Author's response to reviews

Title: Physical activity, ethnicity and sociodemographic factors. Three year follow-up of 15 years olds in Oslo, Norway

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Author's response to reviews: see over
Dear Editor
We appreciate the valuable comments from the reviewers. We have thoroughly revised the text in accordance with the comments – and have below given a response to each reviewer.

Yours Sincerely
Åse Sagatun
Corresponding author

Reviewer: Wendy Brown
Reviewer's report:
Physical activity, ethnicity and sociodemographic factors. Three year follow-up of 15 year olds in Oslo, Norway

General

This is an interesting paper, based on data collection from Norwegian youth at age 15 and 18. While the data are sound and interesting, the paper would benefit from 'tightening up' and focusing more clearly and logically on the research aims. At present it reads more like an extract from a student thesis than an academic paper. In my view the paper could be 'set-up' better by proposing three research questions that relate directly to the three tables. The methods and discussion would then follow the three aims logically and in the same order throughout the paper.
Authors’ response: We have changed the research questions (see below), according to the suggestions the tables and figure reflect the redefined questions. The results and discussion follow the aims logically throughout the paper.

I have annotated many changes and questions throughout the manuscript and highlighted the areas where I think the writing could be shortened and more focused.
Authors’ response: Further down we give a summery of the changes made according to the annotated changes and comments given in the manuscript. The manuscript is considerable shortened and hopefully it is more focused

Background
It is important to provide a clear definition of 'tracking' in this context. Is it 'stability' as in no change in absolute levels of PA, or is it maintenance of a relative position when the data are 'rank ordered'?
Authors’ response: We do no longer use the word tracking. However we use change and stability of physical activity, which is defined in the method part under physical activity as requested in the comments in the manuscript.

I suggest the last paragraph should set up three research questions: (1) to estimate and compare the levels of PA in ethnic Norwegian and ethnic minority youth at age 15 and 18; (2) to examine the associations between sociodemographic factors and these levels of PA in the two groups at 15 and 18
years; and (3) to examine the relationships between sociodemographic factors and three year change in PA in the two groups.

**Authors’ response:** We have adapted the research questions suggested (1, 2 and 4). In addition we have added a question focusing on longitudinal changes in physical activity. Our research questions:

(1) to estimate and compare levels of physical activity in ethnic Norwegians and ethnic minority youth at age 15 and 18; (2) to examine the associations between sociodemographic factors and physical activity in the two groups at 15 and 18 years; (3) to describe change and stability of physical activity in ethnic Norwegians and ethnic minority youth after three years of follow-up (4) to examine the relationships between sociodemographic factors and three-year change in physical activity in the two ethnic groups.

If this is done, then the order of the methods, statistical methods, results and discussion points should be changed to reflect this.

**Authors’ response:** These paragraphs are changed according to the suggested reorganisation.

**Statistics**

I found it difficult to follow some of the statistical methods. Is it possible to make these reflect exactly what is reported in the text (change scores and 95% CIs?) and the tables?

**Authors’ response:** The statistical methods now reflect the results reported in the text exactly.

**Results**

As stated above, I think it would be more logical to report the actual levels of PA first, before looking at the sociodemographic correlates.

**Authors’ response:** According to the new outline of the research questions, the actual levels of PA at 15 and 18 years are reported first. Table 1 in the previous draft, which showed the distribution of sociodemographic factors in the four subgroups of youth, is now removed and the main findings (from this table) are reported in the text in the first paragraph under aim nr 2.

In terms of ‘stability’ it would be interesting to know what proportion of boys and girls in each ethnic group were categorized as ‘active’ or ‘inactive’ at 15, and then what proportion of those in each group were still active/inactive at 18, and what proportion changed from active to inactive or vice-versa. Percent agreement and the Kappa statistic could be used here. It is somewhat confusing to look at ‘increase/decrease’ and ‘no change’ when baseline PA is unknown. (ie increasing from an already high level is not important, while increasing from a lower start may be).

**Authors’ response:** Table 4 in the previous draft is removed and replaced by a new figure 2 (Aim 3). Here we have divided the physical activity level into two groups; 0-2 vs. 3 hours or more per week. We have described what proportion of those in each group that was “active”/“inactive” at 15 and 18, and what proportion turned from active to inactive or vice-versa during the follow-up time among ethnic Norwegian and ethnic minority boys and girls.

**Discussion**

The discussion is much too long. Once any changes are made it should be
possible to shorten it to focus on the main points. Please see the actual paper for further suggestions (attached with track changes on the original pdf - please ask the editors to send this on to you). In summary I think the paper has interesting data – but would benefit from some changes to the ways the data are analysed and presented.

