Author’s response to reviews

Title: Conclusions in systematic reviews of mammography for breast cancer screening and associations with review design and author characteristics

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Response to Reviewers: Conclusions in systematic reviews of mammography for breast cancer screening and associations with review design and author characteristics

Thank you for the opportunity to respond to the comments from the reviewers, which we feel have helped us to improve the study and clarify the manuscript. The following is a detailed response and a description of how we addressed each of the comments. Page and paragraph references below refer to the “tracked changes” version of the manuscript and the revised version of the additional files.

Reviewer 1:
Reviewer #1: Thank you for the opportunity to review the manuscript. I have read the paper with interest. Following you find my comments which will hopefully help improving the paper.

Major Compulsory Revisions: I see a strong limitation of the study by including only the corresponding author. At least, the first and last authors are responsible for the results and conclusions of a systematic review and often the first and the last authors have differing professional roles.

We agree with Reviewer 1 that authors other than the corresponding author may have played a role in shaping the design and reporting in the systematic reviews. To improve the integrity of the study we have identified the professional roles of all authors across all systematic reviews,
and modified the methods section to update our approach (Page 6, Lines 126-139). As we are unable to retrospectively determine the impact of each author on the conclusions in the systematic reviews or assume that only the first and last authors have the greatest impact on the conclusions, we have reported the professional roles of the authors in their entirety (Additional file 6). We have further summarised each review according to the structure of the team—where professional roles were “only clinicians”, only “non-clinicians”, or “mixed”. Where the reviews included a mix of professional roles in the author group, we assigned those conclusions to the category represented by the corresponding author, under the assumption that the corresponding author takes primary responsibility for the conclusions (Page 6, Lines 135-139). These changes did not affect the conclusions of our study, but we felt they helped to more robustly characterise the systematic reviews.

One important aspect is the assignment of the professional role. Please describe why the current employment was used and not the affiliation information in the publications. In this review, publications from 2000 to 2015 have been included and it is very likely that affiliations have been changed for several authors.

The affiliation information (which included their employment at the time of publication) was used to determine the professional roles of the authors, and where we used affiliation and employment information available on websites we were careful to reconcile that information with the authors’ publication histories. We have revised the methods to clarify the method we used to determine the professional roles of the authors from online sources (Page 6, Lines 126-130).

Minor Essential Revisions: Methods: No established methodological framework for conducting systematic reviews is mentioned in the manuscript, e.g. the Cochrane Handbook for Systematic Reviews of Interventions. Please describe which framework was used for this review.

Our study measures the association between conclusions in systematic reviews and factors that are typically not included in standard frameworks for measuring integrity. As our study was not a systematic review of systematic reviews, the Cochrane Handbook was not applicable. The most similar analysis of systematic reviews is one we previously published, which considers fewer factors (10.7326/M14-0933). We were also guided by two previous studies examining primary articles and guidelines in mammography (10.1016/j.jclinepi.2011.12.011 and 10.1186/1741-7015-5-12). Each of these related studies is cited in the manuscript. We note in the limitations section that we did not measure quality using the AMSTAR measure (Page 12, Line 270-273).

In relation to how we determined whether an article was a systematic review and eligible for inclusion in our study, we specified the criteria not on the Cochrane Handbook but instead on the PRISMA statement elements 7, 8 (partially), and 17 (10.1371/journal.pmed.1000097). Very few published systematic reviews capture all of the PRISMA elements and most perform poorly in AMSTAR and other evaluations of quality (e.g. 10.1016/j.jclinepi.2016.03.025), so we are comfortable that we considered the criteria for inclusion carefully and appropriately.

Currently there is no subheading addressing the literature search, which is an important step in a systematic review. This aspect could be added to the subheading 'study selection'. 
We updated the headings to match similar articles in Systematic Reviews (e.g. 10.1186/s13643-016-0353-y), including a new heading “Search strategy” (Page 4, Line 87) and “Selection of reviews” (Page 5, Line 96).

Please add a reason why only PubMed was searched. This should also be mentioned in the title of the review.

Medline is intended to be a comprehensive index for biomedical journals that meet a pre-specified standard of quality. A March 2016 study from Systematic Reviews (10.1186/s13643-016-0215-7) indicates that PubMed provides 92.3% coverage of primary studies across a sample of 120 systematic reviews. Given that systematic reviews are less often published as conference abstracts compared to trials and other primary studies, we expect the PubMed coverage to be even higher for this publication type. Having examined other titles in Systematic Reviews, we decided not included the word PubMed in the title.

Screening and data extraction: Please state on which basis the four age categories for patients have been chosen (page 5, line 110).

The age groups were selected to best match the heterogeneous set of age groups examined in the systematic reviews, with a specific focus on women aged 50-69, where most systematic reviews focus, and where guidelines disagree about frequency of mammography. We have updated the manuscript to clarify the selection of the age categories (Page 6, Lines 119-123), and linked it to the background section to make the link to the guidelines clearer (Page 3, Lines 55-69).

Reviewer 2:

This is a very interesting paper! However, I have a few concerns about the data analysis and the conclusions drawn from it:

1) Tables 1 and 1A: These tables should be merged or at least both in the main body of the text.

We have moved Table 1A into the main text of the manuscript (Page 10, Line 223; Table 2). We felt it would be hard to interpret if it were merged with Table 1 since one describes a subset of the reviews described in the other, so we have kept them separate.

Further, please list chi-squared tests for favorable conclusions and design/author characteristics for women of all ages as well as women 49 and younger and 70 and older. It would be helpful to the reader to list all of these analyses instead of simply those for women 50-69.

We focused specifically on the age group 50-69 because this is where the greatest number of systematic reviews focus their attention, where guidelines disagree about the frequency of screening, and where the volume of available evidence is highest. For completeness, we have updated the manuscript to include the chi-squared tests for the other three age groups in the Appendix for completeness (Additional files 2-4).
2) Figure 1: This figure is very hard to understand. I think it is about bucketing age groups in the articles you abstracted into the age groups used in your article. Please label the axes more clearly and make the Tetris-like shapes more understandable to the reader (what are the unlabeled blocks for?). Also, this figure is better suited the appendix. It details data management instead of results.

This was a figure designed to show how we classified the age groups of the conclusions in the systematic reviews given the heterogeneity of the age groups that were specified. We have updated the manuscript to include more detail about how to interpret the figure (Additional file 1) and moved the figure into the supplementary information (Additional file 1).

3) Figure 2: Please more clearly label the boxes in this figure so that it looks more like the PRISMA flow diagram: http://www.prisma-statement.org/PRISMAStatement/FlowDiagram.aspx

We have updated the figure to use the PRISMA flow diagram template directly (Figure 1).

4) Discussion/Conclusions: The relationship between favorable conclusions and design/author characteristics for women in all age groups and subgroups should be discussed. If author type and competing interests are not significantly related to conclusion favorability overall, then your conclusions are overly broad.

The 50-69 age group is important because this is where the greatest number of systematic reviews focus their attention, where guidelines disagree about the frequency of screening, and where the volume of available primary evidence is highest. We have updated the discussion section to clarify that the results correspond to the analysis of this age group and that the heterogeneity and small number of reviews outside of the 50-69 age group meant that the statistical analyses were less reliable among those (Page 10, Lines 229-230; Page 11, Lines 240-242).