Author’s response to reviews

Title: Urban-rural-specific trend in prevalence of general and central obesity, and association with hypertension in Chinese adults, aged 18-65 years

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Author’s response to reviews:

Dear Dr. Xu,

Many thanks for your kind letter dated 22 Nov 2018. We are very grateful to your and the reviewers’ time and thank for your comments that are very useful for our manuscript. Thank you very much for giving us an opportunity to revise the manuscript.

We have revised the manuscript following your and reviewers’ comments, which are presented below:
List of Actions

LOA 1: Sending our manuscript to the AMERICAN JOURNAL EXPERTS to promote English expression. (Certificate Verification Key: 7CE1-29DA-4293-0946-1541)

LOA 2: Pointing out the data of CHNS is public in the Methods section. (Methods section, line 4, page 5)

LOA 3: Changing the expression in discussion. (Discussion section, line 16, paragraph 2, page 10)

LOA 4: Adding a comment in our limitations section. (Discussion section, line 10, paragraph 5, page 11)

LOA 5: Updating the number of obesity population in China from Chinese Residents Nutrition and Chronic Disease Report 2015. (Background section, line 2, paragraph 1, page 4)

LOA 6: Making the expression more clearly. (Background section, line 7, paragraph 2, page 4)

LOA 7: Revising the axis label in Figure 1, please see Figure 1.

LOA 8: Updating the reference#2

Response to Technical Comments:

Comment: We have noticed that Dr. Xingxing Tao's email address in the manuscript file differs from the email address entered in the submission system. Kindly correct the said error.

*Submission system: singingtao@outlookl.com

*Manuscript file: singingtao@outlook.com

[Response:] We are very sorry for the said error, we have corrected Dr. Xingxing Tao's email address: singingtao@outlook.com in the submission system.

Responses to Editor

Comment: Meanwhile, I have one concern that a native English speaker shall be invited to edit the language throughout your manuscript.
In order to make our manuscript more readable, we have sent our manuscript to the AMERICAN JOURNAL EXPERTS to promote our English expression. See LOA 1.

Responses to Reviewers

To Reviewer 1:

Comment 1: In the part of Method, it's better to clearly describe that this study used the public database rather than the authors' original research.

[Response:] Thank you for pointing this out, we have added a sentence “The data of CHNS can be used freely after registering at the official website (https://www.cpc.unc.edu/projects/china).” in the part of Methods. (Methods section, line 4, page 5)

Comment 2: In the part of Abstract, you mentioned "Participants with both central and general obesity had the highest risk for incident hypertension from normal…". Due to the limitation of the cross-sectional study design, you can't get the incidence of hypertension. Also, you should be cautious to perform causal inference based on the cross-sectional survey.

[Response:] This is a very important comment. Actually, we have noticed the limitation of cross-sectional study design when we conducted our study. We only calculated the prevalence of obesity and hypertension, and pointed out the potential link between obesity and hypertension. We did not give a causal inference. We have changed the expression in discussion. (Discussion section, line 16, paragraph 2, page 9)

Comment 3: In the figure, you describe the horizontal coordinates as "Mean Waist circumference (WC)" and "Mean Body Mass Index (BMI)". In fact, the plots showed the distribution of WC or BMI rather than the mean.

[Response:] In fact, as we mentioned in the Methods section, the blood pressures were measured three times, we used the mean value in this study. But, in order to avoid misunderstanding, we have revised the axis label, please see Figure 1.

Comment 4: Multiple language errors should be corrected before publication.
To Reviewer 2:

Comment 1: There are many articles studying on the relationship between all kinds of indicators of obesity and blood pressure. For example, the CKB project utilized more obesity indicators to analyze the relationship between obesity and blood pressure. The paper only analyzed a few obesity indicators to analyze the relationship with blood pressure, which is difficult to deeply explore the relationship between obesity and blood pressure. The result is too simple and the evidence is weak.

[Response:] Actually, we recognized that our study is a cross-section study and can not deeply explore the relationship between obesity and blood pressure, but our study provides further evidence that obesity may be a risk factor for hypertension.

Moreover, the highlights in our study are that we found the prevalence of obesity increased more rapidly among rural adults than that among urban adults, the prevalence of central obesity only and both central and general obesity in rural adults exceeded that in urban adults in 2011.

We have added this important comment in our limitations section. (Discussion section, line 10, paragraph 5, page 11)

Comment 2: As far as I know, the investigation has been carried out in recent years. Why did you only use the data in 2011 instead of the latest data? The data of 2011 is relatively old, which is difficult to explain the current problems.

[Response:] The latest survey of CHNS was in 2015, but the data of 2015 was released at May 30 2018, when we have already completed our research. Besides, the 2015 survey only disclosed a part of the data. If possible, we will continue our study to pay attention on the changing trend of obesity in urban and rural residents in China when the whole data of 2015 is disclosed.

