Author’s response to reviews

Title: The impact of the health care workforce on under-five mortality in rural China

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January 31, 2019

RE: The impact of the health care workforce on under-five mortality in rural China (#HRHE-D-18-00145)

Dear Editor,

Many thanks for inviting us to revise our manuscript and potentially accept it. We have taken into account all of the very helpful comments and suggestions in the resubmitted version. The reviewer’s comments are laid out below and have been numbered. Relevant changes have been highlighted (with ‘track changes’) in the revised version of the manuscript: Manuscript_revised_v3(with_track) in one of the Supplementary Materials. We have also submitted a clean version of this manuscript named "Manuscript_revised_v3(clean_version)".

*1 Title and framing of statistical approach: While you have tempered your claims of causation, the title is somewhat misleading as it still refers to your results as estimates of "impact." Similarly, the claims in the last sentence in your abstract are quite strong. If you are going to make such strong claims about your findings, then I suggest you reframe your statistical approach to directly state that you are trying to make a causal estimate. I agree that there are quasi-experimental methods that can be used to justifiably claim estimates of "impact." However, the way in which you have currently described and defended your statistical approach
does not explicitly say that this is the type of approach that you are attempting to do, and thus produce estimates of "impact." If you want to make this claim, I recommend that you revise the presentation of your statistical results so as to clearly lay out what your quasi-experimental setup is. As written currently, a reader needs to infer this, which may be difficult for readers without more advance statistical knowledge.

Response: Thanks for pointing this out. Although we used “impact” in our title, we presented all of our results as association and that this study should be considered to be associational rather than causal in limitation (page 17).

“Although we have used panel data with fixed effects specifications and done several sensitivity analyses, because there are still possible sources of biases that we could not account for, this study should be considered to be associational rather than causal in nature.” (page 17)

We have changed the confusing last sentence in the abstract from “This study could be instructive for other developing countries to achieve SDG3 by allocating health professionals where they would have the greatest contribution.” to “This study could be instructive for other developing countries to achieve SDG3 by helping them identify where additional health professionals would have the greatest contribution” (page 3).

*2 The description of the reforms in China in the introduction provide better context for the paper and motivating the central hypothesis. However, it seems to be added as an afterthought, leaving the reading of the introduction somewhat disjointed. I suggest you review the presentation of the information in your background for logic and flow.

Response: We have revised this part in the introduction (page 6).

The original sentence has been changed from “Before the 2009 health reform, China faced a host of human resources for health issues related to shortage of qualified staff, low compensation, and high workload, which were primarily due to low wages and the manner in which health workers were paid, especially in primary health care institutions [34]. The reform increased investment, such as an additional US$ 127 billion to develop infrastructure and expand the health care workforce in thousands of health facilities at county, town, and village levels in rural areas,
The reform also helped establish a more efficient and standardized operating mechanism for health institutions, such as reasonable headcount allocation and scientific performance appraisal, which was intended to increase the motivation and retention of health professionals [35]. Economically disadvantaged areas received more financial and policy support than previously [35, 37].” to “China has made several efforts to strengthen its health system since the health reform in 2009, including actions to enhance the health care workforce, which provides an appealing context for this study. Before 2009, China faced a host of human resources for health issues related to shortage of qualified staff, low compensation, and high workload, which were primarily due to low wages and the manner in which health workers were paid, especially in primary health care institutions [34]. The reform increased investment, such as an additional US$ 127 billion to develop infrastructure and expand the health care workforce in thousands of health facilities at county, town, and village levels in rural areas, and in community health centers and stations in cities [35, 36]. The reform also helped establish a more efficient and standardized operating mechanism for health institutions, such as reasonable headcount allocation and scientific performance appraisal, which was intended to increase the motivation and retention of health professionals [35]. It is noteworthy that economically disadvantaged areas received more financial and policy support than previously [35, 37].” (page 6).

*3 Should you include references for your data sources?

Response: We have added references of data in Data sources and Conceptual model and measurements (page 7-10).

Most of data that support the findings of this study are from National Health and Family Planning Commission, and National Bureau of Statistics of the People's Republic of China, but restrictions apply to the availability of these data, which are used under license for the current study, and so are not publicly available. County-level data of female illiteracy rate are obtained from National population census database, and province-level data are from the China Health and Family Planning Statistical Yearbook.

*4 How our public health "doctors" different from "physicians"? Unclear why different words are used for a specific intention.
Response: We have changed public health doctors to public health physicians in page 9.

*5 What does "poverty type" mean?

Response: We obtained the list of counties’ poverty status from The State Council Leading Group Office of Poverty Alleviation and Development [1]. Counties were officially designated as poor according to a set standard varied by province, such as net income per capita, GDP per capita, and fiscal revenue per capita [2, 3]. These counties were qualify for additional support, such as financial subsidies and tax deductions, from both the Central and province-level governments.

We have added related description in the method (page 7).

“The list of counties’ poverty status was obtained from The State Council Leading Group Office of Poverty Alleviation and Development [39]. Counties were officially designated as poor according to a set standard varied by province, such as net income per capita, GDP per capita, and fiscal revenue per capita [40, 41].” (page 7).

*6 What are "headcount allocation policies?"

Response: Headcount allocation policies are centered on the headcount quota system which is widely used in China to manage public employees, including health workers in Public hospitals and township health centers. The headcount quota system defines the total number of personnel assigned for a certain health facility, meanwhile budgeting and allocation of government subsidy to the health facility is based on this quota system [4].

We have changed the words from “headcount allocation policies” to “headcount quota system” in page 9.
*7 A close copy-editing of the paper is still needed. There are many places where the wording is awkward, incomplete, or imprecise.

Response: We have carefully checked the manuscript and improved the language accordingly.

References:


3. The establishment of retreat mechanism for National poverty alleviation and development focus counties. 2008. [http://nys.mof.gov.cn/zhengfuxinxi/bgtDiaoCheYanJiu_1_1_1_1_2/200807/t20080717_57786.html](http://nys.mof.gov.cn/zhengfuxinxi/bgtDiaoCheYanJiu_1_1_1_1_2/200807/t20080717_57786.html). Accessed 30 Jan 2019. (in Chinese)