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Integration of Provider Initiated Testing and Counseling for HIV with Voluntary Medical Male Circumcision Services

INTEGRATION OF PROVIDER INITIATED TESTING AND COUNSELING FOR HIV WITH VOLUNTARY MEDICAL MALE CIRCUMCISION SERVICES

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ACRONYMS

CT	Care and treatment
CTC	Care and treatment center
FBO	Faith-based organization
GoT	Government of Tanzania
HIV	Human Immunodeficiency Virus
HTC	HIV testing and counseling
IDI	In-depth interview
MC	Male circumcision
MCHIP	Maternal and Child Health Integrated Program
M&E	Monitoring and Evaluation
NACP	National AIDS Control Programme
NGO	Non-governmental organization
OH	High-client-load outreach site
OL	Low-client-load outreach site
PLHIV	Person living with HIV
PITC	Provider Initiated Testing and Counseling
PEPFAR	The U.S. President's Emergency Plan for AIDS Relief
R2P	Research to Prevention
SPM	Service provision model
TACAIDS	Tanzania Commission for AIDS
UNAIDS	Joint United Nations Program on HIV/AIDS
USAID	U.S. Agency for International Development
VMMC	Voluntary Medical Male Circumcision
WHO	World Health Organization

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EXECUTIVE SUMMARY

Background

HIV testing and counseling (HTC) is part of the World Health Organization (WHO) recommended minimum package of services for Voluntary Medical Male Circumcision (VMMC) (WHO, 2007). Including HIV testing as a component of VMMC services provides the potential benefit of reaching more men with testing in the 14 priority countries selected for scale-up of VMMC in eastern and southern Africa. HIV diagnosis is clinically relevant for HIV sero-positive clients with low CD4 counts, as it may be beneficial for these patients to postpone or forego MC services (Kigozi et. al., 2013). HIV testing is also important to ensure counseling on abstinence during the period after VMMC to prevent onward transmission for clients who test positive (WHO, 2007; WHO/UANIDS, 2008; Kigozi et. al., 2013). While there is support for the integration of these two services, there is a gap in documentation of how integration is implemented in practice, and the challenges this may present for counseling and the efficient implementation of VMMC services. In this study, current practices for the integration of HTC/VMMC, and mechanisms to support quality, efficiency, and linkages between services are examined in Tanzania as a means of addressing this gap. Study sites included the Iringa and Njombe regions of Tanzania, which have a significantly higher HIV prevalence compared to the rest of the country.

The specific research aims of the study were:

1. To describe current protocols and practices for the integration of provider initiated testing and counseling (PITC) as part of VMMC in fixed and outreach facilities in relation to international and national standards.

2. To determine provider, site, and system level factors associated with quality of PITC and efficiency of integrated service delivery.

3. To assess coordination, communication, and referral processes across HIV testing and counseling and VMMC service delivery systems.

4. To identify potential mechanisms for increasing integration and referral between VMMC, HTC, and care and treatment services.

A secondary aim of the study was:

1. To determine the relationship between the environment of PITC and client outcomes including: uptake of HIV testing, retention of information, HIV-related behavioral intentions, and successful linkages to HIV referral services including care and treatment.

Methods

A cross sectional study using quantitative and qualitative research methods was conducted. The quantitative portion of the study captured descriptive information through facility assessments (N=11), provider surveys (N=71), provider-client counseling observations (N=307), a client flow analysis (N=397), and client surveys (N=320). The qualitative portion of the study included in-depth interviews (IDIs) with

HTC service providers (in both the VMMC and HTC service systems) and government HIV stakeholders (N=30). Current and former VMMC clients segmented by HIV sero-status were also interviewed (N=30; n=12 HIV-positive). Data was collected between January 15 and April 16, 2013.

Three service provision models (SPM) were defined based on the PEPFAR definition for fixed and outreach sites and client load. Fixed sites are locations where services are provided on a continuous basis by permanent staff. In contrast, outreach sites are temporary sites transformed to facilitate the VMMC service. Health personnel trained in VMMC from other locations work at outreach sites for the short-term the site is in operation. Outreach sites in the current study were defined as "high" and "low" volume base on their daily client load on data collection days, and the client load during the week prior to data collection. The three SPM examined in this study include fixed, outreach low (OL), and outreach high (OH).

Measures of quality and efficiency were constructed from the observation tool and client flow analysis. Quality and efficiency were examined across the SPM, and in relation to provider and client characteristics using items gleaned from their respective surveys. All results presented are at the univariate or bivariate level. Standardized sampling weights based on the inverse probability of selecting participants from the pool of all eligible clients were applied to all client level analysis. Homogeneity at the facility level was accounted for by the use of empirically derived standard error estimates. Chi-square tests were used to detect statistically significant relationships between categorical variables, and linear regression was used for continuous outcome variables. IDIs were audio-recorded and transcribed. Codes were developed *a priori* based on the research aims and applied to qualitative interview texts. Coded segments were summarized in relation to key themes linked to our specific aims.