Comment 3: The description of the study design is not in detail, neither the description of the sampling and data analysis method of other published survey.

[Response:] Since the description of study design in our manuscript is referred from the official document of CHNS, and considering the level of overlap, we did not introduce very detailed.
This information can be easily found on the official website of CHNS: https://www.cpc.unc.edu/projects/china/about/design/survey. The description of survey design is presented below:

“A multistage, random cluster process was used to draw the sample surveyed in each of the provinces. Counties in the nine provinces were stratified by income (low, middle, and high) and a weighted sampling scheme was used to randomly select four counties in each province. In addition, the provincial capital and a lower income city were selected when feasible, except that other large cities rather than provincial capitals had to be selected in two provinces. Villages and townships within the counties and urban/suburban neighborhoods within the cities were selected randomly. The primary sampling units have increased to 360: 60 urban neighborhoods, 60 suburban neighborhoods, 30 towns, and 180 villages.”

Comment 4: Too many references were cited from your own survey, and few or no references with national representativeness are cited.

[Response:] This is a very good comment. Due to the CHNS is a national wide survey and the data of CHNS is public, many publications are based on this survey. This situation maybe tell us two things: 1) The data of CHNS is reliable, but there is lack of another national wide survey to use to study the obesity problem in China. 2) Every coin has two side, as you mentioned, too many researches used data from same survey so that we can not get evidences from other sides to prove the real problem. We have mentioned in limitations.

Comment 5: The determination of obesity is based on Chinese standard, while the determination of central obesity is based on other country's standard, which is unreasonable.

[Response:] The reason why we choose the International Diabetes Federation's standard instead of Chinese standard to define central obesity are that:

1) International Diabetes Federation's standard is a globally standard that is suitable for worldwide

2) Chinese standard of central obesity is usually recommended from “China Guideline for Type 2 Diabetes” and “Guidelines for Prevention and Treatment of Hypertension in China”, but the cut point for central obesity for Chinese adults is derived from the WHO and International Diabetes Federation and was not uniform in previous years. Different literatures recommend different standards.

3) Some researches use the International Diabetes Federation's standard to define the central obesity, such as “Niu, J. , & Seo, D. C. . (2014). Central obesity and hypertension in chinese

Therefore, we think choose the International Diabetes Federation's standard is reasonable.

Comment 6: Have you combined the data of several years to carry on multi-factor logistic analysis in the paper? Its rationality should be considered. Some important risk factors, such as physical activity and diet, were not adjusted. Therefore, the reasonableness of the results in table 3 is questionable.

[Response:] In fact, we pooled the data of seven years for analysis in our study, because the logistic regression will overestimate the risk value, so we selected the log-binomial model that is more suitable.

As you mentioned, the physical activity and diet are important risk factors for obesity, the reasons why we did not control these factors in our regression are presented below:

1) In the process of exploratory analysis, we controlled the physical activity, but physical activity has very little impact on the outcome.

2) The relationship between physical activity and obesity is complex, we are not certain that whether reduction in physical activity leads to obesity or obesity people have less physical activity.

3) Because diets, such as energy-intensive food intake, are associated with obesity, so we think that the obese variable in the regression model already includes variations of diets. To include the diets as control variables may bring multi-collinearity problem.

Comment 7: The English expression needs further modification.

[Response:] Thank you very much. We have recognized our language expression is a serious problem, we have sent our manuscript out for professional English editing, please see LOA 1.

Comment 8 (In PDF file): It's not the latest representative data of China, which can not estimate the national prevalence. Please refer to the Chinese Residents Nutrition and Chronic Disease Report 2015.
[Response:] Thank so much for your reminder, we have updated the data from Chinese Residents Nutrition and Chronic Disease Report 2015. (Background section, line 2, page 4)

Comment 9 (In PDF file): Whether the data of the WC and BMI in normal distribution? If not, why use mean instead of median?
[Response:] As shown in the figure 1, it is clearly that the distribution of BMI and WC is normally distribution, so we think use mean is better.

Comment 10 (In PDF file): The references#13 is not found. Please verify whether it is wrong.
[Response:] The references#13 can be found here: [https://www.sciencedirect.com/science/article/pii/S2095927316305886]

Comment 11 (In PDF file): Are the sampling weights adjusted during the calculation of the rate and the mean? Please describe in detail.
[Response:] To be honest, we did not adjust the sampling weights when calculate the rate and the mean, because the CHNS has not released the sampling weights. However, we estimated prevalence that was age-standardized to 2010 Sixth National population census of Chinese adults by the direct method.

Furthermore, we have run mixed-effects models adjusted for clustering within communities and households, this is recommended by the CHNS team. We have described in the Statistical analysis section.

Once again, thank you and all the reviewers for the kind advices. If there is more question, we are willing to revise it again.

Yours sincerely,

Zhongliang Zhou