Author’s response to reviews

Title: Investigating the associations between productive housework activities, sleep hours and self-reported health among elderly men and women in western industrialised countries

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Title of paper: Investigating the associations between productive housework activities, sleep hours and self-reported health among elderly men and women in western industrialised countries.

Dear Editor,

Thank you for the opportunity to revise our manuscript. The two reviewers provided useful suggestions and comments, which we believe have helped us to improve the quality of this manuscript. In the following paragraphs, we detail the modifications that have been introduced and responded to all the points made by the reviewers (the reviewer’s comments are in italics). In addition, we have modified the title. As instructed, changes are shown in ‘track changes’ mode.

Thank you for considering our study.

Yours sincerely,

Nicholas Kofi Adjei
Tilman Brand

Response to Editor’s comments
Comment: Please format your 'Authors' Contributions' section as follows: Please use initials to refer to each author's contribution in this section, for example: "FC analyzed and interpreted the patient data regarding the hematological disease and the transplant. RH performed the histological examination of the kidney, and was a major contributor in writing the manuscript. All authors read and approved the final manuscript."

Response: We have now formatted the Authors' Contributions as suggested on page 18, line 458-461.

Response to reviewer # 1 (Yvonne Wells)

Comment 1: Although the authors are careful to acknowledge that the study is correlational and that therefore no directionality can be implied, in fact, the conclusion claims "time allocation to housework activities may be beneficial to the health among elderly men and women [sic]. . . . 'To achieve health equity among older adults, elderly women need optimal sleep duration and average housework hours." This conclusion is not justifiable because of the problem of the direction of causation. It is entirely feasible that people who are in the best health are those who are most able to take on housework activities: health affects activity levels, rather than the other way around. The same goes for sleep. It may well be that poor health can cause either disrupted sleep, or need for more hours of sleep than are necessary for those in relatively good health. Prescribing 7-8 hours' sleep and moderate levels of housework for women may be good advice in general, but is not really justified by the study, in my view. Besides, the corollary for men, given their results illustrated in Figure 1a, is that the advice would be to take on as many household tasks as possible.

Response: Thank you for pointing this out. We agree we do not have causal evidence and thus modified the language in the conclusion; page 17, line 435-438.

Comment 2: It is often better to write results so that the DV comes first. For example, the third sentence of the abstract is currently a mess. It would be better expressed as: This study not only examined individual associations between self-rated health and both housework activities and sleep duration, it explored self-rated health by the interaction effect between housework activities and sleep duration separately for men and women.

Response: Thanks for the suggestion. We have included this suggestion in the abstract, page 2, line 40-44.

Comment 3: In the Method section, specify the number of days for which diaries were kept, and explain why self-rated health was dichotomised (was its distribution heavily skewed?).

Use consistent capitalisation of variable names in the Covariates section.
In the Results section, report numbers with only the number of decimal places justified by the scale of measurement. For example, if respondents reported time spent in whole minutes, it is not justified to report mean scores to two decimal places: one is ample.

Response: We have now included the number of days which the diaries were kept on page 5, line 133-137. Self-reported health was dichotomized because it is a global practice embedded in the use of logistic regression models, especially when it is a 4-Likert scale measure. We have further given references on page 7, line 179 to that effect.

In the results section, we corrected the number of decimal places on line 221-237, Page 8-9. We also checked the inconsistencies of the capitalization of variable names in the covariate section, line 189-190 page 7.

Comment 4: Add referents to comparisons (e.g., line 74, elderly men and women are more involved in social roles and activities, such as . . . , than their younger counterparts).

Response: We have now included additional references to the comparisons on page 3, line 78.

Comment 5: Specify the direction of gender differences in the literature review (e.g., lines 86 - 93).

Response: The direction of gender differences have now been specified on page 3, line 90-98.

