

PEER REVIEW HISTORY

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ARTICLE DETAILS

TITLE (PROVISIONAL)	Factors associated with induced abortion among female entertainment workers: A cross-sectional study in Cambodia
AUTHORS	Yi, Siyan; Tuot, Sovannary; Chhoun, Pheak; Pal, Dyla; Tith, Khimuy; Brody, Carinne

VERSION 1 - REVIEW

REVIEWER	Guy Morineau FHI Côte d'Ivoire
REVIEW RETURNED	02-Apr-2015

GENERAL COMMENTS	<p>This article describes the prevalence of induced abortion among entertainment workers (which are low risk female sex workers) benefiting from the SAHACOM project in Cambodia. The high prevalence of induced abortion associated with sex work was previously described and the present paper does not really bring anything new. Were any birth control program integrated in HIV prevention in Cambodia? The uptake of family planning services is not described in the paper, which does not show any progress since the previous publication of the high prevalence of induced abortion among sex workers.</p> <p>This papers requires suffers from major flaws related to analysis and requires some rewriting due to poor English and some misinterpretation of results. I strongly recommend that this paper be reviewed by a senior English native speaker editor.</p> <p>INTRODUCTION: First sentence: A common pathway is the route in a molecular cascade, which obviously does not apply here. Second sentence: Economic migration can be an empowering experience??? In most instance it is just a survival strategy. Those who benefit from it are very seldom. This kind of broad statement ignore what migration is all about. Second sentence: Migrant women are navigating new sexual norm! Is this a judgmental statement? This entire sentence is insulting. It suggest that women coming from their village where they are monogamous arrive in town to become polygamous out of fun. Please review what you want to say. I doubt that the reference that you are naming ever said that. The list of entertainment worker is hard to understand. What is the difference between a woman working in a beer garden and a beer promoter? We will read later in the paper that karaoke workers are at high risk and therefore this section should specify that karaoke are brothels in disguise. In addition this list of definition of entertainment worker is long whereas your study refers to only four types of entertainment workers.</p>
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	<p>Then the authors deliver a blanket statement with a reference to say that sex workers experience poor reproductive health outcomes. This statement ignores the fact that FSW in Nevada (USA) have lower rate of STIs and unwanted pregnancies than the general population in the USA, demonstrating that the risk associated with multiple partnership can be overcome by policies and uptake of services. It is not because they are sex workers that they are at risk but because the policies in place do not protect them adequately. Please do not call commercial sex or commercial sexual intercourse a commercial relationship. It is not necessarily a relationship and in most instances it is just commercial sex.</p> <p>You cannot state that STIs and induced abortions are caused by poor condom use with non-commercial partners. This ignores condom failure and misreporting of condom use with clients in a country where sex-workers have been branded as the cause for the HIV epidemic for over a decade and where is clients of FSW brag about their tricks to avoid using condom. STIs among sex workers is mostly driven by inconsistent use in commercial sex, even though FSWs report using condoms. In addition if you know for a fact that abortions are caused by sex with non-commercial partners, why did you do a study?</p> <p>Then the authors state that the findings on studies among FSWs worldwide are contradictory. However, they name studies describing factors associated with new cases of abortions (incidence) and lifetime exposure to abortion, which is obviously associated with age and duration of exposure to risk (selling sex). It is not contradictory but the authors are comparing apple and oranges. When, reporting the finding of these studies please report the time period during which abortion is measured. Generally, and all along the paper there is an excessive number of references and misuse of references. I strongly recommend that the authors cut their number of reference to 15 so they can think through and use them adequately. For example the ref 12 and 14, describing factors associated with abortion in the general population in Russia are completely out of context in a paper describing sex workers. The same apply to reference 16 and 17. Other references in the paper refer to adolescent whereas the study enrolls women aged 18+.</p> <p>I am not sure of what means "a common sexual reproductive health risk behavior". Please revise the terminology.</p> <p>Please avoid the term "illicit drug" from your paper. It is not because a drug is legal or not that it is risky for sexual and reproductive health. Cannabis is legal in some state in the USA so if you call it illicit is wrong to many readers. It is better to call this mixed bag of drugs: recreational drugs.</p> <p>Generally a better context description is needed in the background. How big is the entertainment workers population in Cambodia? Explain that this term is a politically correct term that came into life after the banning of commercial sex and that it covers wide range of behaviors.</p> <p>Programs available for these women are not described. What is being done for them; What is their access to family planning. Is there a one stop shopping policy?</p> <p>METHODS:</p> <p>The data collection methodology is not described. "self reported interviews" does not mean anything. Is it self-completed or face to face or ACASI?? Where were the data collected? Did you have room or was it in open space?</p> <p>The sample size should be reported in the results section not in the methods section.</p> <p>The text says "the sample size was proportionally allocated to the</p>
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	<p>number of sex workers in each city and province". Is it proportional to the pop size by the city or by province? Then earlier on you said it was proportional to the number of beneficiaries of the program. Please choose one and stick to it.</p> <p>The sampling methodology is unclear. Respondents were selected from a list of entertainment establishments. Did you have a nominative list individuals? If you did a two stage cluster sampling please describe the procedures for each stage.</p> <p>Exclusion of women non-sexually active goes in the results section. The training section should be shortened substantially.</p> <p>The section on questionnaire development does not bring any insight to the paper and should be entirely deleted.</p> <p>The term "induced abortion experience" should be replaced by "history of induced abortion". Do not detail the answers to this question as you will explain later that you have excluded those who never had sex.</p> <p>Age at first instant of sexual intercourse? Is it age at first sex?</p> <p>You mention a Likert scale for the measure of condom use though this does not appear in your paper. If you only use the categories "always" versus "not always", delete this scale description from the paper as it is confusing.</p> <p>You mention inhalants as "illicit" drugs. What does this refer to??? Many inhalants are just medicines.</p> <p>Data that are not reported in the paper should not be mentioned (i.e., use of drug at workplace or forced alcohol drink).</p> <p>Epidata is used for entering the data not to code them.</p> <p>Describe in which case you used the Fisher test instead of the Chi square test.