BMJ -
Decision on
Manuscript
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Body: 23-Nov-2019
BMJ-2019-052342 entitled "Trends and risk factors of mortality and disability-adjusted life year for chronic respiratory diseases from 1990 to 2017"

Dear Dr. Li,

Thank you for sending us your paper. We sent it for external peer review and discussed it at our manuscript committee meeting. We recognise its potential importance and relevance to general medical readers, but I am afraid that we have not yet been able to reach a final decision on it because several important aspects of the work still need clarifying.

We hope very much that you will be willing and able to revise your paper as explained below in the report from the manuscript meeting, so that we will be in a better position to understand your study and decide whether the BMJ is the right journal for it. We are looking forward to reading the revised version and, we hope, reaching a decision.

Please remember that the author list and order were finalised upon initial submission, and reviewers and editors judged the paper in light of this information, particularly regarding any competing interests. If authors are later added to a paper this process is subverted. In that case, we reserve the right to rescind any previous decision or return the paper to the review process. Please also remember that we reserve the right to require formation of an authorship group when there are a large number of authors.

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Dr Jose Merino
US Research Editor
jmerino@bmj.com

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Report from The BMJ's manuscript committee meeting

These comments are an attempt to summarise the discussions at the manuscript meeting. They are not an exact transcript.

Members of the committee were: John Fletcher (chair), Jamie Kirkham (statistical consultant), Tiago Villanueva, Tim Feeney, David Ludwig, Helen Macdonald. Written comments from Elizabeth Loder and Amy Price.

Decision: Put points

Detailed comments from the meeting:

First, please revise your paper to respond to all of the comments by the reviewers. Their reports are available at the end of this letter, below.

Please also respond to these additional comments by the committee:

- It's a secondary analysis but encompasses 195 countries. The spatial trends are interesting.

- The results section is a bit number heavy, where the authors focus on countries with the highest and lowest rates. Perhaps more informative is that we would like to see the numeric values for all 195 countries in Supp material as Tables. We need tables of the disease rates for each contry as well as the maps. The main results section could then be condensed some what.

- Please explain the assumptions one reviewer mentioned, i.e. regarding linearity - sometimes these are overlooked (more serious) or done, verified but not specifically mentioned (less serious). Perhaps a sentence or two on this would suffice.

- The authors describe the SDI ranging from (0-1) - more details on what this represents would be useful. E.g. is 0 or 1 good or bad? And how does this lead to the classifications, e.g. high and low regions.

- highlight the results and report the large numbers as 3.32 million rather than the confusing 3,317.2 thousand. In general 3 significant figures would be about right.

- Caution with use of the word 'significantly increased' when it is unclear this phrase does not come from the use of a statistical test to be compared. I would revise this.

- They should provide more information on what how the SDI is calculated and interpreted as it features so prominently throughout the paper but general readers won't be familiar with it.

- When reporting % change over time it is important to be clear when this is "per annum" and when it is "before and after". eg
a) "Unlike other CRDs, the global ASMR due to interstitial lung disease and pulmonary sarcoidosis increased at an average of 0.97% (95% UI 0.92-1.03%) from 1990 to 2017". They mean per year I think.
b) "The number of deaths due to COPD in 2017 corresponded to a 23% increase compared with that in 1990". They mean overall before and after I think.

- One editor commented: "I kept forgetting what ASMR, SDI, CRDs and EAPC were. Maybe keep these spelled out each time? COPD and DALY are more familar."

- This paper contains no PPI declaration or the mandatory dissemination plan. Please have the authors read and apply our instructions to authors and supply a declaration in their own words.

Mandatory patient and public involvement reporting
The BMJ is encouraging active patient and public involvement in clinical research as part of its patient partnership strategy. This is research which is "co-produced" with patients, carers, or members of the public. Patient involvement in this context is not about being a research participant, answering surveys, or being an interviewee. It encompasses setting research priorities, defining research questions and outcome measures, providing input into study design and conduct, dissemination of results, and evaluation.

