Author's response to reviews

Title: Maternal and neonatal outcomes for an urban Indigenous population compared with their non-Indigenous counterparts and a trend analysis over three triennia.

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Author's response to reviews: see over
Dear Editor,

We would like to thank the reviewers for their considered reports on our manuscript: ‘Maternal and neonatal outcomes for an urban Indigenous population compared with their non-Indigenous counterparts and a trend analysis over three triennia’. We respond to their points below (bullet points and italics) and have attached a revised manuscript with track changes.

**Reviewer 1: Michael Coory**

This is a clear and well-written paper; and, in particular, the Discussion relating the results to other work and to possible solutions is very good. Also, the information on social indicators is extremely valuable.

- *The authors thank the reviewer for these encouraging and positive remarks.*

**Major compulsory revisions**

1. More details about the hospital are needed (and if it could be explicitly named, so much the better). Specifically, is it a public hospital (no out of pocket expenses) or a mix of public and private? How were out-of-area transfers identified? How does the hospital fit into the system of hospitals within its jurisdiction?

- We have added the following information to the background section:

  - *This paper comments on changes over a 12-year period in selected maternal and infant health indicators between Indigenous and non-Indigenous mothers who attended the public facility of a large tertiary maternity hospital with around 5000 public births per year in an urban area of South East Queensland. The hospital is a referral hospital with a fetal medicine unit and the highest level neonatal nursery taking referrals from across the state. However, it is also the local hospital for a large number of women living in the catchment area. The models of maternity care available include hospital and community based antenatal clinics*
with midwives and medical staff, GP shared care, specialist maternity clinics (e.g. Aboriginal and Torres Strait Islander, Women from a Refugee Background, Young Women’s Clinic), and community based midwifery group practices offering caseload midwifery care. Allied health referral is commonly used for social work, psychology, psychiatry, dietetics, and physiotherapy.

- Also added to the last sentence in the methods section:
  - We excluded transfers in from other areas which are identified within the database.

2. Some discussion of the effect (if any) of defining neonatal deaths as those that occurred before discharge would be helpful to the reader. That is, how many neonatal deaths occur after discharge?
  - We have reviewed the definition of neonatal deaths in our database and altered to “occurring within 28 days of birth”, rather than prior to hospital discharge. Although there will inevitably be some neonatal deaths that occur after discharge but before 28 days, it is likely that these are very few as the hospital has a very active Bereavement Support Program.

3. Somewhere in the paper (either in text or a table) the number of stillbirths, neonatal deaths and perinatal deaths should be presented.
  - The numbers of stillbirths, neonatal deaths and perinatal deaths have been added to Table 2.

Minor Essential Revisions

1. DOCS and EPDS should be spelt out (maybe as a footnote) in Table 1.
  - This has now been corrected; the terms DOCS and EPDS have now been spelled out in the footnotes of Table 1.

Discretionary Revisions

1. The Tables would benefit from including “raw” numbers (including number missing) as well as percentages. I can see why the authors have omitted the “raw” numbers from the Tables: different variables were collected in different years & totals are given in footnotes. But, I wonder whether there might not be some way to explicitly include this information without making the Tables too cluttered.
  - Tables 1 and 2 have been edited to include the number of births/pregnancies without missing data for each variable.
Reviewer 2:

1. In general I have the feeling, while reading the manuscript, that it is more an article for a (well informed) newspaper (or a pamphlet) than for a scientific journal, showing that the initiative to close the gap campaign did show insufficient progress and that some of the undesired outcomes (e.g. birth < 32 weeks) even have increased.
   - We disagree with this comment. This initiative has a high priority in Australia with significant resources being invested to try and address the Gap in health outcomes between Aboriginal and Torres Strait Islander Australians and other Australians. At present we do not believe that preterm birth is a national indicator and we are concerned that the rates are rising. Preterm birth can be addressed to some extent in the antenatal period and we believe this paper argues that case well.

