Author's response to reviews

Title: Development and promotion of a national website to improve dissemination of information related to the prevention of mother-to-child HIV transmission (PMTCT) in Tanzania

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Author's response to reviews: see over
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Version: 4 Date: August 13, 2015

Author's response to reviews: see over
Thank you for your consideration of manuscript #8199096001373196. We have revised the manuscript to respond to each reviewer’s comments, as detailed below. To address comments by Reviewer 2, we expanded the time frame for website evaluation to a 2 year period from July 2013 through June 2015 and provided additional Google Analytics statistics about website use and users. With this change, some content has been reorganized and the results and discussion have been separated into 2 sections. We have also copyedited the manuscript, as suggested. Because the manuscript has been submitted as a research article about a website, and is not specific to software or a computer program, the section about Availability and Requirements at the end of the manuscript text has been deleted.

**Reviewer 1:** Anna Gamell

**Reviewer’s report:**
Reviewer’s report: I congratulate the authors for a very well written article. Moreover, as a user of the website, I believe it is worthy to share the experience of developing such resource.

Minor essential revisions:
- Background, 4th paragraph: mention when the MOHSW, NACP and RCH websites were developed.
  
  Although we were unable to identify specific dates for each site, we added the following information on page 5 to provide an overview of the content for these websites and general time frame for the NACP and RCH websites.

  “The MOHSW website ([http://www.moh.go.tz](http://www.moh.go.tz)) addresses a broad range of information and resources about national health and social welfare policies. The National AIDS Control Programme (NACP) website ([http://www.nacp.go.tz](http://www.nacp.go.tz)) was launched in 2006 to share materials related to HIV and sexually transmitted infections (STIs). The Reproductive and Child Health Section (RCHS) website ([http://www.rchs.go.tz/index.php/en](http://www.rchs.go.tz/index.php/en)), which was launched after the PMTCT NRC, focuses on comprehensive reproductive and child health services.
- **Methods, Promotion of the website section:** briefly explain what are the “Health Science Institutes” (public? Private? NGOs?)

  We added a description to clarify the meaning of Health Science Institutes on page 8.

  Promotional materials were also distributed to Health Sciences Institutes—public and private learning institutions for medicine, nursing and other allied health disciplines.

- **Results and Discussion, 2nd paragraph:**
  o Very briefly explain what are “returning visitors”

    We have added an explanation of returning visitors on page 9.

    Almost one-third (30%) of visits were from returning visitors, i.e., individuals who had been on the site previously.

  o “58% of the visitors came from Tanzania”. Is this figure what you expected? I would expect most users to come from Tanzania, since the website is targeting health workers in Tanzania. Who do you think is visiting the website from outside Tanzania?

    PMTCT-related key words used on http://pmtct.or.tz are tagged. Therefore, when anyone searches for these key words on their web browser, search results will include the PMTCT NRC website. The majority (64%) of website visitors are from online search engines, so we expect a proportion of visitors may be from other parts of the world in addition to Tanzania. On page 9, we added the following description, which has been expanded to include statistics from the first two years of the site.

    From July 2013 through June 2015, 50% of website visits originated in Tanzania, with about two-thirds (62%) from Dar es Salaam, which is mostly an urban area. About one-third (32%) of Tanzania visits came from unspecified locations, and there were small numbers from Arusha, Mwanza and Zanzibar, which is consistent with limited internet access outside of urban centers. Visits that originated outside of Tanzania reflect regional interest by users in other African countries (16%), Europe (10%), the United States (9%), India and Indonesia (6%) and others (9%).

- **Results and discussion, 7th paragraph:** when you explain Figure 3 you do not mention the 6% of “October campaign.

  Because have updated the manuscript to include 2 years of Google Analytics data, Figure 3 no longer includes a category for the 6% of website traffic from the October 2013 promotional campaign. Instead we have described the overall proportion of users that accessed the site via social media in the last paragraph of the results section on page 11.

  Social media and listserv emails have played a small but important role in promoting use of the PMTCT NRC website, accounting for 2% of website visitors.

- **Results and conclusions, 9th paragraph:** The sentence “The MOHSW has reported it
now refers people who are looking for PMTCT information to the PMTCT NRC website" is not clear to me, I do not understand it. I suggest rephrasing it.

We have rephrased this sentence in the last paragraph on page 13 as follows:

A link to the PMTCT NRC is featured on the MOHSW home page, and MOHSW personnel direct individuals to the PMTCT NRC website in response to requests for resources and information about PMTCT.

- Results and conclusions, 11th paragraph: If it is possible, it would be very valuable to include data about the percentage of users from rural settings in Tanzania.

