Author's response to reviews

Title: Economic Burden of Asthma: A Systematic Review

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Economic Burden of Asthma: A Systematic Review

Summary
The authors’ objective was to determine the burden of disease costs associated with asthma. A systematic search of MEDLINE, EMBASE, PUBMED, CINAHL, CDSR, OHE-HEED, and Web of Science Databases between 1966 and 2008 was performed and sixty-eight studies were evaluated. Hospitalization and medications were found to be the most important cost driver of direct costs. Work and school loss accounted for the greatest percentage of indirect costs. The cost of asthma was correlated with comorbidities, age, and disease severity.

COMMENTS (Reviewer 1):

1) I think it is always nice to present a figure detailing the process by which the systematic review was conducted - this is pretty much standard practice these days.

- Thank you for the comment. In the manuscript we have included a figure showing the results of our systematic literature search.

2) The paper is very lengthy (in some ways not surprising due to the nature of the content) but I would recommend the authors try to reduce its length – especially the results which are a little difficult to digest because of the large volume of information.

- As you have noted, due to the nature of the manuscript’s content, we are not able to reduce its length as all sections are important and relevant. However, we have presented the most important topics in the form of 9 tables, to make the paper easier to read.
3) I think it would also be wise to have a table of some sort in the results section that attempts to summarise some of the information. For example, the types of costs studies have identified and then some key points relating to each plus maybe a list of the studies addressing that particular issue. With a table such as this it will allow the reader to get a basic understanding of the overall picture before navigating through the lengthy text.

- We have categorized the results of the reviewed studies and presented details in 9 different tables to summarize the information and to give a clearer understanding of their content.

COMMENTS (Reviewer 2):

**Major compulsory revision:**

1) Authors state that due to heterogeneity in cost analysis across studies they did not report this data. Why wasn't the three different types of studies not analysed separately or as subgroups. What attempts were made to deal with the heterogeneity. It would be more interesting for the reader to look at these original results and see how the authors attempted to deal with them than for the authors to have completely change the analysis to an easier option (by reporting percentages of studies and costs). It is difficult to see how the conclusions derived here are supported by the "relative" results presented.

- Individual analysis was done. Pooling the costs was not possible in the most of the studies, as the confidence intervals of the reported costs were not available. Also, in some studies, denominators were direct /indirect costs, and in others, the total costs of asthma. Some of the costs were reported per person and some as the mean cost of the study population. This heterogeneity makes it hard to do a meta-analysis. However, we have provided 9 different tables and extracted detailed information for each study such as: country of origin, study duration, sample size, mean and, if available, standard deviation and 95% CI of the reported costs, and percentage of the total cost. Tables categorize
studies into institutional, regional and national categories to make results easier to understand.

2) The authors have decided to report the findings of the systematic review in relative terms and not mention the exact costs but rather percentages. Both figures should be included and a table should be included listing all such details for the outcomes listed.

- The nature of each study was different, so representing the exact costs of the findings would have increased the length of the manuscript and makes it more convoluted. Therefore, we have reported the costs mainly in percentage, for clarity. However we have made tables available with all of the data. It is crucial to know that all the costs in the tables have been converted to 2008 US dollars.

3) The outcomes listed should provide mean and SD or SEM measurements and the remainder of the details in the table mentioned above (e.g. heterogeneity, weighting, p values, analysis type, etc).

In most of the studies the mean, SD and, in some, confidence intervals were mainly reported. Where possible we tried to extract detailed data as much as it was applicable and available.

Minor essential revision

1) Abstract states that searchers were done from 1966 to 2008, but page three states from 1990 to 2008 - please revise.

- We have revised the inaccurate statement and corrected it to 1966, on page 3.

2) Please justify/explain the exclusion of non-English articles.
- While reviewing the abstracts, 3 non-English articles were found, but excluded. We only included English articles as there was no translator available.