Author's response to reviews

Title: Nutrient intakes of rural Tibetan mothers: a cross-sectional survey

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Version: 3 Date: 30 August 2010

Author's response to reviews: see over
30 August 2010

Dear Dr Norton,

Re: MS: 1664372890365243-Nutrient intakes of rural Tibetan mothers: a cross-sectional survey

We thank the reviewers for their time and thoughtful comments.

To make the reviewer comments available to all of the co-authors, we have repeated the comments from all of the reviewers below. We have responded to the comments for each reviewer and have indicated the changes made in the manuscript.

Thank you for considering our revised manuscript.

Yours sincerely,

Zhenjie Wang, on behalf of authors

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Response to Reviewer 1

Dear Reviewer,

We are extremely grateful for your review of the manuscript. You have raised a number of important issues. We agree with your comments and have modified our manuscript accordingly, as documented below.

Reviewer’s report:

**Major Compulsory Revisions**

1. *As you mentioned the comparison of your data with NNHS 2002 in the results part and with DRI in conclusions, both of them should be mentioned in the Methods.*

Response: We have added descriptions of the 2002 NNHS and DRIs to the Methods.

2. *Please point out some important results (Medians of intake) in the results part.*

Response: We have described the important results (medians of intake) in the Results.

3. *You mentioned the comparison of your data with 2002 NNHS in the results part, but in the conclusions you concluded about it’s comparing with optimal intake, it would be better to be similar.*

Response: We have made the necessary amendments to ensure consistency in the conclusions.
Response: Thanks for this suggestion. However, we feel that “suboptimal” means less than the highest standard or quality.

4. Please justify why you chose mothers with a child aged under 24 months.

Response: We have described the survey conducted in Lhasa (L67-69 and L86-89).

5. As your target group was mothers with a child aged under 24 months in rural area, please consider the following issues:
   - Please mention your target group exactly in line 73.
   - Did you compare your data with the same group in 2002 NNHS or whole women? If you compared them with whole women, how did you consider the different dietary pattern in your target group?

Response: We have rewritten the description of the survey in Lines 67-69. We compared our data with lactating mothers sampled in the 2002 NNHS. Because we did not describe this clearly in the original version, we have added the description of lactating mothers in the 2002 NNHS intake in the “Nutrient reference values” section (L155-159).

6. In page 5, line 105, please explain how you measured height and weight (tools, situations, ...) by referring to reference.

Response: We have added a description of how we measured height and weight (L110-121).

7. In page 4, Setting and survey part, please describe your inclusion and exclusion criteria.

Response: We have added this information to Lines 104-106.

8. In page 5, line 103, please add you reference for the standardized questionnaire.

Response: We have added this reference (L110).

9. As you compare the nutrition status in this study with 2002 NNHS data, please clarify the following matters:
   - Did the studies have a same questionnaire? According to the references, it seems they were different.
   - Was the study design similar?
   - Did the subjects have a same status?

Response: In the 2002 NNHS, a 24h-recall method was used over 3 consecutive days to document food intakes of the lactating mothers (urban and rural), cross-sectional study.
10. In page 7, line 175, please explain about table 3.

Response: Table 3 presents the top 5 foods frequently consumed in the different food groups. First, we calculated the median of the frequency of consumption for each food in each subgroup. Second, we sorted these frequencies into descending order from the most frequently eaten to the least frequently eaten. Third, we chose the first five frequencies of food consumption to present in Table 3. In some subgroups, food frequency was “less than once per month” (number 2 in parentheses).

11. Page 8, line 176, what is the mean of combination foods?

Response: The phrase “combination of foods presented in Tables” means we calculated the energy, protein, fat, carbohydrate, macronutrients and micronutrients from foods presented in Table 3. In our revised manuscript we have described this more clearly.

