Author’s response to reviews

Title: World-wide research architecture of vitamin D research: density-equalizing mapping studies and socio-economic analysis

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Author’s response to reviews:

To

Clare Collins, University of Newcastle, Australia
Sharon Kirkpatrick, University of Waterloo, Canada
Editors-in-Chief
Dear Clare, dear Sharon

Thank you for the opportunity to re-submit our manuscript, entitled “World-wide research architecture of vitamin D research: density-equalizing mapping studies and socio-economic analysis”, for publication in Nutrition J. Also, we thank the reviewers for their comments and extremely helpful suggestions.

We have made the suggested changes to the manuscript (please see track changes) and added new data in respect of these excellent comments, which are detailed below in our point-to-point-reply.

We hope that these revisions successfully address the critiques of the manuscript to your satisfaction, and that you may re-consider it for publication in Nutrition J.

We look forwards to hearing from you soon. Thanks again for your efforts and time.

Best wishes,

David

Member, Editorial Board, Nutrition Journal

Prof Dr David Groneberg, MD PhD
Full Professor of Medicine
Chair, Centre of Health Sciences
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To Reviewers

Point-by-Point Reply:

Reviewer reports:

Reviewer 1:

Synopsis. This study describes the analysis of the origins of the ~26,000 papers identified by a standard literature search engine, using density mapping, for different countries, finding greater outputs in countries with higher GDPs, greater output efficacy [papers/unit of GDP] in certain Scandinavian countries, and a dearth of reports from poorer countries, especially in South America, Africa and Asia, from which the authors conclude that vitamin D research "may need to be enforced in such countries".

General comments.

1. The analyses reported are of interest [and vividly displayed using DEMP] methodology, but of no surprise to anyone who has followed the vitamin D literature over the years; the vivid display of the findings may, however, alert low vitamin D research output countries to, at the least, carry out audits to check what degree of vitamin D deficiency/insufficiency their citizens may be suffering.

Reply: We absolutely agree with this position. We now address this issue in the revised version.
2. Since what is needed is a major effort, globally, to improve population vitamin D status where needed, probably by food fortification, which has been found to be effective in large proportions of the Finnish population since being introduced. This is urgent because the growing endemic problem of hypovitaminosis D is totally unacceptable, being avoidable through simple cost-effective measures without population testing, which would reduce the growing costs of ever more vitamin D research, [much of which is repetitive and adds nothing new to knowledge], and which would also reduce the costs of health care for the clinical problems caused by vitamin D inadequacy.

Reply: Again, we absolutely agree with this position. We now address this issue in the revised version.

3. it would, therefore, be good to see the authors comment on the implications of the growing numbers of vitamin D papers, since even without knowing anything about their content. i.e., on the implication that the problem of vitamin D inadequacy is not being dealt with. Thus, it would be very useful to visualise the global problem of vitamin D inadequacy using the same analytical/display methodology, with maps for deficiency, insufficiency, and 'repletion', [based on reasonable cut offs ranges for 25(OH)D used in the papers quoted], globally, the countries without such data being shown as blank, either in white, or black [black spots?]. If that could be added to this report it would be useful, but if not, it would make a valuable further report.

Reply: This is a very good idea. We want to address this issue in upcoming studies.

4. The English language usage is hard to follow in places, and my specific comments are mainly directed at clarification in those areas.

Specific comments, by page and line numbers.

Page 3, abstract. Lines 13-15, you mention increases in different types of research on vitamin D here in the background, but do not pursue this in the study itself, though this would have been very interesting. Indeed, an increase in papers on how to correct vitamin D inadequacy with a fall in papers simply reporting the presence of hypovitaminosis D and its associations with disease would be a very encouraging trend. Thus, if that data cannot be provided in this report, perhaps it
could be looked at in a further study, as suggested in general comment 3, above; lines 31-4, try '...while Northern America, including the USA, constitutes the major centre for production of vitamin D research, globally, followed by.....'; line 47-9, is '...the global research architecture'. an appropriate phrase, try '... in global research production, or distribution.

Page 4, line 10, please qualify 'vitamin D' by adding status, provision, or something that explains what you are talking about; line 25, why say 'or' when these are additional associations; line 28, 'implications' is the wrong word - I think you mean 'considerations'; line 33, might 'ranging across' be more clear than 'bridging'; line 39, '.... the large numbers of existing ...'; and '.... their widespread implications.

Page 5, line 18, surely mapping implies visualization; line 21, this work began in 2008-9, ...; line 25/6, ...ranging from public health and ..... to ....'; lines 35-8, on relevant diseases and related areas of biomedical research; line 47, 'usually uses' is awkward, try 'commonly uses'?; line 52, try '[21-23] we used this database in the present study. Line 54, omit the first 'the'

Page 6, lines 19-21, ...field to estimate [or to assess] the overall number of published reports; line 25 is repetitive, try 'The research was further refined as follows, by DOCUMENT TYPE and .....'

Page 7, line 39, if no other data lacking than citation rate, say, '...incomplete data on citation rates, results from ....'line 51, '....diseases investigated with ...

Page 8, lines 5-7, [25], used to visualize...line 12, 'separate territories (countries)'; line 53-4, 'Economic data....'? Line 56, [27], and countries were....

