Author’s response to reviews

Title: Comparison of life loss per death attributable to ambient temperature among various development regions: a nationwide study in 364 locations in China

Authors:
Siqi Chen (sisi3338@126.com)
Yize Xiao (xyz6292@sina.com)
Maigeng Zhou (maigengzhou@126.com)
Chunliang Zhou (hncdc4305761@sina.com)
Mín Yu (myu@cdc.zj.cn)
Biao Huang (huangbiao2000@sohu.com)
Yanjun Xu (759888406@qq.com)
Tao Liu (gztt_2002@163.com)
Jianxiong Hu (hzeros_hu@163.com)
Xiaojun Xu (xu-yd@163.com)
Lifeng Lin (1396320174@qq.com)
Ruying Hu (ryhu@cdc.zj.cn)
Zhulin Hou (hzl668@sohu.com)
Junhua Li (Hncdc-LJH@163.com)
Donghui Jin (942019814@qq.com)
Mingfang Qin (qmfjf@126.com)
Qinglong Zhao (jlcdezql@126.com)
Weiwei Gong (wwgong@cdc.zj.cn)
Peng Yin (yinpeng@ncncd.chinacdc.cn)
Yiqing Xu (xu0510yiqing@163.com)
Dear editor,
Thank you for your careful review of our paper and efficient decision-making process, and thank you very much for the opportunity to revise our manuscript “Comparison of life loss per death attributable to ambient temperature among various development regions: a nationwide study in 364 locations in China (ID: ENHE-D-20-00281)”. We also appreciate the two reviewers for their positive and constructive comments and advice on our writing.
We thoroughly reviewed the reviewers' comments and made revisions, highlighted in the revised manuscript. The details regarding the revisions are as follows:

Comments from the reviewers:

Review 1
The authors of the study have examined the disparities in the relationship between ambient temperature and years of life lost (YLLs) in regions of China with different development levels. They used the state-of-the-art statistical modelling techniques (DLNMs) and quantified the burden using attributable fractions. The authors have done a fantastic job in placing the study in context both in the introduction and discussion section and they must be appreciated for this unique work. I am overall satisfied with the quality of the work and do not have any major comments. Some minor comments below:
Abstract- line 27- do the authors mean economic development levels?
Response: Thank you for your comment. Development level in the sentence means socioeconomic development level. We revised it accordingly.

“Background: Several studies have investigated the associations between ambient temperature and years of life lost (YLLs), but few focused on the difference of life loss attributable to temperature among different socioeconomic development levels.”(Line 27, Page 3)
The authors have not mentioned the country in which this study was done. I would suggest that they add it in the methods section.
Response: Thank you for your suggestion. We added the country in the method.
364 Chinese counties or districts were classified into 92 high-development regions (HDRs) and 272 low-development regions (LDRs) according to socioeconomic factors of each location using K-means clustering approach.

Response: Thank you for your suggestion. We revised it accordingly.

This indicator takes only the number of deaths into account and not the age at death.

Response: Thank you for your suggestion. We revised it accordingly.

The detailed information on development level is described below.

Response: Thank you for your suggestion. We revised it accordingly.

Statistical analysis- line 184-200, it would be beneficial for the readers to see the mathematical equation for the DLNM model used.

Response: Thank you for your suggestion. We have added the equation in the method section.

E(Yt) = α + cb(Tmt, lag)+ns(timet, df) +ns(Rht,df)+β1DOWt

Response: Thank you for your suggestion. We revised it accordingly.

Compared with HDRs, the daily mean temperature in LDRs was 1.0 degree Celsius higher.

Response: Thank you for your suggestion. We revised it accordingly.

In the availability of data and materials, it would be really useful if the authors could mention about the R codes used for the analysis for the benefit of the readers who may want to replicate the study in another setting.

Response: Thank you for your suggestion. We added relative information in Availability of data and materials.

The R code of this study are available from the corresponding author (mawj@gdiph.org.cn), upon request.

Review 2

This is a well-done and high-quality study in China. The results are representative because of the large sample size and wide spatial distribution across China. I only have some minor comments to improve the manuscript.

The development regions were categorized into two levels (high and low). Why not into three levels (high, moderate and low)? The large sample size still supported such an analysis.

Response: Thank you for your valuable comments. We employed K-means clustering analysis to classify development level and we determined the optimal number of clusters based on Nbclust, an R package which provides 30 indices for determining the best number of clusters. The result show that 2 cluster is the optimal choice, so we categorized all locations into two levels for the achievement of best classification.
2. It is advisable to perform a meta-regression analysis with the development levels, which may provide more quantitative and valuable information on the modification of socioeconomic status. Response: Thank you for your valuable comments. We fit univariable meta-regression models based on the location-specific coefficient of DLNM. The models included location-special urban dwellers, average years of education, GDP per capita and socioeconomic development level respectively. We tested these effects through a multivariate Wald test. We tested residual heterogeneity and reported it by the multivariate extension of Cochran Q test and F statistic. The results show that socioeconomic development level have insignificant effect modification in the full year (P value for Wald test were 0.280, P value for Q test