12. Page 8, line 176, do the percent show the amount of nutrients intake only from some foods which was presented in table 3? If yes, please explain how did you compare them with the nutrients intake form whole diet in 2002 NNHS and Nutrient Reference Value in table 5, whereas the other foods provide about 25% of energy, ..... 

Response: The percent refers to the nutrient intakes from only those foods presented in Table 3. In the original Table 5 (now Table 4), we present overall nutrient intakes from all foods, and compare these results with the 2002 NNHS.

13. Page 8, line 185-188, please describe about the association of nutrient intake and education and family size.

Response: We now re-describe and adjust the associations among nutrient intake, education and family size (L223-226).

14. Page 8, line 200-201, please bring up the name of “other traditional foods” and “most other foods” in the sentence “Other traditional foods are.......”.

Response: We now describe these foods in detail, and have moved this part to the Results (L206-207).

15. Page 9, line 206-207, The sentence, “Furthermore the combination of foods.......” is not clear.

Response: We have re-written this sentence and moved this description to the Results (L210-211).
16. Page 9, line 217, the sentence in the parenthesis “median of meat, poultry and fish group” is not clear.

Response: We have re-written this sentence (L216-218).

17. Page 9, line 221-222, please explain about comparing the weight of mothers with 2002NNHS data and mention it#s reference.

Response: We have re-written this sentence and added a reference (L269-271).

18. Page 10, line 226-232, please explain more about the food items in the sentences “There were 33 items in these two food groups. However, only seven items had…..”. Also, these results are different with table 3.

Response: We apologize for not describing this clearly. In the vegetables, tubers and starches subgroup and the fruits and nuts subgroup, foods consumed 2-4 times per week were as follows: potato, shallot and sunflower seeds. Those consumed once per week were as follows: Chinese cabbage, hot pepper, tomato and apple. Therefore, there were seven food items.

19. Page 20 and 21, tables 4 and 5, please consider the following matters:
   • What is the difference between these 2 tables, especially about vitamins and minerals?
   • In table 4, what is your purpose about “Percent of median”?
   • Please join together the results in table 4, 5 and figure1 and present them clearly.

Response: Thanks for this suggestion. We have deleted the original Table 4 and Figure 1. The original table 5 is now Table 4 in the revised version.

Discretionary Revisions

1. Page 2, line 35-36, it does not need to bring up data analysis tests.

Response: We have removed the details of the data analysis tests (L37-40).

2. In page 3, line 59, please add the exact percentage of the women who had poor nutritional status and add the reference.

Response: We have added the prevalence of anemia for rural women observed in the 2002 NNHS and the prevalence reported in a study in Tibet to clearly describe the poor nutrition status (L58-64).

3. It is suggested to point out the percent of the energy derived from carbohydrate, protein and fat.
Response: We have added the percent of energy derived from carbohydrate, protein and fat (L 200-201).

**Minor Essential Revisions**

1. **Page 10, line 234, it would be to use “nutrient biomarkers” instead of “nutrient content of the blood”**.

   **Response:** We have changed to nutrient biomarkers. L 267

2. **Page 10, line 242, it should be changed “significance” to “significant”**.

   **Response:** We have adjusted or deleted related description followed by major revisions.

3. **Page 10, line 246, please change “city” to “urban”**.

   **Response:** We have adjusted or deleted related description followed by major revisions.

4. **Page 19, table 3, please add “per week” in the title**.

   **Response:** In fact, the number presented in Table 3 indicates categories of frequency, where 9 = eaten more than 4 times per day, 8 = 2-3 times per day, 7 = once per day, 6 = 5-6 times per week, 5 = 2-4 times per week, 4 = once per week, 3 = 1-3 times per month, 2 = less than once per month and 1 = almost never. Therefore, we have not added “per week” to the title.

**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, but I do not feel adequately qualified to assess the statistics.

**Declaration of competing interests:**
I declare that I have no competing interests
Response to Reviewer 2

Dear Reviewer,

We are extremely grateful for your review of the manuscript. You have raised a number of important issues. We agree with your comments and have modified our manuscript accordingly, as documented below.