</p> <p>You say that you did a model to control for confounders. Confounder of which association? A confounder must be associated with both the outcome and the explanatory variable. In this case you do not have any explanatory variable under scrutiny. If you want to do so, you must state hypothesis and test them with a model specific to each hypothesis. Otherwise if you are just looking for factors associated with induced abortion you can elaborate on your model but you need to clarify your objective. In you search for determinants you must refine your model. All variables that are not statistically significant must be dropped until you obtain the best fit. Note also that your model includes some variables that are collinear such as duration in sex work and duration in current establishment; you must make a choice but you can't adjust twice on collinear variables. Moreover there is no reason to lose some information. Continuous variable should not be dichotomized, please keep them as continuous in the model.</p> <p>Also you probably should run separate models for those who sell sex and those who do not. Alternatively you can force the variable selling sex your model.</p> <p>Finally you have done a complex sampling scheme. Analyze your data using complex sampling scheme functions and weight your data for sampling probabilities as your sampling design is not self-weighted.</p> <p>Ethics</p> <p>Please find a better term that "participant were made clear" that their participation was voluntary. It sound quite harsh and is not adapted to an ethics section. Saying: "participation was voluntary" would just work fine.</p> <p>There is no description of compensation to participants. Does it mean that you did not compensate participants for their time or transport? I suggest that you clarify this.</p> <p>Describe how you provided explanation about the study to the</p>
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	<p>participants.</p> <p>Please describe the identifiers that were collected from participants and secondarily removed.</p> <p>I am surprised that there was no incentive for participants. No education, no information, no condom, nothing!!!!</p> <p>RESULTS:</p> <p>Present sample size, refusals, and excluded to analysis.</p> <p>There are too many tables, with some of them that bring very little information.</p> <p>All descriptive tables should include 4 results columns: history of induced abortion (n/); no history of induced abortion (n/); p-value; total (n/). Then table 3 and 4 will not be needed and table 1 and 2 can be combined.</p> <p>You report the unmarried in the text whereas the married is the largest group. Why? The most appropriate reporting would be to say that you had almost 3 equal groups of marital status.</p> <p>In addition to the number of year of education, I had wished I could see comparison of two groups: no formal education or not completed primary school versus completed primary school.</p> <p>The income is often misreported by participants. The width of the confidence interval proves it. Please use the median to report the income and use a ranksum test to compare two medians.</p> <p>You mention: "Only 29% lived with their family". Is it a judgmental statement? Do you expect adult working women to live with their parents? You mentioned in background that most were migrants. That is somehow contradictory. Do you mean they should be living with their parents?</p> <p>The % of women selling sex should be reported in this first table as it is a critical determinant to understand the population we are talking about.</p> <p>Please include the number of living children of the respondents as it is a known determinant for unwanted pregnancies.</p> <p>In the variable "Places where you have worked in the past 12 months", how did you address those who had worked in different typology of establishments?</p> <p>Please avoid the term "career" for this group of women. Nobody makes a career in this job. The terminology "working duration in this job" would work better.</p> <p>You state that "the mean number of induced abortion during entertainment work was 2.1 with a range 1 to 20." However 79% had no abortion while on the job, therefore the range should be from 0 to 20. In addition it means that the majority who had abortion had more than 5 abortion. Please report that or rephrase your sentence.</p> <p>Note that the terminology "significantly associated" is not adapted. We talk about statistical significance and not significance per se. A death case is a significant event even though it may be not statistically significant. In this case just mention the variable associated as opposed to significantly associated.</p> <p>Reduce the number of variables presented on alcohol drink. None are associated with your outcome and you are not bringing any information. You could simply omit them from the table and report in the text that none of the variable on alcohol intake were associated with induced abortion. If you wish to keep them, drop at least two variables out of four from the table.</p> <p>Table 5 does not bring any information. And the few findings to be reported can be said in the text. In the results section you mention that contraceptive use is associated with abortion. However if you analyze the use of contraceptives other than condoms you will find that contraceptive use is protective. Therefore it is condom failure, misuse of condoms and misreporting of condom use that leads to</p>
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	<p>abortion. Your paper does not report neither does it discuss this critical issue. I may miss something as you report 66 people who had an history of induced abortion and who use contraceptives but the numbers of the detailed methods do not match, please correct. The model is false and I will not discuss it further. Please refer to my previous comments.</p> <p>In your next model please include the n for the model so the reader can assess how the findings apply to your study population. You should run a separate model for those who sell sex and those who do not.</p> <p>DISCUSSION</p> <p>First remind that your population is not the FEW of these cities but the program beneficiaries in these cities. It also should be stated as a limitation of the study.</p> <p>In the discussion you report about unwanted pregnancies but you have not presented any variable about unwanted pregnancies in your result section. Note that a desired pregnancy can lead to an abortion for multiple reasons.</p> <p>You say that self-induced abortion is becoming increasingly popular, please provide your baseline to make this statement. What was the level before?</p> <p>You said that induced abortion was not associated with the number of commercial partner. Did you run the test among those who had commercial partner? It is wrong to make this statement from an analysis including both those who sell sex and those who do not.</p> <p>You state that the cost of abortion may justify the fact that karaoke workers have more abortion. This contradicts the fact that a substantial proportion of abortion are self-induced.</p> <p>It is difficult to comment on a discussion that is based on a flawed model.</p> <p>Please do not call these women "girls". Your study population is made of adults, therefore they are women.</p> <p>In the discussion you state that the sample derived from one city and one province. It suggests that you have sampled across the province at one site and exclusively in the city at the other site. Please describe these procedures in the methods section.</p> <p>You state that the objectives of the study is to make inference on the risk of contracting HIV and STI but you did not test for these diseases. In the same sentence what are the socio-cultural problem you are referring to?</p> <p>The reviewer also provided a marked copy with detailed comments. Please contact the publisher for full information about it.</p>
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REVIEWER	Marie-Claude Couture University of San Francisco, CA, USA
REVIEW RETURNED	05-Apr-2015

