Author's response to reviews

Title: A retrospective population based trend analysis on hospital admissions for lower respiratory illness among Swedish children from 1987 to 2000

Authors:

Ove Bjor (ove.bjor@lvn.se)
Lennart Braback (lennart.braback@lvn.se)

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PDF covering letter
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The authors Ove Bjor and Lennart Braback wishes to thank reviewers for valuable comments.

Responses to Reviewer #1, Job BM van Woensel:

General:
It is well-known that first hospital admissions are more likely in males. However, we have assessed whether the time trend in admissions differed between male and female (Results first paragraph). We found that re-admissions were more likely in males but the difference between male and female tended to disappear in recent birth cohorts. This is added in the last paragraph of the discussion. We have also added information in the results page 8-9.

Page numbers have been added.

We have separate titles and legends at the end of the paper.

The English language has been revised.

Background
The objectives have been reformulated. We have included re-admissions in our analyses in order to evaluate the burden of lower respiratory illness in very young children (background, last paragraph). We have also added one more sentence in the end of the first paragraph of the background. e, page , which motivates why we choose to analyse re-admissions. The reason for having the labelling of symptoms as an objective was that we saw a possible problem in studying trends in lower respiratory illness when a changing in the labelling system has been made. A change in labelling of diagnoses is especially important to follow up in this case because of the difficulties in distinguish between different respiratory illnesses.

Method
The method has been shortened.

We have chosen children aged 8 years or less. We have focussed on changes in trend in young children. Our upper age limit is fairly arbitrary but hospital admissions are very uncommom in school children. We have also used this age limit in a previous retrospective birth cohort study (reference 15).

Bronchiolitis and bronchitis are overlapping entities. We have therefore analysed bronchitis and bronchiolitis together. We may overestimate the real number of bronchiolitis but the time trends are fairly similar.

First admissions were based on discharge year whereas re-admissions were based on birth year:
The text in the methods is slightly modified. First admissions were calculated as the number of children per age group discharged for lower respiratory illness a specific year. However, we had to follow the children from date of birth in order to identify re-admissions. Therefore, we find that it is convenient to report first admissions in terms of discharge year and re-admissions as number of re-admissions per birth year.
We have only analysed re-admissions for children with first admission before one year, since we had our primary focus on this age group. The Kaplan-Meier analysis showed, that the re-admission risk decreased exponentially by time. Most of the re-admissions can be expected to be captured within 1 years from the first admission. Therefore, we have only followed the children for 12 months from first admission.

**Page 6 1st paragraph in the previous version:**
The second sentence of this paragraph has been removed.
We described the trend by performing a linear regression with logarithmated rates as the dependent variable which gave us coefficients (slopes) representing the relative annual change in trend. We believe that it is easier to grasp changes expressed in percent (i.e. it is partly a pedagogical point). A multiplicative model also seems to “fit better” (visual judgement) in the age group < 12 months than the additive model. We could have shown r-squares, but we believe that coefficients and confidence intervals are enough to describe the trend.

**Page 6 3rd paragraph in the previous version:** “Number of days to first admission” is changed to “age in days at first admission”.

**Results**

**Page 7 in the previous version:** The first part of the results (new headline: Time trend in first hospital admissions), has been shortened.
Previous Table 1 has been removed.

**Figure 2:** The order of the graphs has been changed.

**Discussion**

A discussion on potential causes has to be speculative, since we have no data at an individual level on several important issues. The limitations with the study are now commented in the first paragraph of the discussion.

The inverse associations between admission peaks and re-admission/age at first admission are now commented and discussed (discussion, 3rd paragraph)

**Page 10 2nd paragraph new version:** The following rephrased sentence clarifies that changes in the labelling of diagnoses has to be taken into account when assessing trends in lower respiratory illness. “Our observations from Sweden suggest, firstly, that all forms of lower respiratory illness have to be included in trend assessments, since changes in diagnostic criteria could influence the specific trends for asthma and bronchitis”.

**Responses to Reviewer #2, Kai-Hakon Carlsen:**

**General:**
The limitations with the study are now commented in the first paragraph of the discussion

**Abstract**
The objectives with the study have been reformulated.

**Results and Discussion**
We have added information on the delivery of inhaled steroids from the Swedish pharmacies (Table 1). Potential effects of an increased use of inhaled steroids are discussed (mainly in paragraph 8 in the discussion). The discussion on inhaled steroids in bronchiolitis has been expanded. We have added suggested references.

Sweden has a long tradition of population based register studies. An approval by a medical ethical committee is not needed in each specific study.