Responses to the committee's comments

Comments by the committee:

*Major:
- On one hand they appear to "rubbish" other studies saying that the populations included were poorly representative. But on the other hand you want to compare their results directly to these and say DM is growing. I can't see that you can have this can have this both ways!

Response: Thank you so much for this comment. We totally understand your concern. We have never intended to "rubbish" other studies to raise our study. We appreciate all the scientific researchers who make contributions to this field. On the other hand, we were required to explain “the differences of our research compared with previous studies, what uncertainty was there and how did this study seek to reduce that uncertainty” in the Introduction section. We might have overstated the bias of previous research sampling in the response letter. Related sentences have been removed from the revised manuscript. We do not want to cause offence and we apologize if it caused offence in the previous response letter.

*- they spend some time thinking about why DM is more common in older groups. I don't think this is surprising. But the reviewers I think previously pointed out that they exclude people who have moved in the last 5 years and perhaps these are the geographically mobile people that are excluded but have diabetes? This is not discussed.

Response: Thank you so much for this comment. We have highlighted this limitation in the revised manuscript (Page 32 Line 402-405).

*- this seems quite a substantial limitation/one this is not well unpacked "using HbA1c levels of 6.4% to diagnose diabetes might be controversial since that level was set for the United States population." The main point is prevalence and a crucial point of detail is how the criteria for diagnosing diabetes affected the measured prevalence. Table 2 and figure 2 between them don't quite do it. I suggest table 2 report prevalence based on a) self report b) a + Fasting Plasma Glucose >7mmol/L c) b plus Impaired Glucose Tolerance; 2 hr plasma glucose >11.1mmol/L d) c plus HbA1c >6.5% This would make clear how much of the high prevalence is related to differing diagnostic criteria.

*Response: Thank you so much for this suggestion. Table 2 has been revised according to the editor's suggestion. The prevalence based on a) self-reported diabetes; b) self-reported diabetes plus FPG ≥7 mmol/L; c) self-reported diabetes plus FPG ≥7 mmol/L and 2hPG ≥11.1 mmol/L; d) self-reported diabetes plus FPG ≥7 mmol/L and 2hPG ≥11.1 mmol/L and HbA1c ≥ 6.5%; e) prediabetes was now presented in Table 2. Moreover, we have added
more details in the prevalence of newly diagnosed diabetes, IFG and IGT in Supplementary Table 2.

*- In the discussion when comparing prevalence to other studies you also need to be very clear which definitions that study used and which definition you are using to be clear that like is being compared with like.

Response: Thank you so much for this suggestion. We have added the specific diagnosed criteria when comparing with other studies in the Discussion section.

*- The description of the sampling strategy is still inadequate. Which cities, which rural areas, how did they define developed and why did the choose the areas they did? How does this sampling strategy relate back to the census?

Response: Thank you so much for your comments. We have added more details in the Method section. The chosen cities from urban and rural populations are presented in the revised Supplementary Table 1. The developed/developing/underdeveloped cities were defined based on the gross domestic product per capita, concentration of commercial resources, the extent to which a city serves as a commercial hub, vitality of residents, diversity of lifestyle and future dynamism. Thus, 6 tiers of cities were sorted from developed to underdeveloped cities, each 2 tiers being defined as a rank and 3 ranks in all. The cities with tier 1 and new tier 1 were classified as developed cities; tier 2 and tier 3 were classified as developing cities; tier 4 and tier 5 were classified as underdeveloped cities (Supplementary Table 1). We used a multistage, stratified sampling method to select a nationally representative sample of persons 18 years of age and older in the general population. At the final stage, we recruited participants according to the characteristics of sex, age, rural/urban populations proportionally related to the census. The proportion of population composition in each province was based on China’s 2010 national census (please see the table below). We have added more details in the Method section (Page 14 Line 170-181).

<table>
<thead>
<tr>
<th>Age</th>
<th>Proportion</th>
<th>Sample size</th>
<th>Urban population</th>
<th>Rural population</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Men</td>
<td>Women</td>
</tr>
<tr>
<td>18-29</td>
<td>25.70%</td>
<td>681</td>
<td>183</td>
<td>175</td>
</tr>
<tr>
<td>30-39</td>
<td>20.42%</td>
<td>542</td>
<td>146</td>
<td>139</td>
</tr>
<tr>
<td>40-49</td>
<td>21.85%</td>
<td>579</td>
<td>156</td>
<td>148</td>
</tr>
<tr>
<td>50-59</td>
<td>15.19%</td>
<td>402</td>
<td>108</td>
<td>103</td>
</tr>
<tr>
<td>60-69</td>
<td>9.46%</td>
<td>251</td>
<td>68</td>
<td>64</td>
</tr>
<tr>
<td>&gt;=70</td>
<td>7.37%</td>
<td>195</td>
<td>53</td>
<td>50</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
<td>2650</td>
<td>714</td>
<td>679</td>
</tr>
</tbody>
</table>

