Reviewer’s report

Title: Relationship between combination antiretroviral therapy regimens and diabetes mellitus-related comorbidities among HIV patients in Gaborone Botswana

Version: 2 Date: 12 Dec 2017

Reviewer: Justice Moses K. Aheto

Reviewer's report:

Tshikuka and colleagues examines a possible relationship between combination antiretroviral therapy (cART) regimens and diabetes mellitus-related comorbidities among HIV patients in Botswana using data from two HIV Clinics in the country.

Manuscript generally well written and attempts to address an important global public health issue. The manuscript has strength and potentials for contributing new information to understanding the relationship between cART treatment outcomes for HIV patients and the risk of developing diabetes mellitus-related comorbidities (DRCs).

Below are specific comments aimed at improving the message in the manuscript:

Background:

a) The authors provided sound background to the study but few inputs are needed to improve the message (see b and c).

b) In the last paragraph, the authors should briefly and clearly state the expected policy implications for improving cART treatment outcomes for HIV patients with focus on developing diabetes mellitus-related comorbidities in Botswana, especially at the two HIV Clinic centres used in the study.

c) Error in lines 36 and 38. The statement "Recipients of cART recipients have access…” should read "Recipients of cART have access…".

Methods:

d) The methods employed by the authors in the collection and analysis of the data appear sound to me. However, I have some concerns (see below).
e) What informed the authors decision to increase the sample size from the minimum required size of 483 to 540? See lines 56 and 58 at page 6. Brief explanation is needed in the manuscript. For example, is it to take care of attrition rate, etc?

f) In line 44 at page 7, the authors used p≤0.9 (based on the univariate Cox Regression model) to obtain candidate set of covariates for the multiple Cox regression model. What informed the choice of this threshold of p≤0.9?

g) In lines 37 and 39 at page 8, it is also not clear why the authors decided to keep only covariates with p<0.05 in their final multiple Cox regression model after setting p≤0.9 to obtain candidate set of covariates from the univariate Cox regression model. Using the principle of parsimony to justify this is not appropriate. Parsimony in regression is about keeping as few as possible covariates in your model while maintaining a desired level of explanatory or predictive power of that model. However, once you set p≤0.9 to obtain candidate set covariates for the multiple Cox regression model, the variables that achieved p≤0.9 must be reported in the final multiple Cox regression model and should not be dropped, either the variable is significant or not.

h) Under the subsection "Data analysis" in the methods section, the authors could focus on the key variables of interest to keep the section brief which is very important in maintaining the readers interests.

Results:

i) The results presented are interesting and supported by the data.

j) It might be useful to test/compare the 3 survival curves in Figure 1 even if the 2nd and 3rd cART curves nearly overlapped. This could provide a sound statistical support for any differences in the 3 cARTs.

k) The covariates that achieved p≤0.9 but were dropped in the final model because they did not achieve p<0.05 should be brought back to the results and presented in Table 3 in the manuscript.
Discussion and conclusion:

1) The discussion provided is sound and supported by the data.

m) Authors could state clearly policy implications for their study and key beneficiaries of their findings. The authors could cut extraneous text to improve the message.

**Are the methods appropriate and well described?**
If not, please specify what is required in your comments to the authors.

Yes

**Does the work include the necessary controls?**
If not, please specify which controls are required in your comments to the authors.

Yes

**Are the conclusions drawn adequately supported by the data shown?**
If not, please explain in your comments to the authors.

Yes

**Are you able to assess any statistics in the manuscript or would you recommend an additional statistical review?**
If an additional statistical review is recommended, please specify what aspects require further assessment in your comments to the editors.

I am able to assess the statistics

**Quality of written English**
Please indicate the quality of language in the manuscript:

Acceptable
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