Peer Review Report

Review Report on Trends in deaths attributable to smoking in China, Japan, the United Kingdom, and the United States from 1990 to 2019

Original Article, Int J Public Health

Reviewer: Zubair Kabir
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EVALUATION

Q 1 Please summarize the main findings of the study.

The study use the publicly available GBD 2019 Study data to examine trends in smoking-attributable deaths across four contrasting countries- China, Japan, the UK and the United States between two calendar years- 1990 and 2019. The authors employed two additional techniques- the age-period-cohort (APC) modelling framework and a decomposition analysis (Das Gupta's method) to explore the drivers of such smoking attributable trends.
The metrics used are relevant to APC and the decomposition analysis- not the standardized metrics of GBD- namely, DALYs.
The main findings are:
- The age-standardized mortality rates, period effects and cohort effects of smoking attributable mortality in China, Japan, U.K., and U.S. have been declining in both sexes from 1990 to 2019, with varying levels of effects.
- Smoking attributable deaths in China increased due to population ageing and population growth (the main drivers)
- Age and gender variations were observed, for instance, people above 80 years of age had the largest effect, while males in China showed the highest rates and Japanese females the lowest rates
- The third driver (age and cause-specific mortality) contributed the largest to smoking-attributable death reductions in all three countries, except in China
- Both period RRs and cohort RRs of smoking attributable mortality showed monotonic decreasing patterns trend with year in 4 countries
- The net drifts of smoking attributable mortality rates were negative in all four countries, with the U.K. showing the smallest net drift.

Q 2 Please highlight the limitations and strengths.

This study has several strengths:
- A comprehensive database- such as the GBD- which are in the public domain (so transparency and reproducibility is not an issue)
- The utility of an online APC estimation tool of the NCI- which is commonly employed and validated
- The commonly used decomposition analysis method of Das Gupta- well established technique
- The GBD framework of a comparative risk assessment- STGMR and DisMod modelling along with TMREL counterfactual scenario of population attributable risk

The limitations of the study are related to the GBD methodology in particular:
- The use of World Standard Population for age-standardization instead of country-specific Standard Population
- The patchiness of data and the assumptions involved for statistical models
- The lack of individual-level data introducing ecological fallacy

Q 3 **Please provide your detailed review report to the authors. The editors prefer to receive your review structured in major and minor comments. Please consider in your review the methods (statistical methods valid and correctly applied (e.g. sample size, choice of test), is the study replicable based on the method description?), results, data interpretation and references. If there are any objective errors, or if the conclusions are not supported, you should detail your concerns.**

Major comments:
- The lack of individual-level data leading to ecological fallacy- but this was minimised with a comprehensive database, such as the GBD, which employs a standardized methodology and robust statistical models
- The rationale for choosing this specific 4 countries was not clearly articulated
- The statistical models for the GBD estimates are well-established and are in the public domain
- The APC analysis using an online APC tool of the NCI is a common approach
- The DasGupta's method of decomposition analysis is well-established

Minor comments:
- Unclear why the standard metrics of GBD such as DALYs were not used in this study (total DALYs and age-standardized DALYs for smoking, for instance) and to estimate the change between 1990 and 2019 across these 4 countries by age and gender
- The limitations section must have been elaborated instead of alluding to GBD methodological publications
- Figure 2 is interesting and important on decomposition analysis but is not readable- a high resolution image is useful

PLEASE COMMENT

Q 4 **Is the title appropriate, concise, attractive?**

Yes

Q 5 **Are the keywords appropriate?**

Yes

Q 6 **Is the English language of sufficient quality?**

May be some copy-editing is required

Q 7 **Is the quality of the figures and tables satisfactory?**

Yes.

Q 8 **Does the reference list cover the relevant literature adequately and in an unbiased manner?)**

Yes

QUALITY ASSESSMENT

Q 9 **Originality**

Q 10 **Rigor**

Q 11 **Significance to the field**

Q 12 **Interest to a general audience**

Q 13 Quality of the writing

Q 14 Overall scientific quality of the study

REVISION LEVEL

Q 15 Please make a recommendation based on your comments:

Minor revisions.