Author’s response to reviews

Title: Socio-cultural and individual determinants for motivation of sexual and reproductive health workers in Papua New Guinea and their implications for male circumcision as an HIV prevention strategy

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Author’s response to reviews: see over
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Editor, Human Resources for Health

RE: MS: 1806702104785757  Socio-cultural and individual determinants for motivation of sexual and reproductive health workers in Papua New Guinea and their implications for male circumcision as an HIV prevention strategy. Anna Tynan, Andrew Vallely, Angela Kelly, Martha Kupul, James Neo, Richard Naketrumb, Herick Aeno, Greg Law, John Millan, Peter Siba, John Kaldor and Peter S

Dear Human Resource for Health Editorial Team,

We appreciate having the opportunity to review our manuscript and re-submit. Please find enclosed a copy of the above manuscript, which now incorporates major revisions according to the comments from the 3 reviewers. Responses to specific comments are provided below. Changes to text are indicated, with additional text underlined. Many thanks also to all reviewers for the feedback that was provided. Significant changes have been made as a result.

Yours Sincerely

Anna Tynan
(Corresponding Author)
Reviewer: Emily Evens

Major Compulsory Revisions

1. Very interesting research question; I have not read much on the motivation of health workers in the HIV field. However, while the study results are interesting they are not sufficiently connected to MC provision. More details on the role of HW in MC provision in other settings or in HIV prevention programs within PNG is needed. Also, some discussion of how MC may be provided in PNG and how HWs would contribute to MC programs is needed if the focus of the study is to remain on HW motivation for MC provision. The results need to be placed within the service delivery context more deeply.

Thank-you for your feedback and encouragement, we do really appreciate the time you have put in to giving such constructive feedback. We have now reviewed the paper to ensure that the focus on implication for a MC program is clear. The background and discussion in particular have been restructured. The following has been added to the background section to discuss the issues which you raise.

Health worker motivation in the context of HIV: Implications for a MC program in PNG

The motivation of HWs can potentially affect the provision of health services and according to the World Health Report 2006, a capable and motivated health workforce is required to achieve any of the Millennium Development Goals (MDGs), including universal access to HIV prevention and treatment [22-25]. In the context of HIV, HW motivation to engage in HIV services are influenced by HIV related challenges including the additional strain on health service provision due to the burden of the epidemic in some regions; fears of infection; and discriminatory attitude among HWs towards HIV due to dealing with matters pertaining to sexual behaviours [15, 26, 27]. Health worker motivation may also be influenced by the disproportionate funding, resourcing, infrastructure and historical focus that has been described in some contexts [28]. Motivation of HWs in developing countries to engage in recently introduced programs and practices has also been highlighted in the literature to be an important component of program success [29, 30]. Given the complexity of rolling out adult MC programs that has already been described in Africa, understanding HW motivation in the context of sexual reproductive health services and application to MC program roll out is important for policy development.

Effective engagement of human resources has been a widely discussed topic in the implantation of a MC program in African countries [31-33]. Significant numbers of clinicians, counsellors, and support staff are needed to implement even a modest program, given the relative technical difficulty of the surgery compared to other prevention programs such as immunization [34, 35]. In some African countries task shifting, or the delegation of surgical steps to a trained non-physician clinician such as a nurse or clinical officer, has been utilised to greatly expand the size of the workforce available; whilst in other countries non-physicians are restricted from performing MC due to the countries’ regulatory and legal frameworks [34]. Previous research in PNG has shown that non-physician clinicians including community health workers have been called upon to implement no-scalpel vasectomy (NSV) programs and may be considered for a MC program [36]. Suggested roll out strategies for a MC program that may be relevant to PNG include integrating the program into exiting services or setting up centres of excellence based in
regional areas with satellite clinics attached [37]. Whatever the decision, understanding how HWs are likely to engage in the MC program should the government of PNG decide to proceed with such a policy in the future is important, particularly as evidence also exists of all levels of HWs being involved in penile foreskin cutting activities in PNG [7, 9, 38].

Previous research has highlighted the complex and diverse nature of penile cutting practices in PNG [6, 7, 10]. Penile foreskin cutting practices have been described to include traditional practices that are embedded in customary rituals; contemporary practices that are not associated with customary observations but are an outcome of the influence of peers and the socio-cultural environment; and medical male circumcision [6-8]. Adult penile foreskin cutting appears to be common in many parts of PNG within various socio-cultural contexts, and men from a variety of different settings in PNG have been shown to be notionally supportive of MC for HIV prevention [6-8]. A survey among 869 men in National Capital District (NCD), Madang Province, Enga Province, and Oro Province found that 47% had a longitudinal cut or dorsal slit (foreskin cut but not removed), and 10% a circumferential cut (complete removal of foreskin) [39]. Health workers have been described to be involved in management of complications following penile cuts completed by non-health workers and the unauthorised involvement of health workers in penile cutting activities in various contemporary and cultural penile cutting activities [7, 9]. Other research has also shown that of the 396 men reporting a longitudinal foreskin incision, 15% advised that it had been completed by a PNG HW outside of any formal health program [40]. With this in mind, there is likely to be a number of different challenges across PNG in the implementation and sustainability of a MC program and specific understanding about motivation for HWs to engage in sexual and reproductive health programs and how this may impact the delivery of a MC program in PNG is essential.

2. Methods, 2nd paragraph. Clarify which methods were used in which phase. This has now been reviewed and adjusted as follows:

The data collection was completed over 2 phases from 2009 until 2011. Phase 1 fieldwork provided the initial grounding for developing key themes and included in-depth interviews (IDIs), focus group discussions (FGD) and unstructured observations of health facilities. In phase 2 further fieldwork was completed to review these themes and expand on earlier findings using Data was collected through in-depth interviews (IDIs), focus group discussions (FGD) and field notes of unstructured observations of health facilities. IDIs, FGDs and observations were conducted by trained fieldworkers in both phases. IDIs and FGDS were digitally recorded, transcribed and translated into English, where necessary.

3. Methods, 2nd paragraph. What were the issues or domains discussed during interviews and focus groups? Please discuss briefly.

Following the comment, further revision of methods section has been completed to facilitate further clarity about the interview guides.

