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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Version: 5 Date: 03 May 2019

Author’s response to reviews:

Dear Editor Barling,

Many thanks for your letter and for your and reviewers’ comments concerning our manuscript entitled “Urban-rural-specific trend in prevalence of general and central obesity, and association with hypertension in Chinese adults, aged 18-65 years” (PUBH-D-18-02269). Your suggestions really made our manuscript better and more readable. We have carefully studied the comments and have made the correction which we hope meet with approval. We have revised the problems that you and reviewers pointed out. The main corrections in the paper are as flowing:
List of Actions

LOA 1: Updating the clarifications on contributions of DL, DT Z and WY D in Authors’ contributions section, that is “DL, DT Z, and WY D provided language help and analysis assistance and gave significant suggestions in the process of revising”. (Authors’ contributions section, line 2, page 13)

LOA 2: Revising the sentence “The CHNS data can be used freely after registering at the official website (https://www.cpc.unc.edu/projects/china)” to “The CHNS data and questionnaires can be used freely after registering at the official website (Data: https://www.cpc.unc.edu/projects/china/data, Questionnaires: https://www.cpc.unc.edu/projects/china/data/questionnaires ).". (Methods section, line 3, page 5)

LOA 3: Adding a sentence in the Availability of data and materials section, that is “The CHNS data and questionnaires are publically available, everyone can be used freely after registering at the official website” . (Availability of data and materials section, line 4, page 13)

LOA 4: Adding two sentences in Background “However, in 2013 in China, the overall blood pressure control rates of adults with hypertension was only 9.7%. Abnormally high blood pressure can lead serious health problem. In 2013, high systolic blood pressure caused 10.4 million deaths and 208.1 million disability-adjusted life years in the world”. In addition, adding a reference #4. (Background section, line 7, paragraph 1, page 4)

LOA 5: Revising the sentence “in 2002, there were 153 million adults” to “in 2002, there were 153 million adults with hypertension”. (Introduction section, line 6, paragraph 1, page 4)

LOA 6: Changing the sentence “Student's t-test was used to compare the difference in body weight means between urban and rural individuals” to “Student's t-test was used to compare the difference in BMI, WC, SBP, DBP, and age between urban and rural individuals”. (Statistical analysis section, line 5, page 7)

Response to Assistant Editor Comments:

Comment 1: See the associate editors comments below.

[Response:] Please see the responses below.

Comment 2: See the associate editors comments below.
[Response:] We have added a statement in the Authors’ contribution section to point out the contributions of DL, DT Z and WY D. In fact, they have made many substantive intellectual contributions, such as analysis assistance significant suggestions about revision. See LOA 1.

Comment 3: Questionnaire: Please reference the original questionnaire that was used to obtain the original data under 'Methods'.

[Response:] We have added a website reference (https://www.cpc.unc.edu/projects/china/data/questionnaires) to the original questionnaire used in our study in Methods. See LOA 2.

Comment 4: Data Permission: Please state whether the data obtained for your study was publically available under 'availability of data and materials'. If data is not publically available please state any permissions obtained to access the data.

[Response:] Thank you for noting us, we have added a sentence in the Availability of data and materials section, that is “The CHNS data and questionnaires are publically available, everyone can be used freely after registering at the official website”. See LOA 3.

Comment 5: Clean Manuscript

[Response:] We have made our manuscript clean.

Responses to Associate Editor Comments:

Comment 1: Our reviewer 3 provided very good comments to this manuscript. I think some (not all) of them need to be responded by authors...

[Response:] Thank you very much for editors’ work and reviewer’s very good comments. In order to make our study clearer, we try to respond to all comments, including essential revision that the editor recommended.

Responses to Reviewer 3:

Comment 1: Introduction: 1). Please add more background information about descriptive epidemiology of hypertension to highlight the significance of the study.
[Response:]. Thanks for suggestion. We have added control rate of hypertension and result of hypertension in Introduction section. See LOA 4.

Comment 2: Introduction: 2). "in 2002, there were 153 million adults" This statement sounds like the total adult population of China in 2002=153 million. Please rephrase.

[Response:] Thank you for pointing out this. We have revised that description to “in 2002, there were 153 million adults with hypertension”. See LOA 5.

Comment 3: Methods: 1). The rationale for unweighted analysis is not clearly specified. Is the weight variable available in the CHNS dataset?

[Response:] A reviewer in last round has raised a similar comment. We have considered this problem, because the CHNS has not released the sampling weights. So there is no weight variable in the CHNS dataset, 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.

Comment 4: Methods: 2). Did participants also self-reported SBP and DBP?

[Response:] As the SBP and DBP are anthropometrical measurements indicators, no self-reported SBP and DBP in the CHNS dataset.

Comment 5: Methods: 3). It is unclear why the authors only used the t-test to compare body weight factors? What about other variables?

[Response:] Actually, we used a student t-test to compare the difference in BMI, WC, SBP, DBP, and age between urban and rural individuals, we have noted that under the Table 1. In order to make the description clearer, we have revised here. See LOA 6.

Comment 6: Methods: 4). "..adjusting smoking, drinking, gender, survey year, and age, which have been recognized as factors of hypertension" Do the authors mean 'risk factors'?
[Response:] Smoking, drinking can be recognized as risk factors of hypertension, however, although gender, survey year, and age influence the incidence of hypertension, it is not appropriate to name these variables as risk factors.

Comment 7: Methods: 5). The authors may consider performing subgroup analysis by urban vs. rural region? Perhaps there is an interaction between obesity and the region in relation to hypertension.

[Response:] This is a very significant suggestion, the influence of urban-rural dual structure on hypertension is complex in China, as the reviewer mentioned, there may be an interaction between obesity and the urban-rural in relation to hypertension. We are also interested in the mechanism of effect of urbanization on chronic disease, however, we firstly conducted this study to explore the impact of urbanization in China on the prevalence of different types of obesity and the association with hypertension. If available, we will use a longitudinal data in next study to explore the casual relationship of urbanization influencing the prevalence of chronic disease.

Comment 8: Results: 1). It is unclear if the results of the t-test analysis were reported.

[Response:] We think the reader can clearly find the results of the t-test in Tabel 1, and we have revised the description in Method section. See LOA 6.

Comment 9: Discussion: 1). "Another aim of our study was to estimate the risk of hypertension with the three types of obesity and to compare the differences between adults in urban and rural areas" This should be described in the methods.

[Response:] Thank you for pointing this out. We gave our research questions at the end of the Introduction section. The reason we mentioned again here is to make our article read more smoothly.

Comment 10: Discussion: 2). The discussion section would benefit from at least a brief discussion of the biological mechanism underlying the association between obesity and hypertension?

[Response:] We think our study can not provide much more information about the biological mechanism of association between obesity and hypertension, so we are not sure it is suitable to discuss the biological mechanism in our study comparing with social-economics and epidemiology of obesity and hypertension.
Comment 11: Discussion: 3). A notable limitation is the self-report measure of hypertension.

[Response:] We had noticed potential bias of self-report measure of hypertension, therefore, we used a self-reported doctor diagnosis of hypertension combined with measured SBP and DBP to identify hypertension. Details can be found in the Method 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