PEER REVIEW HISTORY

ARTICLE DETAILS

TITLE (PROVISIONAL)	Barriers to Cervical Cancer Screening and Acceptability of HPV Self-Testing: A Cross-Sectional Comparison Between Ethnic Groups in Southern Thailand
AUTHORS	Gottschlich, Anna; Nuntadusit, Thanatta; Zarins, Katie; Hada, Manila; Chooson, Nareerat; Bilheem, Surichai; Navakanitworakul, Raphatphorn; Nittayaboon, Kesara; Virani, Shama; Rozek, Laura; Sriplung, Hutcha; Meza, Rafael

VERSION 1 – REVIEW

REVIEWER	Jissa Vinoda Thulaseedharan AchuthaMenon Centre for Health Science Studies, Sree Chitra Tirunal Institute for Medical Sciences and Technology, Trivandrum, Kerala, India
REVIEW RETURNED	12-Jun-2019

GENERAL COMMENTS	Dear Authors, It is a well-written paper. The study describes the acceptability of collecting self samples for HPV testing and details of prior Pap tests among women from Buddist and Muslim communities. However, the purpose of the paper is inconsistently written in different places. Maybe better if you are consistent with your main objective and say what the sub-objectives are. I will explain to you what I felt while reading the abstract and text. In abstract, you affirmed that “we investigated barriers to screening and use of self-collection HPV testing to reduce rates in Buddhist and Muslim communities in Southern Thailand”. While reading the first part, the reader suspects that the main objective of your paper is to investigate barriers to screening but your title indicates "acceptability of HPV self-testing" and that is not mentioned there. Instead, you mentioned “use of self-collection HPV testing to reduce rates”. In fact, you were not studying whether any rates (of cervical cancer or positivity, etc) were reduced due to use of self-collection HPV testing but your purpose was to study the acceptability of HPV testing. Conclusion is consistent with the title however the way of presenting results makes inconsistency to understand what the paper aims at. Another example is in the introduction in the main text, there you reported “we investigated the differences in access to healthcare between Buddhist and Muslim women in Southern Thailand and examine potential predictors of and barriers to accessing screening for cervical cancer. We also assess willingness to use self-collection HPV testing methods and the

	acceptability of these methods after use." – Again puzzling the reader. I have another comment on sampling 12-15 households from the list. Was it a random sample? Please mention the basis of selection of the households. Best wishes

REVIEWER	Nicole G. Campos Research Scientist Harvard T.H. Chan School of Public Health Boston, MA USA
REVIEW RETURNED	21-Jun-2019

GENERAL COMMENTS	"Acceptability of HPV self-testing and access to cervical cancer screening: A cross-sectional comparison between Buddhist and Muslim women in Southern Thailand" describes the sexual and health history, screening behavior, acceptability of HPV self-collection, and HPV positivity of Buddhist and Muslim women in the Songkhla region of southern Thailand. As HPV-based screening programs are being implemented in LMIC, design of screening delivery strategies and patient preferences are key to successful implementation. The study is well-described and timely. However, the findings are not necessarily generalizable beyond the specific study population, and thus may have limited usefulness to a general clinical and public health readership. I have several comments as to how the paper might be improved. Major comments: • While generally well-written, the paper could benefit from careful editing. For example, on p. 4 (Key questions), the statement "There are difficulties implementing effective cytology screening programs in low resourced settings, leading to the suggested use of self-collected testing for presence of the human papillomavirus (a more highly sensitive and less resource-intense test) in these settings)" is wordy and hard to follow. Similarly, the opening paragraphs of the Introduction could be more concise. • It may be beyond the scope of the study, but a key issue in screening programs is follow-up of screen positive women. Of women with past/present abnormal screening results, what proportion received recommended diagnostics and treatment? Is it possible to acquire these data from the present study population? • A key limitation of the study is that the two districts selected are religiously homogenous, making it difficult to assess the degree to which differences in sexual/screening history and preferences are due to geographic or other differences rather than just religion. Also, were volunteers setting up appointments of the same religious background as the women they were approaching for screening appointments? • P. 9; p. 11: More data could be provided (in supplemental materials perhaps) regarding the development of the survey tool and how it was pilot tested. • For Table 3, had the women asked about preference for self-collection vs Pap all received Pap at some point in the past, or only in the present study? • Another key limitation of the study is that all women were recruited from health centers, so their health seeking behavior is not likely to be representative of the general population of Buddhist and Muslim women in the district. Their screening and health access behavior and preferences are likely to be different. While the primary contribution of the study is providing information to

