Reviewer’s report

Title: The impact of the major causes of death on life expectancy in China: a 60-year longitudinal study

Version: 1 Date: 31 July 2014

Reviewer: Joop de Beer

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The authors show how the sharp decline in infectious and parasitic diseases has contributed to the strong increase in life expectancy in China since 1950, while the number of years lost due to chronic diseases has increased. They calculate Potential gains in life expectancy (PGLE) which is a good indicator of the contribution of different diseases to changes in life expectancy. In addition they show possible changes for the next ten years. The methodology is not new, but the results are interesting.

Major Compulsory Revisions

1. The authors refer to the goal of the Chinese government to increase life expectancy by one year in the next five years. They make projections of life expectancy for the next ten years. However, the authors do not discuss whether the goal can be reached and under what conditions. They should discuss whether this goal can simply be reached if current trends continue or whether stronger policies will be needed.

2. The authors examine the effects of four categories of disease on changes in life expectancy between 1950 and 2010. They do not argue why they chose these four categories. The proportion of deaths due to maternal diseases has been low during the whole period. So it is not clear why this cause of death is included.

3. The authors project a “natural trend” of PGLEs, but do not explain what this trend is and how they calculated this. This is particularly important, because in Table 2 they project an increase in PGLE by tumours, whereas Figure 2 shows that PGLE by tumours declined between 1985 and 2005, but has shown a small increase in the most recent years. Is their projection based on the recent increase or on the average increase between 1950 and 2010?

4. The authors try to assess the effects of prevention and control of diseases by assuming that death rates decline or increase by 10%. These percentages are rather arbitrary. Can the authors argue whether these percentages seem reasonable in view of past developments? Furthermore the results suggest that these alternative projections are symmetric compared with the natural trend. So I guess that the alternative projections are not based on a 10% decline or increase, but on some variation relative to the natural trend. The authors should explain their calculations.

Minor Essential Revisions
5. The section Study setting gives two reasons why A Province is selected. The first reason is that it is a developed province with a high socioeconomic status and that the life expectancy trends were very similar to China as a whole and therefore representative of China. If the authors aim for representativeness they should not look for a province with average rather than high socioeconomic status. The second reason given by the authors is that health development showed rapid progress. Again, I would expect that the authors select a province with average rather than rapid progress. So it is not clear whether the analyses of changes in health are really representative for the entire nation. At the end of the discussion section the authors point out that because of differences in developments between provinces, one should be careful in interpreting the results. Do they mean that the results are representative for the whole of China but not for all provinces? The authors should make clear what they mean.

6. In table 1 the numbers in the third column are higher than in the first column, as one would expect. However, this is not the case for the first row (infectious and parasitic diseases). Is this a mistake or is there an explanation?

Discretionary Revisions

7. In the second paragraph of the background section I would replace 199.9‰ by 19.99% and 2.7‰ by 0.27%. This would be in line with the next sentence.

8. The section Data sources mentions that several years of data were missing. Which years?

9. In the section Historical trends of PGLEs from 1950-2010 the authors mention that the PGLEs of infectious and parasitic disease have decreased to 0.07 years in 2010, “and have remained low.” But there are no observations after 2010. Do the authors mean that the PGLEs have decline until 2000 and have remained low since?

10. Reference 4 concerns the 2002 revision of the UN projections. Why not refer to more recent projections?

11. Last sentence of Discussion section: “indictors” should be “indicators”.

Level of interest: An article whose findings are important to those with closely related research interests

Quality of written English: Acceptable

Statistical review: No, the manuscript does not need to be seen by a statistician.

Declaration of competing interests:

I declare that I have no competing interests