Page 9, line 10, '...found in the selected data bases'; line 15, '...there is a large gap to the next most active country, Japan, ...'; line 44, 'Three major rankings were defined using socio-....'; line 51-2, '... 2174.9, with Israel second with a R of...., followed by....;

Page 10, line 42/3, omit the word 'the' before 'population size'.

Page 11, line 56, 'evolution over time was .....using the subject area as a proportion of ...'
Page 14, line 12/13 is rather confused, and confusing - do you mean '---yet no overall picture of vitamin D research activity has been developed.'; line 23, '...was initiated by experts from both the fields of vitamin D research and the field of ......'; lines 34/36, 'The present approach integrates the NewQIS study protocol [9], combining novel...with scientometrics.]; lines 46/50, '...and points to the fact that not all literature searches can be taken to cover the relevant areas of interest; line 51, .. 'in this respect, the language ....'; line 58, '..not included must be missed out.'

Page 15, line 4, '... database provider to this problem.; line 9, 'This emphasis on ....regional publications...'; line 20, '....impact factors that are included...'; line 26, 'From the results of our ...; line 40, '.....there were differences in both research areas'; line 40, I would omit the word 'present'; line 58, the first word, 'also', is not needed; line 60-61, 'to speculate on whether the global ....'

Page 16, Line 4, '...landscape, and there are parallels, as demonstrated ...'; line 27, omit the word 'the' and the word 'also'; line 36/7, '.....relation of vitamin D research output to...'; line 39, 'research output to...'; line 39/41, '...and, '..3), '....in relation to citizen numbers' [if that is what you mean]; line 42,' ... lead to different pictures of the distribution or research globally.; line 51-2, 'with a calculated .....'.

Page 17-8, line 8, the first analysis of the 'global architecture' of vitamin D research activity'; line 13, ' ... to a major extent, a number of weaknesses are present, for example, South ....'; line 18, remove the word 'the'; line 18, 'However, since vitamin D......is currently increasing in the Americas, ....'

Tables, these are hard to follow as they don't fit A4 pages very well, and I can't see what is in the columns properly. Each Table needs a number and a Legend explaining what it shows so that it can be understood without reference to the text.

Figure legends and Figures are hard to link to each other as the Figure numbering has not come through clearly in my print out.

Re legend to Fig 1, line 12, '... analyses of numbers of vitamin D articles....'; line 39, insights into the fields of activity.
Reviewer 2:

General comment:

This manuscript describes the use of a mapping technique to characterise vitamin D publication productivity globally. The research question is probably of general interest to researchers in the field and the paper comprehensively conveys the global distribution of vitamin D research.

We thank the reviewer for the assessment.

Major points:

On the search terms:

Initially I thought the focus was on vitamin D as a nutrient in context of human health but a number of pharmaceutical/synthetic forms of vitamin D are included in the search terms. I think this should be better justified as it shifts the vitamin D research bias to countries that perform more of this type of work.

Reply: We thank the referee for raising this point. We included the findings of the analysis accordingly (Results).

Were the results restricted to human studies?
Reply: No. The analysis also include experimental studies using cell culture or animal experiments since they generate important data that should not be excluded. We added a paragraph, accordingly.

The WoS categories chosen are extensive but could more general filtering be used, e.g. clinical? May studies of healthy patients been missed?

Reply: The used subject areas are the original categories that are applied to the publishing journals from the WoS. They have been extracted with the bibliometric information and cannot be altered since the data base has designed them. To differentiate the areas furthermore, we used the authors keywords and added a paragraph and a figure accordingly.

Was any further filtering of the search results performed?

Did the search include only full articles or were other sources included (meeting abstracts etc)?

Reply: We added a paragraph, accordingly (see previous paragraph).

Page 11/12. Vitamin D research areas. To what extent do the trends in categories represent trends in the use of the categories in all areas of science rather than reflecting shifting trends in vitamin D research areas?

Reply: This is an interesting issue. We added a paragraph accordingly. Please see the revised version of the manuscript.

Page 15/16 (paragraph on VD research following osteoporosis research). This may be true but is speculative. These countries also account for the highest overall medical research spend and
therefore their vitamin D-related output may simply be reflective of their investment in research overall. This also applies to your comment on page 17 lines 16-18.

Reply:

We thank the referee for this point and clarified it. We corrected the paragraph as follows:

Minor Points:

The last word of the abstract could be "encouraged" as we cannot enforce research in those areas.

Page 14. Line 10. Why are cancers particularly highlighted given the many health and disease areas associated with vitamin D. I have the same comment on page 15, lines 53-56.

Page 14. Line 58. There is a missing word in this sentence.

Page 15. Line 45. This highlights that Japan was 2nd overall and but had less than 300 articles on diabetes -however, without the Japan's ranking in this category it is difficult to place this in context of other countries.

Page 16. Line 41. Rather than citizens, it is population size.

Page 16. Lines 44-54. I am not sure of the relevance of these sentences.

Page 17. Line 13. 'extend' should be 'extent'

Page 17. Line 13. 'Gaps' rather than 'pitfalls'?
Table 1. I found this table quite difficult to follow - could the decimal places be reduced or in some cases removed? It also wasn't obvious how countries were ranked in the table - why did you choose articles / millions of population and if this parameter is used perhaps it could be shifted left in the table.

Figures. In my copy, the resolution of the figures was poor.

Reply: We addressed these issues and corrected them accordingly. We apologize for these errors.