	future care delivery models of HPV self-collection, we still don't know what the preferences/acceptability would be for women who don't seek health care at the clinic routinely. This warrants more discussion space. • P. 18: The authors mention that self-collection can be done by a woman in her own home. This contrasts the study finding that this study population seems to prefer testing in a clinic. Minor comments: • P. 6: The statement that HPV primary screening is "beginning to gain traction" seems inaccurate, given recent guidelines changes in high-income settings. • P. 6: The mention of mailing self-collected samples seems out of place in this paper – there are many possible models of care, including community health workers going door to door, campaign models of self-collection, clinic-based self-collection, etc. • P. 7: what proportion of the Thai population is Muslim vs. Buddhist?

REVIEWER	Margaret Cruickshank Aberdeen Centre for Women's Health Research University of Aberdeen UK
REVIEW RETURNED	05-Jul-2019

GENERAL COMMENTS	There is increasing interest in use of HPV testing in LMIC to overcome limitations of cervical cytology and with that the use of self-testing. There have been a number of studies to date on use of self-testing in screening defaulters and hard to reach groups and in LMIC. There have been different facilitators and barriers in different settings. This study looks at differences between different religious groups within one region of Thailand to address problems with uptake of screening. Also in the key question box, it would be more illustrative to know the cervical cancer rates in Muslim women. In the introduction, line 22, where does cervical cancer rank in Thailand. There are issues of generalisability both within this region and Thailand as well as other LMIC due to the size and selection of groups used. If outcome is barrier to participation, it may have been useful to start the study with some qualitative work to understand what the barriers and promoters are. Abstract: It would be more useful to the reader to give the rates of cervical cancer incidence to understand in international context especially given the wide ranges of incidence in the US by religious/racial/socio-economic groups. The selection process is well described and is a good example of using local infrastructure to engage women in this study. However it is not clear how representative these groups are of the local population, and screening defaulters. In the key question box, the new findings are limited to the Buddhist and Muslim women in Songkla as stated by the authors and may be of more interest to local stakeholders than international journal. The limitations are clearly addressed in the discussion section. Table 2 could be simplified by combining sub-groups or adding as supplementary table.

	The discussion is appropriate and states strengths and limitations of this study but it is repetitive on its key message. HPV self-sampling has been shown to acceptable in many different settings the novelty of this new study data is limited.

VERSION 1 – AUTHOR RESPONSE

Reviewer: 1
Reviewer Name: Jissa Vinoda Thulaseedharan
Institution and Country: AchuthaMenon Centre for Health Science Studies, Sree Chitra Tirunal Institute for Medical Sciences and Technology, Trivandrum, Kerala, India
Please state any competing interests or state 'None declared': None declared

Please leave your comments for the authors below
Dear Authors,

It is a well-written paper. The study describes the acceptability of collecting self samples for HPV testing and details of prior Pap tests among women from Buddist and Muslim communities.

Thank you for helping us improve this manuscript!

However, the purpose of the paper is inconsistently written in different places. Maybe better if you are consistent with your main objective and say what the sub-objectives are. I will explain to you what I felt while reading the abstract and text. In abstract, you affirmed that "we investigated barriers to screening and use of self-collection HPV testing to reduce rates in Buddhist and Muslim communities in Southern Thailand". While reading the first part, the reader suspects that the main objective of your paper is to investigate barriers to screening but your title indicates "acceptability of HPV self-testing" and that is not mentioned there. Instead, you mentioned "use of self-collection HPV testing to reduce rates". In fact, you were not studying whether any rates (of cervical cancer or positivity, etc) were reduced due to use of self-collection HPV testing but your purpose was to study the acceptability of HPV testing.