GENERAL COMMENTS	<p>This is an interesting study about the risk factors associated with induced abortion among sexually active female entertainment workers in Cambodia. Few studies have examined the prevalence and the factors associated with induced abortion among female sex workers. In general, the methodology was well explained and described. But there were some issues in the way some variables were measured. The results were interesting, but the number of</p>
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	<p>variables presented should be reduced. Also, the multivariate analyses need more description and there are some issues in the way they were conducted. Finally, the discussion described well the findings of the study in general. However, one finding was not discussed.</p> <p>INTRODUCTION</p> <p>- The authors report on the effects of alcohol and drug use on sexual behaviors and intimate partners violence. However, they cited studies conducted in very different populations (e.g college students), which is not appropriate for this study. The authors should refer to studies conducted in similar population, such as female sex workers. There are many studies on the effects of alcohol and drug use on sexual behaviors (e.g. unprotected sex) and intimate partner violence that have been conducted among female sex workers.</p> <p>METHODS</p> <p>Study sites, population and sampling</p> <p>-The authors should include the participation rate if available.</p> <p>-The study sites are not really specified.</p> <p>Variables and measurement</p> <p>-One of the main problem is the outcome variable: "During your work as an entertainment worker, have you experienced any induced abortion?". That does not give us any timeframe on this behavior (induced abortion). We don't know if this abortion happened recently or not. Also, another interesting option could be to look at the risk factors among women more at-risk: those who reported more than one abortion.</p> <p>-The authors should have used a validated measure of alcohol use and focus especially on alcohol abuse. Alcohol abuse (and not necessarily use) has been associated with sexual risks. The use of a validated scale, such as AUDIT-C, would have been preferable.</p> <p>-Some variables are not well described in this section. For example, "Self-regarded as heavy alcohol drinkers". How exactly this variable was measured? Again, this seems a very subjective measurement. The use of a validated scale of alcohol use would have been better.</p> <p>Data analyses</p> <p>- The authors should have explained the rational behind examining the numerous variables. There are too many variables examined at the same time. It would have been better to conduct the analyses based on a conceptual model. The authors should have been more parsimonious and only include potential explanatory and confounder variables.</p> <p>-Using variables only significant at $p < 0.05$ in the bivariate analyses is a very conservative approach. Thus, the authors could have missed the effects of other important factors, for example education (with p-value of 0.06). Also, the authors don't explain how the variables were retained in the model. Finally, including all the variables in the model simultaneously might not be the best option and other methods would have been more appropriate.</p> <p>RESULTS</p> <p>-The authors should also report in the tables descriptive statistics for the sexual behaviors and drug/alcohol use. That will give us a better idea of the prevalence of these variables in this population.</p> <p>-Overall, there are many tables and variables presented. The authors should try to focus on the potential explanatory variables</p>
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	<p>that are important for this particular outcome. Also, some variables have too many categories and could be re-categorized. The authors could present the dichotomized variables instead.</p> <p>-The authors should try to be consistent in their terminology. Sometimes the word “regular partner” is used and sometimes the word “non-commercial partner”.</p> <p>-The text says that abortion was associated with “to be currently using a contraceptive method”. But if we look at the Table 6, it is the opposite result: “No” to “currently using contraceptive method” is associated with abortion (AOR= 3.15 95%CI 1.17-4.62). Also, not all contraceptive methods are effective, and some are better than other at reducing the risk of unwanted pregnancy. It would have been better to analyze them separately in term of efficacy.</p> <p>-The variable “Having clients who requested not to use condom” was statistically significant (p=0.03), but not included in the multivariate analysis. The authors don’t explain why.</p> <p>-Finally, the authors should only keep in the multivariate analysis model the variables that are statistically significant, and the other important confounders and explanatory variables. A good idea should have been to use a test to evaluate the goodness of fit of their final model.</p> <p>DISCUSSION</p> <p>-The main reason why alcohol use was not associated with abortion is probably due to the validity of the measure used. So, there is a possibility of misclassification of the exposure. The authors should have used a validated measure of alcohol, such as AUDIT-C or others. Also, the prevalence of drug use was very low in this population and might explain the lack of association.</p> <p>-The authors don’t discuss the statistically significant association between “number of sex partners in the past 12 months” and abortion. This is also an important finding.</p> <p>-This is not surprising that abortion was not associated with the number of commercial sex partners and condom use with commercial partners. Most of the unprotected sex is with regular/non-commercial partners. The prevalence of condom use with commercial partners was high. The article cited in #7 from Maher et al. 2013 discussed the condom use behaviors with the different sex partners among Cambodian sex workers.</p>
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VERSION 1 – AUTHOR RESPONSE

Reviewer: Guy Morineau

Introduction

First sentence: A common pathway is the route in a molecular cascade, which obviously does not apply here.

