Author's response to reviews

Title: Individual and contextual factors related to dental caries in underprivileged Brazilian adolescents

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Author's response to reviews: see over
August 18, 2014.

Dear Professor Thiago Machado Ardenghi
Associate Editor BMC Oral Health (Section Epidemiology of Oral Health)

Paper: MS: 1572417255127702
Title: Multilevel analysis of caries in underprivileged adolescents of Brazilian southeast.

We are resubmitting the referred manuscript to the BMC Oral Health. We have revised it according to the suggestions of reviewers #1, #2 and #3. The corrections inside the manuscript are in red color.

Comments of Reviewer #1:

Reviewer’s report
Title: Multilevel analysis of caries in underprivileged adolescents of brazilian southeast
Version: 2 Date:20 May 2014
Reviewer: Fernanda Ferreira

Reviewer’s report:

1. Major Compulsory Revisions

1.1. Data analysis: -The authors stated that the dependent variables were “number of carious teeth” and "DMFT index". However, throughout the discussion and even in the conclusion, they use expressions such as "presence of caries" (lines 391-392; lines 490-491; line 536), "cases of caries" (line 398), "prevalence of dental caries" (line 487) to refer to these variables. This is misleading, since caries was not a binary outcome in the study. Please check this.

Response: The comments were taken into consideration and alterations were made in the manuscript.

- What procedure was followed to include and/or exclude explanatory variables in the models? Was it based on the bivariate analysis? If so, why were these statistics not presented? Was multicollinearity problems assessed?

Response: The model fit was assessed by Adjustment of the model and it was evaluated by

-2 Res Log Likelihood (the lower, the better fit the model) and p-value. Initially, crude analysis was performed and those variables with p<0.20 were tested in a multilevel multiple
regression model. Crude analysis were not included in the model because these analysis only work to the selection of variables to be tested in the multiple regression model. This analysis is not conclusive since the adjustment for the remained variables is crucial for this study. There was no multicollinearity among the variables included in the model.

- I would like to hear the authors’ reasons for including the variable “need for dental prosthesis” in the models to explain dental caries. Even with the cross-sectional design, which does not allow inferences regarding causality between variables, when building a model, covariates are selected according to a conceptual idea of possible predictors of the outcome. The study aim stated by the authors (to identify individual and contextual risk indicators for caries in underprivileged adolescents, lines 166-168) confirms this intention. However, “need for dental prosthesis” is a measure of missing teeth, which in the adolescence is usually a consequence of more severe stages of dental caries. Moreover, missing teeth is a component of the DMFT index used to measure dental caries in the study. Therefore, the relationship between these 2 variables appears to be obvious, but in the inverse direction. The same reasoning applies to the variable “toothache”, since pain is a consequence of untreated dental caries. Another concern about the variable “need for dental prosthesis” is the fact that the category used as reference in the multiple analysis (need for multiple-element dental prosthesis) had a very low prevalence rate in the sample (n=4, 0.34%; Table 1). How did this impact the accuracy of the estimates in the models? The same applies to the variable “prison inmate in family” (see Table 1).

Response: The choice of these variables are related to the discriminatory power of those in the model. Although these variables show low prevalence were highly significant in the multiple logistic regression model. Furthermore, these variables are poorly investigated, although as mentioned, draw attention by discriminatory power, suggesting new studies that address these information in a social determinants context related to caries. However, if it is absolutely necessary we can change the statistical model.

1.2. Was the length of time the adolescents have lived in the suburbs considered? An adolescent who has resided in the suburb for only few months would not have the same exposure or opportunity to be affected by the social environment as someone who lived in the suburb for several years. This issue is particularly relevant because the study includes high proportions of very low income subjects, and the residential mobility can be quite high among that population. This aspect must be discussed.
Response: The length of time the adolescents have lived in the suburbs was not considered because most of them live in these places since birth, and social mobility is not usual for this population. This information was included in the text.

1.3. The conclusion must be rewritten to be better aligned with the findings, which suggest that variations in the DMFT and the number of decayed teeth in the sample are mainly related to individual variables. The results would benefit from the inclusion of the significance values for the estimated variance in the tables. In fact, the estimated value of the between-suburbs variance (when compared with their SE) appears to be non-significant even in the null models, suggesting that these suburb clusters did not differ with regard to caries severity. The intraclass correlation coefficients were very small (<0.02), which also indicates that a negligible source of variance was found among contexts. The Model 3 did not show any significant improvement when compared to the Model 2.