We agree with the reviewer and have reworded the sentence in the abstract to read:

"We investigated barriers to screening, as well as acceptability of self-collection HPV testing as a primary form of cervical cancer screening among Buddhist and Muslim communities in Southern Thailand." Additionally, we added "and Barriers" to the title to make the objectives of the paper clearer from the start.

Conclusion is consistent with the title however the way of presenting results makes inconsistency to understand what the paper aims at.

We have reorganized the results section to better align with the main objectives of the paper. Section 3.2 is now titled "Prior access and barriers to healthcare". The flow of the results is now: demographics, access and barriers to screening, acceptability of HPV self-sampling, results of HPV testing, and finally predictors of prior screening models.

Another example is in the introduction in the main text, there you reported "we investigated the differences in access to healthcare between Buddhist and Muslim women in Southern Thailand and examine potential predictors of and barriers to accessing screening for cervical cancer. We also assess willingness to use self-collection HPV testing methods and the acceptability of these methods after use." – Again puzzling the reader.

The final paragraph of the introduction section was reworded to fit the main aims of the paper as described in the title. It now reads:

"In this study we investigated the differences in access and barriers to healthcare between Buddhist and Muslim women in Southern Thailand and examined potential predictors of accessing screening for cervical cancer. We also assess willingness to use and acceptability of self-collection HPV testing methods in these communities."

I have another comment on sampling 12-15 households from the list. Was it a random sample? Please mention the basis of selection of the households.

The samples were randomly selected from the entire female population in the provincial health office database. Each health volunteer was randomly assigned 12-15 households from the subject name list and then they visited each subject's house to invite them to participate in the study. This information has been added into the manuscript as follows:

"Women were recruited from lists of the target population for screening provided by reproductive health clinics in these districts, half located in Na Thawi and half in Ranot. The primary care centers made this list by randomly selecting from the entire female population in the province's health office database and then distributed 12-15 names to each health care volunteer, irrespective of the volunteer's religion. The volunteers then visited their assigned households and set up appointments with eligible women for screening at public primary care clinics."

Best wishes

Thanks for your comments and suggestions!

Reviewer: 2
Reviewer Name: Nicole G. Campos
Institution and Country: Research Scientist, Harvard T.H. Chan School of Public Health, Boston, MA USA
Please state any competing interests or state 'None declared': None declared.

Please leave your comments for the authors below

"Acceptability of HPV self-testing and access to cervical cancer screening: A cross-sectional comparison between Buddhist and Muslim women in Southern Thailand" describes the sexual and health history, screening behavior, acceptability of HPV self-collection, and HPV positivity of Buddhist and Muslim women in the Songkhla region of southern Thailand. As HPV-based screening programs are being implemented in LMIC, design of screening delivery strategies and patient preferences are key to successful implementation. The study is well-described and timely. However, the findings are not necessarily generalizable beyond the specific study population, and thus may have limited usefulness to a general clinical and public health readership. I have several comments as to how the paper might be improved.

We would like to thank the reviewer for their comments, which helped us improve the clarity of and content in the paper.

Major comments:

- While generally well-written, the paper could benefit from careful editing. For example, on p. 4 (Key questions), the statement "There are difficulties implementing effective cytology screening programs in low resourced settings, leading to the suggested use of self-collected testing for presence of the human papillomavirus (a more highly sensitive and less resource-intense test) in these settings)" is wordy and hard to follow.

The "Key Questions" section was removed per editor request.

Similarly, the opening paragraphs of the Introduction could be more concise.

Thank you for this observation. The introduction has been trimmed and unnecessary details have been cut.