Because our Google Analytics software does not capture information about rural vs. urban settings, we have not been able to add information about the percentage of users from rural settings. However, as described in our response to a previous comment, we have added some information about users by region in Tanzania on page 9.

From July 2013 through June 2015, 50% of website visits originated in Tanzania, with about two-thirds (62%) from Dar es Salaam, which is mostly an urban area. About one-third (32%) of Tanzania visits came from unspecified locations, and there were small numbers from Arusha, Mwanza and Zanzibar, which is consistent with limited internet access outside of urban centers. Visits that originated outside of Tanzania reflect regional interest by users in other African countries (16%), Europe (10%), the United States (9%), India and Indonesia (6%) and others (9%).

- Tables: it is always good that tables are self-explanatory. In these regards, I suggest to add the meaning of any abbreviation used in a table in the bottom.

We have removed non-essential abbreviations and have defined PMTCT NRC in the table legend and one acronym in a footnote to Table 1.

Discretionary revisions:
- Background section, 3rd paragraph: consider mentioning that after WHO included Option B+ as a PMTCT in 2012, in the WHO Antiretroviral guidelines Option B+ is the recommended option.

We revised the 1st paragraph under the subheading Rationale for the development of the Tanzania PMTCT NRC on page 3 to address this suggestion.

In 2012, the World Health Organization (WHO) updated its PMTCT guidelines to include Option B+—a single, universal antiretroviral regimen for PMTCT and HIV treatment—and in 2013 established Option B+ as the recommended option in the WHO Consolidated guidelines on the use of antiretroviral drugs for treating and preventing HIV infection [18].

Minor issues not for publication:
- Abstract:
  o Line 21: add “the” before “development, promotion and initial...”
Done, now line 20

- Line 22: delete “the” before “prevention of mother-to-child...”
  Done

- Background, 3rd paragraph: consider starting “Prevention of perinatal HIV transmission” instead of “Perinatal HIV prevention...”
  Done

**Level of interest:** An article whose findings are important to those with closely related research interests

**Quality of written English:** Acceptable

**Statistical review:** No, the manuscript does not need to be seen by a statistician.

**Declaration of competing interests:**
I declare that I have no competing interests
Reviewer's report

Title: Development and promotion of a national website to improve dissemination of information related to the prevention of mother-to-child HIV transmission (PMTCT) in Tanzania

Version: 3
Date: 5 April 2015

Reviewer: Jessica Rodrigues

Reviewer's report:
Overall, this article is well-written and provides interesting information on electronic dissemination of health information in a resource-limited setting, which is a topic of increasing interest given the move toward web-based platforms for knowledge dissemination and exchange. It is challenging to demonstrate the long-term outcomes associated with website development and its impact on improving knowledge, access to information and hopefully, clinical practice and this article does a good job at addressing this. The background section, how this fits into the wider context of internet usage in Tanzania and the discussion section are strong. However, the findings and results could be more in-depth and robust in order to improve the quality and relevance of the article and to substantiate the conclusions.

Major Compulsory Revision
• Include more GA statistics on usership to increase robustness of including: number of users at different time points, 1st year v. 2nd year or change in # of users every 6 mos; bounce rates, the profile of users and geographic location within Tanzania urban v. rural areas, etc., which would more convincingly demonstrate the reach of the website and its importance in increase access to information. In many countries dissemination of guidelines in rural areas lags behind dissemination and uptake in urban/peri-urban areas.

We have extended the time frame for evaluation from 8 months to 2 years after the launch of the website and have created separate sections for Results and Discussion to clearly present additional evaluation data. The entire results section (pages 9-11) has been revised in accordance with this change and Figure 2 has been revised to show 2 years. Six-month interval summaries for added Google Analytic statistics are presented in a new Table 2 (Table 2) and in the text; the original Table 2 was deleted as suggested in a later comment. Because the entire results section has been changed, it is not shown here in its entirety, but we have included an excerpts from pages 9-10 below to illustrate the change. This includes quantification and discussion of change and the addition of more detailed, albeit limited, information about the geographic location of users within Tanzania.

After website launch in July 2013, Google Analytics reports showed an increase in visits over the first year that paralleled implementation of promotional activities. Monthly visits spiked by about 70% during October 2013 and January 2014 in response to the release and promotion of online access to the revised national PMTCT guidelines and training package for Option B+, respectively (Figure 2). Six-month interval usage
statistics, summarized in Table 2, indicate that visits increased by 80% to a peak of 8,384 visits during the second 6 months of year 1, then declined by 9-11% but remained fairly stable in year 2, for a total of 28,400 website visits over 2 years. Almost one-third (30%) of visits were from returning visitors, i.e., individuals who had been on the site previously.