Phase 1 interview guides were developed following extensive literature review and discussions amongst the research team and followed a number of research themes including nature of work, feelings about work and work environment, reasons for being involved in work, strengths and
limitations about current work and perception about the implementation of a MC program for HIV prevention, capacity of the facility to undertake a medical MC program. Following the emergence of themes in phase 1, further questioning was incorporated in phase 2 to examine perception of service being delivered and, experience and feelings towards working in the sexual and reproductive health field. The interview guides were revised on an ongoing basis during both phases to elicit more focused responses from participants and to accommodate themes that emerged in the early stages of data analysis. IDIs and FGDs were completed in TokPisin (a lingua franca of PNG) or English by trained fieldworkers in both phases. IDIs and FGDS were digitally recorded, transcribed verbatim and translated into English, where necessary by a team of 6 researchers.

4. Methods, 4th paragraph. How many interviews and FGDs were conducted with each participant group? I see this in the results section but it should be included in methods. A table might be a good way to summarize data collection by type, population and study phase.

As per recommendation, we have moved the number of interviews and FGDs to be under the methods section. Another table has also been developed that shows number of interviews, by type and stage.

One FGD and Twenty – nine 29 IDIs were conducted with 29 frontline HWs in the five provinces over both phases (Table 1). One FGD was completed with three HWs due to limitation of time of the participants to complete individual interviews and suggestion by other key informants that they would offer important insight into the research question. (NC=14, ESP=4, EHP=5, MDGP=1, WNB=5; Figure 2). In phase 1, a total of 13 frontline health workers participated in the interviews. In phase 2, another 19 interviews were completed with 3 key frontline HWs re-interviewed due to them being active leaders in the area of sexual and reproductive health and their ability provide additional insight into service changes since phase 1. In total, 17 men and 12 women took part with distribution of participants across health care profession and gender listed in Table 2. Most participants had been working in their profession for over 5 years (Table 3). A total of 16 health facilities were represented, including provincial hospitals, outpatient clinics and rural health centers (Table 4).

<table>
<thead>
<tr>
<th>Table 1: Data collection by study phase, type and province</th>
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<tr>
<td>Stage 1</td>
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<tr>
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</tr>
<tr>
<td>West New Britain</td>
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<tr>
<td>Eastern Highlands</td>
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<td>National Capital District</td>
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<td><strong>Total</strong></td>
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b) Also, generally a minimum of 2 FGDs are necessary to examine group norms
The focus group discussion was completed due to these health workers having limited time to be involved in individual interviews. The FGD was small, consisting of three female nurses. Details about the reason to include only 1 FGD has been included in text as indicated above.

c) What language were interviews conducted in?
Information about what language the interviews were conducted in have now been included in paragraph 3 of the methods section as suggested

IDIs and FGDs were completed in TokPisin (a lingua franca of PNG) or English by trained fieldworkers in both phases. IDIs and FGDS were digitally recorded, transcribed verbatim and translated into English, where necessary by a team of 6 researchers.

4 Methods, 5th paragraph. Were any inter-coder reliability statistics calculated? Was each transcript coded by one or more people?

Each transcript was coded by two people with a third person reviewing if there were any discrepancies. No inter-coder reliability statistics were calculated. Paragraph 5 of the methods section has been updated accordingly.

Qualitative thematic analysis of the transcripts and field notes was undertaken using social constructivist approach. This approach is considered particularly suitable for applied qualitative research in health care settings [22, 60]. Transcribed and translated interviews were read several times for familiarisation [27]. A codebook was developed and all interviews were double coded. In cases of discrepancy in coding a third researcher coded the selected text in question. The phase 1 interviews were analysed by three in country researchers at PNG Institute of Medical Research (IMR) in Goroka with key themes and findings influencing the progression of analysis in phase 2. In phase 2, the first author subjected all data to further thematic analysis, organising data around the main themes of the framework developed by Franco, Bennet and Kanfer (2002; Figure 1), and entered into the qualitative software program MAXQDA (VERBI software GmbH, Germany). Qualitative data analysis focused on comparing and contrasting specific themes as they occurred in each interview on the meanings and experience of working as a HW in sexual and reproductive health services in PNG. The final coding was reviewed by the in country researchers and emerging themes were discussed with all authors and adjusted where appropriate.

Minor Essential Revisions

1. Abstract, Background, 2nd sentence. PNG should be spelled out as Papua New Guinea at first use.
   - This has been adjusted as suggested

2. Abstract, Background, 2nd sentence. Awkward wording—“motivation and actions of health workers mobilization of sexual and reproductive health services”. Workers do not mobilize services they mobilize users or mobilize for services. This is an issue throughout the paper.
This has been reviewed as suggested and updated as follows:

How the socio-cultural context of Papua New Guinea (PNG) affects the values, motivation and actions of health workers (HWs) involved in mobilization of sexual and reproductive health services is important for policy development and program planning.

This issue has also been reviewed throughout the paper and adjusted accordingly.

3. **Abstract, Methods, 1st sentence.** Mixed methods usually refers to both qualitative and quantitative research methods.
   - Mixed method has been replaced with multi-method qualitative study

4. **Abstract, Results and Discussion, 1st sentence.** Initial use of the term “HW motivation” is unclear—motivation to do what? Provide services? Also needed in the background section.

This has now been reviewed and adjusted as suggested:

| Social-cultural and individual factors influencing HW motivation to be involved in sexual and reproductive health services included community expectation, concern for community, their sense of accomplishment and commitment to service. |
| Successful mobilization of sexual and reproductive health services requires a strong commitment from key HWs. The potential contribution to the success of a MC program that health workers may have means that taking into account the differing needs of communities as well as the motivational influences on HWs that exist within the socio-cultural environment is important. This research highlighted some of the individual determinants of HWs to be involved in understanding the determinants of HW motivation in the context of delivering sexual and reproductive health services in PNG as well as the potential impact this may have on delivering a service that already has significant demand in some communities. These findings will assist not only in program planning for MC, but also in informing the effectiveness expansion of other existing sexual and reproductive health services. |

5. **Abstract, Conclusions, 1st sentence.** The evidence for the statement that successful mobilization of services (again—how do you mobilize a service?) required commitment from HWs is missing. While this intuitively is true, the results do not seem to provide evidence supporting this but instead seem to point more toward the potential contribution of HWs and not what is required for successful provision of services.

