Reviewer’s report

Title: Hospital readmissions with acute infectious diseases in New Zealand children <2 years of age

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Reviewer: Tobias Alfvén

Reviewer's report:

Altogether this study with the aim to describe risk factors for infectious disease readmission following hospital admission with an infectious disease in the first two years of life in New Zealand is well written and, although not presenting very surprising results, adds important information to the literature.

However, there are still some issues that could and should be strengthened before publication. These issues are described below:

Abstract: Well-written and clear.

Background:

- Line 2: "….. in young children", would be good to clarify, globally? in New Zealand? Or?

- Line 6 - 11: "Hospitalisation rates for infectious diseases are higher in NZ than in other developed countries……" This is interesting, and I did not know this? This could also influence the results. Is this due to that children more often are admitted to hospital in NZ than in other countries or that children in NZ have more ID than in other countries? This merits further discussion in the discussion.

- Line 12 - 15 "In a US study, 13 the 3% of children with recurrent admissions accounted for 19% of paediatric hospital admissions" Is this for all causes or only for ID? Would be good to clarify.

- Line 17-20, "In NZ, bronchiectasis remains prevalent and causes significant morbidity and premature death [9]. Three-quarters of children diagnosed with bronchiectasis before age 15 years have a history of acute respiratory infection (ARI) hospitalisation
- During early childhood. Bronchiectasis is in most other countries very rare in children without cystic fibrosis, see e.g. Twiss et al that noted that the incidence of bronchiectasis in New Zealand children was nearly twice the rate of cystic fibrosis and 7 times that of bronchiectasis in Finland, which is the only other country reporting a childhood national rate. They further noted that in central Australian aborigines, the incidence is 14 cases per 1,000 population, compared with 0.1 cases per 1,000 in Scotland and 4.9 cases per 1,000,000 in Finnish children. (Twiss et al Thorax 2006). For readers outside NZ this paragraph therefore needs some further elaboration, at the moment it sounds like bronchiectasis is a common problem for children with ID.

Methods:

- Page 5, Line 12-13: "Children were excluded if they had an ID admission in their first 24 months of life but died within 12 months of this first admission." How many children died within 12 months? (at the moment only shown in Additional file 3) This could have been the most severely ill children?

- Page 6, Line 13-15: Please list the CCC and describe how this list was chosen? And which reference used?

- Page 6, Line 18-19: Please give examples of other infections included in "others", most readers never get to the additional files.

Results:

- Study population and samples". Overall difficult to follow, much easier to follow if "Additional File 3. Flow diagram describing study design." is included in the article itself and not only as an additional file. I strongly suggest adding this clear and nice figure to the article.

- Page 8, line 7: I wondered why the short admissions were excluded. However, I got your answer in the discussion. Fine.

Discussion:

- Page 12 line 2-7, When summarizing the main results I would suggest to add the important result that so many of the children with ID admissions were from the most deprived
household quintiles, this could also be presented as one of the main findings in this study and merits further discussion.

- Page 13 line 8-9 "Our data show that identification of children at risk of recurrent admission and intervention during the first admission could reduce total ID hospitalisation burden." Does this data really show that intervention during the first admission could reduce total ID hospitalisation burden? I do not agree. It shows that it is important to try…

- Page 13, line 13-18 "Clinical pathways including specific admission and discharge criteria can help to reduce the rate of readmissions within two weeks of the first admission, as shown in a recent Australian study of children <12 months old hospitalised with bronchiolitis [18]." Unclear, can you describe in more details, how can "Clinical pathways including specific admission and discharge criteria" help to reduce the rate of readmissions?

- Page 13, line 21 - page 14 line 5: The context in Afghanistan and NZ is very different, especially important regarding nutritional status, not possible to use results from a completely different context without discussing these differences. Further in some countries vitamin D is given to all children < 2 years of age. Please expand discussion in this paragraph.

- Page 14, line 10-11, "Hence offering seasonal influenza vaccination prior to hospital discharge may reduce the risk of the winter readmission of these children." Maybe this suggestion merits some more discussion, e.g. many of the children maybe still have some symptoms of the current ID, is it really a good idea to give the seasonal influenza vaccination before being fully recovered?

References:
- Well handled.

Table 1:
- Under "Illness characteristics" start with "Length of stay" and "Diagnostic group of first admission", and have "Presence of CCC at the end"

- Under "Illness characteristics" add all "CCC" in to a total which is also presented here.

- Household deprivation 40% of all ID admissions in the most deprived quintile, very interesting. See above.
Table 2 - 4

- In the forest plots most of the 95% CIs are missing, please include these.

Supplement files:

- Good to have these and keep these as supplement files, except file 2 which I suggest to instead include in the article as described above.

Are the methods appropriate and well described?
If not, please specify what is required in your comments to the authors.

Yes

Does the work include the necessary controls?
If not, please specify which controls are required in your comments to the authors.

Yes

Are the conclusions drawn adequately supported by the data shown?
If not, please explain in your comments to the authors.

Yes

Are you able to assess any statistics in the manuscript or would you recommend an additional statistical review?
If an additional statistical review is recommended, please specify what aspects require further assessment in your comments to the editors.

I am able to assess the statistics

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