Reviewer's report

Title: High maternal mortality estimated by the sisterhood method: a rural area of Mali

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Reviewer: Susie Dzakpasu

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General comments

The study’s objectives are clear, with a defined outcome measure and established methods. The findings have the potential to add to the limited body of measured rather than modelled data on maternal mortality in low-income countries. The alarmingly high MMR estimated in this study’s rural setting highlights the importance of sociodemographic disaggregation of public health measures whenever this is possible.

1. Major Compulsory Revisions

- The paper does not present any analysis of the quality of the data collected. Consideration must be given to the quality of the data on which the MMR calculation is based. One method of doing this is to compare the number of sisters respondents are expected to have based on the known levels of fertility in the study areas with the average number of sisters reported by respondents.

- Confidence intervals should be calculated and presented for all estimates of maternal mortality. Reporting only point estimates is misleading, suggesting a level of precision in the estimate that is not justifiable. Furthermore, the MMR appears to have been rounded. If this is the case, nature of rounding should be stated in the methods.

- The discussion should include an assessment of the extent to which data quality issues may or may not have biased the estimated MMR. For example, it is known that abortion and ectopic pregnancy related deaths are difficult to capture with the sisterhood method leading to an underestimation of the MMR.

- The presented information on TFRs is confusing.

a. It is stated that it was 6.6 in 2006 for Mali based on the DHS, and varied between 6.2 and 6.8 in the period 1950 and 1995 based on a UN source. Although no uncertainty ranges are given, these figures suggest the TFR has remained relatively constant from 1950 to 2006. This seems unlikely. I suggest authors double check these values.

b. Statement that TFR in Kayes region is higher than in urban settings suggests that TFR in Kayes is known. If this is the case, the value should be stated.

c. It should be made clear which value of the TFR was used to calculate the MMR, and why. Authors should use a TFR estimate that corresponds as closely
to 1999 as possible, eg they could use the TFR from the 2001 DHS.
d. Sensitivity analysis should be used to vary TFR within uncertainty limits to
determine the impact this would have on MMR estimates.

2. Minor Essential Revisions

- The authors should explicitly state whether all households in the 20 villages
were included in the study, or whether only a sample of households were
included. If only a sample of the households were included, the nature and
representativeness of this sample needs to be presented. Also, were the 20
villages contiguous geographically?
- The authors comment on potential misinterpretation of the questions asked, but
do not indicate whether the questions were translated/back translated to
minimize misunderstanding. This should be stated. Also, was using the precise
period of 42 days after delivery effective? If it was not effective, was this question
modified during data collection? If so, what impact might this have had on data
collected?
- Clarify what is meant by “infrastructure” throughout the paper, particularly since
transport is not presented as part of infrastructure.
- Authors should double check that the estimated MMR in this study is based on
maternal deaths and not pregnancy-related deaths.
- What proportion of the population in Mali lives in rural settings? This would give
an indication of potential population at risk of very high MMRs.

Background, para 1
- Consider reporting trend of Mali MMR presented in Hogan et al 2010, rather
than 2005 WHO estimate. In addition to establishing Mali’s high MMR, the
temporal trend also suggests a declining MMR which gives the reader more
information. If left unchanged, the uncertainty range should be added to 2008,
670 (422-1017) MMR estimate which will show that it is not statistically different
from 2005, 970 MMR estimate from WHO report. Also, note that Hogan et al is a
systematic analysis, not a systematic review.

Methods, para 3
- “As a consequence … result. In addition … the population in this rural area” –
These two sentences should be referenced. And, at least one example of cultural
norms and customs referred to should be presented.
- The authors state that a sample of 2372 would give 95% confidence level for a
big population if the real rate is 1%.
a. What is meant by “big population”?
b. Results present a sample of 2070 (2039 after exclusions). This is a smaller
number than presented for sample size calculations. It is expected given the high
MMR in the area, that the study has the power to report it with some level of
certainty. However, authors should present sample size calculations that show
this explicitly.
Methods, para 5
- Authors state that they tried to avoid interviews with siblings. To what extent were they able to do this? To what extent could sibling interviews have impacted their results?

Table 1
- Suggest deleting 60+ row
- Columns 3 and 4, should column headings read 13y rather than 15y since this was the lower age limit used in this study?

Table 2
- Footnote 4 – What do authors mean by “Strong local traditions”?

3. Discretionary Revisions

Abstract, Background
- Specify estimated MMR in Mali, rather than saying that it “is high”.

4. Minor issues not for publication

Abstract, Methods
- “… sisters of reproductive age.”

Background, para 1
- “Many women on the African continent die during pregnancy … “
- “A recent systematic analysis …”

Background, para 2
- “… significant reduction in the risk of institutional maternal death …”
- “… Particularly in rural areas, deliveries …” {missing comma}
- “… in 2002 to improve access to (?) emergency obstetric care …”

Background, para 4
- “Our objective was to estimate the MMR …”

Methods, para 1
- “… the participant has some family relation.” {delete “or” after relation}

Methods, para 3
- Mauritania … not Mauretania
- “… people often arrive late to health facilities in the course …”
- “Through this area the Senegal River flows westward. A development …” {break into two sentences}
- “… expatriates in collaboration with national authorities … {“the” not needed}

Methods, para 4
- What do you mean by location is a predictor? MMR was not regressed on location as far as I can tell from the methods. It would be more appropriate to refer to location as a secondary variable, and to say that data were analyzed descriptively according to this variable.

Methods, para 5
- “How many sisters have you …” {delete “of your”}

Discussion, para 1
- “… studies that informed other estimates.”

Discussion, para 2
- “Efforts in the ministry …” – which ministry?

Discussion, para 4
- “… of Mali, EmOC services were implemented with the assistance of the Save the Children Fund resulting in better use of these services. However, services still need quality improvement.”

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.

Declaration of competing interests:
I declare that I have no competing interests.