

PEER REVIEW HISTORY

BMJ Open publishes all reviews undertaken for accepted manuscripts. Reviewers are asked to complete a checklist review form (<http://bmjopen.bmj.com/site/about/resources/checklist.pdf>) and are provided with free text boxes to elaborate on their assessment. These free text comments are reproduced below.

ARTICLE DETAILS

TITLE (PROVISIONAL)	Time to initiation of antenatal care and its predictors among pregnant women in Ethiopia: Multilevel Mixed-effects Acceleration Failure Time model
AUTHORS	Oyato, Befekadu; Abasimel , Husen; Tufa, Derara Girma; Israel, Hana; Getachew, Tewodros; Awol, Mukemil

VERSION 1 – REVIEW

REVIEWER	Dadi, Tegene Hawassa University College of Medicine and Health Sciences, School of Public health
REVIEW RETURNED	27-Jul-2023

GENERAL COMMENTS	<p>Abstract: Needs major revision. E.g. the background section is not focused to the issue under study. weighted sample of 2933: it is not correct description. Weighting is applied during analysis. the conclusion lacks major implication and recommendation of the paper. Strength and limitations: it is not correct. Should exactly describe the limitation and strengths of the paper. Is infant mortality the issue of the paper? Introduction: not focused, lacks justification. References should be corrected using standard reference manager. Methods: Weibull distribution survival regression model why? A known survival analysis can estimate the time to initiation of ANC. Is th paper methodological paper or subject matter? Id the paper is methodological paper it lacks many details and there should be statistical expert which know about the statistical issues. If the paper is subject issues – no need to put equations and their details. The paper should be focused and should avoid unnecessary details. Have you used weighting? What type of weighting? How the weighting variable is created? If there is no weighting – it is a must to have weighted analysis because the sampling strategy of DHS necessitates the use of weighting.</p> <p>Result: Needs major revision in narrating results? The logical flow of result organization including variable organization is incorrect. Is timely initiation defined by mean survival time or is there any other definition? Is the analysis weighted or not? timely initiation of ANC visit in Ethiopia was found to be 42.7% = what is timely initiation? The overall incidence rate was approximately 11 per 100-person month of observation. What type of incidence is this? is the term</p>
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	<p>incidence correct to use here – with no prospective data? What is censored? Some of the variables are not clear - Community ANC utilization? Community women education? What is their meaning?</p> <p>What new findings you have reported?</p> <p>Discussion Lacks focus and logical flow. First paragraph of the discussion should be summary of the key findings you have – respond your objective. The discussion paragraphs are not matured and they are superficial– lacks detail description – which will help to generate implications for each key finding. References are not updated references. Lacks implication and recommendations. What will be the practical implications to change practices?</p>
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VERSION 1 – AUTHOR RESPONSE

Reviewer 1

Abstract:

Reviewer Comment 1: Needs major revision. E.g. the background section is not focused to the issue under study.

Response to Reviewer’s comment: We are grateful for your comments. Changes were made. Refer to the body of the revised manuscript.

Reviewer Comment 2: weighted sample of 2933: it is not correct description. Weighting is applied during analysis.

Response to Reviewer’s comment: Thank you for the insightful comment. As you said we applied sampling weight before any statistical analysis. This number 2933 indicates the number of women analyzed in this study after applying sampling weight. Consequently, we have made changes. Refer to the revised manuscript.

Reviewer Comment 3: the conclusion lacks major implication and recommendation of the paper.

Response to Reviewer’s comment: We are grateful for your comments. We have made amendments. Refer to the body of the revised manuscript.

Reviewer Comment 4: Strength and limitations: it is not correct. Should exactly describe the limitation and strengths of the paper.

Response to Reviewer's comment: Thank you for the insightful comment. A modification has been made. Take a look at the revised manuscript.

Reviewer Comment 5: Is infant mortality the issue of the paper?

Response: Thank you for your great concern. This is one of the biggest mistakes we committed. Thank you again. Changes were made. Refer to the strength and limitations section of the revised manuscript.

Introduction:

Reviewer Comment 6: not focused, lacks justification.

Response to Reviewer's comment: Thank you again for your constructive comment. We have made changes. Refer to the introductory section [pages 3 and 4] of the revised manuscript.

Reviewer Comment 7: References should be corrected using standard reference manager.

Response to Reviewer's comment: Thank you for your valuable comment. We have made amendments. Refer to the revised manuscript.

Methods:

Reviewer Comment 8: Weibull distribution survival regression model why? A known survival analysis can estimate the time to initiation of ANC.

Response to Reviewer's comment: Thanks a lot. Your concern is appreciated.

- ◆ As you said, a known survival regression model (Cox proportional hazards [PH] model) can estimate the time to initiation of ANC. but if the PH assumption fails, we should consider the alternative model which is accelerated failure time (AFT) model. AFT is a parametric model where the baseline hazard function is supposed to follow a specific distribution compared to the Cox model where the baseline hazard is an unspecified function.
- ◆ Five regression models are implemented using the AFT parameterization: exponential, gamma, log-logistic, lognormal, and Weibull. Additionally, Mixed-effects survival regression model supports five regression models using the AFT parameterization: exponential, gamma, log logistic, lognormal, and Weibull.
- ◆ In our study, the proportional hazards (PH) assumption was tested using Scaled Schoenfeld residuals and found to be unsatisfied, with a global test value of 0.0001. As a result, the data were fitted using an accelerated failure time model with exponential, gamma, log logistic, lognormal, and Weibull distributions as the baseline distribution. The model with the lowest Akaike Information Criteria (AIC) and Bayesian Information Criteria (BIC) is considered to be the best.

- ◆ Therefore, the AFT model with a weibul distribution was found to be the best model to fit the data with a minimum AIC and BIC values of 378.98 and 430.99, respectively.

Reviewer Comment: Is the paper methodological paper or subject matter? If the paper is methodological paper it lacks many details and there should be statistical expert which know about the statistical issues. If the paper is subject issues – no need to put equations and their details. The paper should be focused and should avoid unnecessary details.

Response to Reviewer's comment: Thanks a lot. Your concern is appreciated.

- This research paper is a subject matter paper. But, for the benefit of future researchers who wish to conduct their research using these analytical methods, we have thoroughly shown this section. We discussed it to make it clear and reproducible in the future. Nevertheless, we have removed the equations together with their details which we felt unnecessary. You can refer to page number 21 of the revised manuscript.

Reviewer Comment: Have you used weighting? What type of weighting? How the weighting variable is created? If there is no weighting – it is a must to have weighted analysis because the sampling strategy of DHS necessitates the use of weighting.

Response to Reviewer's comment: Thanks a lot. Your concern is appreciated.

- ◆ We have applied weighting before any performing any descriptive or analytic statistics.
- ◆ Data weighting using probability (sampling) weights [p-weight] were applied to adjust disproportional sampling and non-response as well as to restore the representativeness of the sample so that the total sample looks like the country's actual population.
- ◆ Since we extracted the data from under-five children or women's file, we used the weight variable which is v005. Weights in DHS data are calculated to six decimals but are presented in the standard recode file without decimal point. Therefore, we generated a new weight variable (wgt) dividing the weight variable (v005) by 1,000,000.

Result:

Reviewer Comment: Needs major revision in narrating results? The logical flow of result organization including variable organization is incorrect.

Response to Reviewer's comment: We are grateful for your comments. We have made amendments. Refer to the body of the revised manuscript.

Reviewer Comment: Is timely initiation defined by mean survival time or is there any other definition?

Response: No, it is not defined by mean survival time. It is just the proportion of women who initiated ANC in the first three months of pregnancy as recommended by WHO.

Reviewer Comment: Is the analysis weighted or not?

Response to Reviewer's comment: Thanks a lot. Your concern is appreciated. The analysis performed after applying a sampling weight.

Reviewer Comment: timely initiation of ANC visit in Ethiopia was found to be 42.7% = what is timely initiation?

Response: According to the WHO's safe pregnancy and child birth recommendation, ANC should be initiated in the first 12 weeks (3 months) of pregnancy. As result, timely initiation of ANC in this study is defined as the proportion of women who initiated ANC in the first 3 months of pregnancy or within 3 months of gestational age.

Reviewer Comment: The overall incidence rate was approximately 11 per 100-person month of observation. What type of incidence is this? Is the term incidence correct to use here – with no prospective data?

Response: Thank you a lot for your constructive comment. The type of incidence used to this study is cumulative incidence. Though the data were cross-sectional there is a time sequence in the EDHS.

Reviewer Comment: What is censored?

Response: Censored refers to a participant or subject in a follow-up study who left the study early or who finished it without experiencing the event of interest. The event of interest of interest might be disease, death, recovery, initiation, discontinuation....etc.

Reviewer Comment: Some of the variables are not clear - Community ANC utilization? Community women education? What is their meaning?

Response to Reviewer's comment: We are grateful for your comments. We have made amendments. Refer to the body of the revised manuscript. You can revise page number 7 of the revised manuscript.

Reviewer Comment: What new findings you have reported?

Response to Reviewer's comment: This study indicated that women who were formerly in union commenced ANC visit later than mothers who were currently in union at 5% level of significance. This study also reported that mean survival time to first ANC initiation, which is 6.8 months.

Discussion:

Reviewer Comment: Lacks focus and logical flow.

Response to Reviewer's comment: We are grateful for your comments. We have made amendments. Refer to the body of the revised manuscript

Reviewer Comment: First paragraph of the discussion should be summary of the key findings you have – respond your objective.

Response to Reviewer's comment: We are grateful for your comments. We have made amendments. Refer to the body of the revised manuscript

Reviewer Comment: The discussion paragraphs are not matured and they are superficial– lacks detail description – which will help to generate implications for each key finding.

Response to Reviewer's comment: Thank you in advance. In response to your insightful comments, we have made significant changes and revisions to the discussion section. Please refer to the discussion section of the revised manuscript (pages 14-18).

Reviewer Comment: References are not updated references.

Response to Reviewer's comment: We are grateful for your comments. We have made amendments. Refer to the body of the revised manuscript

Reviewer Comment: Lacks implication and recommendations. What will be the practical implications to change practices?

Response to Reviewer's comment: We are grateful for your comments. We have made amendments. Refer to the body of the revised manuscript.

VERSION 2 – REVIEW

REVIEWER	Dadi, Tegene Hawassa University College of Medicine and Health Sciences, School of Public health
REVIEW RETURNED	20-Jan-2024

GENERAL COMMENTS	Thanks for the revision. Since the paper is not a methodological paper it is good to write the findings in a palatable way for managers or service providers or subject matter experts. Identifying an audience is very crucial to guide the whole writing of the paper.
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VERSION 2 – AUTHOR RESPONSE

Reviewer 1

Reviewer Comment: Thanks for the revision. Since the paper is not a methodological paper it is good to write the findings in a palatable way for managers or service providers or subject matter experts. Identifying an audience is very crucial to guide the whole writing of the paper.

Response to Reviewer's comment: Thank you again for your constructive comment. We are grateful for your insightful and valuable comments. Changes were made. Refer to the result and conclusion part of the revised manuscript.