2. Interesting to see is that although there are not differences in pre-existing medical conditions (pg 7), but impressing differences in indicators of bad social circumstances actual in the Indigenous population a more normal course of delivery is found (even more optimal: table 2), no differences in the most important outcome parameter – perinatal death rate- is found. It is impressive to see that, although an increase is demonstrated in the percentage of deliveries before 32 weeks (and LWB < 2500: fig 6) and that this difference becomes even greater for the non-indigenous population, this does not lead to an increase in perinatal death rate (corrected OR 1.22; 95% CI 0.75-1.99). Actually most of the important perinatal outcome related risk variables become less optimal for the Indigenous population. The (impressive) opposite conclusion could more easily be that the initiative did result in a better utilization of health care resources and good care for the indigenous population.
   - We do agree that these results are interesting and you are correct that one interpretation could be that despite an increase in preterm births and low birthweight infants perinatal death rate is not significantly different highlighting a positive finding. However we think this may be a result of the small numbers for perinatal death

3. The conclusion on page 17 line 2 is not at all supported by the data of this study. Nothing is shown from targeted models of antenatal care (pg 17 line 7) and which gap is there to be closed (pg 17 line 15). And why a “focus on cultural responsive care” (Page 17, line 16) would be essential.
• We have made some additions to clarify our points in these areas (for easier reading we turned off track changes when we reformatted the bibliography). We have also turned off track changes for the tables for the same reason.

• Added to the second paragraph (some of which was removed from the conclusion as we feel it is better placed here): The quality of maternity care provided to Aboriginal women has been highlighted as concerning, and indeed, has been identified as a contributory factor in poor outcomes [12-15]. Findings from a sample of non-Indigenous women at risk of preterm birth identified important issues such as miscommunication and uncaring staff behaviours that negatively influenced care uptake [16], with studies that have focused specifically on the experiences of Indigenous Australians echoing these results [12, 13, 15]. An added concern in this respect is the tendency to treat Indigenous Australians as an homogenous group rather than as discrete populations with distinctive needs, which may inadvertently contribute to worsening disparities in perinatal outcomes [17]. Targeted models of antenatal care have been developed to address these barriers, with evaluations showing improvements in clinic attendance, screening and treatment (e.g. sexually transmitted and urinary infections) uptake, immunisation rates, mean birth weight, and reduced rates of preterm birth [18-21]. However, none of these programs are available to all childbearing Indigenous women living in Australia.

• Close the gap is a very well-known term in Australia which refers to closing the gap in many differences between Indigenous and non-Indigenous Australians. In this paper we are talking about the gap in maternal infant health outcomes. We have highlighted this at the beginning of the paper and have also included this in the conclusion.

Other comments

4. The title is not correct: FOUR triennia are compared (at least in the figures)
   • Thank you - the title has now been corrected to ‘four triennia’.

5. pg 6 line 7: there might be differences in optimal fetal growth curves between Indigenous and the non-Indigenous population. E.g. the P5 on a standard population might be optimal (> P10) for the Indigenous population, if their own, ethnicity specific curves were used. For making a suggestion of SGA population specific growth curves should be used. The differences in SGA and birth weight (table 2) might just be consequences of using incorrect fetal/neonatal growth curve (not corrected for ethnic backgrounds). Actually figures 3 gives a strong argument that the wrong population curve
is used. The use of an incorrect curve and thus the incorrect classification of which baby is SGA (or IUGR) could also (partly) explain why the admittances to a NICU is higher (table 2).

- While it would be ideal to be able to utilise reliable ethnic-specific growth curves (in this case Indigenous curves), unfortunately they are not available at present and the national curves were used instead.

6. It is interesting to see that most of the trends are not significant because 4 triennia are compared and not the three (as suggested by the title). If e.g. in fig 6 the period 1998-2000 would not have been included the trend would be certainly be significant for Low birth weight (fig 6) and Perinatal mortality (fig 7). If these trends are reported to be significant the conclusions of the article are by far more important. Is there a possible difference in registration in the first trienna period?

- We agree with this reviewer’s points and also find them interesting though difficult to understand, as is often the case with retrospective reviews. We do not think there is any reason to believe that the recording of ethnicity was incorrect in the first (or possibly the second) triennia compared with the other three however there has been a concerted effort across Australia, and within our hospital, to improve the recognition and identification of Indigenous women accessing care within our system. We believe that your interpretation of the data will be made by others accessing this paper and hope that it will raise awareness and further scrutiny of national data to see if this is reflective of what is happening across Australia.