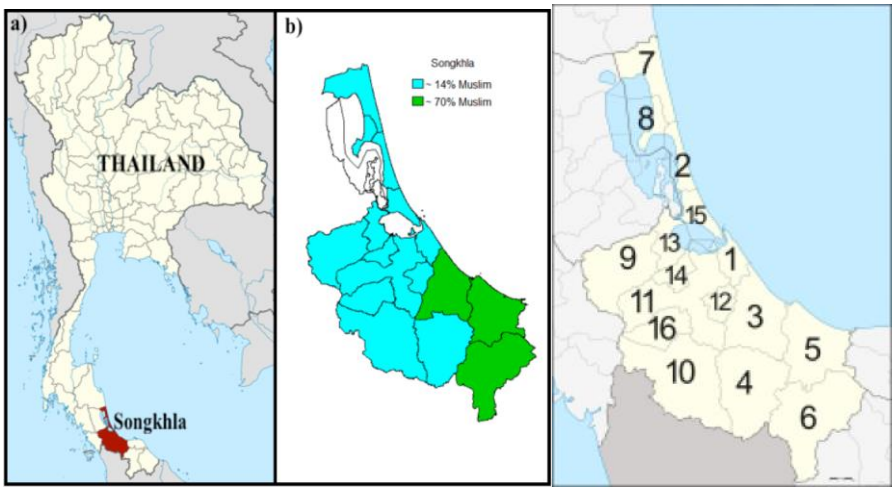
• It may be beyond the scope of the study, but a key issue in screening programs is follow-up of screen positive women. Of women with past/present abnormal screening results, what proportion received recommended diagnostics and treatment? Is it possible to acquire these data from the present study population?

We agree completely with the reviewer, however, unfortunately, diagnostic and treatment data is not available yet for this population. The main goal of this study was to determine if self-collection HPV testing would be an accepted intervention in these populations. Future studies will investigate the impact of an HPV self-collection testing program on uptake of needed further treatment.

• A key limitation of the study is that the two districts selected are religiously homogenous, making it difficult to assess the degree to which differences in sexual/screening history and preferences are due to geographic or other differences rather than just religion.

Thank you for this point. We have added the following figure below to try to improve clarity on the study site. It is true that the two districts selected are predominantly one religion or the other, however there is some religious heterogeneity across districts (see figure b below). In fact, the Muslim district we chose (Na Thawi is labeled 4 in the third image, while Ranot is 7) is not actually in the green, majority-Muslim area, but is very close and most of the people living there migrated from the Muslim predominant provinces. Women were selected randomly from a list of all age-eligible women, but due to the distribution of the population, only Buddhists were selected from Ranot and Muslims from Na Thawi.

Additionally, as the districts are geographically very close to each other (figure a) and from the same province in Thailand, there is little geographic differences between the two districts. While religion is not the only reason behind the differences in sexual/screening history, these differences are likely largely due to cultural differences between the two religious groups (Alvarez et al 2018, Che et al 2014, Muangpaisan 2000, Kerdpon 2000, Khwankong 2016).



For instance, while in general part of the larger community, minority groups, including Muslims in southern Thailand, may have their own cultural practices and language. In Thailand, the government has established policies for cultural assimilation of minority religious groups (e.g. promotion of Thai language and identity). However, there has been resistance to these policies, and cultural differences persist. For example, some Muslims in southern Thailand speak Yawi (a Malay dialect) as their first language, creating barriers to communicating with healthcare personal, who largely speak only Thai. These and other cultural differences are likely driving the differences in access to screening between the two groups.

To clarify this point, we have added the following sentence to the discussion section:

“This is consistent with past research that has shown that cultural differences, including language differences, lead to lower rates of access to healthcare among religious minorities in Thailand.”

Also, were volunteers setting up appointments of the same religious background as the women they were approaching for screening appointments?

Volunteers were assigned participants randomly, independent of their religious background. The following was added to the text:

"The primary care centers made this list by randomly selecting from the entire female population in the province's health office database and then distributed 12-15 names to each health care volunteer, irrespective of the volunteer's religion."

- P. 9; p. 11: More data could be provided (in supplemental materials perhaps) regarding the development of the survey tool and how it was pilot tested.

The following sentences have been added to the methods section of the text:

"The survey was developed using similar questions to prior studies of health risk factors."

