Author’s response to reviews

Title: Errors in estimated gestational ages reduce the likelihood of health facility deliveries: results from an observational cohort study in Zanzibar

Authors:
Isabel Fulcher (isabelfulcher@g.harvard.edu)

Kaya Hedt (kayah@live.unc.edu)

Stella Marealle (smarealle@d-tree.org)

Jalia Tibaijuka (jaliatiba@d-tree.org)

Omar Abdalla (almuntaf@gmail.com)

Rachel Hofmann (rhofmann@d-tree.org)

Erica Layer (elayer@d-tree.org)

Marc Mitchell (mmitchel@hsph.harvard.edu)

Bethany Hedt-Gauthier (bethany_hedt@hms.harvard.edu)

Version: 2 Date: 01 Nov 2019

Author’s response to reviews:

Response to Reviewers

BHSR-D-19-00063R1: Errors in estimated gestational ages reduce the likelihood of health facility deliveries: results from an observational cohort study in Zanzibar

Li-Yin Chien, ScD (Reviewer 3): The manuscript is generally well written and addresses practical issues. But I agreed with the reviewer 1's comments and noted many of the comments cannot be addressed in the current study. I think the authors have made a reasonable effort in addressing the comments. Minor comments are as the follows.

We want to thank the Reviewer for their thoughtful comments. We have attempted to incorporate all of their suggestions and believe the paper is now stronger due to their contributions.
1. Please discuss about the findings "the result was no longer significant for women with severe overestimates (AOR=0.84, 95% CI: [0.69, 2.81], p=0.086)." The result remained significant for women with moderate overestimate, but not severe overestimate. Then how can you conclude "The overestimation of women's EDDs reduces the likelihood of health facility delivery?" How do you explain the differences between moderate and severe underestimation?

While we recognize that the adjusted odds ratio does not meet the standard significance threshold of 0.05, the point estimates and corresponding confidence intervals for the odds ratios are nevertheless similar for moderate and severe overestimates. Indeed, the odds ratio comparing the severe to moderate categories is 95% CI: [0.72, 1.13] with a p-value of 0.361. As such, we cannot conclude that there is a difference between the odds ratios in these overestimation groups. We realize that this point was not made clear in the main text. As such, we have added the following sentence to clarify this point:

Note that there is not a significant difference in the odds of health facility delivery comparing women with severe to moderate overestimates in the adjusted model (P=0.361). (page 7, lines 8-10)

2. For the consideration of "preterm delivery," could you please conduct sensitivity analysis to confirm? Even though 42% of births as preterm was impossible, to certain extent, preterm is still something that could have confounded or biased your results.

We agree that we cannot distinguish between true preterm (or post-term) births and error in the EDD estimate. However, we do not believe it is necessary to distinguish between preterm births and error in EDD estimate in our analysis because we are only concerned with how a birth earlier than anticipated (whether via preterm or mis-estimated EDD) influences a woman’s decision to deliver in a health facility. Implicit in this assumption is that women who experience a preterm birth are not more (or less) likely to deliver in a health facility compared to women who deliver at term but with an incorrect estimated date of delivery. Following this logic, the inclusion of preterm births in this analysis should not bias the findings from our main regression model. We state this more explicitly at the end of our Discussion section:
Lastly, we were unable to classify if the births were truly preterm, term, or post-term due to the likely errors in gestational ages and unavailability of birth weight or physical assessments at birth in our data. This would only bias our findings if the decision to go to a health facility differed between women with an overestimated estimated delivery date and those who delivered preterm, which we do not believe is the case. (Page 9, lines 1-5)

3. The selection of cut-off for severe overestimate (35 days) is not clear.

We thank the Reviewer for catching this oversight. We chose the cutoff of 36 days because it fell outside the severity of misestimated delivery dates reported in the literature. We have now provided the following explanation:

We chose to categorize overestimate as moderate and severe to allow the odds of health facility delivery to vary by severity of LMP misestimation. The cutoff of 36 days for severe overestimation was based on the low proportion (<5%) of women who were beyond this cutoff (e.g. larger misestimation) in studies that reported the full distribution of LMP dating accuracy [2] or gestational age at delivery [2,13]. (Page 5, lines 37-41)

To further address the Reviewer’s concern, we have performed a sensitivity analysis to show that the choice of cutoff does not change our main conclusions. Results are detailed in the tables in the updated manuscript and in the PDF response to reviewers (taken out here due to formatting challenges); note that varying the cutoff for severe overestimation only changes point estimates for moderate and severe overestimates so we only report on these. Our main conclusions would not change if any of these cutoffs had been used.