6. **Background, throughout.** Can you give a sense of what types of providers are included under HWs? Physicians? Nurses? Extension workers?

Further clarification on the focus of which type of providers has been added to the background in the second paragraph as follows:
The purpose of this paper is to identify the socio-cultural and individual factors that motivate frontline HWs, including medical doctors, nursing officers, community health workers, health extension officers, counsellors and other fieldworkers, to become active participants in improving sexual and reproductive health outcomes in their communities.

7. Background, overall. Is there any evidence on how the motivation of HWs can contribute positively or negatively to the success of an HIV intervention or programme?
This has now been reviewed and adjusted accordingly with the inclusion of this section (which was also described under point 1 of suggested major revisions:

Health worker motivation in the context of HIV: Implications for a MC program in PNG

8. Background, 1st paragraph. The statement that the epidemic is progressing less rapidly than feared seems out of place.

Adjusted as suggested:

There has been interest in aligning MC with other HIV intervention programs in Papua New Guinea (PNG), a country of significant geographical, linguistic and cultural diversity where different forms of penile cutting appear to be common in some communities [6-10]. PNG has amongst the highest HIV prevalences in the Asia Pacific Region and the epidemic is primarily linked to heterosexual transmission exhibiting substantial geographic heterogeneity, with cases clustered in a number of key provinces [11-16]. A country-specific mathematical model suggests that MC could have a significant impact on the HIV epidemic in PNG but that increasing condom use and early initiation of antiretroviral therapy could potentially have a greater impact [11]. However, recent national adult prevalence estimates suggest that the epidemic may be progressing less rapidly than previously feared [13, 14]. There has been interest in aligning MC with other HIV intervention programs in PNG, a country of significant geographical, linguistic and cultural diversity where different forms of penile cutting appear to be common in some


As recommended this has been reviewed to increase clarity.

This research forms a component of a wider multi-disciplinary, community-based research program to investigate the acceptability, epidemiological impact, cost-effectiveness and potential service delivery models for programme implementation of MC in PNG, commonly referred to as the Male Circumcision Acceptability and Impact Study (MCAIS).

10. Background, 3rd paragraph, 1st sentence. Are you only talking about HWs willingness to apply themselves? What about their ability to be successful?

This has been adjusted as suggested

Health worker motivation is complex and there are multiple factors that influence health workers’ willingness to apply themselves to their tasks and be successful in delivering health services [23-25].

11. Background, 4th paragraph, 1st sentence. Correct grammar: factors have an effect; they do not “impact on”.

Adjusted as suggested:
Organisational factors thought to have an impact on motivation include resource availability; organisational structures and culture; efficiency of process; and human resource management practice[23].

Adjusted as suggested

13. Background, 4th paragraph, 2nd sentence. Missing word: “To have an impact on”.
Adjusted as suggested.

14. Background, 5th paragraph, 1st sentence. Need space before citation.
Adjusted as suggested.

15. Background, 7th paragraph, 1st sentence. Add word: “…population belonging to a Christian denomination”
Adjusted as suggested

16. Background, 7th paragraph, 2nd sentence. Confusing, do you mean most government HWs identify as Christian too? Also, do not capitalize churches.
Yes we do mean that most government HWs identify as Christians as well. The sentence has been adjusted accordingly.
Christianity is well established in PNG with over 90% of the population belonging to a Christian denomination [47, 48]. The churches provide roughly 50% of PNG’s education and health services, however, influence of Christianity also extends to government services with most government HWs identifying as Christian [48, 49]

17. Background, 8th paragraph, 1st sentence. What is meant by “bonding”?
The sentence has been adjusted to increase clarity of meaning as follows:
The bonding relationships between health facilities systems, the HW and the community in rural areas has also been described as a key driver of HW performance particularly in rural areas of PNG [20, 22].

18. Methods, 1st paragraph. If the study is all qualitative it is not using mixed methods.
Thank-you for pointing this out, we have now adjusted accordingly to describe the study as a multi method qualitative research study that utilised a combination of qualitative research methods.

19. Methods, 1st paragraph, 4th sentence. Awkward start of sentence.
This sentence has now been adjusted to improve clarity as follows:
That is what is known, important or understood is the result of processes within communities rather than of individuals operating as isolated entities. Individuals do not operate as isolated entities but rather are influenced by processes within communities that influence what is known, important or understood [45]

20. Methods, 5th paragraph, 1st sentence. Need space before citation.
Adjusted as suggested

22. Methods, 6th paragraph, last sentence. What considerations are being referred to? On review of this sentence, it was decided to remove from the manuscript due to being repetitive information.

23. Results, 1st paragraph, Table 2. Change title of table: Distribution of study facilities by type of setting and Province.
Adjusted as suggested

24. Results, 2nd paragraph, 2nd sentence. Missing punctuation: “…presented were:”
Adjusted as suggested

25. Results, 4th and 5th paragraphs. The mixing of physical risk and social risk is a bit confusing. While the quote in the 5th paragraph pulls them together the text goes back and forth.
Thank-you for pointing this out. We have now re-arranged the paragraphs so to mark the clear differentiation between the social and physical risk that the respondents were reporting.

Working in challenging environments
The socio-cultural environment had a significant impact on the motivation of the HWs including community expectations and social values as described in Figure 1 [42]. All of the Health workersHWs perceived themselves as front line workers in a dangerous and contested environment, with perseverance despite these challenges a defining characteristic particularly in Port Moresby, NCD. Port Moresby, the capital city of PNG is well-known for its violent crime that threatens the safety and security of all citizens. For example, one clinic visited in NCDPort Moresby had recently moved to a new location due to problems with armed robberies and other security issues. The need to have security guards at entrance gates was common at most health facilities visited, but particularly in urban settings.