"Prior to data collection, the survey was piloted on 10 women, both Buddhist and Muslim, sampled randomly in the Singha Nakhon district."

- For Table 3, had the women asked about preference for self-collection vs Pap all received Pap at some point in the past, or only in the present study?

This is a great point - it originally was for all women, but we have now restricted the comparison to only those women who reported receiving a Pap prior to the study. As a clarification, we did not offer Pap testing during the study, only HPV testing, so the reviewer is correct that it is better to only include those who have actually had a Pap in the preference question. This is now updated in section 3.3 as well as in table 3. As shown in the new table, the results didn't change relative to the original version.

- Another key limitation of the study is that all women were recruited from health centers, so their health seeking behavior is not likely to be representative of the general population of Buddhist and Muslim women in the district. Their screening and health access behavior and preferences are likely to be different. While the primary contribution of the study is providing information to future care delivery models of HPV self-collection, we still don't know what the preferences/acceptability would be for women who don't seek health care at the clinic routinely. This warrants more discussion space.

This is another good point, thank you. The women were actually recruited in their homes, by a list of all age-eligible women provided by the health centers (this clarification has been made in the methods section of the text). Nevertheless, it is true that women participated in the study in clinics and so we may be missing women who chose not to come to the clinic to participate.

However, in this setting healthcare visits are nearly ubiquitous across the population. Table 2 shows that of the women recruited to come into the clinics, only 3% reported never going to a health facility, and 78% report going in the past year (this is similar to prior studies showing high rates of healthcare utilization. Even so, we agree that this limitation deserves acknowledgement in the discussion.

The following sentences have been added to the discussion to inform the reader of this limitation:

"Additionally, since participation in the study occurred in health centers, we may not have a representative sample of the community if certain groups chose not to come to the clinics, although in general, health care utilization is high overall in Thailand."

"As this study was conducted exclusively in clinics, it still needs to be determined if self-collection HPV testing would function the same at the community level. Thus, a natural step would to be to investigate the feasibility of a community-based self-collection HPV testing program, where women received the swabs and collected the samples in their homes and then returned the swabs to a lab for testing."

• P. 18: The authors mention that self-collection can be done by a woman in her own home. This contrasts the study finding that this study population seems to prefer testing in a clinic.
Good point. We have added the following into the discussion to address this:

"While the majority of women still reported a preference for testing in a healthcare setting as opposed to in the home, they also preferred self-testing over doctor-testing. This highlights that it is important to assess not only the acceptability of self-sampling, but the preferred setting for different social groups."

Minor comments:
• P. 6: The statement that HPV primary screening is "beginning to gain traction" seems inaccurate, given recent guidelines changes in high-income settings.

We are confused by the comment. Recent recommendations in the US and the UK have added HPV testing as primary screening. In addition, the results of the HPV focal study (Ogilvie, 2017) in Canada have shown the superiority of HPV testing versus cytology in a high income setting.

Nonetheless we have revised the statement to make it more precise:

"Thus, countries like the US and UK are now recommending HPV testing as a primary form of cervical cancer screening."

• P. 6: The mention of mailing self-collected samples seems out of place in this paper – there are many possible models of care, including community health workers going door to door, campaign models of self-collection, clinic-based self-collection, etc.

Agree, removed.

• P. 7: what proportion of the Thai population is Muslim vs. Buddhist?

Muslim = 5%
Buddhist = 94%
Data added into manuscript.

Reviewer: 3
Reviewer Name: Margaret Cruickshank
Institution and Country: Aberdeen Centre for Women's Health Research, University of Aberdeen, UK
Please state any competing interests or state 'None declared': None declared

Please leave your comments for the authors below

There is increasing interest in use of HPV testing in LMIC to overcome limitations of cervical cytology and with that the use of self-testing. There have been a number of studies to date on use of self-testing in screening defaulters and hard to reach groups and in LMIC. There have been different facilitators and barriers in different settings. This study looks at differences between different religious groups within one region of Thailand to address problems with uptake of screening.

