PEER REVIEW HISTORY

ARTICLE DETAILS

TITLE (PROVISIONAL)	Exploring the association between urbanization and self-rated health of the older adults in China: Evidence from a national population sample survey
AUTHORS	Liu, Ye; Huang, Baishi; Wang, Ruoyu; Feng, Z; Liu, Yuqi; Li, Zhigang

VERSION 1 - REVIEW

REVIEWER	Richard Shaw Institute of Health and Wellbeing, University of Glasgow, UK
REVIEW RETURNED	01-Feb-2019

GENERAL COMMENTS	Overall this a reasonably well-written paper that investigates if the relationship between urbanisation, measured at prefecture-level cities, is associated with self-rated health in 236,030 individuals age 60 to 79 in China. The Introduction and discussion sections are well argued. The use of multilevel models are appropriate, and overall it would appear to be a good paper, but some minor improvements could be made. A concern is the lack of reporting on the recruitment rate of the original survey, and the lack of detail on the amount of missing data for variables and how this was handled. If there is poor recruitment or high rates of missing data these need to be flagged in the limitations section. Generally most of my concerns are pretty minor. Overall “Land use conversion” tends to be used in the text but “ratio of urban built-up areas” tends to be used in the tables. As somebody who is not familiar with the area I found the switch between the two somewhat confusing w, and the paper would be easier to read if the terms were more consistent. Page 2: Overall the abstract is well written but not necessarily in the right style for BMJ Open which has a 300 word limit and the instructions for authors suggests that Odds ratios and 95% confidence intervals should be included for the main results. Page 5: Could you please provide a bit more of an explanation of what “hukou status” , primary endowment insurance, and basic medical insurance are. I do not know the Chinese system well

	enough to understand them and particular the difference between the Attended / Did not attend are. Page 8: The covariates for some of the area level covariates were difficult to interpret. The high level of significance combined with small odds ratios suggest the wrong scale is being used to present the results. Also the results for house area at the bottom of table 2 are problematic. T OR of 0.99 lies outside the (95% 1.00 to 1.00) confidence interval. I found the format of the results presented in the text e.g. “OR (95% CI) = 0.93 (0.87-0.99)” difficult to read and would suggest the authors present them differently.

REVIEWER	Katarzyna Zawisza Jagiellonian University, Poland
REVIEW RETURNED	15-Apr-2019

GENERAL COMMENTS	The aim of the study was to verify the association between level and rate of urbanization and self-rated health status of older people in China. Additionally, the level of education was analyzed as a potential effect modifier of the relation between urbanization and self-rated health. The following points describe areas for improvement: 1. Introduction part/ the last paragraph: the description of the aim of the study does not include information about the analysis of interaction between the level of education and urbanization. In this paragraph are pointed the strength of the study which should be rather placed in the discussion part. 2. Results part/ first paragraph: There is the following statement :“Respondents were more representative of the younger elderly cohorts”, but the fact that there was more younger people under study does not necessarily mean that this group is more representative. Besides, there is no information about Response Rate. 3. There is no information about participants’ consents. 4. Table 1.: The table presents the descriptive statistics of the whole sample. It might be more informative for the research question if the authors present these statistics across the outcome variable groups. 5. Discussion part: Some definitions are place twice in the paper e.g. “salmon bias”. 6. The term elderly might be perceives as ageism and is often used to describe frail individuals. There are some recommendation to use the term older adults over elderly.

VERSION 1 – AUTHOR RESPONSE

Responses to Reviewer #1

Reviewer comment 1: A concern is the lack of reporting on the recruitment rate of the original survey, and the lack of detail on the amount of missing data for variables and how this was handled. If there is poor recruitment or high rates of missing data these need to be flagged in the limitations section.

Response: Thank you for your comments. We have reported the undercount rate on Page 5, paragraph 3.

‘Post-survey enumeration has indicated an undercount rate of 1.72%’.

We have reported the amount of missing data on Page 5, paragraph 3. We simply removed sample members with missing data, as the rate of missing data was low.

‘We excluded 3,701 (1.54% of the total) individuals aged 60-79 years who had any missing value in the outcome variable and covariates’.

Reviewer comment 2: Overall “Land use conversion” tends to be used in the text but “ratio of urban built-up areas” tends to be used in the tables. As somebody who is not familiar with the area I found the switch between the two somewhat confusing w, and the paper would be easier to read if the terms were more consistent.

Response: We agree with your advice and change ‘ratio of urban built-up areas’ into ‘land use conversion’ in the tables.

Reviewer comment 3: Page 2: Overall the abstract is well written but not necessarily in the right style for BMJ Open which has a 300 word limit and the instructions for authors suggests that Odds ratios and 95% confidence intervals should be included for the main results.