Response: The comments were taken into consideration and alterations were made in the manuscript. Conclusion was modified.

Furthermore, the measures of fit of the final models indicated that it was still a considerable caries variation that could not be explained by the individual and contextual variables assessed, which should be better addressed in the discussion section.

Response: The comments were taken into consideration and alterations were made in the manuscript (Discussion section).

The authors have suggested that complementing data with other contextual variables could have reduced the unexplained community-level variance (lines 529-531). However, the community-level variance was almost depleted in Models 3. I believe that what could actually enhance the explanatory power of the models would be the inclusion of other individual variables such as behavioral predictors (dietary practices and oral hygiene habits) as well as bacterial and salivary factors.

Response: Considering the comments of the reviewer, the authors chose to exclude these information and alterations were made in the manuscript.

2. Minor Essential Revisions

2.1. The title is superficial, includes reference to the method of analysis used (which is not necessary) and does not clearly convey the aim of the study. The running title does not mention the dependent variable. Please consider changing them. Suggestion: "Individual and contextual factors related to dental caries in underprivileged Brazilian adolescents"
Response: The comments were taken into consideration and alterations were made in the manuscript.

2.2. There is a typographical error in the sample size in the abstract, line 70 (1,179 instead of 11,779).
Response: The comments were taken into consideration and alterations were made in the manuscript.

2.3. The authors should refrain from using words such as “risk indicators” throughout the text, since the study has a cross-sectional design, which does not allow this kind of inference.
Response: The comments were taken into consideration and alterations were made in the manuscript.

2.4. The text in general is unnecessarily long, especially the abstract, introduction and discussion sections. I suggest that these parts be shortened, if possible. Much space was spent on describing and discussing issues that are not directly addressed in the study, as in the second paragraph on page 18, while relevant information is left out. Beyond that, the authors fail to offer a more in-depth discussion on the results of the study. They also issue some broad and unreferenced statements.
Response: The authors took this comments into consideration. We appreciated your comments, but unfortunately we were not able in reducing the text. We discussed each paragraph and, sincerely for us, a shortened text possibly would make the text poorer.

2.5. In general the reference list is quite comprehensive, but it contains some references that are not relevant to the manuscript and misses closely related studies like: - Celeste RK et al. The individual and contextual pathways between oral health and income inequality in Brazilian adolescents and adults. Soc Sci Med. 2009;69(10):1468-75. - Frias AC et al. [Individual and contextual determinants of the prevalence of untreated caries in Brazil]. Rev Panam Salud Publica. 2007;22(4):279-85.
Response: The comments were taken into consideration and alterations were made in the manuscript (references were included).

2.6. The methods section could be restructured to become clearer. Some suggestions in this regard:
- Only variables that are sufficiently important to accomplish the study purpose should be presented in the text. Moreover, these variables must be well described in the methods section (including the categorization
used for the analysis) and addressed in the results and discussion sections, even if they were not associated with the outcomes. For instance, the variables "periodontal disease", "fluorosis", "fathers’ and mothers’ education level", "type of housing", "family grand program", "has lived in a city other than Piracicaba", "number of siblings", "failure to pass end of year school tests", "adolescent works", "father and mother work", "self-satisfaction with the appearance of teeth", "OIDP", "visit to the dentist", "type of dental service generally used and reason", "WHOQOL-BREF", "total number of residents per suburb", "literacy rate", "% of home ownership", "% garbage collected" and "% within each income stratum" were all listed in Figure 1 as having been assessed in the study; some are described in detail in methods (i.e. lines 260-278), but none is reported in the results or addressed in the discussion. On the other hand, important variables to the results such as "self-perceived oral health" are only briefly mentioned.

Response: All the variables assessed in the study were mentioned in the figure 1 (Methods). In Table 1, the significant variables (p<0.05) were detailed, including categorization. Apologize for not including some significant variables in table 1. Alterations in this table 1 was performed and comments were included in results sections.

Was the feasibility of the questionnaire previously tested? Was it administered in interview format or self-administered?