Authors’ response: In addition to the changes described above, several corrections are made in line with comments in the actual paper. Below follows a short summary of the changes:

Title:
The reviewer suggested: "Three year follow-up of physical activity in two groups of Norwegian youth: associations with sociodemographic factors".
We want to be more specific about which groups are being compared, and have added ethnic: ‘Three year follow-up of physical activity in two ethnic groups of Norwegian youth: associations with sociodemographic factors’.

Abstract:
- Grammar and sentences are changed as suggested
- Parts of the background, methods and results are changed to reflect the new outline

Background:
- Grammar and sentences changed as suggested
- Research questions are changed (see previous comment)

Methods:
- Grammar and sentences are changed as suggested
- Definition of change and stability of physical activity are now given under the description of the physical activity measure.
- In the ‘Lost to follow up’ it was suggested to delete a sentence explaining why we study change in those who participated after reminders. The other reviewer pointed out the importance of the participant rate among ethnic minorities (56%). In an attempt to predict how attrition might bias our results we have kept the paragraph.
- ‘Statistical analysis’ is re-done after the re-organisation of the aims.

Results:
- The presentation of the data is in line with the re-organised aims, and the tables relate directly to the research aims.

Discussion:
- The discussion is in line with the re-organised aims, - shortened and tightened up, with a clearer focus on the research aims.

Level of interest: An article whose findings are important to those with closely related research interests
Quality of written English: Needs some language corrections before being published
Statistical review: No, the manuscript does not need to be seen by a statistician.
Reviewer: Larry Webber
Reviewer's report:
This is a reasonably well-written manuscript describing factors related to physical activity and tracking of physical activity in Norwegian and non-Norwegian adolescents. The questions posed are important, particularly with the decline of physical activity in children and adolescents and the increase of obesity noted in most developed countries. Although the data presented in this manuscript are, for the most part, based on self-report, there is evidence presented concerning the appropriateness of these data.

Major Compulsory Revisions
1. There is a need for a thorough review of some of the statistical procedures used. In some instances there may be more appropriate procedures than those used by these investigators.
Authors' response: We have gone through the statistical procedures with a statistician, who is one of the co-authors (Magne Thoresen).

2. Page 9, last paragraph. The fact that only 56% of the ethnic minorities participated in the follow-up study is important. Data are presented to indicate that participants were different from non-participants at baseline. On page 19, the authors indicate that 54% participated in the follow-up. Which is correct? This is a rather low number. I would wonder if the higher physical activity at baseline in the follow-up participants is reflective of how long these individuals were in Norway. Are there any data to support this?
Authors' response: The correct participant rate is 56%, the figures on page 17 (previously 19) is now corrected. Unfortunately, we do not have data on how long the ethnic minority youth have been in Norway, but we do know whether they were born in Norway or not. Among those lost to follow up, 37% of the immigrants were born in Norway (2nd generation immigrants). The corresponding percentage among the participants at follow up was 45%. When comparing the physical activity level between 1st and 2nd generation immigrants, there was no difference at baseline in either boys or girls among those lost to follow up. We also compared physical activity between 1st and 2nd generation immigrants among the responders, and found no difference at baseline or in the follow up in either boys or girls. Information on level of physical activity among 1st and 2nd generation immigrants are added in the methods, under lost to follow up.

3. Page 11, Results, 1st paragraph. The data in Table 1 seem to be under-analyzed. The analysis as presented compares Norwegian to ethnic minority boys and girls separately. This assumes main effects for ethnicity. No gender comparisons are given. No interaction is described. The variables are all categorical. Perhaps logistic regression, multinomial logistic regression, polytomous logistic regression, or log-linear analyses including interaction terms could be considered.
Authors' response: Table 1 is now removed from the draft, but the main results are presented in the text. The aims are structured differently and tables and figure are now more in line with these aims. However, we still have analysed and presented results separately by gender. Boys and girls report a different level of physical activity, which is essential. We
wanted to describe both the gender- and the ethnic differences in physical activity. By analysing the genders together, the estimates would not be representative for neither boys or girls. Also, it seems to be a tradition in epidemiological research to stratify by gender.

4. Page 11, Results, 2nd paragraph. The outcome variable for the data in Table 2 is continuous; hence, the Analysis of Variance may be appropriate. It appears, however, that the analysis should be a factorial model with interaction.

Authors’ response: Table 2 in the previous draft has become table 1 in the resubmitted version. Table 1 now contains the mean physical activity (with 95% CI) at the two time points, in addition we have included mean change in the table. In accordance with the response to the previous comment, the figures are presented stratified by gender, while we have tested for differences between the ethnic groups using Analysis of Variance.

