Dear Reviewers,

Thank you for your response to our manuscript. I do appreciate the comments raised and have revised the manuscript accordingly. We hope the revised version will be satisfactory. Corresponding points, (which are similarly numbered as reviewer’s remarks) will address these based on each reviewer, in the following pages.

Sincerely

Khadija I.Yahya-Malima
Reviewer 1: Basia Zaba

Corrections based on points as identified by the reviewer

Minor essential revisions

Abstract

“Lifetime non-utilisation of condoms predominated by 78%” has been changed to –“..most of the population (78%) have never used condoms”.

Sampling

Clarification of units of a village that fall under one leader “balozi” has been done to indicate that the balozi can be a leader of more than ten households.

Questionnaire

Details of the questionnaire have been given in the methods section-The questionnaire was adapted from previously validated questionnaires used by the Tanzania HIV/AIDS indicator (2003-2004) survey and the established population-based HIV surveys in Zambia.

Laboratory methods

To our knowledge, several previous studies have shown that testing oral fluids for HIV antibody has excellent sensitivity and specificity for both low and high risk populations. We have included the related information of the saliva test used in the study in the methods section and the appropriate references.

Statistical analysis

The top of page 8 “…..and associated risk given source of infection” the words in bold italics were simply an error in deletion and have now been deleted.

Results

A refusal rate for participation in questionnaire survey is given in the first paragraph of the results section.

We now acknowledge the alternative method of predicting HIV prevalence in non-attendees used by the Kenya DHS as the advised by the reviewer.

Corrections on the middle of page 9 “In contrast, in women, higher HIV prevalence was associated with marital separation…and has been changed accordingly.

The manuscript has been checked and corrected for language errors by a native English speaker at the University of Bergen.
Reviewer 2. Dik Habbema

**Major compulsory revisions**

The findings on risk factors have been compared with other studies in East Africa as advised.

We have corrected figure 1 showing the prevalence of HIV among pregnant women aged 40-49 years is very low. The comparison of HIV infection between pregnant and non-pregnant in the general population (20-49 years) inferred in page 9 is regarding the decreasing prevalence as age increases for both groups.

We agree that the representativeness of ANC-based surveillance may not apply to the younger age women (15-19 years).

**Minor essential revisions** - The numbers correspond to each point for correction as put forward by the reviewer.

1. The confidence intervals for the point estimates have been changed to one digit as advised.
2. The definition of “remote rural” is as it stands that “are those found in the difficult terrain, usually lacking health facilities or utility shop”, this is an attempt to define an area that does not have a strict conventional difference within “rural” boundaries. The catchment area is generally considered rural, we have tried to show that even within the “rural area” there are differences and a “remote rural” is different from “rural” in our situation. The use of the term “contraceptives other than condoms” was aimed at exploring the exposure of unprotected sex as an entry for HIV infection and not for controlling pregnancy, hence all other contraceptives were grouped as one for this manuscript.

3. Africa has been changed to Eastern Africa as advised.

4. Analysis on incentive sex has now been included in table 3 and 4 and discussed accordingly.

5. If HIV prevalence surveys are conducted at the same site at two different periods, then the two prevalence estimates may be used to test whether there is sufficient statistical evidence to determine whether the prevalence has increased or decreased between those periods (UNAIDS Technical guidelines for conducting HIV sentinel serosurveys among pregnant women and other groups). This was the basis of our inference when we compared the two ANC-based surveys in the same clinics in 1999 by Hinderaker et al and by Yahya-Malima et al in 2003/2004. The current population-based survey, conducted at the same period as the recent ANC survey had corresponding HIV estimates, likewise, the Tanzanian HIV/AIDS indicator survey. We believe this suggests that the HIV prevalence is increasing in this area and to our knowledge; there are no other studies that document a different magnitude of HIV prevalence in this rural area.
6. The value of the design effect of 2 was used in the light of experience of previous similar surveys (Zambian population based survey) as a guide for sample size decision, taking account of the cluster effect. The value of the design effect decreases with increasing number of clusters; this is based on a formula in survey methodology.

7. “Contextual HIV prevention efforts have been elaborated in the manuscript as socio-cultural context.

8. Table 3 is adjusted for age only and we have corrected the error in the statement in page 7.

9. We analysed men and women separately because of the critical of differentiation on sexual behaviour by gender. In the analysis of sexual behaviour (as a risk factor for HIV infection) we felt it would be more appropriate to analyse as such since the risk may be different.

10. The reference category for income in table 3 has been corrected.

11. Contraceptive use had been explained in above in number 2 and in the manuscript.
Reviewer 3. John Changalucha

Major compulsory revisions

1. The analysis for which odds ratios are given, corresponding p-values have now been shown as advised.

Minor essential revisions

2. Mean age at first sex has been correctly stated in the manuscript – mean age 17 years ± 3 Standard deviations.

Discretionary revisions

1. The PMTCT services in the catchment area have been incorporated in the hospital services through the reproductive health clinics and referrals from surrounding health centres and dispensary per National guidelines. The Haydom Lutheran Hospital is one among the hospitals that were selected to initiate provision of antiretroviral treatment by the Ministry of Health in 2003/2004.

2. Validation of the essay used for HIV testing has been clarified in the manuscript as advised.

3. The Antenatal and population-based study was done at the same time.