Author’s response to reviews

Title: Screening high-risk clusters for developing birth defects in mothers in Shanxi Province, China: application of latent class cluster analysis

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Responses of the revision

RE: PRCH-D-15-00180 Screening high-risk clusters for developing birth defects in mothers in Shanxi Province, China: application of latent class cluster analysis.

Dear Editor Teijlingen,

We are really grateful to yours and the two reviewers’ critical comments and thoughtful suggestions. We have considered these comments and suggestions seriously and revised the manuscript carefully. Additionally, we added another author in this paper, Xianming Hu, since she made substantial contribution to the revised paper. All changes made to the text are marked in the track changes mode and in red font in the paper. We hope the revised manuscript will be acceptable for publication in the journal. Reviewer 2 has no comment and we appreciate his/her
positive feedback about our work. Below you will find our point-to-point responses to Prof. Pritchard’s comments:

Reviewer: Colin Pritchard’s comments

Major Compulsory Revisions:

(1) It is well written, well argued but again raises other questions for example, might there have been different factors to consider in the cluster than they choice also the vitally important aspect of pollution which was never defined.

Response: We thank you for your suggestions. We think your comments are correct and helpful. There is a risk factor termed “pollution source in area of residence (Yes/No, such as coal mines, coal-fired power plants, chemical plants)” in our questionnaire. It turned out that the results of the class assignment remain the same whether we add the pollution risk factor or not. Thus, we deleted that risk factor in our previous analysis. However, as you suggested, it is important to show the pollution effect. So we have rewritten the result section to reflect this (in red font).

(2) also as the area was one of heavy coal mining, were there opportunities to consider a ‘control’ area?

Response: Thanks for your comments. As a preliminary exploration of high-risk clusters screening based on retrospective epidemiological survey data, we do not have a ‘control’ area in this study. However, we think your comments are helpful to our further confirmatory birth defects screening. We have discussed this as a limitation. In our further confirmatory birth defects screening, we can choose a non-coal mining area as a ‘control’ area, and perform multi-sample Latent class cluster analysis to compare the latent structures in two or more populations.

(3) The high-risk group with 14% defect is notable and would merit in-depth follow-up if feasible- there were a number of `surprises’ for a Western reader, maternal age at 28.3 but not the low education and income- no difference between rural and urban was surprising as China has a markedly different pattern of suicides fro most other countries (Pritchard 1994, Soc Psychiatry) in part because of the high accessibility to agricultural chemicals.

Response: We are grateful for your key comments. Your question about maternal age is right. We made a mistake in writing the average maternal delivery age as maternal age during the survey time (average maternal delivery age: 26.3, maternal age during the survey time: 28.3). We
have corrected the value. The value 26.3 is similar as another population-based study in Shanxi Province during 2003 (birth defects: 27.1 years, control: 26.6 years) [1].

We have accepted your suggestions and explained more in-depth for the high-risk cluster in discussion. Moreover, we have further explained the association between maternal demographic characteristics (residence, education, annual net income per capita) and birth defects in the manuscript.

(4) but the biggest weakness, which hopefully can be resolved - can the authors explain more about what went into their definitions of maternal hazard, including occupation and possible geographic environmental pollution.

Response: Thank you for pointing out this weakness. The indicator variable “Maternal hazards in pregnancy” including several risk factors may confuse readers. Thus, we have changed the indicator variable name to “Environmental risk factors”, which contained six risk factors: pesticides, chemical fertilizers, X-rays, computer use, pets, pollution source in area of residence. We have also modified all the related words in the manuscript.

(5) Finally, and the authors readily admit this, the births that did not go to term, might well have told us more about both the maternal and `environmental factors and how they interacted.

Response: Thank you for your good point about preterm births. We didn’t make a difference between preterm births and full-term birth data in our study, which would be meaningful for detecting maternal exposure risk factors. This will be considered in our future epidemiological survey. We have discussed this limitation in the manuscript.

References