Reviewer's report

Title: Racial disparities in infant mortality: What has birth weight got to do with it and how large is it?

Version: 2 Date: 27 August 2010

Reviewer: Brian Whitcomb

Reviewer's report:

The authors have made substantial revisions to address the reviewer comments. They have included additional text to clarify the approach, and the discussion section in the revision includes a more thorough coverage of work in this area to better place the manuscript in context.

Essential revisions

1. Background paragraph: A more explicit statement of the causal relations of interest (i.e., among race, birth weight and mortality) would help define the question posed by the authors and allow the reader to find orientation. The authors should clearly state the direct and indirect effects of interest and identify the cause, the mediator, and the effect. Currently, the relevant text in the introduction addresses mortality curves, rather than mortality. There has been significant discussion of the curves and the complexity entailed when considering mortality stratified by birth weight (or gestational age).

2. Statistical model - CDDmlr. In introducing the birthweight subpopulations, the authors describe “compromised” births as macrosomic, low birth weight, as well as “compromised” births that occur in the normal birth weight range due to the 2500gm cut point. The explanation for the latter fits with notions of SGA or IUGR, but inclusion of macrosomic births with these other groups is inconsistent with existing research and combines causally disparate groups. Can the authors discuss the reasons for and impact of including macrosomia in the “compromised” group? For example, how does this effect the standardized birth weights used in the mortality model?

3. Discussion. The authors state “This eliminates the main effects (associations) of race and birth weight and the logistic regression can then estimate the direct effect of race on infant mortality versus the potential interaction effects of race and birth weight on infant morality” and cite Schisterman, PPE 2010. Schisterman et al. describe how use of z-scores for adjustment in multivariable logistic regression models of smoking and mortality yields smoking coefficients that represent estimates of the total smoking effect and do not decompose effects into direct and indirect effects. This sentence should be modified accordingly.
Discretionary revisions

4. **Abstract. Background.** “…at least among “normal” births…” Replacing the clause “at least among “normal” births”, with something like, “in most births” or similar phrase that does not use “normal” would help avoid confusion. The authors’ intended meaning of “normal” has not yet been introduced at this point.

5. **Background.** “On the other hand, the Wilcox-Russell hypothesis only applies…”. This is somewhat confusing sentence, in part because of use of the term “normal”; are the authors referring to babies greater than 2500gms or are they referring to their usage of “normal”? If the former, it would be clearer to provide a birthweight range than as it is currently written.

6. **Discussion:** The statement “…suggest that birth weight is not on the “causal pathway” to infant mortality at least for “normal” births.” (page 22 on the uploaded version) would seem to represent a possible self-contradiction. By the same token, many established risk factors for disease (examples: age, cholesterol, blood pressure, etc.) are not related to disease within some range of values. Does non-linearity of an effect mean that it is not on the causal pathway?

7. **Discussion:** The authors suggest that birthweight has a direct effect on mortality only below some birthweight. Assuming this is correct, how does this impact the statement that your “findings suggest that interventions with respect to birth weight cannot reduce racial disparities in mortality among “normal” births but might reduce them among “compromised” births”? One would think that public health interventions would be aimed at reducing mortality (regardless of race) and might target vulnerable populations (identified by race). Is it possible to target only “compromised” births with interventions that affect birth weight?

8. **Discussion:** How does the suggestion of a direct effect only below some cutpoint (i.e., a non-linear direct effect) square with research on other factors that impact birth weights such as altitude?

9. **A major thrust of the authors’ approach is utilizing the latent group membership (i.e., “normal” and “compromised”) rather than observed birthweight derived groupings (e.g., LBW (<2500gms) yes, no). The results include means and variances for these groups, but it would be interesting to see how the methods agree or disagree with observed birthweight derived groupings. Additionally, it would be helpful to see how classification was impacted by consideration of macrosomic births as “compromised”?

10. **The terms “direct” and “indirect” are standard terms and do not require quotation marks unless used in an unconventional manner.**

Not for publication:

1. **There are no paragraph breaks/ indents in the uploaded pdf apart from those with subheadings. For example, the Background appears as a two page single paragraph.**
**Level of interest:** An article whose findings are important to those with closely related research interests

**Quality of written English:** Acceptable

**Statistical review:** No, the manuscript does not need to be seen by a statistician.