Author’s response to reviews

Title: Status of dental caries and associated factors in Tibetan adults: findings from the fourth China National Oral Health Survey

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Author’s response to reviews:

Dear Editor:

We thank you and the reviewers for your constructive review of our work, as well as the opportunity to submit a revised manuscript. Your suggestions are extremely valuable and greatly appreciated. We have made every effort to address your comments, which has been summarized here and highlighted in red in the revised manuscript.

Reviewer reports:

Jessica Klöckner Knorst (Reviewer 1):

Title:
1. The title is confusing. It also refers to unfulfilled analyzes. Suggestion to replace: "Prevalence of dental caries and associated factors in Tibetan adults: findings from the fourth China National Oral Health Survey".

Abstract:
1. L 12, please replace "correlates" to "associated factors".
A: The "correlates" had been replaced by "associated factors". Line 6 in Page 3.
2. L. 15 the authors mention: "A multistage stratified random cluster-sampling method was used to enroll participants from three groups (35-44, 55-64, and 65-74 years old) recommended by the World Health Organization." Please remove the affirmation "WHO information", as age 55-64 is not within the recommended ages for surveys.
A: Thank you very much for your careful review on our manuscript. We have corrected this error. Line 11 and line 12 in Page 3.
3. Please replace the "+-" to "SD (standard deviation)" throughout the manuscript.
A: the "+-" throughout the manuscript had been removed. And in abstract section the revised version was as follows: The mean DMFT (SD) was 7.62(4.84), 12.46(8.16), and 21.38(8.93).
4. Please add the number of individuals evaluated in this study (results).
A: Number of individuals evaluated in this study has been added in the participant section of abstract. Line 19 to line 21 in Page 3.
5. The conclusion is not supported by your results (please see my comment on the 'discussion').
A: Thank you for your comment. We revised the conclusion as: The status of dental caries in the adults in Tibet is severe and the treatment rate is very low. The study suggests a correlation between crown caries and the variables age, level of education and frequency of tooth brushing; correlation between root caries and residence, income level, frequency of tooth brushing and exposed root surfaces. These findings could be as reference to develop community based interventions to reduce the prevalence of caries in Tibet.
6. Please remove the keyword "risk", as this causal relationship has not been evaluated in the present study. One suggestion is to insert the descriptor "observational study".
A: We have removed "risk" and inserted "observational study" as the key word.

Introduction:
1. In the first paragraph, the authors describe the global burden of dental caries and oral diseases around the world. I suggest including more recent revisions.
A: Thank you for the recommended journals. These two latest systematic reviews clearly analyzed the burden of oral disease especially caries are very heavy. We have added these two journals as he reference of our study.
2. Some passages and paragraphs in the introduction lack references. Please check.
These two references described the effect of national and regional oral health surveys on assess oral health and needs, explore disparities between regions, and plan intervention programs and policies at national and local levels.

3. I suggest the insertion of the conceptual hypothesis, as it guides the investigation itself.
A: Thank you for your suggestion. We consider that this was the first national oral health survey in Tibet and decided that only describe the primary objectives.

4. I suggest following the "STROBE guidelines" to report the study.
A: Thank you for your suggestion. We have referred to "Strengthening the Reporting of Observational Studies in Epidemiology (STROBE): explanation and elaboration".[J]. Annals of internal medicine,2007:W163~W194. The manuscript has been revised.

Methods:

1. I suggest a greater contextualization of the region in which the sample was obtained. Provide more details such as the number of inhabitants, as well as the number of individuals in the assessed age groups.
A: More detailed about Tibet has been described in paragraph 2 of the section ‘Study design and sample selection’. And number of each assessed age group was provided in sample selection.