The risks associated with clinical roles were exacerbated by the stigma associated with working in sexual and reproductive health. Dealing explicitly with matters pertaining to sexual and reproductive health is largely seen as a cultural taboo by the whole of the PNG community: This is a Melanesian society and they will criticise you... In our culture we don’t go around going into details about human sexual health, but we are working through this. So this topic [sexual health] is often seen as shameful to our clients, other community members and other people in our country.
Female Medical Officer, NCD

There are substantial The risk to physical safety taken by staff, including volunteers, who enter volatile areas, such as settlement areas, market places and villages, to assist in the follow up of clients and in health promotion activities was highlighted by many respondents. While risk is most obviously associated with Port Moresby, risk was also identified in other contexts including the associated risks of traveling for outreach service including poor roads, weather and other roadside crimes. For example, in the mountainous area of the highlands of EHP, poor road conditions are a frequent hazard along with unpredictability of civil unrest amongst neighbouring
tribes. The best illustration of physical risk comes explained by a medical officer in NCD:

*They* [the volunteers] *do all the hard work in the field. They get abused for talking about sex openly in the market and in the villages. They actually have been threatened and some of them have even had their bags stolen. But they put up with all of this.*

Male Medical officer, NCD

Social risk, or The risks associated with clinical roles were exacerbated by the stigma associated with working in sexual and reproductive health was also a concern for many. Dealing explicitly with matters pertaining to sexual and reproductive health is largely seen as a cultural taboo by the whole of the PNG community:

*This is a Melanesian society and they will criticise you... In our culture we don’t go around going into details about human sexual health, but we are working through this. So this topic [sexual health] is often seen as shameful to our clients, other community members and other people in our country.*

Female Medical Officer, NCD

However, although all the HWs acknowledged the risks, both physical and social, they all were able to describe other positive inspiration for engaging in these health services.

26. Results, 5th paragraph. The risks of working in Port Moresby are not known to all—can you describe this place?

A description of Port Moresby has now been included as recommended. The socio-cultural environment had a significant impact on the motivation of the HWs including community expectations and social values as described in Figure 1 [24]. Health workers perceived themselves as front line workers in a dangerous and contested environment, with perseverance despite these challenges a defining characteristic particularly in Port Moresby, NCD. Port Moresby, the capital city of PNG is well-known for its violent crime that threatens the safety and security of all citizens. For example, one clinic in NCD Port Moresby had recently moved to a new location due to problems with armed robberies and other security issues. The need to have security guards at entrance gates was common at most health facilities visited, but particularly in NCD Port Moresby.

27. Results, 6th paragraph, 1st and 2nd sentences. Confusing and wordy. Also, be careful not to overstate results or themes from one or two mentions in the data.

Thank-you for your comments. This paragraph has now been removed. Whilst from field notes and general observations the emergence of this theme was definitely evident, however, there is perhaps not enough evidence from this particular study to include it. The theme of delivering expectations is also touched on in the following paragraph about community expectation.

27.b The manuscript does not give any mention of the frequency of themes—this would be helpful.

28. Results, 8th paragraph. NSV should not be abbreviated here.

Adjusted as suggested

29. Results, 12th paragraph, 2nd paragraph. Discuss of individual characteristics should be moved to the next section and not with religious faith.
This has been adjusted as suggested.

30. Discussion, 1st paragraph. The paper mentions challenges of accessing appropriate equipment but I do not remember any mention of that in the results section.

The mention of accessing appropriate equipment has now been removed.

31. Discussion, 1st paragraph. This needs a discussion of how motivation for the provision of SRH services applies to MC. In what ways are these results directly transferrable to MC? In what ways might they be different?

As suggested this section has been reviewed and adjusted significantly as follows:

With such tremendous cultural diversity and evident complexity of HW involvement in penile cutting activities, innovative strategies are required to conduct an efficient MC program [16, 38, 61]. The understanding of HWs relationships to the health system, resources and environment in which they operate and the impact this has on performance and motivation has key implications for a potential MC program. HWs reported service delivery barriers working within PNG that undermine motivation including issues around security, and accessing appropriate equipment. However, those interviewed expressed a genuine resolve to rise above these constraints and uphold the sexual and reproductive health services they were delivering. The impact of community influence and expectation, religious conviction and role of different incentives need to be considered when introducing a MC program, particularly to communities where penile foreskin cutting is a common and accepted practice. This study has presented some of the socio-cultural and individual determinants that affect motivation among sexual and reproductive HWs in five provinces in PNG.

32. Discussion, 1st paragraph, last sentence. Saying that this study can be applied to other developing countries could be a bit of an overstatement. Especially given the emphasis placed on socio-cultural context earlier in the paper. Maybe what is meant is that the domains that influence motivation (i.e. religion) could be similar and not the specific findings?

This has now been reviewed and reworded (see above point 31).

33. Discussion, 3rd paragraph. Discuss of social capital is confusing. Who has the social capital? Communities served by HWs?

On review, it was decided that the introduction of the concept of social capital was an emerging theme, however was not confirmed clearly in the data. As a result is has now been removed.

34. Discussion, 5th paragraph. Confusing—what is the main point here?

Following review, this paragraph has now been removed.

35. Discussion, 6th paragraph. This linking of results to what is needed for future sexual and reproductive health programs is very useful. Add this to the other results sections.

Thank-you for pointing this out. A summary of this has now been added to the results section of the abstract as suggested.

36. Discussion. While the framework presented in Figure 1 is usefully conceptually it would be very interesting to add a framework for integrated the study results into
improved performance/motivation for HWs. Have you considered the Performance Improvement approach or another similar programmatic approach for improving health worker performance?

Thank-you for this suggestion. At this stage, we had not considered the performance improvement approach or other programmatic approaches for improving health worker performance. The study was more an examination of the influence that HW motivation may have on health worker performance and in particular to take on a MC program for HIV prevention. Using something such as the performance improvement approach will however be very relevant to our future studies on models of service delivery for a MC program in PNG and policy implications.

37. Discussion, 9th and 10th paragraphs. Somewhat repetitive and too short. Need more application of how findings will affect MC provision.

Following feedback regarding the need to apply the findings and discussion to impact on MC provision, the discussion section has been now been significantly altered to reflect this.

### Implications for delivery of an adult male circumcision program in the context of PNG

**Religious convictions and the concept of service**

The religious convictions evident in HWs will have potential complications with the delivery of any sexual and reproductive health service, particularly one such as MC that to some degree may relate to or contradict religious practice. Religious convictions are motivational determinants that have not been well described in studies of HW motivation in other countries. Religious affiliations and the commitment to serve has been shown to have significant individual level impacts on HW motivation in PNG [19, 20, 49, 51]. The religious undertones of commitment were also described by respondents in this study, confirming the strong impact that the social values and beliefs of HWs and the communities they service have on their performance. [49, 51]. Although it was at times difficult to distinguish between what may have also been general health professional values, motivation was certainly deeply embedded in community expectations and social values.