From July 2013 through June 2015, 50% of website visits originated in Tanzania, with about two-thirds (62%) from Dar es Salaam, which is mostly an urban area. About one-third (32%) of Tanzania visits came from unspecified locations, and there were small numbers from Arusha, Mwanza and Zanzibar, which is consistent with limited internet access outside of urban centers. Visits that originated outside of Tanzania reflect regional interest by users in other African countries (16%), Europe (10%), the United States (9%), India and Indonesia (6%) and others (9%).

Overall, there 28,400 visits with 66,463 page views of the website over 2 years. The bounce rate, which indicates the percentage of single page sessions, ranged from 48-56% (see Table 2). Visitors who viewed more than one page, viewed an average of 4 pages/visit during year 1 and 3 pages/visit during year 2. The Swahili version of the website received only 1,218 page views. Visit duration averaged 3.15 minutes overall, but did decrease from year 1 to year 2 (see Table 2). However, visit duration may be unreliable as it includes visitors who stopped website activities but didn’t close their browser window.

• Suggest referencing more articles and abstracts that have been written on similar topics – global websites on PMTCT for example.

We did not identify additional articles about global websites on PMTCT and believe the current reference list addresses key issues. We also hesitated to add non-essential references since added evaluation data increased the length of the text. However, we did add a recent study about HIV and infant feeding to the discussion, in the sentence that at the end of page 12 to the top of page 13.

A recent study reported sub-optimal and outdated knowledge about the recommended antiretroviral regimens for PMTCT among healthcare workers in Tanzania [20—Gamell et al. 2013] and another identified gaps related to dissemination of guidelines about HIV and infant feeding [21—Shayo et al, 2014].

• Line 26-34 Methods section:
• Focus more on how the website was evaluated and not only a description of how it was created. The development and functioning of websites is usually quite similar and the more interesting and important aspects of the article are the results and uptake of information.

These lines refer to the methods section of the abstract. We have provided a clearer statement about evaluation and the use Google analytics in the abstract and in the Methods section of the text in accordance with the inclusion of expanded results, as described above.
In the abstract (Lines 30-32)
Website implementation, access and performance were evaluated over two years using Google Analytics data about visits, page views, downloads, bounce rates and location of visitors, supplemented by anecdotal feedback.

Under Methods, subheading: Development and evaluation of the PMTCT National Resource Center (NRC) website (Lines 138-141)
Website implementation, access and performance were evaluated from July 2013 through June 2015 using Google Analytics data about key indicators such as visits, page views, downloads, bounce rates and location of visitors, supplemented by anecdotal feedback.

• Lines 106-107: Include information and statistics that compare usage and usership of the PMTCT website to other websites managed and developed by the MOHSW of Tanzania to demonstrate its added value. These data could also be included in the results section as well.

FXBT Health hosts, manages, and updates the PMTCT NRC website for the MOHSW, but does not have access to Google Analytics data for other MOHSW websites and was not able to obtain data for comparison. Without access to Google Analytics, we did not include a comparison due to differing time frames and purposes of the websites. However, we added a Background section subheading on page 4—Rationale for the development of the Tanzania PMTCT NRC on page 4—and a description of the roles of MOHSW websites on pages 5-6, as shown below.

In anticipation of the release of the 2013 Tanzania National Guidelines for Comprehensive Care Services for PMTCT and Keeping Mothers Alive (Option B+) and the National Training Refresher Package PMTCT Manuals (Option B+), a decision was made to create a user friendly, PMTCT-focused website that would support the dissemination of PMTCT resources and information and complement existing or planned websites. The MOHSW website (http://www.moh.go.tz) addresses a broad range of information and resources about national health and social welfare policies. The National AIDS Control Programme (NACP) website (http://www.nacp.go.tz) was launched in 2006 to share materials related to HIV and sexually transmitted infections (STIs). The Reproductive and Child Health Section (RCHS) website (http://www.rchs.go.tz/index.php/en), which was launched after the PMTCT NRC, focuses on comprehensive reproductive and child health services.

• Line 39 – include quantifier to show that website visits have increased over time

The results section of the abstract has been revised as described below. This issue has also been addressed in the results section of the manuscript as described above.

Following its launch in July 2013, the PMTCT NRC website received a total of 28,400 visits, with 66,463 page views, over 2 years; 30% of visits were from returning visitors.
During year 1, visits increased by 80% from the first to second 6 month period and then declined slightly (9-11%) but remained stable in Year 2. Monthly visits spiked by about 70% during October 2013 and January 2014 in response to the release and promotion of revised national PMTCT guidelines and training manuals.