RESPONSE: As suggested, the first paragraph has been re-written. Please see lines 2-12, page 3.

Second sentence: Economic migration can be an empowering experience??? In most instances it is just a survival strategy. Those who benefit from it are very seldom. This kind of broad statement ignores what migration is all about.

RESPONSE: This paragraph has been re-written. Please see lines 2-12, page 3.

Second sentence: Migrant women are navigating new sexual norm! Is this a judgmental statement? This entire sentence is insulting. It suggests that women coming from their village where they are monogamous arrive in town to become polygamous out of fun. Please review what you want to say. I doubt that the reference that you are naming ever said that.

RESPONSE: This paragraph has been re-written. Please see lines 2-12, page 3.

The list of entertainment worker is hard to understand. What is the difference between a woman working in a beer garden and a beer promoter? We will read later in the paper that karaoke workers are at high risk and therefore this section should specify that karaoke are brothels in disguise. In addition this list of definition of entertainment worker is long whereas your study refers to only four types of entertainment workers.

RESPONSE: We have narrowed the list to be more descriptive and parallel to the analysis categories. 'Female entertainment workers' (FEWs) refers to women working in such venues as karaoke bars, massage parlors, restaurants (as hostesses or singers), or at beer gardens. Please see lines 10-12, page 3.

Then the authors deliver a blanket statement with a reference to say that sex workers experience poor reproductive health outcomes. This statement ignores the fact that FSW in Nevada (USA) have lower rate of STIs and unwanted pregnancies than the general population in the USA, demonstrating that the risk associated with multiple partnership can be overcome by policies and uptake of services. It is not because they are sex workers that they are at risk but because the policies in place do not protect them adequately.

RESPONSE: We stated that FEWs in Cambodia are at high risk for poor health outcomes due to limited access to services. Please see lines 17-19, page 3.

Please do not call commercial sex or commercial sexual intercourse a commercial relationship. It is not necessarily a relationship and in most instances it is just commercial sex.

RESPONSE: As advised, we have changed the wording throughout the text.

You cannot state that STIs and induced abortions are caused by poor condom use with noncommercial partners. This ignores condom failure and misreporting of condom use with clients in a country where sex-workers have been branded as the cause for the HIV epidemic for over a decade and where clients of FSW brag about their tricks to avoid using condom. STIs among sex workers is mostly driven by inconsistent use in commercial sex, even though FSWs report using condoms. In addition if you know for a fact that abortions are caused by sex with non-commercial partners, why did you do a study?

RESPONSE: This is an important point and we have revised this part as suggested. Please see lines 22-26, page 3.

Then the authors state that the findings on studies among FSWs worldwide are contradictory. However, they name studies describing factors associated with new cases of abortions (incidence) and lifetime exposure to abortion, which is obviously associated with age and duration of exposure to risk (selling sex). It is not contradictory but the authors are comparing apples and oranges. When reporting the finding of these studies please report the time period during which abortion is measured.

RESPONSE: We have revised the sentence as suggested. Please see line 8-9, page 4. All three studies we cited refer to factors associated with lifetime exposure to abortion. This has been made clearer in the text.

Generally, and all along the paper there is an excessive number of references and misuse of references. I strongly recommend that the authors cut their number of reference to 15 so they can think through and use them adequately. For example the ref 12 and 14, describing factors associated with abortion in the general population in Russia are completely out of context in a paper describing sex workers. The same apply to reference 16 and 17. Other references in the paper refer to adolescent whereas the study enrolls women aged 18+. RESPONSE: Thank you so much for this important comment. Not all entertainment workers are sex workers and therefore their experience may be more closely related to the general population than of sex workers specifically. We made this

clearer in the paper. To also address comments from other reviewers, references 16 and 17 has been removed.

I am not sure of what means “a common sexual reproductive health risk behavior”. Please revise the terminology.

RESPONSE: This sentence has been revised. Please see lines 2-4, page 5.

Please avoid the term “illicit drug” from your paper. It is not because a drug is legal or not that it is risky for sexual and reproductive health. Cannabis is legal in some state in the USA so if you call it illicit is wrong to many readers. It is better to call this mixed bag of drugs: recreational drugs.

RESPONSE: We have removed the sections on drug use per other reviewers comment.

Generally a better context description is needed in the background. How big is the entertainment workers population in Cambodia? Explain that this term is a politically correct term that came into life after the banning of commercial sex and that it covers wide range of behaviors.

RESPONSE: We have added this important information on lines 13-17, page 3.

Programs available for these women are not described. What is being done for them; What is their access to family planning. Is there a one stop shopping policy?

RESPONSE: We have added this information to the text. Please see lines 1-8, page 4.

Methods

The data collection methodology is not described. “self-reported interviews” does not mean anything. Is it self-completed or face to face or ACASI?? Where were the data collected? Did you have room or was it in open space?

RESPONSE: We have changed the wording to describe the interviews in more detail. Data were collected through face-to-face interviews in a private space at their workplace. For further details on the data collection methodology, please see lines 13-20, page 5.

The sample size should be reported in the results section not in the methods section. RESPONSE: This has been addressed and is now in the results section. Please see lines 14-16, page 8.