**Community relations, expectations and perceived responsibilities for state of the health system**

Individual differences are relatively enduring characteristics of the individual, but others are formed by the acculturation of the individual within the larger societal context [42]. Health system failures in PNG have resulted in complications in securing funds; supplying, training and supervising staff; accessing equipment and medicines; and governance and leadership [9, 15, 17, 18, 62, 63]. In the case of sexual and reproductive health services in PNG, the results of this study indicate that individual HWs tended to assume responsibility for this failed system. This is a similar finding to Mbilinyi et. al (2011) in Tanzania, where HWs were forced to take responsibility for dealing with problems arising from organisational inefficiencies [27]. Health workers in PNG adapted to a dysfunctional system by adjusting service to compensate for key barriers to service delivery, acknowledging a commitment to be flexible an important attribute. This was also an important attribute for the challenges HWs reported. This included the general safety and security issues of work and travel in PNG; the associated stigma of work that dealt with matters pertaining to sexual health, and the potential burden on the individual HW to provide accurate and effective service to others within their communities.
Trust, recognition and appreciation from the community can enhance the ability and willingness of HWs to provide an efficient service and have been shown to be integral to HW motivation in a number of other studies [24]. In this study, HW links to the community appeared stronger than their links to the organisation, resulting in community expectation and peer pressure having a much stronger impact on HW motivation than organizational influences, as reported in earlier research from PNG[19, 21, 55]. As a result, competence was seen to be more valued from a community building perspective rather than in terms of organizational capacity. In some cases, this may be the result of isolation of the service or HW, but also seems to be a part of the culture of service and social responsibilities of the HW in PNG.

Community expectations may impact on HWs willingness to take on program, or commit HWs to be directed by the high demand for the service in the community. These obligations may generate unwillingness of HWs to participate in programs such as MC if there is a chance of community misperception. Obligation to the community may also commit the HW to perform specific types of foreskin cuts determined by the community and not the health system. For example, previous research have shown the preference for longitudinal foreskin cuts or dorsal slit within PNG communities over the circumferential cut, which the African trials utilised[7, 10], was also shown to increase commitment to service. Establishing a strong link of support from the health organisation to the individual HW is important to facilitate better outcomes and high quality, standardised service delivery. Further understanding of the potential social pressures that HWs may be exposed too in PNG is critical. Given the heightened awareness of MC for HIV and the demand for penile cutting already evident, HWs are likely to be faced with complex demands. Without the support of a resilient health system, the social factors of community expectations and social responsibility of the HW are likely to take precedent.

Due to fear of repercussions or compensation. Health workers also described situations where concerns arose from community members about the delivery of services which resulted in subsequent threats.

are evident in various parts of PNG [65-67]. Recruiting HWs to work in areas of contrasting cultural experience may also result in further heightening this obligation or community rejection of the HW.

*Task shifting and other incentives*

Health workers reported performing additional duties from technical to administrative tasks beyond their job specification with additional technical duties more likely to be taken up by rural HWs. This study confirmed the results of earlier research in PNG which showed that HWs saw positive opportunities in enhancing their skills and other personal development, that compensated in part for needing to fill the gaps created by under staffing [19]. Pride in accomplishing a new skill was particularly important to HWs in more remote areas and among those who were acquiring skills different to those of their colleagues and peers. This finding further demonstrates the influence of other non-monetary factors of motivation.

Although financial rewards were not indicated by many of the respondents as integral to motivation, many still saw the importance of recognition for their work. Other studies have also reported on the lack of appreciation and limited feedback from supervisors as a de-motivator [64]
However, while financial rewards have been widely discussed as motivational levers, they should be used with a combination of strategies based on country-specific needs and application [44]. Improving motivation to perform well will require multiple interventions and should be integrated with other incentives and interventions such as improved infrastructure to create a more balanced approach to increase motivation, satisfaction, and performance [21, 42, 65].

The results also suggest that the strong ties CHWs have to the community may be beneficial for to implementation of any new program. However if task shifting was to occur and CHWs were to be trained in MC, this has potential medico-legal implications, and unless explicitly covered by regulation, may affect future role descriptions, reporting relationships and remuneration. Requiring CHWs to develop complex new skills, while maintaining their current pay rate, may result in dissatisfaction and be de-motivating. Recognising that HWs value opportunities to increase skills and responsibilities also has implications for a MC program [9, 38].

This social capital—or ability to gain access to benefits by virtue of belonging to a group [67]—within the context of HW performance in PNG appears to have far reaching consequences. The impact of social capital on HW performance in PNG requires further analysis.

Community Relations
Establishing a strong link of support from the health organisation to the individual HW is important to facilitate better outcomes and high quality, standardised service delivery. Health system reforms and application of new health programs are likely to impact upon one or more of the many motivational determinants and those engaged in development of policy need to consider carefully such impacts prior to implementation [44]. Further understanding of the potential social pressures that HWs may be exposed too in PNG is critical.

Implications for a medical male circumcision program
The understanding of HWs relationships to the health system, resources and environment in which they operate and the impact this has on performance and motivation has key implications for a potential MC program. The study has confirmed a number of key factors of motivation for PNG HWs including the role of community expectation and religious conviction. Religious convictions evident in HWs will have potential complications with the delivery of any sexual and reproductive health service, particularly one such as MC that to some degree may relate to or contradict religious practice. Community expectations may also impact on HWs willingness to take on program, or commit HWs to be directed by the high demand for the service in the community. These obligations may also generate unwillingness of HWs to participate in programs such as MC if there is a chance of community misperception.

The results also suggest that the strong ties CHWs have to the community may be beneficial for to implementation of any new program. However if task shifting was to occur and CHWs were to be trained in MC, this has potential medico-legal implications, and unless explicitly covered by regulation, may affect future role descriptions, reporting relationships and remuneration. Requiring CHWs to develop complex new skills, while maintaining their current pay rate, may result in dissatisfaction and be de-motivating. Recognising that HWs value opportunities to increase skills and responsibilities also has implications for a MC program, particularly as we already know that HWs are involved to various degrees in penile cutting practices in PNG [16, 40].
38. Limitations, 1st paragraph, 3rd and 4th sentences. Variations in the capabilities of different levels of facilities are not a limitation.

