Author's response to reviews

Title: Sexual behaviors and their correlates among young people in Mauritius: a cross-sectional study

Authors:

Yumiko H Nishimura (yumiko@pbh.med.kyoto-u.ac.jp)
Masako Ono-Kihara (okmasako@pbh.med.kyoto-u.ac.jp)
Jagdis C Mohith (mihealth@intnet.mu)
Renaud NgManSun (renaud.ngmansun@coi-ioc.org)
Takayuki Homma (thomma@p.kanazawa-u.ac.jp)
Ralph J DiClemente (rdiclem@sph.emory.edu)
Delia L Lang (dlang2@sph.emory.edu)
Masahiro Kihara (poghse@pbh.med.kyoto-u.ac.jp)

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The Editor
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Re: MS: 1760568572138689 - Sexual behaviors and their correlates among young people in Mauritius: a cross-sectional study”

Dear Editor,

We thank you for the valuable comments and suggestions from three significant referees. They provided different insights into our study. We have revised our manuscript accordingly and prepared answer to each comment as below (Referee’s comments are in bold font, quotations from the manuscript are in italic font, and our answers are in normal font).

The manuscript has been formatted to conform to the journal style.

We hope to hear your favorable response,

Yours sincerely,

Yumiko H Nishimura
Corresponding author
Reviewer: Dr Fred Nuwaha.

Comment:
Page 10. It may be better to report Standard deviations instead of standard errors.

Answer:
We used SUDAAN statistical software in order to take account of clustered sampling design. The SUDAAN does not support the standard deviations; therefore, we indicated standard errors instead.

Reviewer: Dr Audrey Pettifor

Comment:
More information on how the multivariate models were built would be useful. For example, was effect modification measured? Were all the variable that went into the final model presented or was their any attempt to remove variables from the model that did not appear to be significant (i.e., did you attempt to attain a more parsimonious model?).

Answer:
The effect modification was not measured. All variables entered in the final model were presented. As the SUDAAN statistical software does not support stepwise variable selection procedures, we entered variables which attained given conditions and did not attempt to remove them from the model.

Comment:
It is curious that the analysis for ever having had sex was stratified by gender yet the analysis for condom use was not. One would hypothesize that the factors associate with condom use may be very different for men versus women? It would be useful to explain more on why this was and was not done. If one model was kept for statistical power reasons, did the authors examine effect modification by gender?

Answer:
We inserted following sentence in results section of the text(p14). “Male and female data were combined for condom nonuse analyses because prior bivariate analyses stratified by gender indicated that the direction and magnitude of all independent variables were similar for men and women.”

Prevalence ratios of condom nonuse for each independent variables from gender-stratified bivariate analyses were as follows; Age group(Male:1.15, Female: 1.69), Geographic area(Male: .89, Female: .69), Currently in school(Male: 1.75, Female:1.03), Work experience(Male: 1.47, Female: 1.13), Perceived difficulty in obtaining a condom (Male:2.49, Female 1.92), Self efficacy of using condom with a new partner (Male: 1.79, Female: 1.69), Confidence to refuse sex without condom (Male: 1.33, Female: 1.44), Used condom at first sexual encounter(Male: 3.37, Female: 5.73), Had more than one
sexual partner (Male: 1.13, Female: 1.11), Effectiveness of condom in HIV prevention (Male: 1.28, Female: 1.64), Effectiveness of having one faithful partner in HIV prevention (Male: 1.03, Female: 3.15), Ever heard of PILS (NGO) (Male: 1.49, Female: 1.27).

Comments:
The prevalence of ever having had sex seems particularly low. It might be useful to present this by age group, one would imagine it would be much higher in the 20-24 year age group? The authors cite DHS data showing that 38% of men and 30% women in SSA reported sex in the past year. This is not the same as ever having had sex it would seem. Given that the median age of first sex in most countries in SSA is around 17-18 (See Wellings K, Lancet 06), it would seem that reported sexual activity is much, much lower than in other countries, not on par. Is there any idea why this is?

Answer:
The prevalence of ever having had sex by age group can be found in Table 3. As suggested by the referee, it is much higher in 20-24 year age group as compared to 15-19 year age group; 42.5% vs 20.7% for men, and 14.5% vs 6.9% for women.

