Author's response to reviews

Title: Premature mortality in Belgium: how did it change over the last 15 years?

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Author’s response to the referees

Manuscript: “Premature mortality in Belgium: how did it change over the last 15 years? An analysis of cause specific mortality for the period 1993-2009.”

Authors: Renard, F. Tafforeau, J. Deboosere, P.

Dear editor, dear reviewers,

Thanks you for your useful comments and suggestions on our manuscript. We have modified the manuscript accordingly and detailed corrections are listed in this response. We have highlighted the changes within the document by using the track changes mode in MS Word. The manuscript has been resubmitted to your journal. We look forward to your positive response.

Sincerely,

The authors.

Answer to referee 1.

Major Compulsory Revisions

Comment: 1. Methods: should include a more elaborate sub-section regarding statistical methods. The actual section on indicators mentions only the indicators that are going to be extracted from the data but not the manner in which comparisons are going to be carried out. From the “Results” and “Tables” it becomes clear that ranking and rates ratios were used, but no description or reference regarding the hypothesis testing of the rates ratio is given (the tables mention the rates ratio and asterisks without interpretation). Also, although in the “Results” a section is devoted to “Evolution over time”, merely rates in 1998-199 and 2003-204 are computed without statistical modelling of the evolution nor – in the Discussion section - the reasons why this was not attempted. A graphical display might constitute a better illustration and first approach of the evolution than table 6.

Answer: We have added a subsection “Comparisons and statistical analysis” in the Methods section, and added references to it. Regarding table 6: indeed, we had previously omitted one
column in our table: we display the relative 15 years change in rates, and tested for the significance of this change the same way that we did for regions. The results are now added in the last column of table 6. Regarding the suggestion of the referee to replace table 6 by a graph, we thought the readers could be interested in the values themselves and not only in the evolution, and values are less readable in a graph.

**Comment:** 2. Discussion, sub-section “Interpretation of findings”: since in this manuscript ranking is the principal tool used for comparison purposes it should be stressed that ranking is an ordinal variable not an interval one. For instance, if one wants to compare the international ranking of premature versus all age mortality the difference in magnitude should also be taken into account. Plotting the corresponding mortality graphs in Figure 1, would allow one to roughly evaluate the statement “When comparing the international ranking of premature versus all age mortality, premature mortality in men ranks quite similar to the ranking of all age mortality (4th place for premature versus 5th place for overall mortality; data not shown), while premature mortality in women ranks worst (3rd) than all age mortality (7th).” Why not compute a rates ratio and 95% CI and/or 99% CI of age adjusted PYLL rates of Belgian males and females versus respectively EU15 males and females?

More generally ranks are a first, often-used approach but is more and more questioned in the field of institutional performance when it comes to comparison of performance.

**Answers:**

We are aware that ranking constitute a first approach, therefore we also present the rates for the regional cause specific comparisons and tested for them.

For the international comparisons: We have replaced the graph with a table, computed a Rate Ratio comparing every country to the best rating country, tested the significance with a z-test and displayed the 95% CI on age-adjusted rates. We have also added in the discussion a sentence on the necessity to look at rates besides the ranks.
Minor essential revisions

Comment: The quality of the data of death certificates depends on coding “stricto sensu” but also on certification by the physician. When you use the term coding does it includes the certification aspect? For instance, apart from coding, certification may contribute to the observed regional differences, see Discussion, sub-section “Quality of death certificates data” paragraph 7. The statement “as the category “symptoms and ill-defined causes” represents a higher proportion of deaths in Wallonia (2.6% in 2008-9) than in Flanders (1.7%) and is almost the same as in Brussels (2.5%),” may be considered to be at least partly due to regional certification differences since the death certificates of Flanders and Brussels are coded by the same Regional Authority. If the aim consists in improving the quality of data this certification aspect deserves consideration.

Answer: We have added a paragraph on the certification aspects in the discussion section, subsection ‘Quality of death certificates data’.

Discretionary revisions

Comment: 1. Discussion, sub-section “Quality of death certificates data”, paragraph 3 the authors state “After evaluation of the data used in the present study, it was decided not to publish the 1998-9 cause specific results, except for neoplasms, because of instability in coding practice.” It may that this instability in coding practice is not seen in Flanders and Brussels, since the Regional Agency in charge of processing these death certificates was set up in 1993. Should this assumption hold, the data regarding Wallonia could be imputed by the method of Autier (Autier P, Boniol M, La VC, Vatten L, Gavin A, Hery C, et al. Disparities in breast cancer mortality trends between 30 European countries: retrospective trend analysis of WHO mortality database. BMJ 2010;341:c3620.). Doing so would allow a more complete analysis of the evolution over time.
**Answer:** indeed the method used by Autier & all is interesting. However, it relies on the hypothesis of similar trends in all regions, which could perhaps be done when working on a single cause of death but seems more hazardous to us when looking at all the causes.

**Comment:** 2. Discussion, sub-section “Quality of death certificates data”. It is noteworthy to mention that in 1998 a new model of death certificate was introduced as well. In contrast with the previous one the new certificate is conform to the WHO model, which was clearly not the case with the previous. The new one being more suitable to be filled in by the certifying physician, less coding errors are to be expected rather than more.

**Answer:** this was added to the discussion.

**Comment:** 3. The aim of the study (Introduction, paragraph 3) “to highlight the regional disparities” concludes already that there exist such differences. I would suggest a more cautious phrasing.

**Answer:** The sentence was changed in the introduction;

**Comment** 4. Results 1st paragraph. Why only the 2009 and not the 2008 data?

**Answer:** I have changed and added the numbers for the 2 years together.

**Minor issues not for publication**

**Comment:** - Methods, All analyses were performed using SAS.3 statistical software. Shouldn’t it be SAS 9.3?

**Answer:** indeed! thanks.

**Comment:** - Discussion, sub-section “Interpretation of findings” “…premature mortality in women ranks worst (3rd) than all age mortality (7th).” I would use worse instead of worst.
**Answer:** Ok, changed

**Comment:** “Table 1: ICD-9 and ICD10 codes10 for the categories and single causes of deaths used.” ICD10 codes10 should be ICD10 codes

**Answer:** ok, changed

**Comment:** Table 3: the asterisks used should be explained

**Answer:** OK, done

**Comment:** More generally in all tables all abbreviations should be written out or entered in a list of abbreviations

**Answer:** done

**Answers to referee 2:**

Most of the comments of reviewer 2 have been addressed straightaway in the revised version of the manuscript.

Here are also answers to the questions:

**Question:** Page 13 (of the non-revised version), sentence “For some conditions, the decrease in PYLL was faster than the decrease in rates, meaning that the mortality improvement concern more young people: this was the case for head & neck and haematological cancers and non-transport accident”.

The question of the reviewer was: “Did you check this for road traffic? I have the impression that it could be different meaning that the decrease is more important in older persons”.  

**Answer:** yes, see table 7, the columns 6 and 11 display the change in PYLL and in rates; as you can see, for road accident, the changes are similar when measured with both indicators, as well in men as in women.
**Question:** Why do you compare Brussels and Wallonia to Flanders only and not Brussels to Wallonia? there is no reason I think

**Answer:** We compared to the region with the lowest rates, which was Flanders, to highlight the potential for improvement. The reason for not comparing the other regions between them was to avoid an overload of information. However, we can provide those results for the reviewer if she would like to get them.

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**Answer to referee 3**

The suggestions made by reviewer 3 have been addressed in the manuscript. There was no specific question.