*- It is not clear from the methods set up that they plan to look at ethnicity and urban/rural.
Response: For ethnicity, if one minority was chosen from the autonomous region with ethnic minorities, then at least 1000 minority participants were recruited in this region. Tibetan, Uyghur, Hui and Zhuang ethnic groups were finally analyzed. In urban/rural areas, we recruited participants in urban districts and rural townships. We have added more details in the Methods section (Page 15Line 184-186).

*- Still far too many numbers reported in the text.

Response: These have been revised in the text.

*- Please be cautious about using the word hypertension and high blood pressure. In this study I think you are talking about raised blood pressure readings only. This study did not have the methods to diagnose hypertension did it (ie repeated home measures over time, or 24 hour ambulatory monitoring). Of course some people with elevated readings might have hypertension but you cannot be sure of that can you?

Response: Thank you so much for this comment. We totally agree with you and have deleted all the words regarding “hypertension” and “high blood pressure”. Only blood pressure readings were presented in the manuscript.

*MINOR
- Throughout the writing is often vague and lacks precision.

Response: The manuscript has been further revised according to the comments.

*- They talk about "following a strict quality assurance and control protocol" as a strength but I'm not really sure what this means. That they took supporting biochem measures etc?

Response: Thank you for this comment. The quality assurance and control protocol have been provided and expanded in Supplementary Appendix 1.

*-I appreciate that China is not enormously ethnically diverse in some ways but would it be better to say adults living in China, rather than Chinese adults?

Response: Yes, we agree with your comments. We have revised the manuscript according to your suggestion.

*- this sentence appears to fold in two totally different problems as far as I can see "Last, we could not provide repeated abnormal glucose values at different times for participants diagnosed with diabetes, and because nonresidents such as internal migrant workers, who were more likely to have a lower prevalence of diabetes, were not included in the study due to the study design." Please separate and expand.
Response: Thank you for this suggestion. We have revised and expanded the sentence in the manuscript (Page 32 Line 401-405).

*Minor (perhaps)*

*- It is not clear from the methods set up that they plan to look at ethnicity and urban/rural. It is also not sufficiently clear how these were measured (or whether they just assume that people who live in a particular area are of that ethnicity and if so they could comment on how accurate that is).*

*Response:* For ethnicity, if one minority was chosen from the autonomous region with ethnic minorities, then at least 1000 minority participants were recruited in this region. Tibetan, Uyghur, Hui and Zhuang ethnic groups were finally analyzed. In urban/rural areas, we recruited participants in urban districts and rural townships. The ethnicity and urban/rural status were confirmed by their identification card or household register. We have added more details in the Methods section (Page 15 Line 184-186).

*- I'm unclear where or how they used the BP measures and lipid measures. I mention this because I find them concerning. - I'm not convinced that we should let them use the word hypertension. This is a diagnostic and the people in the study have not met the diagnostic criteria for hypertension. Perhaps they could use possible hypertension, or isolated elevated BP reading? and the same goes for the lipid measures.*

*Response:* We did not mention “hypertension” in the last revised manuscript. The BP readings were only presented in Table 1 and Table 4. As for the lipid measures, we have deleted the diagnosed criteria for hypercholesterolemia, high LDL-C, low HDL-C and hypertriglyceridemia, and used their readings as continuous variables in Table 4.

*-Def of IGT and IFG - get them out of the supplementary material and into the paper.*

*Response:* The definitions of IFG and IGT have been now added in the Methods section (Page 18 Line 224-228).

*-I find the analysis section hard to follow and would welcome John/Tim C's thoughts on this now it is back in particular beginning with weighted measures. And then quickly talking about standardised results. Does this mean that they have not presented any unadjusted info? Perhaps this related to this point "I'm not really sure what this means "We estimated the prevalence not only by using statistical methods to weigh the results but also by recruiting individuals according to age and sex composition of each community and the urban-rural ratio, referring to the latest national census data, which may have provided more accurate results". I presume they are saying that they adjusted the analysis further to be even more representative but it is not really clear to me how.*
Response: Thank you for this comment. More details have been now added in the Methods section (Page 19 Line 236-238).

Responses to the Reviewer 1's comments
The authors have improved the presentation of the paper following my comments. There remain some further issues concerning the analysis, presentation and interpretation.