We inserted following sentence in the text after quotation of the DHS data to acknowledge the difference of reported sex in past year and ever having had sex (p15). “As prevalence of ever having had sex in these countries should be higher than that of sex in previous year, we can say that sexual activity of Mauritian youth is comparatively much lower than that of other African countries.”

Religious background of Mauritian people, which is different from SSA, may partly explain their lower sexual activity. Familial bond seems to be stronger among Hindus and Muslims than among Christians in Mauritius. That must have prohibited young people from becoming independent in early age and thus becoming sexually active. We inserted following phrase (underlined) in discussion (p15): This relatively low prevalence of sexually active youth may be due at least in part to the predominance of religions with conservative sex norms and may partly explain how Mauritius has managed to maintain a stable low level of HIV infection in the 1990s, despite the devastating HIV epidemic in neighboring Africa.

Reviewer: Dr Richard A Jenkins

General

The manuscript summarizes findings from a probability survey of HIV risk behavior and associated factors among young adults in Mauritius, which has relatively low HIV prevalence, but some evidence of recent increases in reported cases, although this reflects dated epidemiological data. The study makes use of a multi-stage sampling strategy to sample youth. It’s unclear why this population was chosen as no information is provided on the demographic or risk profile of existing cases. Data reported by UNAIDS suggests that cases in Mauritius are
primarily IDU and this may account for the collateral presence of cases in the correctional system. The “Discussion” would benefit from more concise integration of the findings and more attention to the practical utility of different prevention methods and what is known about the local epidemic.

Answer:
All raised points in general comments were responded one by one in following sections.

Introduction:
The information regarding recent cases is somewhat dated (p.4) and there is no mention of the primary modes of transmission or the age range, gender, etc. of the cases. According to data available to UNAIDS, the epidemic recently has become largely characterized by IDU and cases have appeared in the prison system, related to this. Previous cases had been largely attributed to heterosexual transmission. The relevance of some of the background information needs elaboration. Factors such as migration are meaningful if the migration is occurring with population at risk (e.g., sex workers, people associated with drug trafficking routes). In much of the world, HIV risk is often attributed to migratory population in which there is little difference in HIV risk or prevalence relative to local populations.

Answer:
When we conducted this study in January 2003, main modes of transmission was heterosexual (70%). Reported HIV cases associated with IDU strikingly increased in late 2003 in Mauritius (Proportion of IDU/Heterosexual in the total reported cases being 24.5% in 2002 to 86% in 2003). Phrase was inserted on page 4 after description on modes of transmission (underlined); “Of these cases, almost 70% occurred through heterosexual contact and nearly 15% through either heterosexual contact or injecting drug use (IDU), although IDU-related cases have increased rapidly as of 2003.”

Regarding reported cases from 1987 to 2002, we’ve already indicated primary modes of transmission (p.4, lines 9-10; almost 70% occurred through heterosexual contact and nearly 15% through either heterosexual contact or injecting drug use), the age range (line 11-12; The peak age of reported cases up to 2002 was 25-39 years for men and 20-29 years for women), and gender (line 7; 238 male and 136 female).

Information on subpopulation of the immigrant workers was not available. We deleted description on migration workers since it is too speculative to attribute HIV risk to them.

The relevance of sexual experience data (p.5) is somewhat unclear, especially in the absence of a clear rationale for assessing the study population used in the paper. It’s also unclear what was or was not addressed in prior research that this study was able to address.

Answer:
Study population was identified in discussion with the member of the National AIDS Control Program. We added one paragraph in the text on page 5 to explain some of the background related to selection of study population.
“The government of Mauritius launched the National HIV/AIDS Strategic Plan in 2001 and identified 12 strategic objectives [3]. After a reduction in new STI/HIV infections among groups with high-risk behaviors (sex workers, IDUs, men who have sex with men, and prison inmates), reducing vulnerability among the youth and children was the third strategic objective of the plan. About 17% of reported HIV/AIDS up to 2001 were among those aged 15–24. Although more cases were reported among those aged 25–39 for men and 20–29 for women, actual disease contraction must have occurred when these people were younger because people are typically unaware of their infection for several years. Prevention of HIV/AIDS among young people is thus one of the country’s priorities.”

