Author’s response to reviews

**Title:** Gastro-oesophageal reflux: A mixed methods study of infants admitted to hospital in the first 12 months following birth in NSW (2000-2011)

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Response to reviewers

Reviewer reports:

Maria Gianni’ (Reviewer 1): The authors have responded to my previous comments.

Thank you

Madalynn Neu (Reviewer 2): The authors have addressed most of the concerns of the reviewers. I do not have a concern about validating the diagnosis of GERD in young infants because pediatric providers so often prescribe anti-reflux drugs based on parent report of symptoms addressed in this paper. I do have some remaining concerns. My biggest concern is the inclusion
of microbiome (caesarean section/antibiotics) into the theory based on what was found in this study. Reception of antibiotic in these infants was not mentioned as a finding, so is apparently speculation. The mention of tube feeding on pg 13, line 37/38 and pg 14, line 8 also was not a finding of this study. The microbiome thought is interesting, but needs to be stated more as a speculation, with future research examining tube feeding and antibiotics etc. as influences on the microbiome of these infants.

Thank you for these comments. We agree that our data cannot actually identify how many of these babies had antibiotics but we know from research that this is quite high in neonatal units in Australia (around 46% of babies admitted) (Osowicki et al. 2015). We have now added more caution in our discussion and a reference to this data. We have removed reference to antibiotics and tube feeding and any association with GOR/GORD in the model

“While we could not identify antibiotic usage in this study, Australian research has shown that nearly half of all babies that go to neonatal units will have antibiotics administered [50].”

Pg 9, line 23-25. Please explain how the qualitative data collected in Phase 3 was used to inform the questions for the staff focus groups in Phase 3.

It was not the qualitative data but the high incidence of GOR/GORD in the medical records review prompted us to ask the question in the focus group. This is clarified by the following sentence

“ As the high incidence of GOR/GORD emerged from the clinical records review we incorporated this into questions asked during the focus groups.”

Pg 9 lines 35-39. I do not understand the first three sentences in the Results section, Phase 1. Please clarify.

We have added explanation now that over the time period there were multiple admissions for some infants and so we have looked at both the numbers of admissions and then the individuals admitted. We agree this was not clear.
“During the time period there were a total of 1,156,020 admissions recorded in the APDC of infants up to one year of age. Some of these admissions involved multiple admissions for the same infant. Of these admissions, 11,513 (1%) of all admissions contained a diagnostic code for GOR/GORD. This equates to 869,188 individual infants being admitted and of these individual infants, 9152 (1.1%) were admitted with GOR/GORD.”

Pg 15, line 20. Antibiotic use was not a finding of this study. I also do not see the relevance of lines 23-27 in relation to findings of this study. There are other mentions of antibiotics in this section. Again, it can be discussed in terms of speculation, but not as a direct result of your study.

Be careful in the Discussion to separate findings from this study with speculation for all topics.

Thanks we agree and as stated above have now been more cautious about antibiotics in the discussion

In Table 3 why is "vaginally delivered" in the table instead of Caesarean section when C-section is the basis for inclusion of microbiome in the theory?

Thank you for picking this up. We agree it would be more consistent to have caesarean section in the table than vaginal birth and so have re-analysed the data and provided a new table.