- Line 187: Also include data on the number of downloads for other key resources on the website in addition to the PMTCT guidelines.

Data about the number of downloads for other key resources are now presented in Table 2. This includes PMTCT guidelines, pocket guide and training package and the national HIV guidelines. Downloads are describe in the second paragraph on page 10, lines 202-211.

There were a total of 9,322 downloads from the site; large documents are available in sections to facilitate access. As shown in Table 2, total downloads doubled in the second half of year 1 following release of Option B+ resources and dropped by 22% in year 2. Downloads of the national PMTCT guidelines and other PMTCT-specific resources show a similar pattern. Tanzania National Guidelines for the Management of HIV and AIDS downloads now exceed those of PMTCT resources and have remained steady in year 2. Other downloaded resources not listed in the table include smaller sections of the guidelines and training manuals, participant manual for the PMTCT Option B+ Refresher Training Manual, the PMTCT wall chart and dosing chart, national PMTCT indicators, patient record form, etc.

- Include data on the # of followers on Twitter and Facebook, number of messages and/or posts; proportion of followers that are health workers v. other categories of individuals. Elaborate on how the social media strategy has complemented other efforts at publicizing the website.

We added data on PMTCT NRC website Facebook likes and Twitter followers in the second paragraph on page 11. The text does discuss how social media strategy assisted in the initial efforts to promote the website and newly released PMTCT resources. We were not able to include additional information about the social media strategy indicators at this time. We have included information about how users access the site on pages 10-11, see below.

Figure 3 shows the distribution traffic to the site and provides insights about the effectiveness of promotional strategies. About 20% of visitors (n=5,845) came directly to the website, which indicate that they typed the website URL directly in their browsers or had it bookmarked. The website URL was included on distributed promotional materials, e.g., post cards, posters, pens and bags. Direct traffic can be used as a proxy indicator about the success of offline website marketing strategies. Twelve percent of traffic came from referrals. This group includes visitors who were referred to the PMTCT NRC website through an inbound link from other websites, e.g., websites of the MOHSW, PMTCT partners, universities and other organizations. Referral traffic shows that crosslinking played a definite role in directing visitors to the PMTCT NRC website.
However, the majority (64%) of visitors (n=18,066) accessed the website through an organic search, indicating that it was listed on results generated in response to a topic search—commonly through the Google search engine. The PMTCT NRC website is listed first when searching for Tanzania PMTCT on various search engines. This observation demonstrates that the website is well constructed and can be located effectively.

Social media and listserv emails have played a small but important role in promoting use of the PMTCT NRC website, accounting for 2% (n=486) of website visitors. The PMTCT website Facebook page has received 238 likes, and website has 94 followers on Twitter, indicators showing that people are interested and are following posted PMTCT updates. As noted previously, following the launch of a social media campaign on Facebook and Twitter and listserv emails in October 2013 to promote the updated national PMTCT guidelines, there was 70% increase in website traffic and the number of resources downloaded increased almost four-fold compared to the previous month (Figure 2).

- Suggest revising some of the claims in the article if there is no evidence on actual application of the information that was accessed on the website. For example, is there evidence on how the knowledge was put into practice? If not, it is difficult to make strong statements that are included in the article.

    At this point, we don’t have data about the impact of the website on whether and how PMTCT knowledge was put into practice. Therefore we have reviewed and revised wording to avoid overly strong statements.

Abstract, Conclusions.
The successfully implemented PMTCT NRC website provides centralized, easily accessed information designed to address the needs of clinicians, educators and program partners in Tanzania. Ongoing involvement of the MOHSW and key stakeholders are essential ensure the website’s growth, effectiveness and sustainability. Additional efforts are needed to expand use of the PMTCT NRC throughout the country. Future evaluations should examine the role of the website in supporting implementation of national PMTCT guidelines and services in Tanzania.

Text top of page 13
The online PMTCT NRC provides an opportunity to address knowledge deficits by making national PMTCT guidelines and other resources, such as PMTCT training curricula and job aids, more readily available to healthcare workers and health educators. Increasing information access is an important step in improving the implementation and quality of PMTCT services. FXBT Health has begun to include questions about awareness of and access to the website and ability to download resources as part of site visits to PMTCT clinical sites, information that will be useful going forward. Freely available Google Analytics software has been a useful tool in monitoring and evaluating the website. However, other approaches are needed to assess and improve the outcomes and impact of the website, such as focus group discussions, key informant interviews, or surveys of prospective and current users.
• Are there any quotes about the website that could show the positive feedback from stakeholders and users? Consider waiting for more specific qualitative feedback obtained via interviews to include in the article prior to publishing.