7. Is there any possible explanation why the % deliveries before 32 weeks is increasing – the most worrisome finding in the manuscript

- We agree with this reviewer’s comments and we are not sure of the answer. We will be looking closely at this with our prospective study we are about to commence. However we have added a sentence to stress this finding: Our data indicates that targeting early preterm birth will be important with a concerning finding being the increase in very preterm births (<32 weeks).

Minor comments
1. pg 18; table 1: DOCS and EPDS>14 are not explained.

- This has now been corrected; the terms DOCS and EPDS have now been spelt out in the footnotes of Table 1.
2. pg 11; line 11: the tested interaction term is between ethnicity and triennia
   - We have clarified this in the manuscript.

3. fig 3: if the individual triennia are tested no significant differences are found for e.g. SGA (2004-2006 and for 2007-2009): 14.0% and 9.8% should be significantly different when these large number of cases are tested.
   - Differences between Indigenous and non-Indigenous infants for individual triennia were not tested; we were only interested in trends over time. Table 2 indicates a significant difference in the overall proportion of SGA infants.

4. pg 15; line 23: I don’t see the “slight reduction” 2001-2003
   - We thank the reviewer for noticing this error, reference to a slight reduction in 2001-2003’ has been deleted.

5. pg 16; line 1 and 4: It is difficult to find where the “three percent” and the “4%” is actually is coming from. Partly related to summarizing the descriptive statistics?
   - This data was not explicitly shown in the manuscript; we have added in “data not shown”.

6. pg 16; line 14: Although as stated in this line “preterm birth is a leading cause of perinatal mortality” this is surprisingly not suggested by the figures and data in this report (fig 4 and fig 7). More important the “antenatal factors” as suggested in line 15 are not shown in the data of this study to be increased in this Indigenous population. And I think it is a (political) statement (nothing wrong) that these are “amendable to targeted interventions”. The conclusions of the authors of this study is that the data show the opposite!!! Social economic factors (and preterm birth) were less favourable, however not resulting a difference in perinatal mortality. I consider this as a compliment for the Australian health care system and possibly for the “initiative”.
   - We have made some changes to the conclusion to reflect some of these suggestions however we believe the major reason the PMR has not reflected the preterm birth increase is most likely due to small numbers: It is clear that more should, and could, be done to prevent poor MIH outcomes. Further redesign of services is urgently needed to ‘close the gap’ in MIH outcomes between Indigenous and non-Indigenous Australians. A focus on culturally responsive care that incorporates strategies for targeting modifiable risk factors in the early antenatal period, with interventions that span the continuum of care from preconception to infancy is essential. This should be done by building on strategies that have been shown to
make a difference [56, 57]. Our data indicates that targeting early preterm birth will be important with a concerning finding being the increase in very preterm births (<32 weeks). The differences in socio-economic outcomes and high rates of smoking in pregnancy highlighted the challenge in this area. It was encouraging to see that the rising preterm rates had not resulted in a statistically significant increase in PMR (trend), however it is possible this is due to the small numbers as the data has shown an increase in this rate over the time period. A multiagency response would assist in ensuring all possible resources can be cohesively directed towardsremedying one of Australia’s greatest, and most persistent, challenges: that of improving health outcomes for Indigenous mothers and their infants.

We have:

- Clarified a sentence in the abstract: Alternative models for delivering care to Indigenous women and their babies have shown improved outcomes, including preterm birth, though not all have been sustained over time and none are available Australia-wide.
- Clarified a sentence in the discussion: The review found no studies that examined the acceptability or impact of midwifery group practice models of care, known to benefit women generally [24], and Indigenous women [25], with teenage women.
- Strategies to address smoking in pregnancy in Indigenous women to date have been relatively unsuccessful, perhaps not least because research suggests that social context is an important factor with smoking providing a sense of belonging and identity, and group membership [30].
- Changed maternal infant health to MIH throughout

Since the paper was submitted, further cleaning has been undertaken of the data both by our team and system administrators. It has been decided that the information regarding the majority of the social indicators is unreliable, and as such, has been removed from the manuscript.

Regards,

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