2. This manuscript used data from a countrywide survey (fourth National Oral Health Survey of China). However, information about the sample size calculation for the outcome of this study is vague and confusing: what were the parameters considered for sample calculation? What was the minimum sample size to satisfy such requirements? According to what the authors describe, the required sample is much larger (4,320) than the one included in the study (n = 476).
A: Thanks for your kindly inquiry. Our study used the data from a countrywide survey (fourth National Oral Health Survey of China). The fourth National Oral Health Survey of China was aiming to determine the prevalence and risk factors of common oral diseases such as dental caries and periodontitis. According to previous study in Tibet, the prevalence of dental caries was greater than 95% among people over 44 years old[1]. The prevalence of dental caries was not the primary research variable in our study. Our study was aimed to determine the DMFT values in different age groups (35-44, 55-64 and 65-74) and different areas (Urban and Rural). Besides, the associated factor analysis was based on the DMFT values. So the sample size was estimated according to the DMFT and DF-root values as the cross-sectional study. The NCSS PASS 11 was use to calculated the sample size. A minimum sample size of 64 in each group should produce a two-sided 95% confidence interval with the precision that is equal to 2.5 when the estimated standard deviation is 10.0(from the third National Epidemiological Survey of Oral Health)[2]. According to our sampling results in Table 1, the minimum sample size was 66, which satisfied the minimum sample size requirements.

3. What does RMB mean? Please explain the acronym and compare the value with dollars.
A: RMB means Ren Min Bi, the legal tender of the People's Republic of China. ¥ 1 is approximately US$0.14.

4. It is necessary to explain how the covariables were collected, categorized and further used in the statistical analysis. Please provide references for the adopted categories (for example the knowledge and attitude of oral health).
A: The categories of covariables were explained in section of ‘Questionnaire survey’, and we added references about the adopted categories. Thanks for your suggestions.

5. The authors write "characteristics of the baseline." For me, this term refers to the idea of more points in time. Please remove the term baseline throughout the manuscript.
A: we have removed the term baseline throughout the manuscript.

6. L. 58 "Since all baseline characteristics were coded as categorical variables, we first used Chi-square test to identify potential factors correlated with higher odds of crown and root caries. The variables with significant P value (P<0.05) was then selected and included in binary logistic regression model to examine their independent associations with crown and root caries." Why? Based on what variables with p <0.05 in the Chi-square test are included in the Logistic Regression? I suggest reviewing this issue. In addition, the logistic regression model has been adjusted?

A: Thanks for your suggestion. We had redone the univariate and multiple logistic regression analysis for all the potential factors for the high DMFT and DF-root value (>75th percentile DMFT value as cut-off and DF-root≥1). When we performed the multiple logistic regression, the model was adjusted for sex, age and residence. The results were listed in the new table 3 and table 4.

7. I suggest performing unadjusted and adjusted regression. In addition, check if logistic regression is the best option (read about Poisson Regression). Ref: Barros, A. J., & Hirakata, V. N. (2003). Alternatives for logistic regression in cross-sectional studies: an empirical comparison of models that directly estimate the prevalence ratio. BMC medical research methodology, 3(1), 21;

A: Thanks for your kindly suggestions. Both of the unadjusted and adjusted regression had been done in this revised manuscript. In addition, considering that this was a multi-stage complex sampling, the multiple logistic regression was applied for the adjusted regression with the Survey logistic procedure of SAS 9.4 (SAS Institute, Cary, NC). The multilevel structure of the sample: individual (level 1) nested into the community/cluster (level 2) were considered as the strata variables in the logistic regression model.

8. In the statistical analysis, the authors used a logistic regression model to assess the predictors of the outcomes. However, sampling was carried out by clusters (districts or communities, for example). Statistical analyses should consider the multilevel structure of the sample: individual (level 1) nested into the community/cluster (level 2). Multilevel models provide the estimation of contextual effects of neighborhood-level variables by accounting for spatial clustering of individuals within areas [Snijders; Boske, 2003]. In this sense, the occurrence of caries can be influenced by the environment where they live. The analysis should be remade considering this factor.

A: Thanks a lot for your thoughtful suggestions. Considering this was a multistage stratified random sampling technique, the multilevel structure of the sample: individual (level 1) nested into the community/cluster (level 2) should be evaluated in the logistic regression. We had redone the logistic regression. The multiple logistic regression was applied for the adjusted regression with the Survey logistic procedure of SAS 9.4 (SAS Institute, Cary, NC). The areas and the communities were considered as the strata variables, that should eliminated the influence by the environment where they live. Thanks again for your thoughtful suggestion.