Reviewer's report

Title: Nutrient intakes of rural Tibetan mothers: a cross-sectional survey

Version: 2 Date: 1 July 2010

Reviewer: Carl Lachat

Reviewer's report:

Major revisions

The paper describes the food intake pattern of Tibetan mothers. It aims to explore socio-economic differences and compares the diet with the average Chinese diet. The food intake methodology of the paper is adequate for the study. Data on this population are indeed scarce. Various sections require clarification to bring the paper up to standard. In particular
  - Sampling and selection of participants
  - Selection and recoding socio-economic variables
  - The discussion needs to be rewritten. Most of the text needs to be moved to the result section and the findings of the study need to be interpreted more critically and linked to the objectives. Various findings need to be interpreted more carefully with other studies reporting on diets of mothers in remote, rural (high altitude) settings where possible.
  - Limitations need to be acknowledged better.

Abstract

It is unclear how the authors come to the conclusion that more knowledge is needed. There are surely a number of important environmental constraints that play a role in the findings of the study and secondly, nutrition knowledge was not assessed in this study.

Introduction

The justification of the study states that there is no published information on
the diet in Tibet. This is not entirely so
- Kimura Y, et al. Comprehensive geriatric assessment of elderly highlanders in
- Also, did the NNHS survey not report on the diet of Tibet? The discussion needs to compare the findings of this study with the papers (and potentially others) cited higher. The study compares its findings with the 2002 national survey from China. Why was this done? Could the authors not extract information for Tibet from this survey? What methodology was used in the national survey to measure food and nutrient intake?

Response: Thank you for these comments and suggestions. Regarding the selection of participants and sampling, we have revised these descriptions in the manuscript. Also, other aspects of the Methods and Discussion have been rewritten according to suggestions of the reviewers. At present, there are very few published studies focusing on Tibetan diets, as the reviewer indicated. The 2002 NNHS report did not present food or nutrient intake for Tibetans separately. In our study, the 2002 NNHS was used as an average for the whole of China. In the 2002 NNHS, Tibetans made up 0.79% of the total sample size for women aged 18-44. It used a 24h-recall method over 3 consecutive days to collect food intake from lactating mothers.

Methods

The sample size calculations are not clear. The lack of data on nutrients would justify the use of other parameters. Why did the authors not calculate their sample size using estimates on energy intake? There must surely be an estimate from previous studies or the NNHS data. The study needs to detail the sampling better. Simple random sampling was applied. How were the mothers selected for the study? What happened when the women were not at home? What is the bias of selecting rural areas around Lhasa? How can the findings be generalized to the population of Tibet? This should be discussed in the limitations of the study.

Response: We have re-written our description of the survey. Our study included two unique aspects: first, the health status of children aged under 24 months, and the behaviors, attitudes and practices of their mothers’ feeding; and second, the mothers’ nutritional status. When we calculated the sample size, we considered the prevalence of diarrhea first, and then we referred to the sample size for lactating mothers in the 2002 NNHS and published literature. We have re-written the appropriate sections in the revised manuscript L100-103.
The socio-economic variables are poorly described. Why were these variables selected and not others (e.g. employment of the husband, type of house, accumulated wealth and/or livelihoods?) How were the socio-economic variable treated for analysis. Table 6 mentions various groups per variable. Why was it decided to recode the variables in these groups? How were height and body weight measured? What quality control measures were applied? Why BMI < 20 kg/m² to report for underweight (table 1). Please provide a justification for using these cut-offs for BMI categories.

Response: We incorrectly used 20 kg/m² as the cutoff for underweight, and have now corrected this in Table 1 and related sections. Regarding the socio-economic variables, we selected them according to references from nutritional research as they have been found to be associated with food/nutrient intake. We have re-written this section in the revised manuscript. Further, we now provide detailed information about the measurement of height and weight (Lines 110-121).