The text says “the sample size was proportionally allocated to the number of sex workers in each city and province”. Is it proportional to the pop size by the city or by province? Then earlier on you said it was proportional to the number of beneficiaries of the program. Please choose one and stick to it. The sampling methodology is unclear. Respondents were selected from a list of entertainment establishments. Did you have a nominative list individual? If you did a two stage cluster sampling please describe the procedures for each stage.

RESPONSE: We have made this clearer. Please see lines 13-20, page 5.

Exclusion of women non-sexually active goes in the results section.

RESPONSE: This was revised as suggested. Please see lines 14-16, page 8.

The training section should be shortened substantially. The section on questionnaire development does not bring any insight to the paper and should be entirely deleted.

RESPONSE: We have shortened this section. Please see lines 26-29, page 5 and lines 1-4, page 6.

The term “induced abortion experience” should be replaced by “history of induced abortion”. Do not detail the answers to this question as you will explain later that you have excluded those who never had sex.

RESPONSE: We agreed and revised as suggested. We also used this term consistently throughout the text and tables.

Age at first instant of sexual intercourse? Is it age at first sex?

RESPONSE: This has been changed to 'age at the first sexual intercourse.' Please see lines 25-26, page 6.

You mention a Likert scale for the measure of condom use though this does not appear in your paper. If you only use the categories "always" versus "not always", delete this scale description from the paper as it is confusing.

RESPONSE: To avoid confusion, we have deleted the description of the Likert scale from the paper as suggested.

You mention inhalants as "illicit" drugs. What does this refer to??? Many inhalants are just medicines. Data that are not reported in the paper should not be mentioned (i.e., use of drug at workplace or forced alcohol drink).

RESPONSE: Per comments from other reviewers, all texts related to substance use have been removed from the text and tables to avoid confusion.

Epidata is used for entering the data not to code them.

RESPONSE: This has been corrected. Please see line 7, page 7.

Describe in which case you used the Fisher test instead of the Chi square test.

RESPONSE: We clarified that this test was used when sample size was less than 5 in one cell. Please see lines 12-13, page 7.

You say that you did a model to control for confounders. Confounder of which association? A confounder must be associated with both the outcome and the explanatory variable. In this case you do not have any explanatory variable under scrutiny. If you want to do so, you must state hypothesis and test them with a model specific to each hypothesis. Otherwise if you are just looking for factors associated with induced abortion you can elaborate on your model but you need to clarify your objective. In your search for determinants you must refine your model. All variables that are not statistically significant must be dropped until you obtain the best fit. Note also that your model includes some variables that are collinear such as duration in sex work and duration in current establishment; you must make a choice but you can't adjust twice on collinear variables. Moreover there is no reason to lose some information. Continuous variable should not be dichotomized, please keep them as continuous in the model. Finally you have done a complex sampling scheme. Analyze your data using complex sampling scheme functions and weight your data for sampling probabilities as your sampling design is not selfweighted.

RESPONSE: Thank you for these important detailed comments. We have re-done the analysis and re-written our analysis section to reflect our process more accurately. Please see line 18-26, page 7. All the results in the abstract, main text and tables have also been revised. Please see the related sections.

Also you probably should run separate models for those who sell sex and those who do not. Alternatively you can force the variable selling sex your model.

RESPONSE: We did not feel that we had the sample size to run separate models.

Ethics

Please find a better term that "participants were made clear" that their participation was voluntary. It sounds quite harsh and is not adapted to an ethics section. Saying: "participation was voluntary" would just work fine. There is no description of compensation to participants. Does it mean that you did not compensate participants for their time or transport? I suggest that you clarify this. Describe how you provided explanation about the study to the participants. Please describe the identifiers that were

collected from participants and secondarily removed. I am surprised that there was no incentive for participants. No education, no information, no condom, nothing!!!!

RESPONSE: The first sentence of the "Ethical considerations" has been revised as suggested: "The participants were informed that their participation in this study was voluntary both before and during the consenting process." Please see lines 1-2, page 8. Participants received USD2.5 for their time compensation. Transportation support was not provided as the interviews were conducted at their work place. An identification number was used instead for each individual and no personal identifiers such as name or address were collected. This information has been added to the ethics section. Please see lines 5-8, page 8. The participants in this study were beneficiaries of the Sustainable Action against HIV and AIDS in Communities project, and data used for this analysis were collected as part of the project evaluation. Thus the participants did not receive any particular benefits from this study.

