Author’s response to reviews

Title: Pneumonia and Influenza, and Respiratory and Circulatory Hospital Admissions in Belgium: A retrospective database study

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Author’s response to reviews: see over
Response to reviewers’ comments

Reviewer: Ian Sheerin

1. The method that needs an essential clarification is how the costs are estimated. In the current draft, it is not clear if the Belgian hospitals report the actual cost of each admission. Or alternatively, have the authors estimated the cost of each admission using length of stay data? It is important that the exact method of estimating the costs is clarified.

   Response: a descriptive sentence was added in the costs paragraph of the Methods section

2. The discussion and conclusions are valid and contribute to knowledge of the burden of influenza disease. However, it would also be useful if the authors could state the average annual total admissions per year due to PI and RC, together with the range (lowest number to highest number) for the years covered by the data. In addition, it would be helpful if the authors could briefly discuss the Belgian government policy on flu vaccinations eg are they promoted or recommended for specific age groups? Are they free of charge for certain age groups? What were the data on flu vaccination coverage in Belgium in the 2002-2007 timeframe? This discussion could be brief but would help to explain the relevance and importance of the study findings.

   Response: a short paragraph describing the Belgian vaccination policy was added in the Discussion

3. The writing is to a high standard. I am happy with the title, although the abstract could be shortened to better emphasize the main conclusion.

   Response: The abstract was shortened

Reviewer 2: Nathalie Bossuyt

4. The introduction describes the need for accurate estimates of the burden of diseases associated with influenza, but a paragraph on the operationalization of this general research question into specific aims and the justification of the measures that were chosen, is lacking and should be added.

   Response: a paragraph was added in the background section

5. The study addresses a genuine need for information on the economic impact of hospitalisation for severe acute respiratory in the framework of pandemic influenza preparedness. The calculated mortality, length of stay and costs provide new information. The reporting of sample-based relative admission rates is in my opinion more debatable since the national absolute admission rates are already known (and reported in reference 11 of the manuscript).

   Response: we kept reporting the relative admission rates for the sake of national and international comparisons.

6. I believe restricting the results to hospitalisations for Pneumonia and Influenza (PI) and omitting the results on the very broad category of hospitalisations for Respiratory and Circulatory (RC), will provide a better targeted answer to the research question
Response: We cannot agree with this as there is more and more evidence that influenza infection can act as a trigger for a wide array of (chronic) diseases outside P&I, see for example Dawood et al 2014. It is therefore important to focus also on these relatively rare but possibly costly events.

7. For reason of clarity, it should be mentioned explicitly throughout the article that the reported hospital admissions are in fact relative admission rates (relative to the total number of admissions) rather than absolute admission rates within the general population.

Response: the term relative was added wherever relevant

8. The introduction should in my opinion more be focussed on the burden of severe acute respiratory infections, rather than on general information on influenza. Only a small fraction of the cases included in ICD-9-CM codes 480-487 will concern influenza cases whereas the bulk of cases will be due to other pathogens. Therefore I would replace rather replace the term “influenza” by “severe acute respiratory infection” on most occasion throughout the article. I would also omit the second paragraph and the first two sentences of the third paragraph and replace it by the paragraph on the components of the burden that is currently in the discussion: “In Belgium as in most other developed countries the burden of disease and impact on health care systems can be divided into several components which can be presented as a pyramid. At the base of the pyramid are asymptomatic individuals who do not seek health care. Moving bottom-up are individuals with symptomatic uncomplicated cases of influenza who are likely to stay a few days out of work or school since they are unable to perform their daily activities. However, a small proportion of these individuals seek medical ambulatory care, generally through a general practitioner (GP) who in some instances may order a laboratory confirmation test. It is widely established that with the development of influenza-related complications subsequent to infection with the virus, detection of the virus is not usually possible due to its action in indirectly triggering or facilitating other diseases. Moreover, there is no satisfying rapid point-of-care test with high accuracy available for detection of influenza. Consequently, it becomes difficult to estimate the burden of disease of influenza. For complicated cases, when pneumonia is present or suspected, the GP may either refer the patient to a hospital or the patient may visit a hospital emergency department where the patient may be hospitalized for further treatment. Patients and GP’s are free to choose the hospital of their choice in the whole country as there are no restrictions in regional access of care in Belgium.”

Response: the introduction was changed accordingly

9. In fact information is known on other components of the burden (for instance the number of GP consultations for influenza like illnesses and other upper respiratory tract infections is weekly published), but it is correct that very little was known on the hospital care use. Hence I would adapt the first sentence of the discussion accordingly.

Response: The first paragraph of the discussion was changed accordingly

10. Are the data sound and well controlled? The data are provided by a sample of hospitals. Some information on the representativeness of the hospitals for the total group of hospitals should be added to enable a correct interpretation of the results and to give an idea of the generalizability of the findings. Is the interpretation (discussion and conclusion) well
balanced and supported by the data? There are large between-country variations. Please elaborate a bit more on possible explanations.

Response: See Discussion line 240-248 where we discuss the limitations of the study sample.

11. The influenza vaccine is put forward as an effective solution. However I believe the sentence “It is widely suggested that vaccination against seasonal influenza remains the most effective way to tackle the burden associated with influenza and pneumonia associated hospitalizations in both healthy individuals and risk groups.” is too vague. Please add specific information on the effectiveness of the vaccine in preventing hospitalisation in the different age groups.

Response: See discussion line 258-272 where a paragraph was added to this effect.

12. The methods used are relatively straightforward and no review by a statistician is required. Are the methods appropriate and well described, and are sufficient details provided to allow others to evaluate and/or replicate the work? What are the strengths and weaknesses of the methods?

Response: -

13. Please do check the following percentages in the abstract and the results section: “Hospital admissions due to PI and RC in the elderly patient group and children were responsible for 62-73% of all hospital admissions (Figure 1).” On the basis of Table 3 the reader will calculate other percentages.

Response: 62-73%: these numbers come from the Figure 1 (0-5 yrs, 5-17 yrs, 65+ yrs i.e. 16.4+8.2+48.6=73% for PI). In table 3, the % corresponds to the proportion of hospital admission for PI or RC relative to the total number of admission for this age group (see table 2.1a of the study report, and table 3 footnote in the manuscript).

For easier reading all “62-73%” were removed from the text.

14. Please specify if the last sentence of the results section concerns the total costs within the sample of the total costs in Belgium. If the latter is the case, please describe the calculation into more detail in the results section. If the total cost only refers to the sample, in my opinion this adds little information to the article.

Response: 

15. Because a sample is used, generalizability may be an issue. Can the writing, organization, tables and figures be improved?

Response: We have described this limitation of generalizability in the discussion.

16. Table 3: given that the admission rates are expressed as % of the total number of admission, the age distribution of all hospital admissions is needed to enable interpreting this table.
Response: In table 3, the admission rates are not expressed as % of the total number of all admission, but as % of the total number of admission in the respective age group.

Editors’ comments

17. Title of the tables and figures should be informative to include information to study, time and place