To support co-production of research we request that authors provide a short paragraph as a subsection within the methods section of their papers entitled Patient and Public Involvement detailing how they involved the patients and the public in their research. We request this to both encourage the movement and ensure that BMJ readers can easily see whether, and if so how, patients and the public were involved in the research. If they were

not involved in any way this information should be formally documented in the Patient and Public Involvement section.

As co-production of research with patients and the public is relatively new we appreciate that not all authors will have involved them in their studies. We also appreciate that patient / public involvement may not be feasible or appropriate for all papers. We, therefore, continue to consider papers where they were not involved.

The Patient and Public Involvement section should provide a brief response to the following questions, tailored as appropriate for the study design reported:

• At what stage in the research process were patients/public first involved in the research and how?
• How were the research question(s) and outcome measures developed and informed by their priorities, experience, and preferences?
• How were patients/public involved in the design of this study?
• How were they involved in the recruitment to and conduct of the study?
• Were they asked to assess the burden of the intervention and time required to participate in the research?
• How were (or will) patients and the public be involved in choosing the methods and agreeing on
plans for dissemination of the study results to participants and wider relevant communities? For accepted papers, we will ask you to confirm when and how results were (or will be) disseminated to patients and relevant communities. Guidance for best practice in dissemination is set out in the following link and gives examples: https://www.nihr.ac.uk/funding-and-support/documents/funding-for-research-studies/manage-my-study/How-to-disseminate-your-research/dissemination-guidance.pdf

In addition to considering the points above, we advise authors to look at the guidance for best reporting of patient and public involvement as set out in the GRIPP2 reporting checklist.

In your response please provide, point by point, your replies to the comments made by the reviewers and the editors, explaining how you have dealt with them in the paper.

Comments from Reviewers

Reviewer: 1

Reviewer: Prof. Robin Haring, PhD
General comments
In comparison with other leading causes of global morbidity and mortality, chronic obstructive pulmonary disease (COPD) gets little attention. Despite that, COPD is expected to become the global leading cause of death in 15 years. Thus, the research question and content of the present paper is valuable and timely.
In their manuscript: "Trends and risk factors of mortality and disability-adjusted life year for chronic respiratory diseases from 1990 to 2017" Li X et al. performed a secondary data analysis based on data from the Global Burden of Diseases, Injuries and Risk Factors Study 2017 (GBD) to provide a comprehensive assessment of the mortality and disability-adjusted life years due to chronic respiratory diseases in 195 countries and territories from 1990 to 2017.
The manuscript is well written, the methodology, as well as the statistical analysis appears sound, and the discussion is focused on the empirical findings. Please find below detailed comments raised during revision of the manuscript:

Abstract: please specify "DisMod-MR 2.1" as Baysian meta-regression tool.

Abstract: suggest to cut the “Findings” part by 50% and include some estimates for CRD risk factors, and to pronounce socio-demographics (income, education) as the single most important chronic respiratory disease risk factor to be addressed in order to further decrease mortality in developing countries.

Methods: Based on open data from the GBD 2017, the present manuscript is based on secondary data analysis. However, in order to provide reliable and transparent findings, I would like to ask the authors to provide their statistical analysis syntax and data set in an open science repository (e.g. Open Science Framework) to be assessable for independent re-analysis.

Results: suggest to use “confidence interval” instead of “uncertainty interval” throughout the manuscript.

Discussion: suggest to strengthen discussion regarding the global under-recognition, misdiagnosis and inequity (in prevalence) of COPD.

References: up to date and relevant, without any glaring omissions.