5. Pages 11-12. It appears that the data described in Tables 3a and 3b were analyzed separately for boys and girls. This may not be appropriate as this leads to a large number of tests. The effects of type 1 error are not described.

Authors’ response: The effect of type 1 error is now included in the discussion of methodological issues, page 17, line 7:

“When performing a large number of tests, like we do when studying physical activity and sociodemographic factors (aim 2and 4), the risk of type 1 error is largely increased. Hence, the pattern of the findings must be emphasized, and a single statistically significant association interpreted with caution.”

Minor Essential Revisions
1. There are a number of grammatical errors that will need correcting.

Authors’ response: Several errors are corrected according to suggestions from the reviewers

2. The ethnicity of the non-Norwegian subjects is not well described. It is very difficult to assess the relevance of the findings without further documentation of the countries of origin for these adolescents.

Authors’ response: See answer to comment 10. Possible influences of the composition of the ethnic minority group in Norway to physical activity are included in the discussion.

3. Page 2, Abstract, Background. The second sentence should be slightly reworded. “This paper investigates sociodemographic factors associated with …”

Authors’ response: The sentence is rewritten, in accordance with the reformulated aims.

4. Page 4, Background, 4th sentence. “… adult patterns of health behaviours start …”

Authors’ response: Done

5. Page 4, Background, 1st paragraph, 2nd to last sentence. “Moreover, studies indicate that physical activity tracks at …”.
Authors’ response: The sentence is removed from the resubmitted draft.

6. Page 5, Background, 2nd line from the top. “In children and adolescents, the …”
   Authors’ response: Done

7. Page 5, Background, 4th line from the top. “… physical activity level are positively …”
   Authors’ response: Done

8. Page 5, Background, 2nd paragraph, last sentence. “… despite the fact that some …”
   Authors’ response: This sentence is changed, in line with comments from the other reviewer.

9. Page 6, Methods, Follow-up study, 1st sentence. Delete the word thoroughly.
   Authors’ response: Done

10. Page 7, Methods, Study population. After 2489, please enter the percent participation (65.3%) in the text. Also, the last sentence of this paragraph is very important for interpreting the results of this study. Can these results be provided for the sample that is being followed at the two time points? Are data present on how long the adolescents have lived in Norway?
   Authors’ response: The participation rate is included in the text (under study population, page 6). We have now described where the ethnic minorities in Norway come from in our study population. As previously written, we do not have information on how long the adolescents have lived in Norway, but information on whether they were born in Norway or not is included:

   “The majority of the ethnic minority youth (96%) came from non-Western countries. The largest ethnic minority groups were from the Indian subcontinent (42%), Middle East (16%) and Eastern Europe (11%). Fifty-four percent of the minority group was born in another country than Norway (1st generation immigrants).” (Methods, Study population, page 7, line 1)

   The fact that 96% of the ethnic minorities have a non-Western origin, is emphasised in the discussion were the possible reasons for the low physical activity level among ethnic minority girls are discussed (page 13, second last line).

11. Page 8, Methods, Ethnic minority/ethnic Norwegian. This short paragraph is somewhat redundant with the information under study population. Perhaps the two paragraphs can be combined.
   Authors’ response: The two paragraphs are now combined, under ‘Study population’ (page 6).

12. Page 10, Statistical analysis, 2nd to last line. By variance analysis, do the authors mean Analysis of Variance?
   Authors’ response: Yes, it is Analysis of Variance. The text is now changed.

13. Page 11, Statistical analysis, 3rd line. Since only participants who had information on all variables are included, how many participants were excluded?
Were there any differences in those included and excluded for any variables?

**Authors’ response:** In aim four, where we have only included individuals with non-missing values on the variables included in the adjusted analysis, 154 boys and 235 girls are excluded. The excluded individuals do not differ in their physical activity level at baseline compared to the once included in the analysis.

14. Page 11, Statistics analysis, top paragraph, last line. “Data were analyzed …”
**Authors’ response:** Done.

15. Page 14, Discussion, 3rd line from the bottom of the page. “…sports in Norway, where the gender …”
**Authors’ response:** Done.

16. Page 20, Conclusions, 2nd line. “… differences in physical activity are more …”
**Authors’ response:** Done.

17. Table 4. I don’t think the 95% confidence intervals are necessary; rather, there should be a statistical test indicating whether the percent who decreases, increase or remain stable is consistent by ethnicity and gender.
**Authors’ response:** Table 4 is now removed from the draft following comments from the other reviewer. Figure 2 is included instead and kappa statistics and percent agreement performed for each group of ethnicity end gender.

Discretionary Revisions

**Level of interest:** An article whose findings are important to those with closely related research interests

**Quality of written English:** Needs some language corrections before being published

**Statistical review:** Yes, and I have assessed the statistics in my report.