Response: Most questions is taken from previously validated instruments. So, we were not previously tested them. The questionnaires were self-administered under supervision in case of doubt.

Please briefly describe the "social exclusion index".

Response: We believe that the description of "social exclusion index", described in the text, is enough. Please, check the text below. There is a briefly description and references for it.

“The Social Exclusion Index (SEI) of the 36 suburb where the adolescents resided was collected at the Piracicaba Research and Planning Institute and the Municipal Secretary for Social Development (37). The purpose was the quantitative dimensioning of some of the attributes of social inequalities between the suburbs, ranging from -1 (suburbs with the worst indices – most vulnerable) to 1 (suburbs with the best indices – least vulnerable)”
What exactly was considered as “caries teeth” in the study? The component “D” of the DMFT index?

Response: The comments were taken into consideration and alterations were made in the manuscript.

Was the variable “prison inmate in family” determined through the adolescents’ reports (lines 349) or the SIAB (lines 283-285)?

Response: The variable “prison inmate in family” was determined through SIAB.

What was really measured – “household crowding” or “number of persons in the family”?

Response: It was really measured "number of persons in the family". The alterations were made in the manuscript.

The sections “Study location”, “Study universe”, “Sample”, “Inclusion and exclusion criteria” can be grouped.

Response: Because of the large number of information on the methodology, we chose to maintain these separate topics.

The randomization method needs to be described. How was it defined how many and which adolescents would be contacted from schools and which would be from the PHC-HF units? Did this double selection procedure represent selection bias? Were both examinations (in the schools and the PHC-HF units) conducted in a clinical setting (on a dental chair, under conventional dental illumination and with the assistance of a 3-in-1 syringe)? - I suggest the authors revise the criteria for inclusion, exclusion and reporting losses. I believe there is some confusion with regard to these aspects.

Response: The comments were taken into consideration and alterations were made in the manuscript.

A randomly sample of adolescents was obtained by data PHC-HF units (registration). The absentees were contacted and examined in the school.

- Was a pilot study conducted before the data collection?

Response: It was not conducted a pilot study.
2.7. Please consider including the location and date of the data collection in the title of the tables and a description of the contextual variables in the results. This would be helpful to clarify the level of heterogeneity of the suburbs characteristics.

Response: The comments were taken into consideration and alterations were made in the manuscript.

2.8. In the discussion section, I could not understand what the authors mean in the closing argument in the first paragraph on page 20 (lines 472-473). The authors failed to explain the association between DMFT and age, since the cumulative effect of the disease was disregarded.

Response: Considering the comments of the reviewer, the authors chose to exclude these information and alterations were made in the manuscript.

2.9. The text needs proper English language editing.

Response: Thank you for your suggestion.

Comments of Reviewer #2:

Reviewer's report
Title: Multilevel analysis of caries in underprivileged adolescents of brazilian southeast
Version:2 Date:16 June 2014
Reviewer: Jenny Abanto

Reviewer's report:
Minor Essential Revisions
Methods: - There is no clear in abstract and methods the final sample of the study. This information is confuse.

Response: The comments were taken into consideration and alterations were made in the manuscript.

- The authors used the Brazilian versions of the OHRQoL instruments. If yes, there are not cited in the references, please cite Brazilian validations.

Response: The comments were taken into consideration and alterations were made in the manuscript.
Results: - Provide positive response rate.
Response: This information were included in the manuscript (results section)

Comments of Reviewer #3:

Reviewer's report
Title: Multilevel analysis of caries in underprivileged adolescents of brazilian southeast
Version: 2 Date: 17 June 2014
Reviewer: Kanade Ito

Reviewer's report:
1) This study used many independent variables. Do they have no correlation? I concern about their multicollinearity.
Response: There was no multicollinearity among the variables included in the model.

2) At the survey area, there had a fluoridated public water supply. Water fluoridation might be possible to reduce the oral health inequality. So, subjects of this study may differ from other underprivileged adolescents.
Response: The comments were taken into consideration and alterations were made in the manuscript (discussion section).

The authors are so grateful for the useful remarks and suggestions. They will surely improve our manuscript. We are looking forward to having this revised manuscript reconsidered for publication in the BMC Oral Health.

Yours Sincerely
Fabiana Vazquez