Author’s response to reviews

Title: Reproducible and Transparent Research Practices in Published Neurology Research

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Dear Editor,

We appreciate the opportunity to revise and resubmit our manuscript to your journal. We have carefully reviewed and incorporated suggestions, which we feel has resulted in an improved manuscript. We have addressed each comment in turn below.

Reviewer #1 (Malcolm Macleod):

Thanks for the opportunity to review this important work. I have only a few comments:

1. I note the protocol was uploaded to OSF the day before the study (ie the search) was initiated. This represents best practice, and I congratulate the authors

Authors reply: Thank you.

2. Why did you choose a sample of 300 publications?
Authors reply: To address this reviewer’s comment, we conducted a power analysis. Results from our analysis indicated that we needed a sample size of 232 for the primary outcome, data sharing. To account for studies that would be excluded, we derived a final sample size of 400. Our methods section now reads:

“To estimate the required sample size for our study, we used Open Epi 3.0 (openepi.com). We selected data availability as our primary outcome based on its importance for study [3]. Our estimated parameters included a population size of 223,932 publications; a hypothesized % frequency of 18.5% for the data availability factor in the population (which was based upon data obtained by Hardwicke et al.); a confidence limit of 5%; and a design factor of 1, which is used in random sampling. Based upon these considerations, a 95% confidence level would require a sample size of 232. From our previous studies [21,22] we estimated that approximately 40% of studies would be excluded following screening. Thus, a random sample of 400 publications with a hypothesized attrition rate of 40% would yield a final, minimum sample of 240 for analysis. Previous investigations, upon which this study is based, have included random samples of 250 publications in the social sciences and 150 publications in the biomedical sciences. Thus, our sample size exceeds those used in previous investigations.”

3. You provide percentages to 2 decimal places, which is not appropriate for n=300 - 1 d.p. would be sufficient

Authors reply: To address this comment, we have updated all the decimal places throughout the manuscript.

4. I see from the OSF that this is one of a number of parallel studies across disciplines. I'm fine with you publishing how and where you choose, but somewhere it would be helpful to have an overview of how the different disciplines compare. Is this planned? Do you have an ex ante protocol for that (I didn't see it in the OSF materials)? Had you thought about one big paper rather than a series of discipline specific ones? I should make clear my point 4 is not a criticism - the work is of good quality and can stand on its own.

Authors reply: We developed a protocol that outlines the methodology for this particular study; however, we have not developed a protocol for a synthesis of these investigations yet.

Reviewer #2

Rauh et al. have 'cloned' the article and methods of Hardwicke et al. (referenced) to systematically review and meta-analyze transparency and reproducibility practices of articles published in neurology journals from 2014 until 2018. The methodology of Hardwicke et al. (which to my knowledge only exists as a preprint, not a peer reviewed article) as applied in the current study appears to be sound. This article seems to be part of a large scale investigation which applies the same methodology (and uses much of the same text) on at least 17 fields of
Authors reply: We have added the following narrative to the Methods to clarify:

“This study was part of a comprehensive investigation on reproducibility across multiple clinical specialties.”

The reference to the study materials is misspelled (BIOARKIV/2019/763730, should be BIORXIV/2019/763730).

Authors reply: This has been updated in the paper.

The random sample of 300 studies was drawn from an NLM catalog query (Neurology[ST]). Using this query, I retrieved 492 publications with an extreme bandwidth of types of study, audience, quality, etc. Taking a random sample of 300 publications from those journals (even if a portion of them is excluded due to language etc.) in my view is a gross undersampling, and may almost certainly lead to erroneous results. I doubt that from such an approach one can claim to present results that accurately and quantitatively reflect transparency and reproducibility practices in neurology in general. How stable would the results be if replicated on a different sample? And how relevant is it to lump clinical journals, in which opening up raw data is limited by data protection laws, and journals which almost exclusively use animals, where no such restrictions exist. In fact I doubt that such an omnibus approach to a huge and diverse field is very useful, even if done on a much larger sample.

Authors reply: Please see reply to reviewer #1’s comment #2. This has been addressed in the paper by coding additional studies.

I agree with the authors that Neurology (clinical, experimental, computational, imaging, cognition...) has a transparency and reproducibility problem, but to expose it in such a diffuse manner will be rightfully criticized by many who don't feel that there is an issue. I therefore believe that the paper is potentially harmful to the quest to improve transparency. At a minimum, the article would require a much longer and more complete list of limitations. But taking those limitations seriously, I am afraid that what can be concluded safely from the article is rather minute.

Authors reply: To address this comment we have expanded the limitations of our study: “(Add whatever you added to the limitations).”

“We feel that our methodology is robust and has many strengths, including blind and duplicate data extraction. Additionally, our protocol and data are available online to encourage
reproducibility and transparency. However, we acknowledge a few limitations. First, we recognize that not all publications (clinical trials and protected patient data) are readily able to share their data and materials, although we feel a statement should still be reported, as justification was not always provided in each publication. Second, we did not contact the authors to obtain data, materials or analysis scripts and only used published materials for extraction. Had we contacted the authors, then source data, materials, and protocols may have been available, but the goal of this publication was to examine readily available, published indicators of reproducibility. Finally, the scope of this study is limited to PubMed indexed journals in neurology, and the results of this cross-sectional study may not be generalizable beyond this reach.”