What was or was not addressed in prior research that this study was able to address was elaborated on page 6. We added following phrases (underlined) in the paragraph: “In addition, the studies assessed the sexual behaviors of people in terms of certain demographic characteristics, and did not adequately assess them in relation to social and cultural factors, ---.” In short, limitations of the prior researches were; 1) lack of generalizability because of limited sampling method, 2) inadequate assessment of social and cultural factors in relation to sexual behavior, and 3) outdated for early 2000s. Strengths of this study were; 1) used probability sampling of young people on the island to ensure generalizability of the results, 2) examined various correlates of sexual behaviors including social life items, and 3) updated information for early 2000s.

Methods:
More detail would be desirable regarding enumeration areas (p6) such as population size, and rural v. urban location. A brief description of piloting procedures would be desirable – was a technique such as cognitive interviewing used? Were there observations of interviews?

Answer:
Regarding enumeration areas, we added following sentence in the text (p7): “Each EA consisted of approximately 300-600 people comprising 75-150 households, and those in the capital city of Port Louis and Plaines Wilhems District were defined as being from urban areas (43% of the total population).” To complement, this is a common definition of the urban area in any national survey carried out in Mauritius. The capital city of Port Louis and Plaines Wilhems District are highly populated and industrialized areas of the Mauritius island.

Cognitive interviewing technique and observation of interviews were not used in pilot-testing of the instrument. Description on pilot-testing procedure was added as follows (p8, underlined); “Fieldworkers reported the items for which participants had difficulty in understanding the phrase or terms of the question after the pretest interview. The questionnaire was modified based on the fieldworkers’ comments and finalized in January 2003”

Was the project reviewed by Emory University’s IRB?
Answer:
No, it was not reviewed by Emory University's IRB. The project was planned in 2002 and actual survey was carried out in January 2003. As mentioned in the text, the project
protocol was approved by the Kyoto University Graduate School and Faculty of Medicine Ethics committee and Mauritius Ministry of Health, prior to the data collection in the field. When the study was planned and undertaken, I was not at Emory University. I went to Emory after all data had been collected.

Results:
In table 1, a racial/ethnic breakdown would be desirable. The educational levels should be translated into a 12 year educational system or one with primary and secondary levels of instructions.

Answer:
Asking race/ethnicity was taboo and not allowed in this type of survey in Mauritius. Religion, therefore, was asked in order to represent racial/ethnic background of the participant. Usually, Hindus represent those originated from India, Muslims, those from India and Middle-East, and Christians, those from Africa, Europe, and China. The educational levels were changed from “Form III” to “3 years in secondary” in table1.

Discussion:
This section would be more useful if it focused on implications of the most significant findings (largest Ors, significant in multivariate analysis). Findings that are significant in univariate, but not multivariate analysis may be worth further exploration, but some consideration also should be given to what they represent in relation to each other and to variables that were significant in multivariate analysis. There are a number of variables that were significant at the univariate analysis may reflect a personality disposition along the lines of sensation seeking (e.g., ever been to a nightclub, ever watched pornography, substance use), but only some of them were significant in the multivariate analysis (nightclub visitation, marijuana use). The religious difference may represent cultural differences for which religion is a status marker, as opposed to something unique about a particular denomination or the value of using churches as venues for HIV prevention.

Answer:
Following the suggestion of the referee, we reformulated our discussion into three groups; out-of school and in-school approaches, nightclub and popular site approaches, and religion and social status approaches. In the text, we described as follows (p16); “We grouped them into three possible approaches: (1) out-of school and in-school approaches, (2) nightclub and popular site approaches, and (3) religion and social status approaches.” We also added subtitles to each part of the text. Variables which were statistically significant in multivariate analyses were the pillar of each section. The variables that were significant in bivariate analyses but not in multivariate were discussed under each representing variable.

Similarly, the approach interpreting finding seems reflexive and need to address practical considerations. It tends to be difficult to mount prevention activities in nightclubs, beyond low impact approaches like dissemination of brochures. Studies targeting gay clubs have had more success, but these are venues where sex sometimes takes place (given the stigma attached to same-gender couples
elsewhere) and venue owners often have an interest in serving the particular needs of the gay community. In contrast, people have had less success gaining entry into heterosexual venues. Targeting the kinds of youth you go to nightclubs and considering the motives for this activity might be more useful. There are many examples of media campaigns specifically targeting people who seek out risk and provided repeated exposure to prevention messages through radio melodramas, role model stories, etc.

