our manuscript to further highlight the synthesis from Recio-Saucedo et al., (2) which summarizes funders' policy interventions and subsequent outcomes. We note that only two agencies (the NIH and Research Council UK) have sufficiently accessible information to permit study of their policy interventions. Unfortunately, there are no available data related to resubmission success included in Recio-Saucedo's et al. review.</p> <p>The following text has been added to our manuscript:  <i>"Funding agencies can pull the necessary levers to improve the granting process for applicants (by extending resubmission timelines) and agencies themselves (by reducing application burden) through data-informed policy changes. The 2022 synthesis by Recio-Saucedo et al. summarizes the real-life interventions that funders have employed. Only the NIH and Research Council UK have published data related to resubmission policy change. Other funders may have evaluated how their own policies are implemented, without making the data available. Unfortunately, the landscape is, at present, data deficient."</i></p> <p>In the discussion, we are also pleased to include new work completed by our team in conjunction with the Canadian Institutes of Health Research - a pre-print (currently under review) titled <i>What Factors are Important to the Success of Resubmitted Grant Applications in Health Research? A Retrospective Study of Over 20,000 Applications to the Canadian Institutes of Health Research</i>. This contributes new knowledge on resubmission success and demonstrates our ongoing commitment to collaboration between large biomedical research funders and meta-researchers to better inform all participants in the research community.</p> <p>The following text has been added:  <i>"Applicants whose original submissions performed well should be highly motivated to resubmit. This finding is further supported by our recent analysis of the CIHR Project Grant competition. We encourage other funding agencies to follow the NIH and CIHR in making these data available to applicants and researchers."</i></p>
<p>Reviewer 2:  Ms. Seba Qussini, Hamad Medical Corporation  Medical Research Center, KU Leuven  Biomedical Sciences Group</p>	
<p>The introduction could benefit from incorporating more relevant literature on the topic, explain why demographics relate to resubmissions of biomedical grants, for instance. You might also further elaborate on the current funding landscape, success rates, hyper-competition, etc. Building on the existing evidence, you could better highlight the gap in the literature that this review aims to address, in</p>	<p>Thank you for your attention to the Introduction section, and for nudging us to ensure we have clearly framed why our review is important and what it adds to the field. We have clarified the success rates for first-time grant applications as a way of justifying our focus on resubmissions, and on grant funders' policies about resubmissions.</p>

<p>order to capture readers' attention and underscore the need for this investigation.</p>	<p>We added a short paragraph to justify our objective of summarising demographic characteristics of applicants who resubmitted their grant applications:  <i>"It is also unclear whether demographic and institutional factors predict who does and does not resubmit a grant application. Some underrepresented groups might have to resubmit grant applications more times before getting funded or may be less likely to resubmit an unsuccessful application. Obtaining public research funding is becoming increasingly difficult, and women, racialised individuals and early-career researchers face greater barriers than others."</i></p> <p>Finally, we have reinforced the need for better data transparency (which was previously introduced in our Discussion). The following text has been added:  <i>"Scientists are increasingly prompted to engage in open science practices, including data transparency, and yet funding agencies still withhold important funding data from the public domain."</i></p>
<p>Please ensure that statements in the introduction expressing strong opinions or judgments about the topic (such as "Most first-time biomedical research grant applications are not funded.") are substantiated with relevant references to enhance the credibility and support of the claims made.</p>	<p>The statement <i>"Most first-time biomedical research grant applications are not funded"</i> is in the abstract, where we are unable to provide a citation number. We return to this point in the Introduction, where we support the statement with corresponding citations the Swiss National Science Foundation(3) and US National Institutes of Health(4).</p>
<p>Generally speaking, the distinctive nature of scoping reviews lies in their broad approach to mapping the existing literature in a research area. Consequently, the current objectives appear to be too specific relative to the overall aim and the results provided. I suggest revising the objectives and incorporating a broader research question that aligns more closely with the scope of the project.</p>	<p>We believe that our review objectives are aligned with our choice of scoping review methods. In their helpful guidance paper "Systematic review or scoping review? Guidance for authors when choosing between a systematic or scoping review approach", Dr Munn and his colleagues outlined 6 purposes for conducting a scoping review, including "to examine how research is conducted on a certain topic or field" (i.e. to summarise the outcomes of resubmitting biomedical research grant applications to competitive funding agencies), "to identify key characteristics or factors related to a concept" (i.e. to summarise the demographic characteristics of scientists who resubmitted their grant applications), and "to identify and analyse knowledge gaps".</p> <p>When deciding on the most appropriate methods for our review, we drew on our experience studying and publishing on grant peer review, which as you know, is a relatively sparse field. Dr Munn and his colleagues continue, suggesting that for "authors [who] do not always wish to ask ... single or precise questions, and may be more interested in the identification of certain characteristics/concepts in papers or studies, and in the mapping, reporting or discussion of these characteristics/concepts" (of which we were), "a scoping review is the better choice". Therefore, we respectfully suggest that our choice of scoping review methods was appropriate.</p> <p>To change our objectives or frame a new research question at this point would clash with our commitment to pre-registering our work, and require a substantial deviation from the study protocol, which we do not feel we could justify appropriately. We were guided by methodological</p>

