Dear prof Bernabe,

Thank you for giving us an opportunity to revise our manuscript entitled
Self-reported oral and general health in relation to socioeconomic position—a national survey in Sweden (Please note that the title of the manuscript is slightly changed following the revision).

We have thoughtfully considered all remarks and suggestions from the editor and the reviewers, and have made changes according to the following comments:

Editor Comments:

1) Please revise the format of your tables, drawing some lines to separate the header and the body of the tables would improve clarity.

Response: We have revised the format of the tables
2) Revise the statement that SEP was more strongly related to general health than oral health. In the abstract, for instance, you are comparing the ORs coming from different explanatory variables. Did you run a specific test to show that a given SEP indicator was more strongly correlated with an outcome than to another outcome? In which results are you basing this statement? Simply visualisation of the magnitude of the ORs would not suffice.

Response: We agree with the editor, and have now altered this line of reasoning in the abstract and the main document. Abstract page 2 lines 28-32. We include the OR:s from the multivariate models and exemplify with the income-variable. In the Result section changes have been made (page 6 lines 33-48).

3) You need to address the limitations of your study. Simply saying response rate was high is not enough. Why you think that is not affecting your results in the first place? Do you have any evidence on the validity of SRH and SROH (especially in the study setting)? Provide evidence and arguments to support your statement that your study has "reasonable internal and external validity".

Response: We believe that the single item questions concerning self-reported health are widely used and have been used for decades. These variables have been found to correlate highly with other outcome measures such as different morbidity variables. Our Swedish questions have been used extensively in surveys over time. We have changed the text on page 10, lines 10-14.

Reviewer reports:

(Reviewer 1): Interesting piece of research, however, it may benefit from some suggestions:

1. Title. It may be misleading to call this survey 'national'. Despite the recruitment agency efforts, the non-response rate was high and no description of those who opted-out of the study is provided.

Response: We have now removed the word national from the title and also in the text.
2. Methods. There is no mention to ethical approval for this study.
Response: Following the guidelines we report Ethical approval in the section “Declaration”, placed before the references. We have now included a statement of ethical approval in the Methods section, page 4, line 17.

3. Methods. Some comparison of participants and non-participants on this study would be desirable (areas of residency, gender or other characteristics may be assessed)
Response: We agree with the reviewer and have now included text on page 4, line 17.

4. Methods. Agree with previous reviewers; analysis should be weighted based on national figures (census data) for the study to be representative; the authors mentioned the age difference and performing a quick search seems like there is a gender difference as well.
Response: We understand the concern in relation to non-participation and certain variables. However, we believe that weighting is not a universal solution and may introduce other problems with regard to interpretation of the results. For example, those who have participated may represent a more or less ‘special’ group of people and will get a higher ‘voice’ in the survey vis-à-vis the true distribution of individuals in the population. Therefore, we prefer to use the original sample in the analysis. It is an ongoing debate in survey methodology among researchers concerning this issue.

5. Methods. It would be advisable to have the same number of individuals on every analysis to make them consistent.
Response: We prefer to keep the maximum number of valid answers in order to use all of the information obtained.
5. Methods. An explanation of how the variables were recoded for analysis purposes must be provided.

Response: Thank you, we agree with the reviewer and have included an explanation of the variables’ recoding in the methods section.

(Reviewer 2): The paper entitled 'Self-reported oral and general health in relation to socioeconomic position - a national survey in Sweden' presents interesting findings on a relevant topic. The manuscript is well conceived and implemented. The data treatment is appropriate and provide interesting insights with multiple measurements. There are, however, some issues the authors might want to consider to further improve the quality of the manuscript:

Background

- I think the reader would benefit from a sentence or two at the end of the Background section that states more clearly the rationale of the analysis. For example, whether the study aimed to compare the magnitude of inequalities between general and oral health and/or to identify which socioeconomic indicators had stronger relationships with the two outcomes.

Response: Thank you for the suggestion to improve the aim. We have changed the aim accordingly on page 3.

- I would also suggest including a couple of sentences that place the study in the context of what is already known about socioeconomic inequalities in oral health in Sweden and how this analysis builds upon the existing literature.

Response: We have added text and reference in the Background, page 3.
Methods

- On page 4 line 71, I would suggest replacing "The participants were randomised..." for "The participants were randomly selected..."

Response: We have changed to the suggested wordings.

- When mentioning the inclusion criteria, please indicate the age inclusion criterion and if institutionalized individuals (living in prisons, elderly care homes, etc.) were also in the SPAR register and therefore, potentially selected in the sample.

Response: Adults above 18 years of age were included (page 4, 16) and all residents including institutionalized had the same probability of being selected.

- Regarding the questions on self-rated health, is there any particular reason why the response options were different for general health and oral health?

Response: We used questions from several, large scale epidemiological surveys and that includes also the self-rated general and oral health questions. We understand the reviewer’s observation and concern and for future surveys this will be an issue to consider.

- Given that income is a family/household measure, please clarify whether income was equivalised to adjust for the number of people in each household. If that was not the case, I would suggest acknowledging this limitation in the Discussion section.