The third and 4th sentence has now been removed.

39. Conclusion. Study results are interesting but they are not connected to MC provision enough. More details on how MC may be provided in PNG and how HWs would contribute to MC programs is needed if the focus of the study is on HW motivation for MC provision.

Further reframing has been completed to ensure that the focus of MC implications is clear.

The results of this study confirm that motivation is not a function of a single determinant, but is the result of a complex interplay of factors that operate within a cultural context. Thus, an effective MC program for HIV prevention interventions must operate on the set of key determinants, and will need to address local contextual factors as well as broader health sectoral factors that are affecting worker motivation at the local level [42]. Certain similarities among key determinants exist between other developing and transitional countries including, pride, management openness, organizational support, job properties, and values [42]. However, the interconnectedness of the HW with the community appeared to be unique to PNG compared to what other studies have discussed.

Introduction of new health programs such as a MC program for HIV prevention, are likely to impact upon one or more of the many motivational determinants and those engaged in development of policy need to consider carefully such impacts prior to implementation. These findings highlight the need to take into account the differing needs of communities as well as the motivational influences on HWs that exist within the socio-cultural environment. In particular, consideration of the local workforce and culture, and the potential impact this may have on delivering a service such as MC that already may have significant demand and meaning within some communities. If a national MC program is to be implemented in PNG, failure to acknowledge the impact of HW
motivation to perform and engage in such a program within policy discussions could significantly limit future program success.

Discretionary Revisions
1. Results, 2nd paragraph, 4th sentence. Repetitive, could be deleted.

After review, this has been deleted as suggested.
Reviewer: Michael Stalker

Reviewer's report:

1. The authors describe the study as "mixed methods" however, only qualitative methods are mentioned in the manuscript. Creswell (2006) defines mixed methods as a philosophical and methodological approach that combines qualitative and quantitative methods. It would be helpful for the authors to offer an operational definition of mixed methods that justifies their use of the term/approach for this study. Only qualitative data are presented.

   Thank-you for highlighting this obvious error. The study does not use “mixed methods” but is rather “multi-method” qualitative study. This has now been updated throughout the text.

2. The authors cite the WHO/UNIADS recommendations to provide male circumcision in high HIV prevalence areas. The recommendations are more narrow and suggest that male circumcision be offered as part of a comprehensive HIV prevention strategy in geographic areas with high HIV and low MC rates. It would be helpful for the authors to relate the specific recommendation to the PNG context. It seems somehow incomplete to only mention the HIV rates.

   The introduction has now been reviewed to ensure that the specific recommendation of an MC program for HIV prevention is related to the PNG context.

Following three clinical trials in Africa which showed that male circumcision (MC) reduces the risk of HIV acquisition for men during vaginal intercourse by up to 60%, UNAIDS/WHO has recommended that MC be considered as an essential component of comprehensive HIV prevention programs in high prevalence settings [1-5]. There has been interest in aligning MC with other HIV intervention programs in Papua New Guinea (PNG), a country of significant geographical, linguistic and cultural diversity where different forms of penile cutting appear to be common in some communities [6-10]. PNG has amongst the highest HIV prevalences in the Asia Pacific Region and the epidemic is primarily linked to heterosexual transmission exhibiting substantial geographic heterogeneity, with cases clustered in a number of key provinces [11-16]. A country-specific mathematical model suggests that MC could have a significant impact on the HIV epidemic in PNG but that increasing condom use and early initiation of antiretroviral therapy could potentially have a greater impact [11]. However, recent national adult prevalence estimates suggest that the epidemic may be progressing less rapidly than previously feared [13, 14]. There has been interest in aligning MC with other HIV intervention programs in PNG, a country of significant geographical, linguistic and cultural diversity where different forms of penile cutting appear to be common in some. Difficulties have already been described in the capacity of the health system to undertake even simple health programs with demonstrated challenges in governance, financing, access to equipment and staffing [9, 17, 18]. Complex interaction of the socio-cultural environment and the health system has also been shown with evidence of health workers (HWs) already participating informally and formally in penile cutting activities though no national programme has yet been established [19-21]. Understanding the social and individual factors influencing sexual and reproductive HW motivation to engage in sexual and reproductive services
and their impact this may have on more complex intervention programs such as medical male circumcision is critical.

3. Related to the above, it would be helpful to understand the MC context more, including traditional or cultural MC. This would be important for PNG-naïve readers.

Following this recommendation, further details of penile foreskin cutting in the context of PNG has been added to the introduction.

Previous research has highlighted the complex and diverse nature of penile cutting practices in PNG [6, 7, 10]. Penile foreskin cutting practices have been described to include traditional practices that are embedded in customary rituals; contemporary practices that are not associated with customary observations but are an outcome of the influence of peers and the socio-cultural environment; and medical male circumcision [6-8]. Adult penile foreskin cutting appears to be common in many parts of PNG within various socio-cultural contexts, and men from a variety of different settings in PNG have been shown to be notionally supportive of MC for HIV prevention [6-8]. A survey among 869 men in National Capital District (NCD), Madang Province, Enga Province, and Oro Province found that 47% had a longitudinal cut or dorsal slit (foreskin cut but not removed), and 10% a circumferential cut (complete removal of foreskin) [39]. Health workers have been described to be involved in management of complications following penile cuts completed by non-health workers and the unauthorised involvement of health workers in penile cutting activities in various contemporary and cultural penile cutting activities [7, 9]. Other research has also shown that of the 396 men reporting a longitudinal foreskin incision, 15% advised that it had been completed by a PNG HW outside of any formal health program [40]. With this in mind, there is likely to be a number of different challenges across PNG in the implementation and sustainability of a MC program and specific understanding about motivation for HWs to engage in sexual and reproductive health programs and how this may impact the delivery of a MC program in PNG is essential.

4. The framework section includes a discussion of organisational factors, which is essential to frame the work. However, this discussion includes elements from the health systems strengthening - specifically the first sentence in the second paragraph that starts, "In PNG, a review of health system capacity..." The organisational capacity is a subset of broader health systems strengthening. Clarification on the intersection of the two levels, or different treatment of the health system capacity would be helpful.

