Author's response to reviews

Title: Increased prevalence and incidence of anemia among adults in transforming rural China: Two cross-sectional surveys

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Author's response to reviews: see over
Dear Editors,

Re: “Increased prevalence and incidence of anemia among adults in transforming rural China” (9190999271661861)

We are grateful to all the comments from the reviewers on our manuscript. We have revised our paper based on the comments, and please find our point-to-point response.

Thank you for your consideration.

Sincerely,

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Reviewer 1

Abstract
Question 1:
Disparity of results in abstract and results section: Women are at increased risk in abstract but in results men were at increased risk. Please correct this.
Response:
Thanks. It have been corrected in the revised manuscript.

Material and Methods
Question 2:
The sampling design is not clearly written/defined. Provide more details on sample selection and data collection e.g. Eligibility Criteria, Physical examination data includes what? any anticoagulant used for blood sample collection, method used for haemoglobin estimation.
Response:
Thanks. Detailed information on sampling design, eligibility criteria, physical examination and hemoglobin test had been added in materials and methods section of the revised manuscript.

Question 3:
Details on how often were the follow-up visits done between the periods 2006 and 2008 in the cohort component? And, how they have been tracked?
Response:
Two surveys were conducted in 2006 and 2008 and there was none in between. All subjects of the 2006 survey in Nalu Community were invited to be followed up in 2008. Personal ID number was used to identify the same subjects in the two surveys.

Question 4: Is there any rationale for using this age classification (18-34, 34-44 yrs etc.)?
Response:
We classified age categories by 10-year age. Since the number of participants less than 35 years of age was small, they were lumped together. A footnote was added to the table 1.

Results
Question 5: Were there any differences in prevalence of anemia by three rural communities? May be supplementary table can be added.
Response:
Yes, there was a difference in the prevalence of anemia among three rural communities due to age- and sex- variations. After adjustment of age and sex, difference was no longer present

Question 6:
Are there any associations of years of education, farmer occupation and household income with anemia before and after adjustment for age (continuous), gender, BMI (continuous), smoking, and alcohol drinking.
Response:
There were no significant associations of anemia with years of education, farmer occupation and household income before or after adjustment for age (continuous), gender, BMI (continuous), smoking, and alcohol drinking.

Discussion

**Question 7:** No other biochemical parameter was analysed to describe the etiology of anemia (vitamin B12, folate, vitamin A etc); genetic causes and other causes of anemia such as chronic disease were not discussed. Association of hb concentration with income and educational levels was not discussed. Probable justification of that in discussion also.

**Response:**
We did not measure other biochemical parameters. Additional discussion has been added to address these concerns.

**Reviewer 2:**

**Methods**

**Question 1:**
Methodology poorly described. The authors must describe how the samples were selected for cross sectional study. For cohort component- eligibility criteria are not clear. Figure 1 confusing, i.e. the box saying prevalence in 2006 (I guess this total samples were available for haemoglobin measurement).

**Response:**
Detailed information on sampling design, and eligibility criteria have been added in the materials and methods section of the revised manuscript and Figure 1 has been modified.

**Question 2:** Discussion is poor. Merely compared the prevalence and incidence of anemia among study population with other studies. One would have expected more discussion on why 45 years and above have higher incidence of anemia than other age group.

**Response:**
We have provided some additional discussion in the revised manuscript.

**Question 3:** Why were the prevalence and incidence higher when using WHO criteria than using Chinese criteria? (Is it not expected- as Chinese criteria used higher cut-off). Further, relevance of using Chinese criteria needs be discussed. Any suggestion for the future investigation – which one to use and why?

**Response:**
It is correct that Chinese criteria use higher cut-off points for anemia than the WHO criteria and this is the reason for that both the prevalence and incidence were lower when the Chinese criteria was used. As we discussed, the cut-off points for anemia in the CN criteria, regardless of gender, were 10g/L lower than those in the WHO criteria (WHO vs CN: 130 vs 120g/L for men; 120 vs 110g/L for women), but the prevalence and incidence dropped by nearly 50%, which suggested that about half of patients with anemia in rural Deqing had their hemoglobin levels in 120-130 g/L among men and 110-120 g/L women. This was one of reasons why a quarter of anemia adults recovered without any treatment during the 2-year follow-up period. More researches are needed to the impact of the different criteria of anemia on disease treatment, control and prevention for Chinese.
**Question 4:** Further, general issues with determining anemia by haemoglobin needs to be pointed out especially when describing repeated surveys. i.e. about 20% variation of anemia is expected due to the regression towards mean.

**Response:**
We have added the discussion about regression towards mean in the revision.

**Question 5:** Incidence data needs to be interpreted properly. As mentioned in the introduction- rapid urbanization is taking place is rural China. What is the impact of this with incidence of anemia in this population?

**Response:**
This has been discussed in the revision.

**Question 6:** In the limitation the authors have indicated measurement error. The authors should mention whether they have used any control haemoglobin and whether they have any information on inter-assay and intra-assay coefficient of variation data.

**Response:**
We did not have information on inter- and intra-assay coefficient of variation for this study but used equipment which was evaluated and adjusted every year at a national center for laboratory equipment and testing under the related SOP. It has been added in the revision.

**Question 7:** The study population were from a selected area, may not be representative of all rural areas in China- must be mentioned in the

**Response:**
It is discussed in the revision.

**Question 8:** Finally, the take home message for the reader is not clear.

**Response:**
We have tried to clarify this in the revision.