	<p>literature for scoping reviews (5,6) and our author team's expertise to ensure alignment between study elements. Our co-author, Dr. Moher, is a founding member of the expert panel who developed the PRISMA-ScR guidelines(7), which also guided our choice of methods and how we conducted our scoping review.</p>
<p>The review of grey literature may have included more websites to ensure adequate coverage such as searching grey literature specialized databases (for example: GreySource, BASE &amp; Grey Matters).</p>	<p>Thank you for your attention to our search. We understand that there are numerous approaches to searching grey literature. Our search (including of grey literature) was developed in close consultation with a knowledge synthesis and medical liaison librarian (Dr. Kitchin) and a Peer Review of Electronic Search Strategies (PRESS) was conducted by a second independent health research librarian. We are confident that they have provided appropriate expertise in devising a reasonable grey literature search strategy to balance the capacity and resources available to our team for delivering a robust grey literature search.</p>
<p>Please explicitly mention the selection criteria adopted in this scoping review and consider factors such as study design, funding agency type (e.g., charities vs. national funding bodies), first resubmissions, or any subsequent resubmissions.</p>	<p>In our original manuscript, we were aiming to balance detail with succinct writing. We appreciate your invitation to re-visit Section 2.3.</p> <p>We agree that additional detail could help the reader, and we have added the following text:  <i>"Studies were included regardless of funding agency type, study design, or date of publication. Only studies published in English were included. Full details are available in the study protocol."</i></p>
<p>Utilizing existing literature, please outline your outcome measures, such as success rates, reasons for rejection, changes made between submissions, or feedback provided by reviewers.</p>	<p>In Appendix 2 we provide a detailed outline and definition of each outcome measure listed in this manuscript. We did not consider the outcomes 'reasons for rejection' or 'changes made between submissions' in our manuscript. We are happy to move additional detail from Appendix 2 to the main manuscript should the editorial team feel it is required.</p>
<p>To further strengthen the discussion section, I recommend elaborating on the factors that increase the likelihood of success for resubmissions.</p>	<p>We have added a sentence to strengthen the finding that favourability of the original submission is the only factor demonstrating a relationship with likelihood of success for resubmission.</p>
<p>Scoping reviews are prone to several limitations, beyond the lack of risk of bias assessment. These limitations might include a lack of depth and selection bias, for example. I recommend that the authors further reflect on the limitations of their project.</p>	<p>Thank you for the opportunity to carefully review our methods and how we described our approach in the manuscript. We are uncertain what you mean by "lack of depth" as a limitation. Given we (1) screened almost 17,000 records in duplicate, (2) conducted a detailed grey literature search, guided by two knowledge synthesis experts, to identify data from grant funding agencies, and (3) included 40 records in our review, we feel we have covered the field in a way that accurately reflects its current state. Similarly, we believe our approach has helped us minimise evidence selection bias, which occurs when reviewers miss relevant literature. If you feel we have missed a relevant record, we welcome your alerting us to it.</p>
<p>Based on the results of this review, could you draw some insights that highlight the research still needed regarding</p>	<p>We have revised Section 4.1 to emphasise our recommendation that further research should be preceded by better data accessibility from biomedical research funders.</p> <p>The following text has been added:</p>

<p><i>“Successful future research hinges on the accessibility of this data. For that reason, we do not suggest a systematic review is performed until funders significantly improve their grant-related data transparency.”</i></p>
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1. Richards DP, Twomey R, Flynn T, Hunter L, Lui E, Stordy A, et al. Patient engagement in a Canadian health research funding institute: implementation and impact. *BMJ Open* [Internet]. 2024 Jul 8 [cited 2024 Oct 10];14(7). Available from: <https://pubmed.ncbi.nlm.nih.gov/38977365/>
2. Recio-Saucedo A, Crane K, Meadmore K, Fackrell K, Church H, Fraser S, et al. What works for peer review and decision-making in research funding: a realist synthesis. *Res Integr Peer Rev*. 2022 Dec;7(1). [snf.ch/en/93E43Wi7LIXzhqTN/news/snsf-starting-grants-2023-67-projects-approved-report.nih.gov/nihdatabook/category/10](https://snf.ch/en/93E43Wi7LIXzhqTN/news/snsf-starting-grants-2023-67-projects-approved-report.nih.gov/nihdatabook/category/10). 2024.
3. Campbell F, Tricco AC, Munn Z, Pollock D, Saran A, Sutton A, et al. Mapping reviews, scoping reviews, and evidence and gap maps (EGMs): the same but different— the “Big Picture” review family. *Syst Rev*. 2023 Dec 1;12(1).
4. Munn Z, Peters MDJ, Stern C, Tufanaru C, McArthur A, Aromataris E. Systematic review or scoping review? Guidance for authors when choosing between a systematic or scoping review approach. *BMC Med Res Methodol*. 2018 Nov 19;18(1).
5. Tricco AC, Lillie E, Zarin W, O’Brien KK, Colquhoun H, Levac D, et al. PRISMA extension for scoping reviews (PRISMA-ScR): Checklist and explanation. *Ann Intern Med* [Internet]. 2018 Oct 2 [cited 2022 Jul 10];169(7):467–73. Available from: <https://www.acpjournals.org/doi/10.7326/M18-0850>
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