Results:

1. I suggest that the authors describe the main characteristics of the sample (sex, income) regardless of the level of caries.
The beginning of the results section was revised as follows. A total of 446 were enrolled in the survey and response rate was 100%. Of these, 149, 151 and 146 were aged 35-44, 55-64 and 65-74 years respectively. The majority were Tibetan (433 [97.1%]), while the rest were Han ethnicity (10 [2.2%]) and other ethnic minorities (3[0.7%]).

2. Move the subtitle "Crown caries of Tibetan in three age groups" to after the first descriptive paragraph.
A: The subtitle "Crown caries of Tibetan in three age groups" has been moved to after the first descriptive paragraph.

3. Please replace the "+-" to "SD (standard deviation)".
A: the "+-" throughout the manuscript had been removed.

4. Please replace the subtitle "Correlates of dental caries in the study population" to "Factors associated with dental caries severity".
A: We have replaced the subtitle "Correlates of dental caries in the study population" to "Factors associated with dental caries severity".

5. I suggest adding the adjusted "OR" and CI values in the results section for variables associated with the outcomes. Furthermore, interpret the values observed.
A: Adjusted "OR" and CI values had been added in the results.

6. The "Loss of attachment" variable only appears in the table and results. Please include in the methodology.
A: Loss of attachment may be associated with root caries. CPI was used to detect tooth with CLA. We have added it in methodology.

Discussion:
1. Please replace "Discution" to "Discussion". The manuscript needs a careful revision of the English language.
A: Thank you very much. The mistake has been corrected. We would revise the English language again with the help of Medjaden Bioscience Limited.

2. The discussion should start recapitulating the aims and main results of the study.
A: We summarized key results of the study in the start of discussion according to STROBE guidelines.

3. I suggest not repeating the values of the results again in the discussion.
A: The repeated values of results had been deleted.

4. Pay attention to basic formatting, such as the space between words.
A: Thank you very much. And we have corrected these errors.

5. P. 12, L. 3: "In addition, the higher DMFT index in rural compared to area may indicate the disparity of oral health services, as we as the oral health awareness and educational resources in these two areas." This finding deserves a deeper discussion.
A: In addition, the present survey showed that DMFT index in 65-74 age group of Tibet was higher in rural areas than that in the urban areas (P<0.05). MT index in this age group accounted for 78.86% of DMFT, and was the main component caused difference of DMFT between rural and urban areas. Most of the elderly individuals in rural areas prefer to remove a seriously decayed teeth rather than restoring it, leading to more MT. This situation may result from low income, limited access to dental care services, and limited healthcare knowledge. A revised discussion was presented as above.

6. Why was income not associated with crown decay? This finding is controversial with the literature [Ref: Schwendicke, F., Dörfer, C. E., Schlattmann, P., Page, L. F., Thomson, W. M.,

A: We consider that although OR and CI were showed in all included studies in this systematic review, but specific statistical method were not provided. In our study, results of Chi-square showed that level of income was significant associated factor (P<0.05). After adjusting for age group, educational level, frequency of brushing et al, the effects of income disappeared. This result shows that the effects of income inequality on crown caries appear to be mediated largely by other factors. And this results is similar to Linyan Wang’s study.

7. P.13, L.44: "Our results suggest that more healthcare resources need to be distributed to Tibet, and more programs targeting prevention and treatment of dental caries, as well as educational programs to increase the awareness and knowledge of dental health need to be conducted in Tibet." This statement is not supported by the results of the study. The distribution of healthcare resources was not evaluated. This is an assumption of the authors. Furthermore, are education and knowledge alone sufficient in terms of public health?

A: Thank you for your comment. We have revised the discussion section and the statement had been deleted. The education and knowledge are parts of public health and are not sufficient.


Bruno Emmanuelli (Reviewer 2)

Abstract:
1. With respect to age of participants, authors wrote that the three age groups are recommended by the World Health Organization (WHO), but throughout the manuscript the authors themselves point out that the age group of 55-64 years old is not a WHO recommendation. Please correct this information.