Line 129. Why use moderate PAL levels? As stated in the results, most women were farming. They were quite likely to do vigorous activities on the field. The lack of an attempt to estimate PAL is a limitation of this study and needs to be discussed.

Response: We now discuss the selection of PAL more fully in the discussion (L288-292).

The paper needs to describe better how the FFQ was adapted to the local context. The authors mention that they added “some Tibetan foods”. More information on the testing and adaptation is needed to warrant the validity of the adapted FFQ (in particular since the recall period is 12 months)

Response: With the exception of unique Tibetan foods, intake of other foods was influenced significantly by dietary habits of the Han nationality. We explored the foods consumed in rural Tibetan thoroughly and found that most foods consumed regularly by Tibetans were similar to those consumed in rural western China. Therefore, we based this FFQ on one we had used in a previous study in the western part of China, but we added some Tibetan food items.

Line 154. Please justify why median values reported and not means#SD. It would be informative to document a measure of spread of the estimates.

Response: Because the nutrient intakes were not normally distributed, we presented median values instead.

Results

It would be interesting to know if the variable were not internally correlated. (for example. years of education, age of the women, family size?)
Although the authors compare their finding wish recommendations for lactating mothers, the paper does not document how many women were breastfeeding. This is a limitation of the study and should be discussed.

Response: We have now added a discussion of this problem.

Discussions

A lot of the text in the discussion needs to be moved to the results. A description of information in the tables needs to be in the results not in the discussion.

Line 196. How did the authors conclude which foods were ‘most consumed’. The list foods most consumed does not correspond with Table 2: Rice, green tea, shallot potato, pork, wheat noodles and sunflower seeds (not all typical Tibetan foods I would think) are as frequently consumed as some of the traditional Tibetan foods mentioned.

Response: We have re-written the relevant description (L231-233).

Line 225. Why do the authors conclude that it is the frequency that leads to the low intakes of vitamins? Can it not be the quantity?

Response: We inferred that there may be vitamin deficiencies based on the low frequency of vegetable and fruit intake.

Line 251-252. This information is not presented and the conclusion drawn from it is speculative

Response: There was confusion here with the main result presented; therefore, we have deleted the related sentences.

Line 267-269. The link with nutrition education is speculative (see higher)

Response: We have deleted the original sentences and have rewritten this section.

MINOR

The authors should consistently refer to the diet of Tibetan mothers with young children instead of “the Tibetan diet”. (e.g. 191).
Response: We now consistently write “the diet of Tibetan mothers with young children” instead of the “Tibetan diet” in the text.

Line 29. Later in the text, it is mentioned that the authors are not aware of any studies. Please clarify. The methods should include the food intake methodology.

Response: We now include in the Methods the food intake methodology (L35-37).

Line 45. This statement is very general and not informative

Response: We have rewritten this, and have given more information (L46-48).

Lines 73. The findings of the study were compared to the results of the NNHS survey. Did these findings refer to the entire Chinese population? Adults only? Or lactating mothers. This should be clearly stated and any potential bias should be discussed.

Response: We compared our results with those of lactating mothers from the 2002 NNHS. We have rewritten this text.

Line 117. How were food groups classified?

Response: In food composition tables, the food groups were classified into 21 subgroups of food. In current analysis, we combined 21 food groups into 6 dietary food groups followed by local dietary habit.

There are various inconsistencies in the nutrients reported. (Table 2, line 133 and line 121) Line 121 mentions which nutrients were included in the analysis as a reference but in line 133, various others are listed. It is not useful to report reference values for which no analysis can be conducted and will not be reported. Did the food composition table contain all the data for these micronutrients for the foods consumed by the mothers? If not, what was done?

Response: Thank you for these comments. The food composition table contains all the required data, with the exception of Tibetan cream tea and Tibetan milk tea. For these two food items, we calculated the average consumption of local recipes.

