Author's response to reviews

Title: Mortality profiles in a country facing different stages of epidemiological transition: An analysis of registered data

Authors:

Luis Huicho (huicho@gmail.com)
J. Jaime Miranda (jaime.miranda@lshtm.ac.uk)
Miguel Trelles (cayetaniense@yahoo.com)
Fernando Gonzales (fgonzale@per.ops-oms.org)
Walter Mendoza (mendoza@unfpa.org.pe)

Version: 2 Date: 30 October 2008

Author's response to reviews: see over
Lima, October 30th, 2008

REF: MS: 1737663412171985 - Mortality profiles in a country facing different stages of epidemiological transition: An analysis of registered data

BMC Central Editorial

Dear Editors

Many thanks for sharing the useful comments of reviewers to our manuscript submitted to BMC Public Health.

Please find below a rebuttal letter answering point-by-point each of the reviewers’ comments and the corresponding changes to the manuscript.

Yours sincerely,

Luis Huicho
Reviewer 1

Major Compulsory Revisions

1. In the first part of their results section, the authors should add more details about the under-reporting observed in this study to support data in Table 1. The authors should describe in details the initial finding before their correction attempts. This will be important information for the readers to justify the validity of the results obtained.

**Answer:** Details for data before correction and details about under-reporting are shown now in the revised manuscript (Results, page 12, first paragraph). Summary life table measures such as life expectancy and mortality risk by age including under-five mortality and adult mortality have also been included as an appendix (Additional file 2) in the revised manuscript. Please see also below our answer to first comment from Reviewer 2.

2. The use of the cut-offs to stratify departments into three profiles are confusing. The criteria used were not mutually exclusive. An imaginary department which had 60% of non-communicable diseases death, 25% of communicable diseases death, and 15% of death caused by injury, can be categorized as in Profile 2 and Profile 3 at the same time. The authors need to consider the better use of profile.

**Answer:** We checked our cut-offs for stratifying the departments into three profiles and we confirmed that there are correct. Thus, the imaginary department proposed by reviewer would belong in fact to profile 1, because having more than 40% of communicable deaths excludes it from profile 2 or profile 3.

The last figure might be more informative if it shows the progress of the non-communicable disease over time in different regions. If the authors were to buy this suggestion, the results description under the heading “Transition of mortality profiles” should be revised accordingly.

**Answer:** We thank the reviewer for this remark. We have accordingly modified the legend of Figure 4 for better showing the cut-offs, and in particular for highlighting the increase of non-communicable diseases.

3. The reviewer questions the way the authors redistributed the unregistered total deaths according to the proportion of rural and urban distribution. If the protracted epidemiological transition with one of its feature of within country health inequalities exists in Peru as suggested by Huynen et al. (2005), one might expect health inequalities also exists between rural and urban population, and that rural population in general might have higher mortality rate compared to urban population. The reviewer assumes the registration system worked better in urban setting, thus most of the unregistered death might come from the rural population. It does not make any sense to redistribute the unregistered death according to the rural and urban population distribution.

Answer: We agree. We removed accordingly all the information referred to the redistribution of deaths in rural and urban areas, in Abstract, Methods, Results, Discussion, and Tables. Specifically, former Table 3 was removed completely and data referred to “urban” and “rural” were also removed from former Table 5. Tables are renumbered now from 1 to 3.

4. The reviewer tries to sum up the proportion of deaths in Table 2 for each region, but could not get the total of 100%. Is this because that the authors classified the deaths into 44 different categories and presented only the 10 most common causes of death? The proportions presented in Table 1 only cover less than 50% of the total death. It might be therefore more useful to reclassify the causes of death into fewer categories (but more than just NCD, communicable diseases and injury), and this will make the table more informative.

Answer: Yes, we only show in Table 2 the 10 leading causes of death, which do not constitute 100% of total deaths. What we did in fact in our analysis is that we combined the 61 categories of the ICD-9 and the 67 categories of ICD-10 classification of diseases (please, see details in Methods section under Data Analysis, third paragraph). We then chose to present only the 10 most common causes in the Table, like other reports did, such as the paper from Beaglehole and Yatch (Beaglehole R, Yach D. Globalisation and the prevention and control of non-communicable disease: the neglected chronic diseases of adults. Lancet 2003; 362: 903–08). In this way we think we avoided too many categories while keeping the table informative.

5. The authors’ discussion and interpretation of cardiovascular disease epidemic, smoking and lung cancer is confusing. How can the authors infer that tobacco was not responsible for the increase in cardiovascular disease mortality in Peru? The data in Table 4 showed that over 5 years of time, the mortality of CVD increased by 3.5%, cancer 10.1%, COPD 1% and diabetes 8%. All of these chronic diseases share the common risk factors, among which are tobacco uses. The US Surgeon General Report in 2004 stated that “smoking harms all body organs”. An ecological study assessing the trends of cigarette consumption and cardiovascular diseases mortality over the same time period might enable one to make the claim stated by the authors. Without such study, it is too premature to claim that the increase of CVD mortality rate was not related to tobacco.


