Author’s response to reviews

Title: One size does not fit all: HIV prevalence and correlates of risk for men who have sex with men, transgender women in multiple cities in Papua New Guinea

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Reviewer reports:

Pande Putu Januraga, DrPH, MD (Reviewer 1): This is a well-written manuscript with good quality in term of methodology and how the findings were discussed. However, I have some inputs for every chapter in this study, as follows:

1. Introduction
- Focusing on MSM and TG in this study needs more justifications. It is not only about the unavailability data on HIV prevalence of MSM and TG who did not work as sex workers, but also add the urgency of this situation. Please add the data on the trend of HIV mode of transmissions in PNG. For example, is there any changing pattern from heterosexual to homosexual transmission?
  • There are no data to show explicitly that most HIV transmission occurs sexually between males rather than between males and females. However, we feel the key point has been addressed in lines 90-92 in the introduction, “a consensus has emerged that with an HIV prevalence estimated at 0.9%, the country is experiencing an epidemic concentrated in specific populations, namely key populations: sex workers, men who have sex with men (MSM), and transgender women (TGW).(3-8)”

-This study did not explain why survey was conducted in only three cities in PNG. Authors only stated "In conjunction with the PNG National Department of Health and National AIDS Council Secretariat, we conducted a respondent-driven sampling (RDS) biobehavioural surveys (BBS) of MSM and TG in Port Moresby to fill this information gap" (page 3 line 106-108) without any explanation "why" MSM and TG were recruited in three cities as mentioned in method part. Is there any consideration to select these three cities?
  • We have added the following to the methods section: “These cities were selected for the survey because they are the most populous and include the national capital (Port Moresby), the main economic city and port (Lae), and a city that is at the intersection of roads and natural resource extraction activities in the country (Mt. Hagen).”

2. Methods
- It is not clear the reason for selecting "a very low criterion of p-value <0.01" as threshold (page 7, line 172).
  • I’m not sure where this quotation comes from as it is not in the manuscript. Please note that we used a threshold of p<0.1, not 0.01, for inclusion in multivariate analysis. This is on the lower (i.e., more conservative) end of what is acceptable but it is not out of the ordinary.

Authors also did not mention what the aims of multivariate model whether it aims to predict or control potential confounding variables. In many studies, some authors preferred to use "enter model" - a multivariate model developed by incorporating all independent variables into a model, in order to investigate the adjusted effect by controlling other existing independent variables. Please elaborate
more on this issue.

- We describe on line 173 that “Our analysis characterizes MSM and TGW and correlates of HIV infection among these populations in each of the three survey cities.” Thus, we are looking at variables associated with HIV infection. As a cross-sectional study, it is not possible to indicate if anything predicts HIV infection because we do not know when people were infected in relation to the dependent variable.

- As we describe, we first assessed what variables were significant at p<0.1 in bivariate analysis and incorporated those variables that were significant in a multivariable model. We then used backward elimination to arrive at a model in which everything was significant. This is a standard approach used in many analyses.

- Is there any multi-collinearity testing performed prior to multivariate analysis?

- We assessed this and found no collinearity.

3. Results

- For the outcome variable, such as HIV prevalence in this study, the 95% CI can be mentioned when the proportion is interpreted.

- We have added the 95% CI for HIV prevalence in Port Moresby and Lae. As noted in the text, given the low sample size in Mt. Hagen, the prevalence in Mt. Hagen provided in the text is only for study participants rather than the entire population (i.e., the weighted prevalence). As such, no confidence interval is provided.

- It is important to show readers the result of bivariate analysis for all independent variables which included OR, 95%CI OR, and p-value. Even though not all bivariate results showed a p-value <0.1 as threshold for inclusion in multivariate analysis, readers want to be informed about the magnitude of association for each pair of independent and dependent variables. Therefore, please add bivariate results for other independent variables in Table 4 and 5, or please add in supplements for the benefit of the readers

- These have been added.

4. Discussion

- Authors did a good job for discussion part. Moreover, I suggest putting the current situation related to HIV prevention program in three cities and compare what have been done possibly by stakeholders and NGO and what should be done according to findings in this study in order to justify the title of this manuscript "One size does not fit all".