Results

Present sample size, refusals, and excluded to analysis. There are too many tables, with some of them that bring very little information. All descriptive tables should include 4 results columns: history of induced abortion (n/); no history of induced abortion (n/); p-value; total (n/). Then table 3 and 4 will not be needed and table 1 and 2 can be combined. You report the unmarried in the text whereas the married is the largest group. Why? The most appropriate reporting would be to say that you had almost 3 equal groups of marital status. In addition to the number of year of education, I had wished I could see comparison of two groups: no formal education or not completed primary school versus completed primary school. The income is often misreported by participants. The width of the confidence interval proves it. Please use the median to report the income and use a rank sum test to compare two medians. You mention: "Only 29% lived with their family". Is it a judgmental statement? Do you expect adult working women to live with their parents? You mentioned in background that most were migrants. That is somehow contradictory. Do you mean they should be living with their parents? The % of women selling sex should be reported in this first table as it is a critical determinant to understand the population we are talking about. Please include the number of living children of the respondents as it is a known determinant for unwanted pregnancies. In the variable "Places where you have worked in the past 12 months", how did you address those who had worked in different typology of establishments? Please avoid the term "career" for this group of women. Nobody makes a career in this job. The terminology "working duration in this job" would work better. You state that "the mean number of induced abortion during entertainment work was 2.1 with a range 1 to 20." However 79% had no abortion while on the job, therefore the range should be from 0 to 20. In addition it means that the majority who had abortion had more than 5 abortions. Please report that or rephrase your sentence. Note that the terminology "significantly associated" is not adapted. We talk about statistical significance and not significance per se. A death case is a significant event even though it may be not statistically significant. In this case just mention the variable associated as opposed to significantly associated. Reduce the number of variables presented on alcohol drink. None are associated with your outcome and you are not bringing any information. You could simply omit them from the table and report in the text that none of the variable on alcohol intake were associated with induced abortion. If you wish to keep them, drop at least two variables out of four from the table. Table 5 does not bring any information. And the few findings to be reported can be said in the text. In the results section you mention that contraceptive use is associated with abortion. However if you analyze the use of contraceptives other than condoms you will find that contraceptive use is protective. Therefore it is condom failure, misuse of condoms and misreporting of condom use that leads to abortion. Your paper does not report neither does it discuss this critical issue. I may miss something as you report 66 people who had a history of induced abortion and who use contraceptives but the numbers of the detailed methods do not match, please correct. The model is false and I will not discuss it further. Please refer to my previous comments. In your next model please include the n for the model so the reader can assess how the findings apply to your study population. You should run a separate model for those who sell sex and those who do not.

RESPONSE: To also address previous comments and comments from other reviewers, we have addressed all of these comments and presented three new tables and a revised result section. Please see the "Results" section and tables. Results in the abstract have also been revised accordingly.

Discussion

First remind that your population is not the FEW of these cities but the program beneficiaries in these cities. It also should be stated as a limitation of the study.

RESPONSE: We had already stated this limitation but made it more explicit. Please see lines 11-17, page 12.

In the discussion you report about unwanted pregnancies but you have not presented any variable about unwanted pregnancies in your result section. Note that a desired pregnancy can lead to an abortion for multiple reasons.

RESPONSE: We have changed our wording.

You say that self-induced abortion is becoming increasingly popular, please provide your baseline to make this statement. What was the level before?

RESPONSE: We omitted this statement for lack of baseline from same population.

You said that induced abortion was not associated with the number of commercial partner. Did you run the test among those who had commercial partner? It is wrong to make this statement from an analysis including both those who sell sex and those who do not.

RESPONSE: We have included clarifying statements. Please see lines 8-10, page 10.

You state that the cost of abortion may justify the fact that karaoke workers have more abortion. This contradicts the fact that a substantial proportion of abortion is self-induced.

RESPONSE: Self-abortion means home medication abortion and cost money. We have clarified this on lines 24-27, page 11.

Please do not call these women "girls". Your study population is made of adults, therefore they are women.

RESPONSE: We have corrected the term as suggested.

In the discussion you state that the sample derived from one city and one province. It suggests that you have sampled across the province at one site and exclusively in the city at the other site. Please describe these procedures in the methods section. You state that the objectives of the study are to make inference on the risk of contracting HIV and STI but you did not test for these diseases. In the same sentence what are the socio-cultural problem you are referring to?

RESPONSE: We have amended the discussion as suggested.

Reviewer: Marie-Claude Couture

The authors report on the effects of alcohol and drug use on sexual behaviors and intimate partner violence. However, they cited studies conducted in very different populations (e.g. college students), which is not appropriate for this study. The authors should refer to studies conducted in similar population, such as female sex workers. There are many studies on the effects of alcohol and drug use on sexual behaviors (e.g. unprotected sex) and intimate partner violence that have been conducted among female sex workers.

RESPONSE: Thank you very much for your constructive comments. We agreed and have taken out the drug and alcohol variables from our analyses in order to better focus the paper. All related contents in the texts and tables have also been corrected accordingly.

The authors should include the participation rate if available.

RESPONSE: The participation rate could not be calculated. Under the arrangement of the outreach workers, very few women approached refused the participation or were absent on day of the interview and were replaced immediately on sites. No record was available.

The study sites are not really specified.

RESPONSE: More details on study sites and sampling procedures have been added to the text. Please see lines 13-20, page 5.

One of the main problems is the outcome variable: "During your work as an entertainment worker, have you experienced any induced abortion?" That does not give us any timeframe on this behavior (induced abortion). We don't know if this abortion happened recently or not. Also, another interesting option could be to look at the risk factors among women more at-risk: those who reported more than one abortion.

RESPONSE: We understand that the nature of the question did not provide us a clear timeframe and it was difficult to know if the induced abortion happened recently. Regarding more at risk women, we did not feel that we had sufficient sample size to look at the risk factors among women who reported more than one abortion.

The authors should have explained the rationale behind examining the numerous variables. There are too many variables examined at the same time. It would have been better to conduct the analyses based on a conceptual model. The authors should have been more parsimonious and only include potential explanatory and confounder variables. Using variables only significant at $p < 0.05$ in the bivariate analyses is a very conservative approach. Thus, the authors could have missed the effects of other important factors, for example education (with p-value of 0.06). Also, the authors don't explain how the variables were retained in the model. Finally, including all the variables in the model simultaneously might not be the best option and other methods would have been more appropriate.

RESPONSE: To also address comments from other reviewers, we have re-done the analyses to reduce the number of tables and variables and better focus the study. All relevant contents in the abstract, main text and tables have been revised accordingly.