Additional Questions:
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Please confirm that you understand and consent to the above terms and conditions.: No

Please enter your name: Robin Haring

Job Title: Professor Public Health

Institution: Monash University

Reimbursement for attending a symposium?: No

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Reviewer: 2

General comment:
Dr. Xie and Dr. Liu performed an analysis about the trend and risk factors of mortality and DALY for chronic respiratory disease (CRD) with GBD 2017 data available online. The finding included increased number of death and decreased ASMR of CRD from 1990 to 2017. The trend of DALY from 1990 to 2017 also varied across different diseases. This is a challenging work especially for combining and analyzing data from 195 countries, in which the definition of CRDs must be different. The association of risk factors with age-standardized mortality rate (ASMR) of CRD are all well analyzed in former studies and seems to be lack of novelty.

Major comments:
METHOD
1. The authors obtained DALY and mortality data for CRDs in 195 countries and territories from GBD 2017 data available online. However, the diagnosis of CRDs in different data or study of each countrie may be different. Could you give a detailed description for the specific methods used to deal with the inconsistency, which can have a direct impact on the results?

2. Data source: As this is GBD study, incorporating data from 195 countries must be a great challenge for author, not only for outcome but also for risk factors. The definition for risk factors including secondhand smoking, particulate matter pollution, high body mass index should also be clarified. This is very important for interpretation of results.

3. Data source: Please give definition for “high, high-middle, middle, low-middle and low SDI regions”

4. Statistical analyses: The author employed generalized linear model with a Gaussian distribution to calculate estimated annual percentage change (EAPC) of the ASMR. The generalized linear model method here requires an assumption that expected value of the response is related to the time by a logarithm expression, that is, a linear relationship should exist between the ln(ASMR) and the calendar year, which is equivalent to a constant change assumption. Such assumption is important and a significant deviation from linearity assumption (e.g., increase at first and decrease later which have trend of quadratic function) might greatly undermine the validity of the results, which makes an assessment of the linearity based on scatter plots necessary here, to check whether the linearity assumption holds.

5. Statistical analyses: Pearson correlation coefficient was used to measure the strength of the association between the SDI and ASMR. However, Pearson correlation assume a linear relationship exists, which refers to a “straight line” relationship between the variables.

Moreover, the homoscedascity assumption, which means the size of the error is the same for all values of the independent variable, should also be considered. While, according to supplement figure 5, I am struggling to be convinced that the homoscedascity assumption could hold. Besides, the influence of outliers, which could pull the line of best fit formed by the correlation too far in one direction or another, should also be assessed here.

RESULTS
6. "Approximately 2.87 billion DALYs were attributed to CRDs from 1990 to 2017 worldwide." This number cannot be found in Tables or Figures. The authors should give an explanation for how this number was calculated.

7. "Nevertheless, the ASMR declined by an average of 2.41% (95% UI 2.27-2.56%) during the same period" This number cannot be found in Tables or Figures. The authors should give an explanation for how this number was calculated.
8. Risk factors: "Tobacco-attributable deaths decreased as the SDI declined". The description is contrary to results shown in Figure 8a.

9. The results shown in Figure 6b is very confusing. What is the difference between tobacco and smoking as the results for these two items was different? The authors used the term "tobacco" when introducing risk exposures in Data sources without mentioning "smoking". Please give your definition if these two words refer to different things in this manuscript.

DISCUSSION
10. SDI was a key point among risk factors. However, discussion section about SDI was mainly repetition for the contents in results section. The discussion should be more specific, with mentioning which countries have high, high-middle, …, low SDI and the explanation for opposite direction for the association of SDI with COPD/pneumoconiosis/asthma and interstitial lung disease/pulmonary sarcoidosis.

Minor comments:
METHOD
1. In "Statistical analyses", the 95% UIs should be determined using the 2.5th and 97.5th percentiles of the ordered 1000 values.

SUPPLEMENTARY MATERIAL
2. The numbers of decimal places in Supplementary Table 2 should be consistent.

3. Add correlation coefficients and p values to Supplementary Figure 5.

Additional Questions:
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Please enter your name: Chen WANG

Job Title: President and Professor

Institution: Chinese Academy of Medical Science and Peking Union Medical School

Reimbursement for attending a symposium?: No

A fee for speaking?: No

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Funds for research?: No

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