Response: Interesting point, thank you. We have not taken into account the number of individuals in the household, but have included a sentence in the limitation paragraph (page 10, line 1).
- Also related to the income variable, please mention how the categories were defined. Are they quartiles based on the income distribution of the sample?

Response: We selected the categories based on other Swedish surveys.

- On page 5, line 97, I recommend including the word "descriptive" in the sentence "The analysis included frequencies, measures of central tendency (means), and variability (standard deviation)."

Response: Thank you, the word descriptive is incorporated on page 5.

- On page 5, lines 99-100, I think it is important to expand the sentence to: "Multivariate logistic regression analysis (MLR) was used with the self-rated health variables as the dependent variables and the socioeconomic indicators as the independent variables".

Response: Thanks, sentence expanded.

- Please clarify how the socioeconomic variables were introduced in the models and if there was a model where all the SEP variables were included at the same time.

Response: The socioeconomic variables were entered at the same time in models 1 and 2 (Tables 6 & 7).

Results

- I think current Tables 1 and 2 should be merged in a single Table 1: Descriptive statistics for study variables.

Response: This may be a matter of opinion, but the argument we have is to avoid a large table. So, we would like to keep the tables.
- By looking at the percentages of poor oral and general health presented in Table 3, I assume that these derived measures correspond to a combination of the 'poor' and 'fair' vs. otherwise response options for oral health; and a combination of the 'poor' and 'bad' vs. otherwise response options for general health. However, that is not clearly mentioned in the Methods or Results sections. Please clarify how these health measures were derived. Additionally, the authors should consider stating what would be the implications (in terms of comparability between the two outcomes) of placing the 'fair' response option in a different way for the oral and general health derived variables.

Response: Good observation! We have performed a bad or poor (not fair) translation from the Swedish questionnaire. The cut-off is the same in the Swedish version, poor/fair vs. good/very good for SROH, and poor/fair vs. good/very good/excellent for SRH. We have changed the wordings for the categories (Methods, Table 2).

- Related to the previous comment, if the 'fair' response option was indeed part of the poor oral health derived outcome, but not part of the poor general health one, please revise the statements on page 6 (lines 124-128 and 136-135) as the comparison between the two derived measures would not be straightforward.

Response: Please see the above comment. The fair response option is part of the poor category for both variables.

- On Tables 3 and 4, I suggest adding subheadings for each socioeconomic measure.

Response: The suggested changes improved the tables a lot, and we did alter the tables accordingly.

- Table 5 shows three categories of education. However, four categories of education had been presented in previous tables and text. I assume that 'University' and 'Masters or PhD' were combined in one group for the regression analysis. Please clarify this when presenting the results.

Response: This is correct and we have added this information in the Methods section (page 4).
- I would suggest including a similar clarification for the SEP measure of obtaining 15,000 SEK in one week which appears with three categories in Table 5.

Response: Correct, and we have included this information (page 4).

- Related to the two previous comments, I think it would be better if the authors categorize the socioeconomic variables in a certain way and use this categorization consistently throughout the paper (descriptive, bivariate and multivariate analyses).

Response: In tables 1-3, we want show the distributions and thereby displaying the gradients in more detail. However, for the regression analyses we had to collapse some categories due to too few responses in some categories. We therefore prefer to keep the data presentation as it is.

Discussion

- I think the first paragraph would be strengthened by the addition of a sentence about the SEP measures that showed stronger associations with the two health outcomes.

Response: Thank you for the input, and we have added a sentence in the Discussion section (page 7, first paragraph).

- Regarding the discussion point on the national insurance system, I would suggest adding that the dental care system is less generous and universal for adults compared to children in Sweden (if I understand well).

Response: We have clarified this issue on page 9, line 7.

- On page 9 line 190, I recommend replacing the word 'personal' for 'material' so the sentence would read: '…the variables most clearly associated with material resources in a short-term perspective…' This is because: a) at least one of the variables was measured at the household
rather than at the individual level and b) both variables refer to a specific type of resources: financial or material.

Response: Thank you for the suggestion, we changed the wording.

- Authors refer to results obtained when using all categories of the SEP variables (page 9 lines 203-208). I wonder whether is possible to present those results in an online appendix.

Response: We have included information about odds ratios for the two variables marital status and ethnicity on page 8, first paragraph, for respective outcome variable. When using all categories of the SEP-variables the logistic regression models were not robust due to few individuals in some of the variables’ categories. This is why, from a statistical point of view, it is not accurate to display such results.

- The authors might want to consider discussing the potential limitations derived of excluding people who do not speak Swedish in the survey.

Response: Thank you, we have included a sentence on page 10, line 1.

- Authors could mention that results on education need to be looked bearing in mind the inclusion of participants aged 19-25 years, who could be still studying and therefore have not reached their highest educational level.

Response: We have added text in the limitations of the study (page 10, line 1).

- On page 10 lines 215 and 229, I think 'risk ratios' need to be replaced by 'odds ratios'.

Response: We replaced risk ratios with odds ratios.
Sincerely

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Ulla Wide Boman

Professor, DDS

Assoc professor, Psychologist