Overall, there are many tables and variables presented. The authors should try to focus on the potential explanatory variables that are important for this particular outcome. Also, some variables have too many categories and could be re-categorized. The authors could present the dichotomized variables instead.

RESPONSE: We have addressed all these comments. Data have been re-analyzed, and three new tables have been made. A multivariate logistic regression model was constructed to examine the independent association between demographic characteristics and risky sexual behaviors and history of induced abortion. All variables found to have significant association with transactional sex in bivariate analyses at a level of $p < 0.05$ were simultaneously included in a preliminary model. A final model was developed by removing variables with the highest p-value greater than 0.05, refitting the model and repeating the step until all p-values of included variables were less than 0.05. Categorical variables have been dichotomized and continuous variables have been used as they are.

The authors should try to be consistent in their terminology. Sometimes the word "regular partner" is used and sometimes the word "non-commercial partner".

RESPONSE: The term 'non-commercial partner' has been used consistently throughout the text and tables.

The text says that abortion was associated with "to be currently using a contraceptive method". But if we look at the Table 6, it is the opposite result: "No" to "currently using contraceptive method" is associated with abortion (AOR= 3.15 95%CI 1.17-4.62). Also, not all contraceptive methods are

effective, and some are better than other at reducing the risk of unwanted pregnancy. It would have been better to analyze them separately in term of efficacy. -The variable "Having clients who requested not to use condom" was statistically significant ($p=0.03$), but not included in the multivariate analysis. The authors don't explain why. Finally, the authors should only keep in the multivariate analysis model the variables that are statistically significant, and the other important confounders and explanatory variables. A good idea should have been to use a test to evaluate the goodness of fit of their final model.

RESPONSE: We have redone all analyses and reported the new findings in the tables and text in the "Results" section. All related parts have been revised.

Discussion

The main reason why alcohol use was not associated with abortion is probably due to the validity of the measure used. So, there is a possibility of misclassification of the exposure. The authors should have used a validated measure of alcohol, such as AUDIT-C or others. Also, the prevalence of drug use was very low in this population and might explain the lack of association.

RESPONSE: As suggested, we have taken these variables out of the analyses, and all related contents in the text and tables have been corrected accordingly.

The authors don't discuss the statistically significant association between "number of sex partners in the past 12 months" and abortion. This is also an important finding.

RESPONSE: The discussion on this important finding has been added as advised. Please see the discussion section on lines 5-17, page 11.

This is not surprising that abortion was not associated with the number of commercial sex partners and condom use with commercial partners. Most of the unprotected sex is with regular/non-commercial partners. The prevalence of condom use with commercial partners was high. The article cited in #7 from Maher et al. 2013 discussed the condom use behaviors with the different sex partners among Cambodian sex workers.

RESPONSE: Thanks for this comment. We have revised the discussion section as advised. Please see lines 8-10, page 10.

VERSION 2 – REVIEW

REVIEWER	Marie-Claude Couture University of San Francisco, California, USA
REVIEW RETURNED	02-Jun-2015

GENERAL COMMENTS	<p>INTRODUCTION</p> <ul style="list-style-type: none"> - The acronym "female entertainment workers (FEW)" is more appropriate. - Page 3, lines 22-25: It would good to add information on the prevalence of condom use among Cambodian FEW with the different sex partners - Page 3, lines 27-28: "In our most 27 recent survey, 46% of EWs reported having experienced at least one induced abortion, and 40% reported having experienced two or more induced abortions in their lifetime". The authors should specified that this was among Cambodian FEW. - Page 4, first paragraph: The authors should discuss the general sexual and reproductive health services available for EW in Cambodia, not just Khana. - The term "Non-commercial relationships" should be better defined to help the readers. <p>METHODS</p>
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	<p>Data collection training and procedure This paragraph should be removed. The authors should only keep these two sentences below and integrate them to the previous paragraph:</p> <p>"A structured questionnaire was developed based on the results from a pilot study and comments from public health experts in the areas of sexual and reproductive health in Cambodia. A three-day training on data collection methods was conducted for all interviewers and field supervisors"</p> <p>Variables and measurement -I mentioned previously, that one problem was the outcome variable: "During your work as an entertainment worker, have you experienced any induced abortion?" We don't know about the timeframe of this behavior, if this abortion happened recently or not. This should be discussed in the limitations.</p> <p>-The authors should explain how exactly "condom use with both types of sexual partners in the past three months" was measured. Which question was used exactly? Was it condom use in general with commercial (or non-commercial) partners in the last 3 months? 3 months is a long timeframe. Condom use can vary a lot during that time. Moreover, there are several types of commercial and non-commercial partners in Cambodia. Condom use will vary greatly according to these different sub-types. This should be acknowledged in the discussion.</p> <p>Data analyses - Maybe use the term "sociodemographic" than demographic or socioeconomic.. -I still think that using variables only significant at $p < 0.05$ in the bivariate analyses is a very conservative approach. Thus, the authors could have missed the effects of other important factors. The authors should have tested the effects of marginally significant variables by adding them to their model and look at their effects.</p> <p>RESULTS -Page 8, lines 19-20: Add also the % of induced abortion in the text. Also, I thought that abortion was measured with this question: "History of induced abortion was assessed via a question, "During your work as an EW, have you experienced any induced abortion?". So, it is not necessarily "Induced abortion in their lifetime" as written in the text but more "induced abortion during their work as FEW". -Page 8, lines 20-21: "The mean times of induced abortion during the time working as an EW was 2.1 (SD= 3.1)." The authors should add here that this in "years".</p> <p>DISCUSSION -Again I think the authors should discuss the results from the the article cited in #7 from Maher et al. 2013 (and other related studies) when they talk about the complexity of the condom use behaviors with the different sex partners (more specifically non-commercial partners) among Cambodian sex workers. -"A study in Ethiopia found that one third of female sex workers had a regular partner, while condoms were not consistently used in such relationship, and this practice increased the number of unintended</p>
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	pregnancy". There are studies showing information on number of regular partners and condom use behaviors with them among Cambodian sex workers. So, there is no need to cite a study from Ethiopia. Instead, the authors should cite the Cambodian studies.
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VERSION 2 – AUTHOR RESPONSE

Reviewer: Marie-Claude Couture

INTRODUCTION

- The acronym "female entertainment workers (FEW)" is more appropriate.