We would like to thank you for your comments and suggestions, which have helped us improve this manuscript.

Also in the key question box, it would be more illustrative to know the cervical cancer rates in Muslim women.

The "Key Questions" section was removed per editor request.

In the introduction, line 22, where does cervical cancer rank in Thailand.

The following has been added into the introduction: "Cervical cancer is still the 2ndmost common cancer among women in Thailand, causing over 10% of new female cases in 2018[21]."

There are issues of generalisability both within this region and Thailand as well as other LMIC due to the size and selection of groups used.

Participants were selected randomly from a list of all age-eligible women (see methods section), thus there is likely minimal issues with generalizability in the region, however you are correct that it is not generalizable to other populations. Nonetheless, we also have found acceptability of HPV self-sampling to be higher in hard to reach populations in other settings such as indigenous women in Guatemala (Gottschlich et al, JGO 2018) or Arab American women in the US (not published). So as more local evidence emerges from different places in the world, we might have a general sense of the features that make self-sampling more appealing among certain groups. In addition, as they are, our results are important future hypothesis-generating evidence that could lead to larger and more comprehensive studies in Thailand and other settings.

If outcome is barrier to participation, it may have been useful to start the study with some qualitative work to understand what the barriers and promoters are.

This is a great suggestion and will be taken into account in planning of future studies. In fact, we conducted a similar study in Guatemala and collected qualitative interviews that we are currently in the process of analyzing, and perhaps we could try the same in Thailand.

Abstract: It would be more useful to the reader to give the rates of cervical cancer incidence to understand in international context especially given the wide ranges of incidence in the US by religious/racial/socio-economic groups.

Thank you, we have added this into the abstract.

The selection process is well described and is a good example of using local infrastructure to engage women in this study. However it is not clear how representative these groups are of the local population, and screening defaulters.

Thank you for this point. We have clarified in the methods section that the participants were randomly chosen from the general population of age-eligible women, thus the samples were representative of the local population, including screening defaulters.

In the key question box, the new findings are limited to the Buddhist and Muslim women in Songkla as stated by the authors and may be of more interest to local stakeholders than international journal. The limitations are clearly addressed in the discussion section.

The key question box has been removed, per editor request. We feel that, while the results are definitely of interest to local stakeholders and are being shared as such, that as the world becomes more interconnected and heterogeneous, the international community would benefit to see how different populations in the same setting react and receive differently newer interventions, including HPV self-screening.

Table 2 could be simplified by combining sub-groups or adding as supplementary table.

Thanks for the comment. Table 2 was left in the text as we believe it is important to show the differences in health care utilization between the two religious groups. This was already a simplified table from the original version, so we are hoping we can keep as is.

The discussion is appropriate and states strengths and limitations of this study but it is repetitive on its key message.

The discussion has been edited for clarity and simplicity.

HPV self-sampling has been shown to acceptable in many different settings the novelty of this new study data is limited.

While we agree that HPV self-sampling has been shown to be acceptable in many settings, our analyses show that there are differences in the level of acceptability and that this type of screening might be even more preferred by women from groups with lower levels of access to current screening modalities. This highlights that even in settings where current screening levels are acceptable, HPV self-sampling could serve as an additional tool to reduce disparities in access and eventually in cancer risk. We are certain that researchers and health authorities in many countries will find our results helpful and that these results might motivate them to consider providing multiple screening modalities in an effort to reach the hardest-to-reach populations. In fact, the results of our studies will be quite informative for addressing disparities in cervical cancer access among Arab-Americans and other minorities in the US.

