Reviewer’s report

Title: The burden of laboratory-confirmed pertussis in low- and middle-income countries since the inception of the Expanded Programme on Immunisation (EPI) in 1974: a systematic review and meta-analysis

Version: 0 Date: 02 Apr 2020

Reviewer: Andrew Duncan Steele

Reviewer's report:

This is an extremely well conducted analysis and well written manuscript with a comprehensive systematic review of the literature over the past 45 years. The study is timely with respect to our understanding of the vaccine strategies available and the increasing observation of pertussis cases occurring world wide. It is apparent that the authors have expertise in the field of Bordetella pertussis, and they articulate their concern about the increased vulnerability of children with HIV-exposure or HIV-infection in countries.

The manuscript would be enhanced by considering these aspects:

1. There seems scant recognition of the EPI vaccine coverage in LMIC and LIC countries. We know from global figures of routine EPI vaccine coverage, that this seems to have stagnated at about 80% globally and many of the countries included in this analysis will be on the lower ranges globally.

2. Secondly, we know that the timing of the full schedule of routine immunization doses is sub-optimal and that the timeliness of EPI-2 and EPI-3 can be quite late in many developing countries.

3. Besides the natural epidemiology of pertussis, these factors would drive the most serious disease and highest mortality into the youngest age groups (<6 month olds as reported in this study).

4. The conclusion that maternal immunization could play a significant role should be expanded on as this is an immediate and short-term solution that should be recommended.

5. The authors do not specifically call out and describe limitations to this analysis, but surely one is that almost 50% of the studies are conducted in only 5 UMI countries.

6. The authors could make stronger recommendations, based on this study and their previous work in this field, for increasing efforts for higher coverage and more timely vaccination, for studies on maternal immunization and for other gaps in our knowledge that should be explored.
Minor factors that the authors may want to consider include:

1. The global estimates of disease burden and mortality are relatively old now (2003 and 2008), and could be updated with more recent figures, possibly from IHME Global Burden of Disease estimates.

2. Vaccine hesitancy has played a role in the increase of pertussis seen in HICs, and could be referenced without detracting from the key messages of the manuscript.

**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?**
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Yes

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