Author’s response to reviews

Title: Urban-rural Disparities in Health Care Utilization among Chinese Adults from 1993 to 2011

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Author’s response to reviews:

Response to Reviewers

We are pleased to resubmit for publication the revised version of “Urban-rural Disparities in Health Care Utilization among Chinese Adults from 1993 to 2011.” We appreciate the time and efforts by the editor and referees in reviewing this manuscript. We have addressed all issues indicated in the review report as outlined below.

Response to Comments from Reviewer 1

Please proofread manuscript. I noticed several minor typos, grammatical and spelling errors throughout the manuscript.

Response:

We greatly appreciate the reviewer’s efforts to carefully review the paper and the valuable suggestions offered. We have performed a careful grammatical check and removed all typos and errors in the revised manuscript. Please refer to the track changes throughout the revised manuscript.

Response to Comments from Reviewer 2

The authors try to estimate trends in urban-rural disparities in self-care, and inpatient care utilization from a perspective of the hukou system. However, they have not been successful in achieving their objective. In fact, I have both major and minor comments.
We appreciate the valuable comments by reviewer 2 and have modified the manuscript in order to accomplish the research objectives.

Major Comment 1:

Although the authors point out among their limitations (lines 45-49), the fact that health-related data, including self-reported health status and some objective indicators are not available for the period 2009-2011 reduces the sample size and, therefore, significantly reduces the power of statistical contrasts. The authors have two options, not necessarily exclusive, to reduce the period analyzed to 1993-2009 or increase the level of significance (up to 10% or 15%, for example), thereby also increasing potency. Better the two options.

Thanks for the valuable suggestion. We fully agree with the reviewer that the lack of health-related data reduces the power of statistical contrasts. Both of your suggestions can solve this problem well. However, given that China conducted a nationwide healthcare reform in 2009, the data of 2009-2011 period may contain some important information about the health reform. Therefore, we have adopted your second suggestion and have increased the significance level up to 15%. Accordingly, some additional results at the 15% level have been supplemented in the Results Section (line 17-23, page 8; Table 2, page 23-25) of the revised manuscript.

Major Comment 2:

Since they use multinomial logistic models, the authors should test the independence of irrelevant alternatives (IIA) (Hausman-McFadden test (1984) or the Small-Hsiao test (1985)). In general, when the IIA property does not hold will yield inconsistent parameter estimates and biased forecasts. Authors should provide evidence (tables and graphs) of compliance with this hypothesis and, in the very likely case of non-compliance, use alternative methods (i.e. nested logit model which does not have the IIA property, etc.).

We greatly appreciate the reviewer’s comments and efforts. As suggested by the reviewer, we have performed a Hausman test of the independence of irrelevant alternatives (IIA) using the command “mlogtest , hausman base” in Stata 14.0. The results are as followed.

<table>
<thead>
<tr>
<th>Omitted</th>
<th>chi2</th>
<th>df</th>
<th>P&gt;chi2</th>
<th>evidence</th>
</tr>
</thead>
<tbody>
<tr>
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<td>28</td>
<td>1.000</td>
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<tr>
<td>1</td>
<td>-4000.000</td>
<td>54</td>
<td>1.000</td>
<td>for Ho</td>
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<td>56</td>
<td>1.000</td>
<td>for Ho</td>
</tr>
<tr>
<td>3</td>
<td>-510.629</td>
<td>28</td>
<td>1.000</td>
<td>for Ho</td>
</tr>
</tbody>
</table>
The Hausman test results showed that none of the four options would reject the IIA assumption. Correspondingly, we have added this evidence in the Results Section (line 23-24, page 7; Table 3, page 25) and explained the test in the Methods Section (line 2-6, page 6) of the revised manuscript.

Major Comment 3:

Authors should consider interactions between need variables, area and predisposing characteristics (age and sex, in particular).

In any case they should perform some sensitivity analysis that allows interactions to be included in the model.

Response:

We thank the reviewer for the constructive comment. Indeed, it will be more profound if we take these interactions into consideration. As suggested by the reviewer, we have tried to include the interactions between age and area, between sex and area, between illness severity and area, between disease history and area, between illness severity and age, between illness severity and sex, between disease history and area, and between disease history and sex. We have also analyzed the sensitivity of the interactions. These results (with interactions) may be found in the attachment. As the results show, most of the interactions are not statistically significant. Considering the main purpose of this study being examining the extent and trends of urban-rural disparities in health care utilization, we did not include these interactions into the final model in the revised manuscript. The reviewer’s concern is of importance for our further study, and we will attempt to analyze the interactions among need variables, area and predisposing characteristics by using other databases in our next project. Many thanks for your kind help.

Minor Comment 1:

Authors should define CHNS before using it (page 3, line 24).

Response:

Thanks for the careful review. Per the reviewer’s suggestion, the full description of the CHNS has been included in the revised manuscript (line 30, page 4).