Answer:
We agree that media campaign is one of the most important strategies for young people we are targeting. We, therefore, made recommendation for media campaign as the first priority strategy. In the text, it reads as follows (p18): “Nightclub visitation was correlated with other variables assessing popular sensation-seeking behavior, such as possession of a mobile phone, watching pornographic films, alcohol intake, and marijuana use, in bivariate analysis. Although only nightclub visitation was significantly associated with sexual behavior in both men and women in multivariate analyses, the effects of these other items should be considered in the HIV prevention program. Media campaigns using various channels are potentially one of the most effective approaches to convey HIV prevention messages to these young people who seek out and are exposed to risks. As suggested in previous studies, role model stories printed in youth-attracting flyers may be a useful means to convey HIV prevention messages, even to hard-to-reach youths, because they can readily be distributed at popular sites where young people congregate [28, 29].”

We recommended intervention at the nightclub as the next choice and challenges for it were also indicated (p18-9; added or changed parts were underlined); “In addition, HIV prevention interventions, including education on the risks of drinking and drug use, could be explored in nightclubs because we identified nightclubs as an important place where sexually experienced young men and women congregate.” And “Although gaining the cooperation of venue owners may be challenging, such events could be considered in nightclubs in Mauritius to effectively reach young people with high risk factors for contracting HIV.”

A paragraph discussing the effects of pornographic films was moved into the section of nightclub and popular sites approaches (p19). The last sentence was added in this paragraph (p19): “Video rental stores, of which there are many on the island, are potential intervention sites to address the watchers of pornographic films.”

The involvement of churches in HIV care has had little if any translation into prevention and there often has been an aspect of “love the sinner, hate the sin” attached to this. The Roma Catholic Church has supported hospice activities in many countries but this has not altered attitudes toward promoting HIV prevention. Protestant organizations often have taken a more evangelically approach that is similarly unable to engage the rage of activities needed for HIV prevention. As mentioned previously, consideration of how social religion acts as a status marker and for whom would be more useful, along with consideration of
how social practices (e.g., control over virginity) is managed differently among different religious communities.

Answer:
Following the suggestions of the referee, we looked at our data carefully. We realized that religion may be related to the exposure to popular sensation-seeking items through the difference of geographic area people live. In the text we added following sentences (p19): “This may be partly related to their higher exposure to nightclubs, alcohol, and marijuana use because a relatively higher proportion of Christians live in urban areas compared to Muslims or Hindus. In this context, the popular site approaches (above) should be implemented, focusing on Christian youth.”

We agree with the referee on the difficulty of involving religious people in HIV prevention. However, given the disproportionate differences in sexual experience rates, we also believe that we should keep efforts to cooperate with religious people and not to give up potential opportunity to influence people at large from their value system. Therefore, the recommendation on use of religious gathering in HIV prevention is still kept in the text.

Data here need to be considered in light of HIV in Mauritius and the population where cases have appeared. Intensive infectious disease control efforts with affected persons and their sexual or drug using networks, coupled with prevention counseling may be better first line approach than mass campaigns, especially if youth are not the main population affected. Under those circumstances, HIV prevention makes more sense in the context of a broader health agenda.

Answer:
We agree with the referee’s suggestion that in the HIV low prevalence setting, prevention efforts need to be concentrated on the sexual or drug using networks. In fact, in Mauritius, strategic priorities of the National AIDS Control Program are given to the people with higher risks as we mentioned in the introduction. This, however, does not diminish relative importance of young people in HIV prevention program. Rather, as young people are the potential seed to become any type of group with higher risk, e.g. sex workers or injecting drug users, far-front HIV prevention program for youth and monitoring of their risk behavior need to be reinforced. In this context, we believe that our study can be recognized as an important locus of the HIV program in Mauritius.

Other major changes from the first manuscript to this one:

- In discussion, the paragraph on needs of the special attention for women was incorporated into the second last paragraph of the discussion.
- Tables were moved to the last section of the manuscript after the references.