Thank-you for pointing out this inconsistency. The parts dealing specifically with health system capacity or strengthening have now been removed and included succinctly in the initial part of the background. The research around health system capacity to undertake a medical MC program has previously been completed and we agree that it is more appropriate to include as part of the initial introductory section about PNG and not within the discussion about the framework.

5. The end of the framework section seems to end with a broad assumption that understanding motivation can produce structural changes, which in turn can lead to more effective services. The paper could be strengthened by more explicit explanation for this. Perhaps the section could be softened somewhat to suggest that understanding motivation can play an essential role in delivering services. Individual motivation may result in
service enhancements, independent of structural changes - at least from my understanding of the data presented.

Thank-you for highlighting this. We have now reviewed the section and as suggested “softened” the premise that understanding HW motivation will produce structural change.

6. The methods section could be enhanced with additional details on some of the design decisions that were made. Based on the information presented, 29 frontline healthcare workers participated in a total of 32 IDIs (it is not clear why some were interviewed twice or how those who did were selected), 1 focus group (what was the methodological rationale for conducting an FGD among study participants who were also IDI respondents, did the FGD come before the IDIs or after), and an unspecified number were also observed. Answers to these mythological questions might help with replicability of the study in other contexts.

The method section has now been adjusted to include the number of IDIs and FGDs completed. Further details have also been provided to clarify why 1 FGD was completed and why some informants were re-interviewed.

One FGD and Twenty – nine 29 IDIs were conducted with 29 frontline HWs in the five provinces over both phases (Table 1). One FGD was completed with three HWs due to limitation of time of the participants to complete individual interviews and suggestion by other key informants that they would offer important insight into the research question. (NCD=14, ESP=4, EHP=5, MDGP=1, WNBP=5; Figure 2). In phase 1, a total of 13 frontline health workers participated in the interviews. In phase 2, another 19 interviews were completed with 3 key frontline HWs re-interviewed due to them being active leaders in the area of sexual and reproductive health and their ability provide additional insight into service changes since phase 1. In total, 17 men and 12 women took part with distribution of participants across health care profession and gender listed in Table 2. Most participants had been working in their profession for over 5 years (Table 3). A total of 16 health facilities were represented, including provincial hospitals, outpatient clinics and rural health centers (Table 4).

7. It is not clear how many people were involved in the data analysis. More information on this, possible inter-coder reliability, and how the data was managed/synthesized would also help with replicability.

Further clarification of the data analysis has now been included as follows:

8. Qualitative thematic analysis of the transcripts and field notes was undertaken using social constructivist approach. This approach is considered particularly suitable for applied qualitative research in health care settings [22, 60]. Transcribed and translated interviews were read several times for familiarisation [27]. A codebook was developed and all interviews were double coded. In cases of discrepancy in coding a third researcher coded the selected text in question. The phase 1 interviews were analysed by three in country researchers at PNG Institute of Medical Research (IMR) in Goroka with key themes and findings influencing the progression of analysis in phase 2. In phase 2, the first author subjected all data to further thematic analysis,
organising data around the main themes of the framework developed by Franco, Bennet and Kanfer (2002; Figure 1), and entered into the qualitative software program MAXQDA (VERBI software GmbH, Germany). Qualitative data analysis focused on comparing and contrasting specific themes as they occurred in each interview on the meanings and experience of working as a HW in sexual and reproductive health services in PNG. The final coding was reviewed by the in country researchers and emerging themes were discussed with all authors and adjusted where appropriate.

9. In the result section, the concept of volunteer workers is introduced. Are there any major findings that are unique to the volunteer workers? How do the data from that segment differ from paid HWs?

In the PNG context, these volunteer workers do actually get an allowance, and their work is mostly around health promotion. In general, there was no major findings that were specific for the volunteer workers.

10. The comment "While risk is most obviously associate with Port Moresby..." presumes a familiarity of context that may not be present for readers with limited knowledge of the PNG context.

As suggested, further details around the context of security in Port Moresby have now been included as follows:

**Working in challenging environments**  
The socio-cultural environment had a significant impact on the motivation of the HWs including community expectations and social values as described in Figure 1 [42]. All of the Health workers HWs perceived themselves as front line workers in a dangerous and contested environment, with perseverance despite these challenges a defining characteristic particularly in Port Moresby, NCD. Port Moresby, the capital city of PNG is well-known for its violent crime that threatens the safety and security of all citizens. For example, one clinic visited in NCD Port Moresby had recently moved to a new location due to problems with armed robberies and other security issues. The need to have security guards at entrance gates was common at most health facilities visited, but particularly in urban settings.

11. The selected quote for doing God's work or God making it possible for success seems to have a more narrow focus, specifically of God making is possible. I did not see supporting data for doing God's work.

Thank-you for pointing this out. We agree that the quote is more relevant to “god making it possible.” However, it is evident that there is an emerging theme of doing god’s work within the sense of service and sacrifice theme. As a result, we have now decided to combine service, sacrifice and religion into one heading.

**Service, Sacrifice and Religious Conviction**  
Sacrifice, humility and willingness to extend the boundaries of their roles was an attribute that most respondents described as important for HWs to be successful in delivering sexual and reproductive health programs. Acknowledging the constraints in health service delivery in general in PNG, many saw the need to do whatever was possible.
To help the local people and the people of Papua New Guinea, we just have to serve our people with what little we have and manage it.

Female Nursing Officer, NCD

Many frontline HWs expressed how their own dedication and perseverance resulted in program and service success. Some frontline HW also reported self-funding parts of the service, such as travel, accommodation and health promotion, if it needed to be done. They felt it was often difficult to maintain momentum given system difficulties such as obtaining funding or access to transport. Being flexible to the constraints was often needed.

I went through kind of a stressful time. And I was thinking, if I don't get clients, then what I was trained to for is, useless.... So I used a lot of my personal money. You had to, to get fuel, hire a vehicle and buy refreshments. It was quite a great challenge to me. But I did it.

Male Nursing Officer, NCD

The commitment to serve appeared to be underpinned by the influence of religion with HWs valuing doing good an important motivator for their work. The role of religious faith and a commitment to serve was a key theme identified throughout all interviews and played an important role in the impetus to work within sexual and reproductive health. The perception that they were doing God's work or that God had made it possible for them to succeed was directly acknowledged as an important motivator for a few.