*1. Table 2 gives the diabetes prevalence results in four columns: total, self-reported, newly diagnosed and diagnosed on extended information, where total is the sum of self-reported and newly diagnosed. A proportion of those self-reporting will have been wrong in their reporting, and in others their symptoms will have eased since diagnosis. So the current prevalence of diabetes in this group will be exaggerated. Should this not be adjusted for? For example what proportion of self-reporting subjects had an FPG <126 mg/dL? I do understand that without the 2-hour PG the self-report group cannot be diagnosed using the ADA guidelines.

Response: Thank you for your comments. It is indeed true that the patients’ symptoms or high blood glucose may have eased since diagnosis. Self-reported (previously diagnosed) diabetes was defined as a self-reported diagnosis that was determined previously by a health care professional in this study, which was adapted by previous national studies. For safety concerns in the epidemiological survey, we could not conduct a 2-hour PG test on diagnosed diabetes patients. We have analyzed the overall proportion of self-reported diabetes patients who had their FPG < 126 mg/dL (7.0 mmol/L), HbA1c level < 6.5%, FPG < 126 mg/dL (7.0 mmol/L) and/or HbA1c level < 6.5% among whole patients with self-reported diabetes, which were 52.4%, 50.8% and 59.1%, respectively.

*Related to this, the fourth diabetes column is not mentioned at all in the Results, and its derivation is unclear, yet it looks to be based on extra information. The prevalences are slightly less than the total prevalences, so it is important to explain how the two are related.

Response: Thank you for your comment. The fourth diabetes column was calculated based on the WHO diagnosed criteria for diabetes. The prevalence of diabetes defined by the WHO diagnosed criteria without the term of HbA1c was lower than the total diabetes defined by the ADA criteria. Table 2 has been revised according to the editor’s suggestion. Moreover, we have added more details in the prevalence of diabetes based on different combinations of 1) self-reported, 2) self-reported/FPG, 3) self-reported/FPG/2hPG, and 4) self-reported/FPG/2hPG/HbA1c in Table 2, which can compare with other surveys.
2. Table 3 summarises rates of treatment, awareness and control of diabetes, with denominators of respectively 9772, 4464 and 2792. Which cells of Table 2 do these numbers come from?

Response: The number of 9772 comes from the overall number of total diabetes in original Table 2 (First row, first column) which is the total number of the total diabetes. The number of 4464 comes from the overall number of total self-reported diabetes in original Table 2 (First row, second column). 2792 was the total number of self-reported diabetes who were taking diabetes medications.

3. Overweight is defined on page 14 as BMI 25.0 to 29.9. But this is not strictly correct as BMI 29.95 is also overweight. I suggest you define it as in the tables, overweight 25 to <30 and obesity ≥30.

Response: Thank you so much for this suggestion. This has been corrected in the Methods section.

4. The first main paragraph of Results gives lots of prevalence rates and confidence intervals. The text is hard to read with the CIs, and they are in the table, so there is no need to repeat them in the text. The same applies to the last paragraph on page 19.

Response: Thank you so much for your suggestion. We have revised the Results section.

5. The annual percentage change (APC) across surveys is mentioned on page 19, but the way it is calculated should be given in the Methods.

Response: Thank you so much for this suggestion. We have added more details in the Methods section (Page 20 Line 246-251).

6. The Limitations section refers to an HbA1c cut-off of 6.4, yet it is ≥ 6.5 in the Methods.

Response: We are sorry for this typo, which should be “6.5” in the limitation part. We have corrected this error in the manuscript.

7. Non-resident internal migrant workers are mentioned on line 588 - roughly what proportion of the population are they?

Response: It is estimated that internal migrant workers account for more than one sixth of the nation’s total population in mainland China according to the National Bureau of Statistics of China. We have added details in the Discussion section (Page 32 Line 402-403).

8. The Conclusion on page 28 is that "diabetes is still an important public health problem in China". I would go further - it is an increasingly important health problem.
Response: We have revised the conclusion according to your suggestion (Page 8 Line 101; Page 33 Line 411).

*9. On page 24 BMI is given in units of km/m2 rather than kg/m2 (twice), and "ethic group" should be "ethnic group" (twice). On page 26 line 562 "weigh" should be "weight".

Response: We have corrected these errors in the manuscript.

*10. There is a Figure Legend for Figure 1 on page 31 but I did not see the corresponding figure. Also Supplementary Figure 3 is not cited anywhere.

Response: Figure 1 was submitted as a separate file. Supplementary Figure 3 was cited in the Results section (Page 22 Figure 276). Please see the merged PDF.

11. Previously I asked for prevalence rates to be given to one decimal place. This has been done except for lines 130 and 449.

Response: This has been revised.