Line 133. What does it mean ‘we chose the middle of the range’?

Response: Because there is a range of recommended values for fat (63.4-95.0g), and carbohydrate (379.2-448.2), we chose the median of the range as the recommended value in the present analysis (L149-150).
Line 170 Please make sure the figures in the text are consistent with the table. If I add the % contribution from the staple foods (wheat products, rice and naked barley) in Table 2, I get a total of 60.9% not 64.1% as mentioned in the text. (same for protein, fat..) Why do the figures not add up to 100%?

Response: In a normally-distributed dataset, the value of median equals the mean, and the sum of the subgroups is 100%. However, in our asymmetrically distributed dataset, the mean and median are not equal, and the proportions cannot equal 100.

Line 185. Rephrase? Nutrients do not have intakes.
Table 1: Recode =0 into <1
Table 1: Report the family size in the text instead of the table. The column details the n and % and adding the median to the table makes it confusing.
Table 2 and Table 5 overlap. Table 2 could be reduced substantially by tabulating only the % contribution. The reader can calculate the absolute contribution with the figures from Table 5. Same remark for Table 6
Table 2 and table 3: what I meant with “/”?
Table 2: why were drinks and snacks combined in one food group? The same for fruits and nuts?
Table 6: why was family size categorised like this?
Table 6: Use symbols to indicate statistical differences in the table with the respective figures. The figures repeat the results in Table 3 and Table 5 and can be omitted.

Response: Thank you for noting these problems. In the tables, “/” means there is no value. Family size was classified by quartile rage. The original Table 4 and Figure 1 have been deleted.

Lines 191-193. The explanation on the lack of findings on the diet of Tibetans is speculative and should be omitted.

Response: We have deleted these sentences.

Line 195. Which findings support the statement that the diet is unbalanced? In terms of what?

Response: We re-written this part and added more evidence from our survey (L235-236).

Line 222. The objective of this study was to compare diets and nutrients in take with the NNHS study not nutrition status.

Response: We have added the description of 2002 NNHS nutritional status and have included a reference (L269-271).
These references essentially related to high income countries. Is the comparison with Tibet valid? There are surely papers detailing findings from rural areas of low and middle income countries.

Response: In the 2002 NNHS, there were almost no differences in nutrient intakes between urban and rural samples.

Line 250. Please rephrase. This statement is not clear

Response: We have adjusted or deleted related description followed by major revisions.

Line 254. What is an ideal diet? Please rephrase.

Response: We have adjusted or deleted related description followed by major revisions.

Line 255. Nutrition knowledge was not assessed in this study.

Response: We have adjusted or deleted related description followed by major revisions.

**DISCRETIONARY REVISIONS**

Line 64. Omit the statement on the cold temperatures and hypoxia; this bears not relation with the objective of the study and is not further discussed.

Response: We have deleted this sentence.

Lines 70-72. The reference to the grant number can be omitted since this information is already included in the acknowledgments

Response: We have deleted the grant number in this section (L70-72).

Line 74. Use associations instead of relationship. Causality cannot be inferred from this study.

Response: We have replaced relationship with association (L74).

Line 98 -101 should be deleted.

Response: We have deleted these sentences.

Line 125. What are food components (nutrients?)

Response: We did not express this clearly, and have rewritten this sentence (L141).
Line 214. Please discuss bioavailability of iron and zinc from these foods.

Response: We have added a discussion of bioavailability of iron and zinc (L242-250).

Line 233. It is not clear to me why the researchers wish to use blood samples.

Response: We can determine the nutrient content in serum. It will be useful for advanced research.

Line 243-244. Please provide reference.

Response: We have adjusted or deleted related description followed by major revisions.

Line 259. Why is the research urgent?

Response: We have adjusted or deleted related description followed by major revisions.

**Level of interest:** An article of importance in its field

**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.

**Declaration of competing interests:**
I declare that I have no competing interests.