The big man [God] gave me this idea and ... I was proud because I have never gone to a school for this... And I thank the big man from above [God] who is giving me more wisdom and knowledge for this work. Thank you.

Male Community Health Worker ESP

The role of religious faith and commitment to serve was also evident in the individual determinants of motivation described by the HWs, however, typical HW values of doing good and achievement was also noted. Individual characteristics that seemed to be common amongst all HWs interviewed included: flexibility and sacrifice; a sense of achievement and recognition for work; and strong determination for success despite the barriers and constraints to service delivery within the health system.

12. The authors suggest that the findings have the potential to be applied in other developing countries considering implementation... However, it seems that it is the need to understand the variables or constructs (from the social constructionist perspective) that might influence sexual and reproductive health, and other, services. It seems the framework or approach is what might have applicability in other areas, rather than the findings from PNG, per se

This has now been reviewed and adjusted as suggested by the reviewer. The emphasis of this research was in fact placed on socio-cultural using a social constructionist perspective. The findings may illustrate similar themes to other contexts but certainly not specific correlation.

The influence that religion and relationship with community has on motivation of HWs may be similar to... and has potential application to other developing countries considering implementation of a MC program or other complex sexual and reproductive health interventions and treatment.
13. There were new concepts, e.g., social capital, self-efficacy, tribal tension, task shifting, introduced in the discussion section, which had not been presented as part of the framework nor seemed to emerge from the data. These concepts need to be presented earlier in the manuscript. It is not clear, based on my read, that these emerged explicitly from the data.

Social capital and the theme of self-efficacy have now been removed following review. Tribal tensions was in relation to security and risk theme, but as the reviewer has pointed out, was not directly referred to in the data and so has now been removed. Task shifting is an important component of human resourcing in the implementation of MC programs in other countries so has been kept. However, further details of task shifting is now included in the background about role of HWs in MC programs and the impact HW motivation may have on this as follows:

**Effective engagement of human resources has been a widely discussed topic in the implantation of a MC program in African countries** [32-34]. Significant numbers of clinicians, counsellors, and support staff are needed to implement even a modest program, given the relative technical difficulty of the surgery compared to other programs such as immunization [35, 36]. HW density in PNG has been shown to be comparably lower than other Asia Pacific countries and there are significant variations in health resources and staffing between and within provinces in PNG with some districts extremely limited in terms of access to health services [37-39]. In some African countries task shifting, or the delegation of surgical steps to a trained non-physician clinician such as a nurse or clinical officer has been utilised to greatly expand the size of the workforce available, whilst in other countries non-physicians are restricted from performing MC due to the countries’ regulatory and legal frameworks [35]. Previous research in PNG has shown that community health workers have been called upon to implement no-scalpel vasectomy programs and may be considered for a MC program [40]. Evidence also exists of all levels of HWs being involved in penile cutting activities including, management of complications following penile cuts completed by non-health workers and the unauthorised involvement of health workers in penile cutting activities in various contemporary and cultural penile cutting activities [14, 16, 41]. With this in mind, there is also likely to be a number of different challenges across PNG in the implementation and sustainability of a MC program should the government of PNG decide to proceed with such a policy in the future.

14. The link between the findings and their applicability to MC services is not clearly linked. The findings could equally apply to expanding other SRH services.

Additional information about has been added to the background section to assist with the link to MC services. The results have also been restructured to ensure specific findings relevant to MC programs are highlighted.

15. It would be helpful to know if the study examined possible differences between adult MC services and early infant MC services.

The study focus was on implementation of an MC program for HIV prevention more generally. Whilst an early infant MC service is likely to be less resource intensive, and would need to be considered, direct impact on the epidemic would be delayed by 10-15 years depending on sexual debut. Other qualitative research is currently looking at age acceptability of implementing a MC program in PNG and preliminary results also suggest that preference is for around the age of sexual debut.
16. One possible limitation may be the apparent lack of explicit exploration on motivation to deliver MC services. That was not clear in my read of the manuscript.

This was difficult to examine across the HWs interviewed due to the varied previous awareness of MC for HIV prevention and therefore tend to be more around acceptability in general rather than motivation to deliver the service. Questions were however asked about thoughts on whether a MC program should be incorporated. Almost all HWs were supportive of the program, particularly from a community concern for HIV prevention and risk minimisation for other penile cutting activities occurring in their communities. This has now been included in the results section to broaden the connection of HW motivation to MC program implementation.
Reviewer: Charles Hongoro

I think that the research question is new in that it attempts to delve into the socio-cultural determinants and context of health work motivation something that has not been thoroughly explored to date.

The study design is informed by an acceptable diagnostic theory and analytical framework, which makes it appropriate to the research question. The authors admit that the specific results may not be externally valid because of the importance of context specificity, however, the key thematic findings around what motivates HWs are applicable to most limited resource settings and therefore important. The depth of analysis brings some credibility to the results.

   1. Although 29 respondents is certainly a small number given the size of the PNG health workforce, it is important that authors expand their profiling of respondents beyond male/female and professional categories, to include other factors such as age, years in service, job location versus home town or village, etc because these affect individual determinants for motivation. For example, a young worker is likely to respond differently to various determinants of motivation than an old worker with many years of service.

Thank-you for your reviewing the paper and your encouragement. We agree that it is indeed important to understand other factors such as age, years in service, job location versus home town or village and the impact this may have on individual determinants for HW motivation. We have now included a table of years as a health worker across discipline as suggested. Age of HW, however was not routinely collected and location of job compared with home town was also difficult to distinguish.

The new table is as follows:

<table>
<thead>
<tr>
<th>Years in Service</th>
<th>Medical Officer</th>
<th>Nursing Officers</th>
<th>Health Extension Officers</th>
<th>Community Health Workers</th>
<th>Other</th>
<th>Total Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 5 years</td>
<td>4</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>8</td>
</tr>
<tr>
<td>5-10 years</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>10-20 years</td>
<td>1</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>8</td>
</tr>
<tr>
<td>&gt;20 years</td>
<td>4</td>
<td>4</td>
<td>1</td>
<td>2</td>
<td>0</td>
<td>11</td>
</tr>
</tbody>
</table>