Answer: The reviewer is right. We removed therefore the paragraph on cardiovascular disease, smoking and lung cancer, as it is entirely speculative.

6. The authors should interpret the Reference #44 carefully in Peru setting. Ezzati and Lopez (2004) based their calculation of smoking attributable mortality from for lung cancer, upper aerodigestive cancer, all other cancers, chronic obstructive pulmonary disease (COPD), other respiratory diseases,
cardiovascular diseases, and selected other medical causes of death. One should question the validity of the Ezzati and Lopez’s statement that Peru was classified as region with low total adult mortality attributed by smoking if 50% of deaths in Peru were unreported (Table 1 in the manuscript).


**Answer:** Yes, again we agree with this reviewer’s comment, which is related to the previous one. The entire paragraph was removed to avoid speculative interpretations.

**Minor Essential Revisions**

1. In the background section, the authors used a research from Thailand (Reference #16 and #17) as an example to illustrate the effort to patterning epidemiological transition in developing countries. The reviewer thinks that it is not appropriate to use a paper reporting trends of cardiovascular disease mortality and its risk factor to illustrate epidemiological transition. Other references cited (#18, #19, #20, #21) serve their function well to portray the epidemiological transition with their detailed descriptions on the share of communicable and non-communicable diseases as the main cause of death in respective countries.

**Answer:** We removed Thailand from the text along with the references. We included instead two references describing China’s epidemiological transition as another prominent Asian example. References 16 and 17 are thus now:


2. The authors referred to Reference #24 as study which presented only “general description of the stages of transition at country-level”. Indeed, the main aims of the paper is to prove whether protracted epidemiological polarization exists in a transitional country of Peru, one of which feature is unequal distribution of wealth and health status within the country. The authors contrast several important health indicators, including the mortality rate of communicable diseases, cardiovascular diseases, and neoplasm, between Lima (the richest) and Huancavelica (the poorest parts of the country). The authors might rephrase the phrase quoted above, while keeping the following phrase of “but without an in-depth analysis of sub-national causes of death”.

**Answer.** We rephrased the paragraph on reference 24, describing the points raised by the reviewer (page 5, last paragraph, lines 9-15).

3. In their description about CELADE model life-table, the authors should clarify to which population was the life-table fitted. Was it to the age and sex distribution of the national Peruvian population and of national registered deaths? Is it correct that the authors tried to standardize the mortality rates in each department accordingly to the national mortality rate? If so, more detailed description on this will help the reader to understand the correction process described by the authors.
Answer: In fact, the CELADE model life-table was fitted to the age and sex distribution of each Peruvian department and we make this clear now in Methods (page 8, first paragraph, lines 1 and 2). We also clarify now that for estimating age-standardized death rates in each department we used the direct standardization in which the age-specific rates for the population of interest are applied to a standard population (page 9, second paragraph).

4. There is no explicit description in the Methods section of the manuscript whether the redistribution of unregistered death into different age-and sex groups and different causes of death was done for each department separately. If it was not, the authors need to specify the limitation of the estimates obtained.
Answer: Actually, the redistribution of unregistered deaths into different age-and sex groups and different causes of death was done for each department separately. This is indicated now in the revised manuscript (page 8, first paragraph, lines 1 and 2).

5. Figures should be numbered clearly.
Answer: Figure numbers are indicated in the text at the end of the paper, before Tables. This is an automatic upload resulting from the BMC electronic submission process. The figures themselves are presented by separate, also following BMC requirements.

6. The reviewer suggests the authors to revise their Table 1:
a. Table 1 should not be sorted alphabetically, instead, the departments should be categorized according to four regions used in this paper: Lima, coastal, Andean and rainforest. The authors can then shorten their Data Analysis section by removing the description of the region stratification which will be obvious to the reader from reading revised Table 1.
Answer: We present now the data with departments categorized by regions, and we have also removed the description of the region stratification from Data Analysis section.

b. Table 1 should include a column of proportion of families living below the poverty line, and the authors can then remove such description from their Methods section (2nd paragraph under Context in the Methods section).
Answer: We added data on poverty line in Table 1 and removed such description from the Methods section.

c. Table 1 should be condensed. More detailed information, such as the standardized death rate and population can be put as appendix. The reviewer suggests the Table 1 presents only information on poverty and under-registration over year to give the readers background characteristics of each region needed to interpret the data presented later.
Answer: Table 1 is condensed now and data on standardized death rate and population is included as an appendix (Additional file 3).

7. The reviewer suggests the authors to merge Table 4 and 5. Instead of sorting Table 4 alphabetically, the authors can list the departments for each region in Table 5. This will allow the readers to access detailed and aggregated data at once.
Answer: Thanks for the suggestion. We merged accordingly Tables 4 and 5, listing departments for each region.