A: The mistake has been corrected in abstract. 35-44 and 65-74 age groups are recommended by WHO. In order to observe the developmental trends of oral disease, the present survey included additional 55-64 age group.

2. In the methodology described in your abstract there is no mention of periodontal evaluation, however, you comment on the attachment loss in the results.

A: Thank you for your suggestion. We have revised in the ‘abstract section’ and ‘clinical examination section’. Detection clinical attachment loss used CPI probe was added.

3. The results described in the abstract could be improved, adding important informations such as the number of individuals assessed, as well as the response rate of the study. Besides that, the way the results are described does not make the direction of the associations clear. Age and brushing frequency were associated to dental caries; but how did this association occur? The greater the age, the greater the odds of having dental caries? Please make your result more clear.

A: Number of individuals has been added in the abstract and results of logistic regression had been revised. The revised abstract was as follows: A total of 446 participants were enrolled in the survey. Of these: 222 (49.8 %) were females, 224 (50.2 %) were males; 149 (33.4 %), 151 (33.9
%, 146 (32.7 %) were aged 35–44, 55–64 and 65–74 years respectively. The caries rate was 98.0%, 98.0%, and 100.0% among three age groups, respectively. The mean DMFT (SD) was 7.62(4.84), 12.46±8.16, and 21.38±8.93, and the mean DMFT of female were higher than that of male. The filling rate was very low in all age groups(1.77%, 0.98%, 0.45%). In age groups of 35-44 and 55-64 years, DMFT were mostly concentrated in the posterior teeth. In all age groups, the root caries rate was 27.50%, 39.70%, and 49.30%, and the mean DF-Root was 0.50±1.04, 1.04±2.02, 1.32±2.14, respectively. Root caries index was 42.27%, 44.78% and 57.60%. Binary logistic regression analysis indicated that older age was positively associated with crown caries in both 55-64 age group (odds ratio = 5.511, 95 % confidence interval: 1.847–16.446) and 65-74 age group (odds ratio = 31.235, 95 % confidence interval: 10.565–92.350). Brushing teeth less than once a day was positively associated with crown caries (odds ratio = 2.394, 95 % confidence interval: 1.398–4.095). Tooth with loss of attachment was positively associated with root caries (odds ratio = 3.941, 95 % confidence interval: 2.101–7.393). High level of income was negatively associated with root caries (odds ratio = 0.521, 95 % confidence interval: 0.314–0.865).

4. If we think that when you quote "caries prevalence" you are referring to the presence of cavitated caries lesions, the second sentence should not begin with "However" since the information contained in that sentence does not contradict the previous information.
A: We have replaced ‘however’ with ‘and’. And the conclusion had been revised as: The prevalence of dental caries in the adults in Tibet is high and the treatment rate is very low. The study suggests a correlation between crown caries and the variables age and frequency of tooth brushing; correlation between root caries and income level and exposed root surfaces. These findings could be as reference to develop community based interventions to reduce the prevalence of caries in Tibet.

5. In the first phrase of the conclusion, line 59, what do you mean with Northeast Tibet? Was there a comparison with other regions? Why doesn't this information appear in the main results? Please review this information.
A: we are so sorry for this mistake. There was no comparison with other regions. This information had been revised.

Introduction:
1. Please standardize the terms used throughout the text. In some sentences you use coronal caries and in others crown caries.
A: We have checked the manuscript and used crown caries as the standardized term.

Material and methods:
Study design and sample size:
1. In this section it is expected to read the sample plan and then the way the participants were selected, however the information appears in reverse.
A: Thanks for your kindly inquiry. Our study used the data from a countrywide survey (fourth National Oral Health Survey of China). The fourth National Oral Health Survey of China was aiming to determine the prevalence and risk factors of common oral diseases such as dental caries and periodontitis. According to previous study in Tibet, the prevalence of dental caries was greater than 95% among people over 44 years old. Our study was aimed to determine the DMFT values in different age groups (35-44, 55-64 and 65-74) and different areas (Urban and Rural). Besides, the risk factor analysis was based on the DMFT values. So the sample size was
estimated according to the DMFT and DF-root values as the cross-sectional study. The NCSS PASS 11 was use to calculated the sample size. A minimum sample size of 64 in each group should produce a two-sided 95% confidence interval with the precision that is equal to 2.5 when the estimated standard deviation is 10.0(from the third National Epidemiological Survey of Oral Health)(2). According to our sampling results in Table 1, the minimum sample size was 66, which satisfied the minimum sample size requirements.