- Regrettably, very little has been done in the cities for MSM/TGW. While there are services targeting them in Port Moresby, no such services exist in Lae and Mt. Hagen. The idea of the title is to say that as service providers and policy makers move forward they should consider that each city may need its own approach.

- With low cases of HIV-positive in Mt. Hagen leads to the multivariate model cannot be produced. However, it does not mean that the discussion related to the findings in Mt.Hagen is neglected. I noticed interesting findings from descriptive statistics that even though interventional factors such as the proportion of HIV testing, having contact with peer outreach, given free condoms were found at low level among samples recruited in Mt. Hagen, but interestingly, HIV prevalence was the lowest and the protected sex (i.e., condom use) with a men or TG was the highest compared to the findings in two other cities. Please discuss this interesting finding.

- Given the low sample size in Mt. Hagen, we believe it best to be cautious with the data and
would prefer not to comment on these points in the text precisely because they are so important and our data for Mt. Hagen is so limited. That is the reason we only present in the text sample (unweighted) proportions for HIV prevalence rather than population (weighted) proportions. We cannot say for sure if HIV prevalence is really so low. Even for the weighted data, the wide confidence intervals in Mt. Hagen make in challenging to draw conclusions. Our data show that there is no significant difference in condom use at last sex with a man or TGW across any of the cities.

David MacLaren (Reviewer 2): Thank-you for the opportunity to review this manuscript.

This study is very important. The study provides essential evidence about HIV prevalence and correlates of HIV for men who have sex with men and transgender women in PNG. Conducting such research in this setting is extremely challenging. The authors are to be commended for successfully completing the study. The authors have produced a comprehensive and well-written manuscript, which describes their study, presents the results and discusses the implications for HIV transmission and HIV prevention in PNG.

- Thank you for your kind words.

My assessment is that this manuscript should be published. However, there are a few places throughout the manuscript that are cumbersome/unclear and require relatively simple re-wording and/or clarification prior to publication. I list these below:

  * Revised to read: “In the last six months, 73.2% of MSM/TGW in Port Moresby, 77.9% in Lae, and 75.9% in Mt. Hagen, had a concurrent partnership with partners of any sex were engaged. Upwards of 70% of MSM/TGW in all three cities had sex with a woman in the same period.”
* Line 74. "less than half of MSM/TGW has tested for HIV given time frame" is unclear. Consider re-wording.
  * This has been revised to read: “Less than half of MSM/TGW had ever tested for HIV.”
  * Revised as follows: “Papua New Guinea (PNG) is one such example. It was previously described as having a generalized epidemic. The expansion of antenatal clinic surveillance data, as well as biobehavioural surveys, have resulted in a better understanding of PNG’s HIV epidemic and a consensus has emerged that with an HIV prevalence estimated at 0.9%, the country is experiencing an epidemic concentrated the key populations of sex workers, men who have sex with men (MSM), and transgender women (TGW).(3-8)”
* Line 234. Insert the words 'ever tested' into sentence for clarity and to reflect the wording in the table.
  * Added
* Line 235 - 236. Need to be explicate that the HIV prevalence results stated in line 236 are from the HIV tests conducted as part of the study, not from the previous testing referred to in the previous sentence.
  * We modified this to say “Survey-related testing found HIV prevalence among MSM and TGW was 8.5% …”
* Lines 284 - 285. This sentence states that the low proportion of travelling outside Port Moresby is a protective factor for HIV, when the HIV prevalence is highest in this study in Port Moresby. Authors need to explain this point further or re-word this sentence.
  * Great catch. Thanks. We’ve revised as follows: “This may also lend itself to preventing the
spread of HIV from the capital to Lae and Mt. Hagen.”

* Line 300. This sentence states that the study was able to reach MSM and TGW that were not engaged in HIV services, however the study results state that between 25 - 40% of study participants had previously tested for HIV. Consider re-wording/clarifying this sentence.

• We feel the sentence is true as is as more than half of MSM/TGW had never been tested for HIV, so it is correct that we reached people who were not accessing services. Furthermore, of those who had tested, over half last tested more than 6 months ago, longer than is recommended for MSM and TGW.

* Line 304. Consider changing "uptake of HIV services" to "uptake of routine HIV services".

• Added the word “routine.”