8. The authors might want to consider the use of “notorious” in the manuscript. **Answer:** We replaced “notorious” by more appropriate words in the text.

9. The authors might want to use the term “mortality rates” more strictly. In their description of the 2nd part of the Result, under the heading “Main causes of death by geographical region”, the authors stated “….. show different mortality rates in each of these areas, ranging from 9.3% in Lima and Callao to 15.3% in the Andean region.” **Answer:** We replaced the term “mortality rates” by “proportions” wherever deemed adequate.

**Discretionary Revisions**

1. While describing the use of causes of death analysis in the last paragraph in the background section, in addition to the benefits described, the authors might want to point out the possibility of identifying the most appropriate groups as the target of health intervention thus increases the cost-effectiveness of such intervention. **Answer:** We added a sentence pointing out that the causes of death analysis also may increase the cost-effectiveness of health interventions by identifying the most appropriate target groups (page…, paragraph…, lines…).

2. The statement “Each of these different patterns of mortality are usually uniquely attributed to global regions in international reports” in Discussion section demands clarification. **Answer:** We clarified this statement now, emphasizing that epidemiological transition characterized by different patterns of mortality is more frequently described for different world regions in international reports, with less emphasis on within country differences (page 6, first paragraph, lines 4 and 5).
Reviewer 2

Major compulsory revisions.
1. The authors have used age-standardized mortality rates to assess mortality differentials at subnational level as well as to assess trends over time. However, summary life table measures such as life expectancy at birth, risks of under five mortality, and adult mortality (risk of dying between 15 and 60) are conventional measures that are more informative in assessing such differentials; and are routinely used in WHO reports to compare mortality across countries. Hence, the authors should calculate these measures at least for urban/rural; and the four major regions. These should be reported both from raw data as well as following adjustment for under-registration.

   Answer: Summary life table measures such as life expectancy and mortality risk by age including under-five mortality and adult mortality are included now as an appendix (Additional file 2).

2. The actual method applied in assessing under registration using model life tables needs to be described with more clarity. The authors should also include a note in the discussion of other methods that could be applied to assess under registration, as in the following reference:


   Answer: We have described now with more clarity the CELADE method that we used. Also, we include now a paragraph on other direct and indirect methods for assessing completeness of registered deaths, along with Preston review on this issue (page 20, second paragraph, and page 21, first paragraph).

3. The cause of death categories reported should be qualified with corresponding ICD codes, preferably from both ICD 9 and 10. The categories used here do not correspond clearly with any known list, e.g. Acute Airways Disease is non-specific (and is not a category in ICD 10; or even the PAHO 6/67 List); and suggests Acute Asthma; but over here includes deaths due to pneumonia; which is actually a parenchymal disorder. Hence, ICD codes will at least provide an understanding of the conditions included in each reported category.

   Answer: Thanks to the reviewer for pointing this out. We qualified now the cause of death categories with corresponding ICD 10 codes throughout the paper (text, tables and figures).

4. The raw data would have proportions of deaths that had been assigned to the ICD Chapter ‘Symptoms, signs and ill-defined conditions’ for each year. These proportions should be reported, for readers to get an idea of the overall data quality, an the potential biases that could exist in the available proportions for specific cause categories.

   Answer: These proportions are now included in the Results section (Results section, page 12, first paragraph). Detailed proportions of deaths assigned to
'Symptoms, signs and ill-defined conditions' for each year are also included now as an appendix (Additional file 1).

**Discretionary Revisions**

1. Given the significant under reporting in many of the departments, the author could probably restrict the main analyses to the four regions, which themselves demonstrate significant heterogeneity in mortality profiles. Additional information on heterogeneity at department level could be mentioned in the text.  
**Answer:** We agree that regions themselves show significant heterogeneity, as well as the departments. We reduced the number of tables to 3 now, all of them showing the mortality characteristics of the different regions. Table 2 shows information on regions, whereas Tables 1 and 3 display data for departments categorized by regions.

2. The authors declare in the discussion that there is no audit system to evaluate the quality of data from registration systems. They could read the following articles that provide some details on frameworks for such evaluation.  
**Answer:** Thanks for raising this point. The paragraph was referred actually to Peru. We clarified it now, stating that “While efforts are in progress for improving quality of certification and coding at health services in Peru, we could not identify a Peruvian comprehensive audit system currently in place, and we are not aware of any published study aimed at assessing systematically the above noted problems in this country, to suggest implementation of specific solutions” (Page 22, second paragraph).

3. There are some portions of the text (particularly in the discussion) which could be reworded to provide greater clarity and ease in reading; and these changes could be effected by a close review by an experienced English language scientific expert.  
**Answer:** English grammar has been thoroughly revised.