2. In the first paragraph (lines 22 and 24), authors stated "In China, the population aged 55-64 years was bigger than the age groups of 35-44 and 65-74 years". Please quote the reference from which this information was obtained.

A: This section has been revised as: In order to observe the developmental trends of oral disease, the present survey included additional 55-64 age group. Therefore, the current study evaluated the oral health status among three age groups of 35-44, 55-64, and 65-74 years.

3. In the second paragraph (lines 51 and 54) please standardize the terms "gingival bleeding" and "periodontal bleeding". Regarding the sample calculation, was a non-response rate or refusals considered?

A: We have replaced periodontal bleeding with gingival bleeding. 10% non-response rate was considered.

4. The authors comment that they divided the minimum sample size by the number of provinces in China. Are all provinces proportional in terms of size and population density? Sampling should consider the weight (size) of each province for the study participant selection.

A: Thank a lot. Our study used the data from a countrywide survey (fourth National Oral Health Survey of China). The fourth National Oral Health Survey of China was aiming to determine the prevalence and risk factors of common oral diseases such as dental caries and periodontitis. However, our study aimed to determine the DMFT values among adult people in Tibet. The sample size was calculated with the NCSS PASS 11 and the minimum sample size was 64 in each subgroup. A multistage stratified random sampling technique was employed during the sample selection in Tibet. In the first stage, two districts including Lhasa and Xigaze and two countries including Nyingchi and Nagqu were chosen randomly using the Probability Proportional to size (PPS) method. In the second stage, three neighborhood committees in each district and three village committees in each country were selected randomly. In the third stage, participants were recruited by quota sampling.

5. At the end of this section I suggest you make it clear that for your study you only d out in China.

A: The date presented in this study was about population only in Tibet. We added this sentence in the last paragraph of this section.

Quality control

1. What was the methodology followed for the training and calibration of the team of examiners? Please present the reference for these steps.

A: Reference had been inserted in the manuscript. CSA. Manual for the fourth National Oral Health Survey. Series Title. In press 2015

Clinical examination

1. In this section, some evaluations or even the way the variables were considered are not clear.

A: In this section, we added explanation about some variables such as RCI, DMFT and CAL.
2. The use of portable dental chair, quoted in line 32, is not a WHO recommendation.
A: We have revised this section. Instruments for oral examination including plane mouth mirrors; metallic periodontal probes (Community Periodontal Index (CPI) probe) that conform to WHO specifications, i.e. 0.5 mm ball tip; a black band between 3.5 and 5.5 mm and rings at 8.5 and 11.5 mm from the ball tip; and several pairs of tweezers.
3. Please replace "mouth mirrors" (line 34) by "plane dental mirrors", as the WHO recommendation.
A: Plane mouth mirrors are recommended by WHO. The reference is “Oral Health Surveys Basic Methods-5th Edition”.
4. I suggest you to use "caries prevalence" instead of "caries rate" (line 44).
A: Caries rate has been replaced by caries prevalence.
5. Is there a reference to the root caries index (RCI)? If so, please quote it.