  Qualitative feedback was obtained from key constituents and acted on during the website development and piloting. We have added one comment sent through the feedback link available on the website in the second paragraph on page 12. Allocated resources are needed for expanded evaluation, including systematic qualitative feedback. Publication of this initial evaluation may provide the impetus for additional evaluation activities to support the growth and impact of the PMTCT NRC.

  One user commented that “the website is good—updated with current peer reviewed articles and guidelines” but suggested adding more information about the current PMTCT situation in Tanzania, including annual data and trends over time.

Discretionary Revisions
• Table 1 and Table 2 do not add much to the article. However, strongly recommend addressing the output/outcomes in the article itself. There was not much evidence in the article that shows how the website has achieved the intended outcomes – such as improving communication and increased knowledge among health workers or policymakers.

  We do believe it is important to report about the process of developing a website through government / partner collaborations to address public health issues like PMTCT and to learn about promoting and supporting internet access to information in countries that are just developing online communication technologies through the Internet. Therefore, we have retained Table 1. As suggested, Table 2 has been deleted. The added Google Analytics statistics and extension of the observation period to two years has strengthened our ability to evaluate the development, promotion and access to the PMTCT NRC website and its resources. However, the current data are not adequate to show results about specific outcomes in the practice setting, such as increased knowledge.

• Lines 11 to 116 – Why was the decision to create a separate PMTCT website that was not part of the broader MOHSW website or upgrade existing website to include functions such as a search capacity etc.? One could argue that this may make it more challenging to access information if you have to visit multiple websites.

  We have added a description of the rationale for creating PMTCT website in the manuscript in the last paragraph of the background on page 6. See previous response to reviewer comment regarding original lines 106-107.

  The MOHSW website (http://www.moh.go.tz) addresses a broad range of information and resources about national health and social welfare policies. The National AIDS Control Programme (NACP) website (http://www.nACP.go.tz) was launched in 2006 to share materials related to HIV and sexually transmitted infections (STIs). The Reproductive and Child Health Section (RCHS) website
(http://www.rchs.go.tz/index.php/en), which was launched after the PMTCT NRC, focuses on comprehensive reproductive and child health services. However, these websites address multiple topics and were not designed to provide comprehensive information and resources on PMTCT. In addition, they have limited search capacity, requiring users to browse the site to locate PMTCT specific materials. It can also be challenging for large, governmental websites to keep pace with frequent changes in a single topic area, such as PMTCT. These issues contributed to the recognized need for a centralized, online information repository for PMTCT-related news, resources, best practices, reports and publications.

• Line 163-168 – is there any information on how the website contributed to health worker knowledge of Option B+ recommendations? Or create more awareness among the civil society or the average person in TZ?
  
The current data on the PMTCT website usage does not provide information about knowledge and awareness of Option B+ among healthcare workers or others but future work is needed to address this as noted in the concluding sentence of the manuscript on page 15.

  Future evaluations should address the role and impact of the website in improving knowledge about PMTCT and supporting implementation of national PMTCT guidelines and services.

• Strongly suggest waiting more time to assess the impact of the website. 1.5 years is not a long time to evaluate a website and more qualitative data would strengthen the evidence and support the conclusions in the article.
  
  As noted previously we have extended the period of evaluation about website usage from 8 months to 2 years. Additional resources would be needed to obtain more qualitative data about the website. This point is made at the end of the first paragraph on page 13.

  However, other approaches are needed to assess and improve the outcomes and impact of the website, such as focus group discussions, key informant interviews, or surveys of prospective and current users.

• Figures included in the article could be more nuanced, compare website to social media and overall improve the appearance.
  
  We have redone existing figures to improve their appearance and to fit with the expanded time frame of evaluation data (Figures 2 and 3).

• Consider discussing in conclusion how the website maintained and will be sustained by the MOHSW over time.
  
  We added and clarified information about how the website will be sustained by the MOHSW at the end of page 13, beginning of page 14.
The PMTCT NRC website belongs to the MOHSW but is hosted, managed and updated by FXBT Health, a PMTCT technical assistance partner. It is imperative that key PMTCT stakeholders take ownership of the website in order to increase its credibility and ensure its sustainability over time. PMTCT partners in Tanzania have demonstrated their ownership of and commitment to the website by contributing resources based on their work in different regions and by providing feedback about the website.

**Level of interest:** An article whose findings are important to those with closely related research interests

**Quality of written English:** Needs some language corrections before being published

As suggested, we have copyedited the manuscript to improve written English.

**Statistical review:** No, the manuscript does not need to be seen by a statistician.

**Declaration of competing interests:**

No.