VERSION 2 – REVIEW

REVIEWER	Jissa Vinoda Thulaseedharan Achutha Menon Centre for Health Science studies, Sree Chitra Tirunal Institute for Medical Sciences and Technology, Trivandrum
REVIEW RETURNED	23-Sep-2019

GENERAL COMMENTS	Dear authors, The paper has much improvement. A small suggestion to think is with the following statement “In this study, we investigated the differences in access and barriers to healthcare between Buddhist and Muslim women in Southern Thailand…” Your study actually focussed on screening, which is ofcourse part of healthcare. But when you use the word ‘healthcare’, it makes a much broader sence. But, other than sceening related data, your study only describes health location and last health visit as some information related to healthcare. So, may be better to avoid the broader term. Regards,

REVIEWER	Nicole Gastineau Campos Research Scientist Harvard T.H. Chan School of Public Health USA
REVIEW RETURNED	26-Sep-2019

GENERAL COMMENTS	The revision represents thoughtful consideration of reviewer comments. There remain several minor issues that should be addressed prior to publication. • The new title is long and wordy, and it seems that access/barriers should generally come before acceptability of a new screening method (as the authors have organized the Results section). • In the Discussion or Conclusions, the authors might mention the importance of future study in linkage to treatment for screen-positive women. Improving access to screening does not improve health outcomes if high-risk women are not receiving treatment. • The sentence added to the Discussion mentions a model of care in which women self-collect at homes and return samples to the lab. This is just one model – health promotors could also facilitate return of samples to ensure better compliance. Having women return their own samples to the lab will not likely to achieve improved compliance relative to screening at the clinic. • Regarding the mention of US and UK guidelines in the Introduction – this seems a bit far afield. The previous comment regarding HPV primary screening guidelines was just referring to

	the fact that there was phrasing to indicate that HPV primary screening is “beginning to gain traction,” which seems an understatement given that it has already been added to screening guidelines in numerous HIC. I don’t think this manuscript needs to get into specifics about the FOCAL trial and specific country guidelines – I think it is sufficient to say that HPV primary screening has been demonstrated to be more sensitive/efficacious than cytology, VIA, etc. (could cite India study by Sankaranarayanan and colleagues, as this demonstrates reduction in advanced cervical cancers and deaths in a LMIC). • The paper conclusions state that “self-collection has the potential to replace our current methods for cervical cancer screening.” However, the response to reviewers highlights that “even in settings where current screening levels are acceptable, HPV self-sampling could serve as an additional tool to reduce disparities in access…” It is important to indicate not only the potential for replacement (as in the Conclusion), but for complementarity in HPV-based approaches – depending on the population, self-sampling could be the primary screening program for all, or it could focus on underscreened populations.

REVIEWER	Margaret Cruickshank University of Aberdeen UK
REVIEW RETURNED	21-Sep-2019

GENERAL COMMENTS	thank you for revising this paper which I think now reflects better what it contributes to existing knowledge and the limitations. You have succeeded in collecting very detailed data and I appreciate how challenging this can be.

VERSION 2 – AUTHOR RESPONSE

Reviewer: 3
Reviewer Name: Margaret Cruickshank
Institution and Country: University of Aberdeen UK
Please state any competing interests or state ‘None declared’: None declared

Please leave your comments for the authors below
thank you for revising this paper which I think now reflects better what it contributes to existing knowledge and the limitations. You have succeeded in collecting very detailed data and I appreciate how challenging this can be.

Thank you for your suggestions and comments.

Reviewer: 1
Reviewer Name: Jissa Vinoda Thulaseedharan
Institution and Country:
Achutha Menon Centre for Health Science studies, Sree Chitra Tirunal Institute for Medical Sciences and Technology, Trivandrum
Please state any competing interests or state ‘None declared’: None declared

Please leave your comments for the authors below
Dear authors,
The paper has much improvement. A small suggestion to think is with the following statement “In this study, we investigated the differences in access and barriers to healthcare between Buddhist and Muslim women in Southern Thailand…” Your study actually focussed on screening, which is of course

part of healthcare. But when you use the word ‘healthcare’, it makes a much broader sense. But, other than screening related data, your study only describes health location and last health visit as some information related to healthcare. So, may be better to avoid the broader term.
Regards,

We agree and have changed that sentence to read:

“In this study we investigated the differences in access and barriers to cervical cancer screening between Buddhist and Muslim women in Southern Thailand and examined potential screening predictors.”

Additionally, we changed other mentioned of “barriers to health care” to “barriers to screening” throughout the text.