Questionnaire survey
1. Are the questions related to the frequency of dessert and sugary beverages consumption validated? Have other studies used this type of question? If so, please quote the reference.
2. Regarding the brushing frequency, why did you use the cutoff point of once/day? The American Dental Association (ADA) recommendation is that brushing must be performed at least twice a day. Please refers to: American Dental Association. Mouth Healthy: Brushing Your Teeth.
A: Thank you very much for your advice. Brushing teeth at least twice a day is a recommended oral health method, but in the present study only 61 adults answered brushing teeth twice a day or above in the questionnaire. So once a day was used as an criteria in the study, and the same classification also was used in other previous research.
3. What was measured in relation to oral health knowledge and attitude? What is a positive or a negative knowledge? What is classified as a positive or a negative attitude? Please provide more information regarding these variables.
A: In the questionnaire of our study, 12 questions regarding attitude and knowledge of oral health were involved. These questions included attitude toward importance of oral health, regular oral examination, relationship of oral disease and self protection, importance of oral disease prevention and knowledge about gingival bleeding, caries, fluoride, pit and fissure sealants and so on. Positive attitude and knowledge means answer these questions correctly &gt;=6, and negative attitude and knowledge means answer these questions correctly &lt;:6. We have added this section in manuscript.
Data Analysis
1. Please replace "date" by "data" in the subtitle.
A: we are so sorry for this mistake. We have replaced "date" by "data" in all manuscript.
2. The description made for caries rate (lines 44 and 46) should appear in the clinical examination section. In that session, when you write "caries rate", it appears that it is related to the DMFT. In addition, it has been suggested previously to replace "caries rate" with caries prevalence.
A: Description of caries prevalence was moved to clinical examination section. And caries rate in our manuscript has been replaced with caries prevalence.
3. In line 56, why do you use the expression "baseline characteristics"? Since all the variables in your study were collected at the same time, I suggest you to remove the term "baseline" throughout the manuscript.
A: thank you for your suggestion, and "baseline" had been removed throughout the manuscript.
4. Rather than performing the chi-square test to check the association between predictors and outcomes, don't you think it would be more appropriate to perform unadjusted logistic regression analysis? This is just a suggestion.
A: Thank you for your suggestion. And results of chi-square test had been deleted. Unadjusted logistic regression analysis had been tested. The results were showed in table 3 and table 4.
5. For your adjusted analysis (binary logistic regression), how were the variables included in the final model? Did you use any conceptual framework? Considering all of the predictor variables at the same level leads to underestimation of the effects of distal determinants of oral health. This can compromise your results. Family income is a characteristic that is not influenced by brushing frequency, for example. The opposite, however, can happen. This needs to be considered in your adjusted model. For more information refers to: C G Victora, S R Huttly, S C Fuchs, M T Olinto. The role of conceptual frameworks in epidemiological analysis: a hierarchical approach. International Journal of Epidemiology, Volume 26, Issue 1, Feb 1997, Pages 224-227, https://doi.org/10.1093/ije/26.1.224.
A: Thanks for your comments. In the revised manuscript, we had done the multiple logistic regression and ten potential factors were evaluated in the model. These factors included: Gender, Residence, Age, Level of education, Level of income, Frequency of tooth brushing, Dental visit experience, Knowledge and attitude of oral health, Frequency of dessert, Frequency of drink with sugar. When one of the factors was the risk or protective factor (P<0.05) , that means the factor was the independent risk or protective factor when other nine factors were controlled in the multiple regression model, that had the same effect when conceptual frameworks were considered with the hierarchical approach in epidemiological analysis(1).
6. Is DF-root presented as a percentage? How is this calculation done?
A: We are so sorry for this mistake. DF-Root is the number of caries and filled teeth. We have removed %.

Results
1. Please when describing your study, call research participants as "participants" and not subjects.
A: Thank you for your advice. All the "subjects" had been replaced with "participants".
2. I suggest you reinforce that the results to be presented refer to the Tibet sample and not to the total number of participants evaluated in the 4th Oral Health Survey in China.
A: The results presented in this section were all about participants in Tibet.
3. Besides that, at the beginning of this section, it is important to highlight the total number of participants, as well as the response rate of the study.

A: Thank you for your suggestion and we have revised as follows: A total of 446 were enrolled in the survey and response rate was 100%. Of these, 149, 151 and 146 were aged 35-44, 55-64 and 65–74 years respectively. The majority were Tibetan (433 [97.1%]), while the rest were Han ethnicity (10 [2.2%]) and other ethnic minorities (0.7%).

4. In the sections that describe the prevalence of caries and the prevalence of root caries I suggest you just checking the grammar. In line 27, insert the number 3 before the 0.7 percentage.

