Author’s response to reviews

Title: Burden of Ischaemic Heart Disease and Attributable Risk Factors in China from 1990 to 2015: Findings from the Global Burden of Disease 2015 Study

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Author’s response to reviews:

Dear Dr. Elgendy,

Thank you very much for giving us an opportunity to revise our manuscript (Manuscript ID: BCAR-D-17-00661). On behalf of my co-authors, we appreciate you and reviewers very much for the positive and constructive comments and suggestions on our manuscript. We have revised the manuscript according to the comments and suggestions raised by the reviewers, and responded point by point as listed below.

Replies to reviewer #1

1. Accompanied by more interventional therapy, more standardized and effective treatment process of STEMI, and more widely applied cardiac rehabilitation, a surprised finding from the current study was that the death rate increased by 13.3% from 1990 to 2015, although final conclusions was hard to be summerized, preliminary hypothesis should be supplied and also highlighted on the basis of the present big-data analysis, instead of simply descripting the change of death risk.

Answer: Agree. Thank you for your comments. Our study showed IHD burden increased in most of Chinese provinces before 2005, yet declined afterwards. Since premature death was the
main sources of IHD burden, age-standardized IHD death rate in China also increased before 2005, yet declined after 2005. Our data showed age-standardized death rate per 100 000 increased from 101.3 (95%UI: 95.3-107.5) in 1990 to 126.3 (95%UI: 122.3-130.9) in 2005, then declined to 114.8 (95%UI: 109.8-120.1) in 2015. Besides, research about the rapid health transition in China based on GBD 2010 study (Yang et al, 2013) also found age-standardized IHD death rate increased largely between 1990 and 2010. As the reviewer said, in recent years, more effective treatments and more widely cardiac rehabilitation were applied to cure IHD patients in China, which made great sense in reducing mortality of IHD patients and could be one of the reason why age-standardized IHD death rates declined after 2005.

However, age-standardized IHD death rates have increased overall during 1990 to 2015. One of the reason could be the increase of life expectancy (8.5 years increase since 1990) in China help people to survive long enough to develop IHD, but many of them had still not access to optimal medical or surgical treatment (Please see Discussion section of revised manuscript, line 229-232, page 11). There were evidence showed mortality of IHD has increased largely in low-and middle-income countries (WHO, 2011), and IHD patients accessed to less affordable, available and high quality CVD medication in those countries (Wirtz et al, 2016). Besides, major IHD risk factors has increased over the past decades in China such as hypertension, dyslipidemia, ambient particulate matter pollution. (Yang et al, 2013) China is one of the largest developing countries, which has undergone rapid economy growth and health transition. Non-communicable disease of China has increased largely, especially cardiovascular disease. Therefore, it is possible for age-standardized IHD death rate increased during 1990 to 2015 in China.

Considering the reviewer’s comments, we revised our discussion about the different tendency before and after 2005 as follow: “In different periods, IHD burden in most of provinces ascended before 2005, but declined afterwards. This transition occurred for multiple reasons. The increases before 2005 was mainly caused by the increased prevalence of IHD risk factors such as hypertension, dyslipidemia, ambient particulate matter pollution. IHD burden declined after 2005 partly because in that period, there were many important strategies released and implemented on tobacco, diet, physical activities, and harmful use of alcohol, to prevent and control chronic non-communicable diseases. Besides, the improvement of IHD treatments and wildly applying cardiac rehabilitation in recent years made great sense in reducing mortality of IHD patients”. (Please see Discussion section of revised manuscript, lines 241-249, page 12)

2. Southern provinces was showed with obviously lower death rate compared with northern provinces, except for enviromental factors, is there any other attributable factors involved in this huge difference?
Answer: Agree. Thank you for your notice. Our study showed most of southern provinces, especially southeastern coastal provinces, had lower age-standardized death rates and DALY rates compared with northeastern provinces. Except for environmental risks dominated by ambient particulate matter pollution, there were still some factors involved in this huge difference, including behavioral risks such as diet high in sodium and smoking, metabolic risks such as high blood pressure and high total cholesterol, meteorological conditions, and household income levels. Southern provinces, especially southeastern coastal provinces, had lower age-standardized death rates and DALY rates partly because those provinces had lower hypertension rate, lower air pollution, eating habits closed to the Mediterranean diet or Japanese diet, warm climate condition and higher household income. (Please see Discussion section of revised manuscript, line 254-258, page 12)

3. Big-data analysis might be of more significance if it demonstrated not only phenomenon but also possible reasons, especially when it showed surprised conclusions. If the current data could not support the relevant analysis, it should be figured out in the section of limitation.

Answer: Agree. Thank you for your comments. Considering the Reviewer’s suggestion, we have stated the limitation about the data we used as follow: “GBD 2015 study used big-data analysis technologies to integrate heterogeneous data and estimate burden of diseases and risk factors. Although many methods and process were used to reduce bias, including misclassification corrections, redistribution of garbage code, and noise reduction, it was difficult to thoroughly avoid inaccuracy. Therefore, our results about IHD burden in provinces of China should be treated carefully as the data we used were estimated.” (Please see Discussion section of revised manuscript, line 282-287, page 13)

References


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Replies to reviewer #2

1. The authors state that "regional differences partly caused by the differences in behavior and lifestyles, environmental qualities, meteorological conditions, and household income levels between different regions….Southeastern coastal provinces went through lighter IHD burden as those provinces had higher household income, lower air pollutions, warm climate conditions and eating habits closed to the Mediterranean diet or Japanese diet". Do the authors have data on differences between provinces in other top IHD risk factors, importantly smoking rates, systolic BP and total cholesterol?

Answer: Agree. Thank you for your notice. We are so sorry that we don’t have data about smoking rates, systolic blood pressure and total cholesterol for each province of China based on GBD 2015 study, but we found data on differences between provinces or cities for smoking, hypertension, and total cholesterol from other articles and publications. For smoking, a report on adults tobacco survey in 14 Chinese cities released by National CDC of China showed that smoking rate for southern cities were lower than northern cities. For hypertension, Jinwei Wang and its colleagues found prevalence of hypertension were higher among adults from north of China compared with those from south. Dianjiang Li and its colleagues also had similar results. For total cholesterol, Jing Yang (from National CDC of China) and its colleagues found deaths and DALYs attributed to high total cholesterol in northern provinces were higher than southern provinces based on result of GBD 2013 study.

Considering the reviewer’s comments, we revised the discussion about the reason of regional differences listed as below: “These regional disparities partly caused by the differences in exposure of metabolic risks and behavioral risks, environmental qualities, meteorological conditions, and household income levels between different regions. Southeastern coastal provinces went through lighter IHD burden as those provinces had lower prevalence of hypertension and high total cholesterol, lower smoking rate, lower air pollution, higher household income, warm climate conditions and eating habits closed to the Mediterranean diet or Japanese diet” (Please see Discussion section of revised manuscript, line 251-258, page 12). We also outlined the lack of data for risk factors in provinces of China in Limitation section as follow: “accurate data such as follow-up data on non-fatal IHD outcomes, as well as data on prevalence of IHD risk factors, are still very limited in provinces of China. Because the insufficiency of data on risk factors by provinces, our study lacked analysis of regional differences of IHD risk factors, which should be conducted in the future”.( Please see Discussion section of revised manuscript, line 287-291, page 13-14)

References


In addition, the language of our manuscript has been carefully reviewed and revised. We look forward to the positive responses from you and reviewers. Thank you very much for your consideration.

Should you have any questions, please contact us without hesitate.

Yours sincerely,

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