Response: Thank you for pointing this out. We have made some revision and the word count of the revised abstract is 283, which is now less than 300 words. We have included odds ratios and 95% confidence intervals in the revision of the abstract. Here are some examples:

The odds of reporting fair or poor health was negatively associated with the level and rate of population concentration (OR=0.93 (95%CI 0.87 to 0.99) and 0.74, (95%CI 0.59 to 0.93) respectively) and positively associated with the level of health services (OR=1.12, 95%CI 1.06 to 1.19).

Reviewer comment 4: Page 5: Could you please provide a bit more of an explanation of what “hukou status”, primary endowment insurance, and basic medical insurance are. I do not know the Chinese system well enough to understand them and particular the difference between the Attended / Did not attend are.

Response: Thank you for this comment! “Hukou status” is governmental household registration system to identify whether resident is local or non-local. In the same area (city), it also identifies whether resident is agricultural (mainly from rural areas) or non-agricultural (mainly from urban areas). It is extremely difficult for people from rural areas to convert their hukou status from agricultural (rural) hukou to urban hukou. They are not able to access the social security in urban areas. We have provided more explanation of “hukou status” on page 6.

In China, it is voluntary for people to take “primary endowment insurance” and “basic medical insurance” before they reach 60 years of age. After the age of 60 years, people who took ‘primary endowment insurance’ and ‘basic medical insurance’ can access pension and medical insurance when they are 60 years old and above. We have changed ‘primary endowment insurance’ and ‘basic medical insurance’ to ‘having primary endowment insurance’ and ‘having basic medical insurance’ respectively and revised the responses for these two as ‘have/do not have’. We think these changes are easier for readers to understand.

Reviewer comment 5: Page 8: The covariates for some of the area level covariates were difficult to interpret. The high level of significance combined with small odds ratios suggest the wrong scale is being used to present the results.

Response: We have considered/tested using different scales for the area level covariates, but we keep these scales as there was no substantial change in the results. Previous literature has also used the same scale.[1] The high level of significance in this study may be due to its large sample size.

Reference:

[1] Chen H, Liu Y, Li Z, et al. Urbanization, economic development and health: evidence from China’s labor-force dynamic survey. Int J Equity Health 2017;16(1):207-214.

Reviewer comment 6: Also the results for house area at the bottom of table 2 are problematic. T OR of 0.99 lies outside the (95% 1.00 to 1.00) confidence interval.

Response: Thank you for this comment. We have checked the results and found that the issue is due to the number of decimal places we used. We have corrected this and only kept 3 decimal points for this result.

Housing area per capita (m^2)	0.998 (0.997 - 0.999) ***	0.998 (0.997 - 0.999) ***

Reviewer comment 7: I found the format of the results presented in the text e.g. “OR (95% CI) = 0.93 (0.87-0.99)” difficult to read and would suggest the authors present them differently.

Response: Thank you. We have reformatted the interpretation of results. For example,

‘The results of Model 2 show that the level and the rate of population concentration were negatively associated with the odds of reporting fair or poor health (OR=0.93 (95%CI 0.87 to 0.99) and 0.74 (95%CI 0.59 to 0.93) respectively), while the level of health services was positively correlated with the odds of reporting fair or poor health (OR=1.12, 95%CI 1.06 to 1.19)’.

Responses to Reviewer #2

Reviewer comment 1: Introduction part/ the last paragraph: the description of the aim of the study does not include information about the analysis of interaction between the level of education and urbanization. In this paragraph are pointed the strength of the study which should be rather placed in the discussion part.

Response: Thank you for this comment! We have provided the description of the aim of the analysis of interaction between the level of education and urbanization in the last paragraph of introduction.

‘Further, it examined the moderating effect of education on the association between each of the four dimensions of urbanization and health’.

Reviewer comment 2: Results part/ first paragraph: There is the following statement :“Respondents were more representative of the younger elderly cohorts”, but the fact that there was more younger people under study does not necessarily mean that this group is more representative. Besides, there is no information about Response Rate.

Response: Thank you for this comment! We have revised this sentence. In terms of the response rate, the official document of the survey does not report the response rate. However, the undercount rate is reported. We have reported the undercount rate on paragraph 3, Page 5.

‘Post-survey enumeration has indicated an undercount rate of 1.72%’.

Reviewer comment 3: There is no information about participants’ consents.

Response: We have provided information about participants’ consents on Paragraph 3, Page 5:

‘The survey team obtained written consents from each participant at the time of survey’.

Reviewer comment 4: Table 1.: The table presents the descriptive statistics of the whole sample. It might be more informative for the research question if the authors present these statistics across the outcome variable groups.

Response: Thank you for your comment. We have presented the descriptive statistics of the whole sample, self-reported good health sample, and self-reported fair or poor health sample in Table 1.