We thank the reviewer for their suggestions and comments.

Reviewer: 2
Reviewer Name: Nicole Gastineau Campos
Institution and Country:
Research Scientist
Harvard T.H. Chan School of Public Health
USA
Please state any competing interests or state ‘None declared’: None declared.

Please leave your comments for the authors below
The revision represents thoughtful consideration of reviewer comments. There remain several minor issues that should be addressed prior to publication.

Thank you for your suggestions and comments.

- The new title is long and wordy, and it seems that access/barriers should generally come before acceptability of a new screening method (as the authors have organized the Results section).

The new title reads: “Barriers to Cervical Cancer Screening and Acceptability of HPV Self-Testing: A Cross-Sectional Comparison Between Ethnic Groups in Southern Thailand”

- In the Discussion or Conclusions, the authors might mention the importance of future study in linkage to treatment for screen-positive women. Improving access to screening does not improve health outcomes if high-risk women are not receiving treatment.

We agree and have added the following into the conclusion:

“However, improvement of screening alone will not improve health outcomes if women who receive abnormal results do not have access to follow-up care. Thus, it is vital to study linkage to treatment for those who screen positive.”

- The sentence added to the Discussion mentions a model of care in which women self-collect at homes and return samples to the lab. This is just one model – health promotors could also facilitate return of samples to ensure better compliance. Having women return their own samples to the lab will not likely to achieve improved compliance relative to screening at the clinic.

This is a good point, and quite a possibility in Thailand. The sentence was not meant to imply that women would need to return their own samples, but simply that those samples would get returned to the labs. To improve the clarity of the meaning of this sentence, the wording was changed to the following:

“Thus, a natural step would be to investigate the feasibility of a community-based self-collection HPV testing program, where women receive swabs and collect samples at homes and then samples are transferred to labs for testing.”

• Regarding the mention of US and UK guidelines in the Introduction – this seems a bit far afield. The previous comment regarding HPV primary screening guidelines was just referring to the fact that there was phrasing to indicate that HPV primary screening is "beginning to gain traction," which seems an understatement given that it has already been added to screening guidelines in numerous HIC. I don't think this manuscript needs to get into specifics about the FOCAL trial and specific country guidelines – I think it is sufficient to say that HPV primary screening has been demonstrated to be more sensitive/efficacious than cytology, VIA, etc. (could cite India study by Sankaranarayanan and colleagues, as this demonstrates reduction in advanced cervical cancers and deaths in a LMIC).

Thank you for the clarification. We thought that the comment was suggesting an overstatement, and so wanted to provide more evidence to support our claim. We have reduced the paragraph to now read:

"HPV testing has been shown to be a valid cervical cancer screening modality, and some countries are now recommending it as a primary form of screening.[6,15] In particular, studies have shown that the use of primary HPV testing, as compared to cytology alone, significantly lowers the likelihood of the development of precancerous lesions among women undergoing cervical cancer screening, due to increased sensitivity and specificity of cytology testing when restricted to only those women who test positive for HPV.[16]"

• The paper conclusions state that "self-collection has the potential to replace our current methods for cervical cancer screening." However, the response to reviewers highlights that "even in settings where current screening levels are acceptable, HPV self-sampling could serve as an additional tool to reduce disparities in access…" It is important to indicate not only the potential for replacement (as in the Conclusion), but for complementarity in HPV-based approaches – depending on the population, self-sampling could be the primary screening program for all, or it could focus on underscreened populations.

We agree and have reworded that sentence to read:

"Due to the simplicity of testing and the sensitivity of the assay, HPV self-collection sampling has the potential to improve screening across many different populations, complementing, or even replacing in some settings, current approaches for cervical cancer screening."

VERSION 3 – REVIEW

REVIEWER	Nicole Gastineau Campos Harvard T.H. Chan School of Public Health, USA
REVIEW RETURNED	02-Oct-2019

GENERAL COMMENTS	Thank you for revising the manuscript. This revision represents thorough consideration of the reviewer comments.