Comment 6: Achieve agreement in number between nouns and verbs (e.g., line 98: the increasing prevalence of health conditions at older ages restricts time allocation for other daily activities; line 266: any combination of sleep duration not equal to 7-8 hours and fewer hours spent on total housework was significantly associated with poorer health than the reference group, who had 7-8 hours/day sleep and engaged in 1-3 hours/day total housework; line 332: heavy housework activities were . . . )

Response: Thanks for the suggestion. We have improved on those sentences on line 103, page 4; line 283-286, page 11 and line 352, page 13 as suggested.

Comment 7: Simplify sentences explaining relationships between the DV and IVs (line 183: we applied binary logistic regression to model the association between self-reported health and each of the three broad housework categories, total housework, and sleep hours).

Response: Thanks for the suggestion. We have now simplified that sentence on page 7-8, line 199-201, as suggested.

Comment 8: Fix typos (e.g., line 204, women in the study were slightly older than men).
Response: We have fixed the typo on page 8, line 217.

Comment 9: Use "than" rather than "compared to" in comparisons (line 205: Men had higher educational attainment than women; line 211: Older men and women both allocated more time to cleaning and cooking than to occasional tasks such as gardening and maintenance.)

Response: We have fixed those comparison issues on page 8, line 217-227 as suggested.

Comment 10: Keep the number of decimal places in text consistent (line 208: About 9.0% of older men were in paid employment, compared with 4.7% of women)

Response: We have now fixed the decimal places on page 8, line 219-221.

Comment 11: Rewrite the sentence beginning line 317 to: Previous studies have also stressed the health benefits of gardening for older adults; such benefits include physical health, psychological health, cognitive ability, and low risk of depression.

Response: Thank you. We have rewritten the sentence on page 13, line 337-339, to make it clearer for the reader.

Response to reviewer # 2 (Robert Meadows)

Comment 1: We need to know more about the method of delivering the diary. It is not immediately clear to the reader whether the data is for one 24 hour period per person; same day of the week; whether individuals were allowed to code primary and secondary activities.

Comment 2: Nothing is said about response rate, representativeness, weights etc

Response: Thank you for this useful comments and suggestions. We have now included these information in the data and methods section, page 5-6, line 127-148.

Comment 3: It appears that simple binary logistic regression was used, but the data would seem to be appropriate for some form of multilevel model

Response: Thank you for the suggestion. We used this method because the number of countries for the analysis were not enough (7 countries) for a group-level variance. Moreover, a small sample size at the country-level (level-two) leads to biased estimates of the second-level standard errors. See a paper by Maas, CJM & Hox, JJ (2005). Sufficient sample sizes for multilevel modeling. Methodology, 1, 86-92.
Comment 4: Doing analysis separately for men and women is also quite simplistic. See paper by Mood 'Logistic Regression: Why We Cannot Do What We Think We Can Do, and What We Can Do About It.

Response: Thank you for the suggestion. We have taken the argument/debate of whether the influence of unobserved heterogeneity makes the interpretation of logistic regression coefficient between two groups simplistic (Mood, 2010), into account before we stratified our analysis by gender, following a recent paper by Buis (2017) - “Logistic regression: When can we do what we think we can do.” He concluded that “unobserved heterogeneity does not have those effects” as argued by Mood (2010). Thus, “a comparison of odds ratios across groups provides an accurate description of the differences in effects across groups” (Buis 2017, p. 16).

Comment 5: Some further reflection is needed on the challenges of using time use methods to capture sleep. The statements on page 16 are talking about sleep, housework, health at the same time - so it is not clear what is being referred to in the point about time use being more accurate than survey data.

Response: Thank you for the comment. We have now modified the statement on page 16, line 413-420, as suggested.

Comment 6: Whilst the author(s) do a good job of avoiding statements of causation - there is a need to be constantly vigilant throughout that this is, at most, a statement of association and the direction of travels remains unknown.

Response: Thank you for pointing this out. We agree we do not have causal evidence and thus modified languages that may imply causation. See for example, page 17, line 435-438, in the discussion section.