Table 1 Summary statistics of variables

	Whole sample (n=236,030)	Self-reported good health sample (n=156,222)	Self-reported fair or poor health sample (n=79,808)
Self-reported health (%)			
Good	66.19		
Fair or poor	33.81		
Predictors (prefecture-level variables)			
Land-use conversion in 2005 (%)	1.95 (3.48)	2.06 (3.65)	1.76 (3.13)
GDP per capita in 2005 (10,000 Yuan)	1.87 (1.49)	1.91 (1.53)	1.77 (1.40)
Population density in 2005 (population per km^2)	548.98 (443.51)	562.51 (449.37)	522.51 (430.58)
The number of hospital beds per thousand population in 2005 (bed)	2.93 (1.53)	2.96 (1.55)	2.88 (1.49)
The change in land-use conversion from 2000 to 2005 (%)	59.10 (88.93)	60.70 (92.26)	55.98 (81.92)
The change in GDP per capita from 2000 to 2005 (%)	87.47 (41.19)	87.39 (41.90)	87.63 (39.77)
The change in population density from 2000 to 2005 (%)	3.40 (11.88)	3.59 (13.11)	3.02 (8.97)
The change in number of hospital beds per thousand population from 2000 to 2005 (%)	5.21 (13.46)	5.42 (13.44)	4.80 (13.48)
Gender (%)			
Female	48.74	45.96	54.18
Male	51.26	54.04	45.82
Age (years) (%)			
60-64	33.64	41.11	19.02
65-69	28.49	29.86	25.80
70-74	23.09	19.18	30.76
75-79	14.78	9.85	24.42
Ethnicity (%)			
Han Chinese	96.49	96.70	96.08
Minority	3.51	3.30	3.92
Marital status (%)			
Single, divorced, or widowed	75.34	79.77	66.67
Married	24.66	20.23	33.33
Hukou status (%)			

Local agricultural	63.77	60.35	70.48
Local non-agricultural	28.68	31.13	23.87
Non-local agricultural	2.37	2.59	1.93
Non-local non-agricultural	5.18	5.93	3.72
Education (%)			
No schooling	34.73	28.09	47.72
Elementary school or junior high school	55.04	59.58	46.14
Senior high school	6.12	7.32	3.78
College or above	4.11	5.01	2.36
Primary endowment insurance (%)			
Attended	24.68	27.55	19.05
Did not attend	75.32	72.45	80.95
Basic Medical insurance (%)			
Attended	41.44	43.67	37.07
Did not attend	58.56	56.33	62.93
Urbanicity of current residence (%)			
Rural areas	52.20	48.92	58.61
Urban areas: towns	14.87	15.47	13.69
Urban areas: cities	32.93	35.61	27.70
Housing area per capita (m^2)	32.57 (25.98)	32.76 (25.81)	32.21 (26.30)
Housing construction time (%)			
Before 1978	22.62	20.63	26.52
After 1978	77.38	79.37	73.48
Housing facilities (%)			
None, one or two types of facilities	45.64	42.92	50.97
Three types of facilities	24.84	24.04	26.41
Four types of facilities	29.52	33.04	22.62

Note: results are presented as proportion for categorical variables and as mean (standard errors) for continuous variables. GDP: Gross Domestic Product

Reviewer comment 5: Discussion part: Some definitions are place twice in the paper e.g. “salmon bias”.

Response: Thank you very much for pointing out this! We have combined the duplicated definitions and explanations.

Reviewer comment 6: The term elderly might be perceives as ageism and is often used to describe frail individuals. There are some recommendation to use the term older adults over elderly.

Response: Thank you for your recommendation. We have replaced the term ‘elderly’ with ‘older adults’ throughout the manuscript.

VERSION 2 – REVIEW

REVIEWER	Richard Shaw Institute of Health and Wellbeing, University of Glasgow, United Kingdom.
REVIEW RETURNED	12-May-2019

GENERAL COMMENTS	I am happy with the authors response to my comments. I note that they have not completed a couple of the criteria in the Strobe checklist. However, I do not think the omissions pose a problem and I do not have anything else to add.

REVIEWER	Katarzyna Zawisza Jagiellonian University, Poland
REVIEW RETURNED	22-May-2019

GENERAL COMMENTS	I have just one comment: 1. The authors placed the sentence in the results part: "Respondents were more representative of ethnic majority….", but the fact that there is more people in same group it is not necessarily mean that the group is "more representative" for the population. It is also associated with the sampling methods. Thus, my suggestion is to not use word" representative" in this context, unless there is another justification more than sample size.

VERSION 2 – AUTHOR RESPONSE

Here are our replies to reviewers' comments:

Reviewer: 1

I am happy with the authors response to my comments. I note that they have not completed a couple of the criteria in the Strobe checklist. However, I do not think the omissions pose a problem and I do not have anything else to add.

Response: Thank you very much for accepting our revision. We have now completed the criteria in the Strobe checklist.

Reviewer: 2

1. The authors placed the sentence in the results part: "Respondents were more representative of ethnic majority….", but the fact that there is more people in same group it is not necessarily mean that the group is "more representative" for the population. It is also associated with the sampling methods. Thus, my suggestion is to not use word" representative" in this context, unless there is another justification more than sample size.

Response: We have revised this sentence and avoided to use word "representative" in this context.