RESPONSE: As advised, the acronym FEWs has been used consistently throughout the text.

- Page 3, lines 22-25: It would good to add information on the prevalence of condom use among Cambodian FEW with the different sex partners

RESPONSE: We have added this information to the last paragraph of the introduction: "Recent studies of FEWs in Cambodia found that 34-54% of FEWs report always using condoms with their regular, non-commercial partners and 83-85% report always using condoms with commercial partners." Please see lines 2-4, page 5.

- Page 3, lines 27-28: "In our most 27 recent survey, 46% of EWs reported having experienced at least one induced abortion, and 40% reported having experienced two or more induced abortions in their lifetime". The authors should specify that this was among Cambodian FEW.

RESPONSE: This info has been specified. Please see line 28, page 3.

- Page 4, first paragraph: The authors should discuss the general sexual and reproductive health services available for EW in Cambodia, not just Khana.

RESPONSE: The information on sexual and reproductive health services available for FEWs in Cambodia has been added. Please see lines 1-4, page 4.

- The term "Non-commercial relationships" should be better defined to help the readers.

RESPONSE: We have extended the wording for better understanding of the term. Please see line 25, page 3.

METHODS

- Data collection training and procedure

This paragraph should be removed. The authors should only keep these two sentences below and integrate them to the previous paragraph: "A structured questionnaire was developed based on the results from a pilot study and comments from public health experts in the areas of sexual and reproductive health in Cambodia. A three-day training on data collection methods was conducted for all interviewers and field supervisors."

RESPONSE: This part has been shortened as suggested. Please see lines 26-29, page 5.

Variables and measurement:

- I mentioned previously, that one problem was the outcome variable: "During your work as an entertainment worker, have you experienced any induced abortion?" We don't know about the timeframe of this behavior, if this abortion happened recently or not. This should be discussed in the limitations.

RESPONSE: As advised, a limitation concerning the timeframe of the reported induced abortion history has been added to the list. Please see lines 3-7, page 12.

- The authors should explain how exactly "condom use with both types of sexual partners in the past

three months" was measured. Which question was used exactly? Was it condom use in general with commercial (or non-commercial) partners in the last 3 months? 3 months is a long timeframe. Condom use can vary a lot during that time. Moreover, there are several types of commercial and non-commercial partners in Cambodia. Condom use will vary greatly according to these different subtypes. This should be acknowledged in the discussion.

RESPONSE: The information on the measurement of condom use with sweethearts and commercial partners have been added to the methods (see lines 26-29, page 6 and lines 1-2, page 7) and discussion (see lines 9-13, page 10).

Data analyses:

- Maybe use the term "sociodemographic" than demographic or socioeconomic.

RESPONSE: This term has been corrected. Please see line 9, page 7.

- I still think that using variables only significant at $p < 0.05$ in the bivariate analyses is a very conservative approach. Thus, the authors could have missed the effects of other important factors. The authors should have tested the effects of marginally significant variables by adding them to their model and look at their effects.

RESPONSE: As advised, we have re-done the analysis using borderline associations of up to $p < 0.10$, and it did not make any difference.

RESULTS

- Page 8, lines 19-20: Add also the % of induced abortion in the text.

RESPONSE: The % has been added. Please see lines 17-18, page 8.

- Also, I thought that abortion was measured with this question: "History of induced abortion was assessed via a question, "During your work as an EW, have you experienced any induced abortion?". So, it is not necessarily "Induced abortion in their lifetime" as written in the text but more "induced abortion during their work as FEW".

RESPONSE: The info on the timeframe for the induced abortion has been corrected. Please see lines 17-19, page 8.

- Page 8, lines 20-21: "The mean times of induced abortion during the time working as an EW was 2.1 (SD= 3.1)." The authors should add here that this in "years".

RESPONSE: This figure is the mean number of abortion, not years.

DISCUSSION

- Again I think the authors should discuss the results from the article cited in #7 from Maher et al. 2013 (and other related studies) when they talk about the complexity of the condom use behaviors with the different sex partners (more specifically non-commercial partners) among Cambodian sex workers.

RESPONSE: We have added the discussion on the complexity of the condom use behaviors with the different sex partners among FEWs using finding from the important study among FSWs in Cambodia. Please see lines 9-13, page 10.

- "A study in Ethiopia found that one third of female sex workers had a regular partner, while condoms were not consistently used in such relationship, and this practice increased the number of unintended pregnancy". There are studies showing information on number of regular partners and condom use behaviors with them among Cambodian sex workers. So, there is no need to cite a study from Ethiopia. Instead, the authors should cite the Cambodian studies.

RESPONSE: We decided to keep this citation for international comparison and to link unprotected sex in non-commercial relationship to unwanted pregnancies that potentially lead to induced abortion. No study in Cambodia has investigated this link.