A: Thank you for your suggestion and we would check the grammar carefully. The number 3 has been inserted before 0.7.

5. In the "Correlates of dental caries in the study population" section, if the suggestions made previously, regarding the hierarchical analysis, following a conceptual model, are accepted, it is possible that some results will be changed.

A: Thanks for your constructive suggestion. We had redone the multiple regression analysis. Ten potential factors were evaluated in the logistic model. In the same time, due to the multi-stage complex sampling, the multilevel structure of the sample: individual (level 1) nested into the community/cluster (level 2) were considered as the strata variables in the logistic regression model. And yes, the results changed. The details were showed in table 3 and table 4.

Discussion

1. First, I believe that the discussion does not need to be subdivided into topics.

A: Thank you for your suggestion and subtitles had been removed in discussion.

2. Its discussion in relation to the main results found in the study seems to be quite superficial. More in-depth explanations, based on consistent theories and studies, could be proposed to explain, for example, the fact that women have a higher DMFT index and, especially, a higher rate of decayed teeth than men. Do you really believe that this difference between genders (a socially defined construct) is due to biological differences between the sexes?

A: We have revised some associated factors in the manuscript and for the gender difference, biological differences between the sexes was definitely one important reason. And considering the social property, we added other explanations. This section was revised as follows: The observed gender difference may due to earlier eruption of teeth in females, hence longer exposure to the cariogenic oral environment and easier access to food supplies by women and frequent snacking during food preparation. Other reasons for example lower flow rate of saliva in females than males also could resulted severe caries. Another reason maybe that female are more likely to be affected by autoimmune diseases such as xerostomia and then cause dental caries (2).

3. In the section "Correlates of dental caries and other findings" (lines 56 and 58) you compare those who brush their teeth less than once a day with those who brush more than once a day. Remember that in your categorization there is no such division. You considered who brushed less than a once a day, who brushed at least once a day or more. See the materials and methods section, Questionnaire Survey: "(frequency of tooth brushing [<&lt; once / day, = once / day])"

A: Frequency of tooth brushing was divided into two categories, one is ‘< once/day’, means less than once a day, another is ‘≥once/day’, means at least once a day or more.

4. Still in the section "Correlates of dental caries and other findings" when you comente on the association of income level and root caries your explanations regarding your findings are quite superficial. The socioeconomic factor seems to be underestimated from your point of view. I
suggest you a more in-depth reading about social deprivation theory and how much and in what ways socioeconomic aspects can impact the population's health.

A: Thank you very much and we have learned the references recommended by you carefully. And effects of income level had been revised as follows: In the unadjusted logistic regression analysis, the higher the household income, the higher was the prevalence of caries both in crown and root. Generally, higher household income allowing access to services, which may improve health directly (such as proper oral health preventive services and other treatment measures) or indirectly (such as behaviors). After adjusting for age group, educational level, frequency of tooth brushing, knowledge and attitude of oral health, the effects of income disappeared in crown. This result showed that the effects of income inequality on crown caries experience appear to be mediated largely by oral health-related behaviors.

5. In the "Strengths and limitations" section, line 27, what kind of measurement errors do you refer to? To control these errors, training and calibration are carried out. If you have taken adequate precautions to control this type of error, I do not think it is a weakness of the study.

In addition, the fact that it is a cross-sectional study does not represent a limitation. The absence of a temporal nexus between outcome and predictors is a characteristic of this study design. Your aim was to identify dental caries prevalence and associated factors and, in this sense, a cross-sectional study fulfills its role.

Finally you write that longitudinal studies are necessary to validate your results. Do you believe that your results are not valid? I think you need to clarify your research question for yourselves. Do you want to investigate causal factors or simply identify factors associated with your outcome? If the idea is to understand the causal factors, in this case, another type of design would be essential. However, I believe that this is not your intention and that you will be able to achieve good results with the adopted design.

A: Thank you for your suggestion. In the present study, our aims were to study the caries status and identify associated factors of caries. The limitation in this section was revised as follows: However, we considered that reporting bias was existed in questionnaires of the present study. The majority of detected people were Tibetan and different comprehension of participants caused by language was inevitable.

References: