Review of: "Using a Health and Demographic Surveillance System to Assess Stillbirths Trends and Risk Factors in Siaya County, Kenya between 2008 and 2019"

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Potential competing interests: No potential competing interests to declare.

COMMENT TO THE AUTHORS

TITLE: Using a Health and Demographic Surveillance System to Assess Stillbirth Trends and Risk Factors in Siaya County, Kenya between 2008 and 2019

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General Comments

The study used data from the Kenya Medical Research Institute's Health and Demographic Surveillance System to analyze trends and risk factors for stillbirths in Siaya County, Kenya in the period between 2008 and 2019.

The abstract, introduction, method, and results were presented well. However, the study did not clearly state the study design and sampling method. The ANC visit variable and wealth index variable need to be relooked at as high numbers of missing values are indicated. It is not advisable to include a separate data set just for one variable (ANC visits) and incorporate it in the discussion and conclusion; that may have biased the whole study. It is better to limit the ***whole data set to 2013-2019 and focus your study on the findings from this data set***, unless you come up with a mechanism for managing the huge number of missing values.

The results section should briefly summarize the major findings in the tables. In your discussion, the literatures referenced are old and very limited; adequate and latest references should be included to substantiate your findings.

It is advisable to first focus your discussion on the major risk factors that showed statistical significance, particularly when presenting the abstract. However, factors not showing statistical significance but proved to be potential predictors from other studies could be discussed and justified, as you tried to do. The conclusion needs to focus on your findings, nothing else. Tables need to be properly labeled to be informative.

The ethical clearance, conflict of interest, as well as acknowledgements, are well written. But the authors'***contributions*** should be clearly stated.

References need to be updated and adequate, starting by searching from local to regional, and then global studies.

Specific Comments

The title better fine-tuned: suggested

“Stillbirth Trends and Associated Risk Factors: A Retrospective Chart Review of Health and Demographic Surveillance Data (2008-2019), Siaya County, Kenya”

Advisable to move funding and competing interest information to the end of the paper

Funding: No specific funding was received for this work.

Potential competing interests: No potential competing interests to declare.

Abstract - better to rephrase it.

Suggested corrections

Introduction: Every year, about 4 million stillbirths occur. Although stillbirths are more prevalent in developing countries, they are least studied, and hence their rates remain unknown. For evidence-based interventions, it is imperative to track trends and identify determinants of stillbirths.

Methods: This is a retrospective chart review. Data (2008-2019) for Siaya County, Kenya, on the pregnancy outcomes of women in the reproductive age (13 - 49 years)*.[SH1]WHO's recommended age limits of women in reproductive age groups are between 15 and 49 years old]* that was collected twice a year by the Kenya Medical Research Institute’s Health and Demographic Surveillance System were used for this study. Once a pregnancy is registered, its outcome (stillbirth/live birth) is monitored at subsequent visits, and the outcome type is reported.

Stata software (Version 14; Stata Corporation, College Station, TX, U.S.A.) was used to analyze the surveillance data. Descriptive statistics, such as numbers, percentages, the mean, graphs, and frequency tables, were used to describe the study subjects’ characteristics. The pregnancy outcome was recorded as a dichotomous variable (stillbirths or live birth). The trend of stillbirths was analyzed for the whole dataset/county as well as for each sub-county. While potential risk factors from the bivariate analysis were determined using Pearson’s chi-square test, those variables showing a statistically significant association (<0.05 5alpha) with the outcome variable of interest (stillbirth) were re-run using a multivariate logistic regression analysis, at <0.05 5alpha and a 95% confidence interval.

Results: A total of 59,028 birth records were reviewed, of which 1,250 (2.1%) were found to be stillbirths. The prevalence of stillbirths declined from 3.69% in 2008 to 1.77% in 2019. Mothers aged >36 years, having no formal education, living in Rarieda sub-County, a low wealth index, and the reporting year of pregnancy have shown a statistically significant association with stillbirth. From a separate analysis (2013-2019), the number of ANC clinic visits of four and above demonstrated a statistically significant association, showing a protective effect (adjusted OR = 0.51, 95% CI: 0.27, 0.96).

Conclusion:

“A reducing trend of stillbirths was observed over the years; and education, parity/gravida, wealth index, and

year of pregnancy were found to be the major risk factors strongly associated with stillbirth at Siaya County, Kenya; which calls for urgent and appropriate interventions."

Take the correspondence address and key words to the end of the manuscript

Remove the authors (already listed above the abstract)

Introduction

The introduction tried to portray global and national stillbirth rates.

But it lacks flow, as the global-regional and local stillbirth situation should be described sequentially (in an inverted funnel) to see the information available and clearly indicate the gap in information on stillbirth in the study area (Siaya/Kenya). Besides, the possible factors from the literature should be well investigated and presented using the latest literature to validate the need for this specific study, including the latest references, as most are old. The last paragraph, particularly, should be dedicated to this, clearly demonstrating the information gap on the trends of stillbirth and the risk factors associated, so that the study is justified in filling the gap and addresses the stated objectives.

Additionally, consider the following few corrections:

- First paragraph of the introduction section:
  - "Stillbirth rate with stark contrast with the USA" (at line four), but failed to indicate the magnitude that can help in appreciating the difference.
  - Try to include the latest references as suggested above; most of the literature is**older** than 10 years (between 2007-2009), and check the second paragraph also for the same.

Materials and Methods

- Study population: well described
- Study **design**: not mentioned

Suggested: "Retrospective cohort chart review", using Health and Demographic Surveillance Data (HDSD), as you have retrospectively reviewed secondary data.

- The sampling method is not indicated. Though it is surveillance data, the sampling method should be stated. This is not the standard probabilistic random or non-probabilistic sampling method; however, it is conventional to call it exhaustive, as the entire data set (>93%) is included in the study.

Suggested "exhaustive sampling, including all births from 2008-2019"

- Data collection method: well described
- Data analysis: well stated (please summarize this in a similar fashion in your abstract section, which was not well **written)**

- **Table-1: Proper titling of tables is required; suggested: "Table-1 Categorization of potential predictors (independent variables) for stillbirth, Siaya County, Kenya (2008 and 2019).**

Ethical consideration: well described

Results

- Table-2: Title needs to be descriptive. Suggested ***"Socio-demographic and economic characteristics of the study participants,* Siaya County, Kenya (2008 and 2019)."**
- Missing values for ANC visits are very high (not acceptable for analysis, biasing your findings) and need to be dealt with. It is advisable to remove them or limit your analysis of the whole dataset to between 2013-2019, as this variable is critical for the proposed future intervention (recommendations made).
- Manage all variables with missing values above 10%; they are better kept under 5%.
- The missing values indicated for the wealth index also need relooking and correction; please check!
- The stillbirth trends table was described, but the findings on table-2 were not well described. Suggested: ***"From the bivariate analysis, maternal age, education level, marital status, parity/Gravida, residence, and year of pregnancy showed a statistically significant association with stillbirth."*** ;
- ***"Whereas, on the subsequent multivariate analysis, only maternal education, residence, wealth index, and year of pregnancy remained statistically significant as the major risk factors for stillbirth."***

Note: The high level of missing values for ANC visits and the wealth index does not allow us to make such a remark on association as it will be biased (needs correction first)

Discussions

- Prevalence of stillbirth

Well summarized; the stillbirth rates over the years and the trends were described. Also, efforts have been made to justify why there are spikes on the line graph at certain periods of time/years, relating it to local events/circumstances at the time.

However, proper comparing/contrasting with other local/regional research findings, even global results, is minimal.

- Factors associated with stillbirth

Major risk factors were indicated and relevant literature was referenced, but very limited references were mentioned as commented above (add more relevant literature from Africa or elsewhere)

- Likewise, the discussion on education as the main determining factor for stillbirth was discussed well, but still needs more relevant up-to-date literature as a reference; the same applies to the wealth index. Therefore, adequate latest references should be incorporated while discussing findings on education and the wealth index as major risk factors for the high stillbirth rate documented in the study area.

- One of the strengths of the study is that above 93% (59028/63465) of all the surveillance data was included in the analysis, leaving just less than 10% for the reasons stated.

Conclusions

- Your conclusions must focus on your study findings. No reference is needed here!

The statement you're making, “Our findings show a reducing trend of stillbirths, suggesting that the interventions, mainly ANC clinic services, are effective,” is incorrect. You cannot claim that ANC services are effective as the variable itself is full of missing values (using a separate dataset for 2008-2012 needs close scrutiny and decision to ensure the internal validity of your study, avoiding bias, including selection bias that might be incurred while looking at your whole dataset for the study)

Suggested conclusion:

“The stillbirth trend markedly decreased over the years. Age, level of education, residency, economic status, and year of pregnancy were found to be the major risk factors. From a separate analysis made (2013-2019) ???, frequent ANC clinic visits showed a statistically significant association with the stillbirth rate, showing ANC visits' protective effect. Although, from this finding, modifiable risk factors are limited and it may need long-term interventions (formal education and economic status) to effectively reduce the incidence of stillbirth, it is highly recommended that other proven interventions be implemented, such as quality ANC services with intensified counseling and group education. Engaging Community Health Volunteers could also improve access and coverage as cost-effective interventions which the MoH/Kenya could consider as immediate preventive measures.”

References

- References should be the latest/up-to-date
- The references included should address the relevant major sections adequately: trends of stillbirth, risk factors, and possible interventions
- The list of references needs to be formatted consistently with the same referencing style