Reviewer's report

Title: Changes in Healthy Life Expectancy and the Correlates of Self-rated Health in Bangladesh between 1996 and 2002

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Reviewer: Emmanuelle Cambois

Reviewer’s report:

This paper provides first estimates of HLE for Bangladesh for two dates 1996 and 2002. The analysis uses an internationally designed survey comprising information on health, values and social situations run in 1996 and 2002. Data on self-rated health are combined with regular life table of the corresponding years for men and women separately. Additional analyses are run to highlight correlations between SRH and various socioeconomic and values variables. Observed changes in the health determinants are discussed.

The study indicates that healthy life expectancy has increased. The analysis indicates that some advantaged groups (education, ...) happened to have gained less than more disadvantaged group between 1996 and 2002; moreover the gain difference was such regarding literacy that the illiterate group reports better health than the literate group in 2002. These results are unusual and unexpected and should be discussed or documented. Indeed, in the meantime, life expectancy did not increase so much for women and even decreased for men; this could be part of the explanation. And in parallel, there are some survey issues that could interfere. (see below).

This is a valuable study because little information is available on health in this country and health expectancies are useful indicators combining mortality and health patterns. Meanwhile, further information, in particular looking at survey issues, could help comforting the outcome and improving substantially the relevance of the paper. If survey issues happen to be source of bias regarding trends analysis, this should be known and discussed. Other explanations of the observed trends need to be addressed.

Major revisions

First, I would argue that points of major interest concerning Bangladesh is the massive increase in life expectancy over past decades, as mentioned in the introduction, but further is the recent stagnation in LE or even decrease for men. This latter pattern is mentioned but very late in the paper; while it makes the motivation of the paper even more relevant in my point of view: How this trend articulates with health outcomes? How far increasing mortality impacts the whole population or a selection of it? Health expectancy is a useful tool to explore this. Furthermore, it could be part of the explanation of the results obtained.

Indeed mortality seems to have declined rather at older ages inducing, at least
for men, that the gains in LE were made at younger ages at which "good SRH" is the highest. I would suggest developing more this aspect: it is mentioned in the text that mortality should have increased at older ages, but more importantly it needs to be mentioned by which mechanism: were older people (whole or part of) more exposed to adverse conditions over the recent period? Is this been more pronounced for the most deprived (did the SES distribution of the population at older ages has changed over this period)? If such a process explains the mortality increase, then it could also explain a stronger selection effect and an increase in the healthy years for the survivors who might be more robust. This could be a way of interpreting the unexpected outcome of increasing HLE and increasing good SRH in all groups especially among the disadvantaged. Therefore, I would suggest putting forward this information and further document it, at least in terms of age impacted as mentioned in the discussion.

Second, there are survey issues:

> I think the authors needs to provide more information on the 1996 and 2002 samples (at least participation rates) to ensure the validity of the results or to highlight possible artefact in the observed trends. While the sample size is limited, its representativeness regarding health and social factors is an important issue. This information should be checked and discussed as this might compromise the trends analysis. Determinants of non-participation to surveys are known to be associated with social status and poor health; a reduction in the participation rate might go with a stronger selection on both health and social factors (and higher probability of good health). Changes in the sample coverage might participate to the outcomes and it is good to know if the coverage is high and stable from 1996 to 2002.

> The data does not cover institutions: is this a major issue in Bangladesh? Did the % of institution residents' changed from 1996 to 2002? This could be documented.

> The change in the response categories for self-rated health might have had an impact: in 2002 the category "very poor health" has been suppressed. The authors implicitly assumed that the changing category only impact those with 'very poor health' who would rate themselves in "poor health" in 2002. Meanwhile whether this missing category induced all people to over-rate their health in 2002 is an option; the whole distribution between good-average-poor health might have moved towards better health as interviewees calibrate their answer relative to the response categories scale; changing the scale might change the individual calibration. Here again, this has to be discussed as it might compromise the trends analysis.

Question/suggestions:

Page 4: as mentioned above, recent trend in mortality could be presented and documented in introduction, in particular, exposing that LE loss concern older ages, at which poor health is more prevalent.
Page 4 (end of line 5): I think it should be written "Health expectancy can be measured by a variety of different health dimensions" (and not LE can be measured...). I suggest also that this sentence comes at the end of the paragraph. Indeed, the following sentences discuss the health expectancy indicators in general and not the HLE in particular.

Page 5: In Mathers et al., I wonder whether the indicator used is a HLE (the health expectancy based on SRH) or another indicators (health or disability adjusted indicator as the paper refers to the GBD project). This should be clarified.

Page 5: Figure 1 is not so useful.

Page 6: Participation rates to the Bangladesh survey is needed to discuss possible bias as mentioned above.

Page 7: Discussion about change in response category for self-rated health is needed as mentioned above.

Page 7 (3 lines before last): the age groups and independent variables rather refer to "SHR" than "health expectancy calculation"?

Page 8: Rationales for analysing the various explicative variables are too brief, especially regarding the link made between religious faith and diseases of the central nervous system. All the variables used are indeed interrelated and associated with health altogether. This should be better exposed. Is religious faith in Bangladesh linked to education, locus of control, income and life satisfaction? Did this changed over time (or did the sample distribution changed in this respect)? This needs to be discussed especially because the results are counterintuitive regarding what is explained in this paragraph: if religious faith tends to increase comfort and to reduce stress, religious should be associated with relatively better health, which is not what is found if I understood well.

Quality of the reported information can be discussed: is income known to be accurately documented? Etc...

Page 14 (first line): here the reader finds out that LE actually decreased for men, in spite of what is said in introduction about the massive increase in LE. Therefore, this recent trends should be mentioned in introduction as discussed above.

Page 15-16: here unexpected results are presented showing a greater increase in good health for the most disadvantaged and for the religious, ending up with some "inverted" association with health. And Page 17 (first paragraph), the authors highlight the fact that life satisfaction is the only variable remaining associated with health in both surveys. I wonder whether the authors could have rather proceeded in two steps with univariate and then multivariate analysis, rather than correlations, to compare the association with health: the variables are all interrelated and the SRH prevalence might be strongly related to age structure.
and social structure of these groups: Are the religious with poorer health because they are mainly older people? The authors suggest this, but then it could be more informative to see whether the associations are changing from univariate to multivariate models.

The association with life satisfaction is interpreted as a major driver in the association with health. But here again I would say that changing population composition (and/or sample coverage?) might lead to a changing association in the model rather than a changing influence of life satisfaction on health.

Page 18: as suggested above the increase in male mortality can be highlighted in introduction as part of the context. This might be an explanation of the growing HLE if the increase in mortality has impacted the most deprived and less robust groups.

Page 19: Life satisfaction and the other variables are associated with health. The authors suggest that these variables impact health, but health impacts all these variables. This is mentioned in the conclusion but should be discussed here. Furthermore, this section explains possible interaction between variables and this could be documented by univariate+multivariate analysis as suggested above.

Page 20: the limitations should be further discussed to see how much data quality/reliability issues could impact the results. Not only regarding the sample and the health measure, but also regarding the other variables such as income. Are these surveys brings coherent outcome with respect to what is known on the population structure and from other data sources?

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

**Quality of written English:** Acceptable

**Statistical review:** Yes, but I do not feel adequately qualified to assess the statistics.

**Declaration of competing interests:**

I declare that I have no competing interests