**Reviewer's report**

**Title:** Optimal fetal growth for the Caucasian singleton and assessment of appropriateness of fetal growth: an analysis of a total population perinatal database

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**Reviewer:** Russell S. Kirby

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Optimal fetal growth for the Caucasian singleton and assessment of appropriateness of fetal growth: an analysis of a total population perinatal database

In this manuscript, the authors develop estimates of optimal fetal growth and then estimate the percentage of optimal growth for each delivery in a population-based sample. The methodology is developed first for birth weight for gestational age, then be extended to other measures of fetal growth including birth length and head circumference.

The manuscript is not presented in a traditional scientific report style. The “background” section begins on p 3 and concludes on p 8, and contains much material better placed in a “discussion” section. Portions are very casual and hard to follow (ie p 4, where readers are presented with Table 1 without any context, or later on this page where we learn that some study is limited to Caucasian singletons without yet knowing what the study we are reading is about and with no reference to ref 12 if that is what is referred to as “this study”). It would be much better to focus the introduction on the specific research objective at hand, concluding with a succinct statement of study purpose, in perhaps at most 3 pages. Then develop the issues of measurement in the methods section. Again, results (such as on bottom of p 10) should be confined to the results section, and presented there objectively and without discussion. Instead of “turning points” use mathematically accepted terms, ie “inflection” points.

The results section could be simplified: the equations given in the text are repetitive of results in Table 7 and can be eliminated. Since these are regression equations, include additional statistics (standard errors not C.I.s for each parameter estimate!, overall adjusted R-square, p-values for each term).

The discussion should focus first on the statistical utility of the proposed method, then compare it with the work of others. A detailed discussion of the limitations of these results should be included. Its extension to other populations should be discussed especially for publication in an international journal

A significant weakness of this study is the small size of the study population and the severe restrictions due to exclusion criteria. Beginning with only 51,558 births, the authors only study 26,461 births which is only about 50% but undoubtedly represents some systematic biases due to the exclusions. Why not include all births from 1998-2003, and present a table showing how the included and excluded cases compare on key demographic and reproductive health characteristics? With only 26K births, this is smaller than the population studied by Brenner, not much larger than Usher, and very difficult to use as a basis for generalization for western Australia or elsewhere around the globe.

**Additional comments:**
The writing style of this manuscript could be improved by attention to use of active voice wherever possible.

What are the additional files referenced at the end of the manuscript?

The authors should carefully review the references, both for journal formatting and completeness. Of special note are book chapters, refs 1-3 where the page numbers are repeated, and ref 15 where the last author is someone with no last name, and ref 23 where the word “transformations™” is incorrectly capitalized.

In Table 1, why are some entries included if they are NA, and is it really likely that no cases of TORCH or high altitude (however that may be defined) occurred? The column heading is really part of the title.

What is the relevance of Table 2? Surely this is part of the results of the current study, so why does it appear before the study has been developed and presented?

Table 3: compare the included and excluded with respect to other characteristics, like maternal age, education, prenatal care, parity, etc. and provide p-values for these statistical comparisons.

Is Table 4 necessary? Given that only 25 cases are excluded couldn’t this be mentioned in a sentence in the text instead?

Table 5 could be incorporated into the suggested expanded Table 3.

Table 6 could be included in Table 7 in the relevant cells.