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 Editor Xu,

Thank you very much for your letter and for the 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). We have studied comments carefully and have made the correction which we hope meet with approval. We have revised the problems that you pointed out. The main corrections in the paper are as flowing:

Technical Comments:

1. 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.
RESPONSE: We have corrected Dr. Xingxing Tao’s email address in the submission system as same as in manuscript file (singingtao@outlook.com).

Editor Comments:

METHODS:

1. You stated that "We used data from a cohort study across 18 years in China to conduct our study." However, you also addressed that you used data from 7 waves of CHNS. Please clarify what exact data (cohort or cross-sectional data?) you used in the present work. I guess what you used were cross-sectional data.

RESPONSE: We checked the official description on the website of CHNS (https://www.cpc.unc.edu/projects/china). It describes that the China Health and Nutrition Survey (CHNS) is an ongoing open cohort, international collaborative project. However, we used the cross-sectional data of this survey in our study. In order to avoid the misunderstanding, we revised this sentence “We used data from a cohort study across 18 years in China to conduct our study.” to “We used cross-sectional data from a survey across 18 years in China to conduct our study.”

2. The sampling approaches should be addressed in detail, although they might be described elsewhere. Whether the sampling methods were the same for all the seven-wave surveys? what were the response rates for those surveys?


According to the article, we have added some details in the section of Methods, that is “In each province, counties and cities were stratified by income (low, middle and high), four counties and two cities were randomly selected by a weighted sampling scheme. In the selected counties, villages and townships were randomly selected. In selected cities, urban and suburban neighborhoods were randomly selected. 20 households all household members were randomly selected and interviewed in each community.”

The response rates for each survey were also reported in that article, the result is as below:

Individual: in 1989, 1991, 1993, 1997, 2000, 2004, and 2006, the response rates were 100%, 88.1%, 88.2%, 80.9%, 83.0%, 80.2%, and 88.0%, separately.
Household: in 1989, 1991, 1993, 1997, 2000, 2004, and 2006, the response rates were 100%, 94.9%, 93.5%, 79.3%, 89.4%, 85.9%, and 89.9%, separately.

3. Please show the balance test for the main socio-demographic characteristics of those responded and not responded in the surveys?

RESPONSE: As we only can download the data about responded participants, we cannot provide the balance test for the main socio-demographic characteristics of those responded and not responded in the surveys.

4. All variables (outcome, independent variable, and covariates) involved in your study should be well-defined.

RESPONSE: In our study, the outcome variables were the prevalence of obesity and hypertension, and independent variables were smoking, drinking, gender, survey year, age. We have defined each variable in the section of Study variables. In order to make the reader see more clearly, we have added a description about the outcome and independent variables at the end of section Study variables.

5. All those people with elevated blood pressure measured at a survey site by research members NOT by physicians were not able to be recognized as hypertensive patients. Diagnosis of hypertension shall be made by registered physicians with consideration of clinical symptoms using standardized procedures.

RESPONSE: In fact, the blood pressure of each participant was measured three times by well-trained physicians NOT by research members in CHNS surveys. In addition, recommended to “Guidelines for Prevention and Treatment of Hypertension in China (Revised 2017)”, a person can be diagnosed as hypertension when a measured mean systolic blood pressure ≥ 140 mmHg or diastolic blood pressure ≥ 90 mmHg.


Therefore, we think it is reasonable to use the blood pressure data from CHNS to make a diagnosis of hypertension.
6. Very important, please clearly define the term "prevalence ratio" in your work. Was it a widely-accepted term?

RESPONSE: Prevalence ratio (PR), the same as Odds ratio (OR), is an estimation of the Relative ratio (RR). PR is widely used in the log-binomial model and is a widely-accepted term in Epidemiology. Such as in the following publications:


GAO Yan-hui ZHOU Shu-dong LI Li-Xia YANG Yi CHEN Yue. Statistical methods on the estimation of relative risk or prevalence ratio. China journal epidemiology (In Chiese). 2013. 34(9): 935-939

STATISTICAL ANALYSIS

1. Mixed-effects models should be used with adjustment for clustering effects, and energy-densed food (e.g., redmeat) intake should be considered as a major confounder of hypertension in the analysis.

RESPONSE: Thanks for your comments, we re-run mixed-effects models adjusted for clustering within communities and households using GENMOD procedure in SAS. We have changed the result of mixed-effects in Table 3 in the revision. The results of the mixed-effects model are similar to ordinary models, which indicates that the model results in our study are robust.

The reasons why we did not include the food intake as a confounder are that 1) the energy-dense food intake is also related to the obesity, and obesity is already an independent variable in our models; 2) we did not find an exact variable to evaluate the energy-dense food intake.

RESULTS

1. Please present some information on data quality, e.g., the difference in selected socio-demographic factors between respondents and non-respondents for the surveys. Were the data used in your work representative of general population in China?

RESPONSE: As mention before, we can not present the data of non-respondents, but several other information can indicate the high quality of data of CHNS. First, the CHNS is conducted by Carolina Population Center at the University of North Carolina at Chapel Hill and Center for Disease Control and Prevention (CCDC), and an international team of researchers whose backgrounds include nutrition, public health, economics, sociology, Chinese studies, and
demography take the responsibility for collecting data. Second, more than 1000 articles have been published using the data from CHNS.

The CHNS is a national survey that draw a sample of about 7,200 households with over 30,000 individuals in 15 provinces and municipal cities, and the CHNS used a strict multistage, random cluster process. Therefore, we used the data of CHNS without re-sampling, our study can represent the population aged 18-65 years in China.

2. Table 2 and Figure2 displayed the same findings. Please remove one of them.

RESPONSE: We have removed the Figure 2.

DISCUSSION

Generally, this section was a little bit weak, and limitations were not well discussed.

1. Authors stated that "The positive relationship between hypertension and obesity has been reported in many studies widely [29, 30]." Please note you just cited two NOT many references.

RESPONSE: Thank you for noting this, we have revised this part, please see in revision.

2. Please double check your statement "We found that the risk of hypertension among the three types of obesity in urban adults is: both central and general obesity > only general obesity > only central obesity, in urban adults is: both central and general obesity > only central obesity > only general obesity." Was this conclusion able drawn from your study?

RESPONSE: Thank you very much for notice, we have revise the second “urban” to “rural” , please see in revision.

DISCLOSURE

Please clarify the University of North Carolina at Chapel Hill approve your present work or the original 7-wave surveys?

Again, please clarify NIH support your present work or the original data collection surveys?

RESPONSE:
The data of CHNS can be used freely after registering at the official website (https://www.cpc.unc.edu/projects/china), and the website provide a uniform acknowledgment, such as:

“Please use the following acknowledgment in all publications resulting from use of the China Health and Nutrition Survey data: This research uses data from China Health and Nutrition Survey (CHNS). We thank the National Institute for Nutrition and Health, China Center for Disease Control and Prevention, Carolina Population Center (P2C HD050924, T32 HD007168), the University of North Carolina at Chapel Hill, the NIH (R01-HD30880, DK056350, R24 HD050924, and R01-HD38700) and the NIH Fogarty International Center (D43 TW009077, D43 TW007709) for financial support for the CHNS data collection and analysis files from 1989 to 2015 and future surveys, and the China-Japan Friendship Hospital, Ministry of Health for support for CHNS 2009, Chinese National Human Genome Center at Shanghai since 2009, and Beijing Municipal Center for Disease Prevention and Control since 2011.”

Therefore, we think we have obtained approval from University of North Carolina at Chapel Hill and NIH when we registering at the official website.