Key Findings

Protocols and practices for PITC at VMMC service sites

- VMMC clients in Tanzania move through a series of four counseling stations including group, individual, post-operative, and 48-hour follow-up counseling. During these sessions, information about HIV testing and VMMC services is delivered in an integrated and complementary way using standardized visual aids.

- Approximately four providers facilitate counseling at each of the SPM (fixed, OL, OH), although the client load is significantly higher at outreach sites. Almost all providers are nurses and female.

- All sites performed well in relation to critical criteria that evaluated the adequacy of existing structures and key processes to support the provision of PITC (scores range from 86-96 out of a possible 100 across SPM). Items not met relate to the number of certified HTC counselors, maintenance of registries, and performance of additional tests for indeterminate results.

Quality of counseling

- Consent: For 66% of clients observed a provider explained that the test is optional. For 59% of clients observed a provider explained that a client who declines the HIV test can still get circumcised. The provider followed the proper consent procedure in 66% of client observations.

- Confidentiality: For 65% of clients observed, all the counselors seen by the client showed respect for confidentiality and privacy. This was more likely for clients at OL sites (87%) compared to fixed (56%) or OH sites (58%). In 66% of all client observations, the provider explained that the test was confidential. This also happened more often in OL sites (57%) compared to fixed (38%) or OH sites (23%), although the difference was not statistically significant.

- Technical competence: Almost all providers documented information appropriately in the VMMC service register (92%) and clearly explained the meaning of the HIV test result to clients (93%). However, in only 38% of observations was the client asked about recent testing for HIV and receipt of the result.

- Information about HIV prevention: Almost all the clients who were observed received key information about HIV prevention at one of the four counseling stations. This included a counselor explaining to the client the importance of abstinence (92%), being faithful to one partner (94%), reducing the number of sexual partners (87%), and wearing condoms (99%) for HIV prevention. In 89% of client observations a counselor explained how VMMC reduces HIV acquisition for men, and in 100% of client observations, a counselor explained that VMMC gives only partial protection from HIV. A counselor explained how HIV is transmitted in 67% of client observations.

- Information about the HIV test: Almost all the clients who were observed received information about why the HIV test was a recommended part of VMMC (86%), the clinical and prevention benefits of knowing your HIV status (75%), and the window period (67%). In 45% of client observations a counselor explained the different possible outcomes of the test. In only 24% of client observations a counselor explained an indeterminate outcome and what it means.

- Interpersonal skill: For most of the clients observed, all the counselors who attended to the client exhibited a non-judgmental approach (84%) and provided a warm reception or greeting (57%). Clients were more likely to have counselors who exhibited a non-judgmental approach at OL (95%) compared to fixed (71%) or OH sites (84%). For less than half of the clients observed all counselors who attended to the client: demonstrated adequate counseling skill by paraphrasing, using appropriate body language, asking and answering questions, and summarizing information (41%); checked for understanding (34%); demonstrated client-centered skills by listening to patient ideas and concerns (24%); or encouraged questions and client participation (25%).

- Overall quality: An overall quality score was constructed based on the domains of information given to clients about HIV prevention, information given to clients about the HIV test, and interpersonal skill for each facility. Facility scores were averaged within SPM to develop overall

quality mean scores. OL sites had the highest overall quality mean score of all SPM, and a statistically significantly higher overall quality mean score when compared to fixed sites (OL 0.46 vs. fixed 0.38). This pattern was also present for the domains of information related to HIV prevention and interpersonal skill, although the difference was not statistically significant. Mean scores for the information about HIV testing domain were similar across SPM.

- When examined by counseling station, OL sites had a higher overall quality mean score compared to other sites for each station. OL sites also outperformed other sites for the information given about HIV prevention domain during post-operative counseling. OH sites performed better than fixed sites in the domain of interpersonal skill during post-operative counseling, but performed worse than other sites for the domain of information given about HIV testing during individual counseling, and all measures of quality during 48-hour follow-up counseling.

- OL sites had a higher percentage of individual counseling sessions rated as "excellent" based on observer-rating of overall quality compared to other site types. OH sites had the lowest percentage of 48-hour follow-up sessions rated as excellent compared to other site types.

- Providers who were certified to provide HTC had a higher mean quality score compared to providers who were not certified (0.44 vs. 0.56, n=56 providers). Providers in the age category 35-44 had a higher mean quality score compared to providers under 35 years old (0.46 vs. 0.62, n=58 providers).

Efficiency of service delivery

- The average total time spent at the VMMC site on the day of the circumcision procedure for all clients across study sites was 216.4 minutes (3.6 hours). The duration of time was trending towards being statistically significantly longer at OH sites compared to fixed sites (222.1 minutes vs. 208.5 minutes).

- Average wait time for clients across all study sites was 149.6 minutes, and average active time was 69.1 minutes. Clients at OH sites experienced longer wait times and shorter active times compared to clients at fixed sites, although this difference was not statistically significant.

- Clients spent almost twice as much time waiting for services rather than receiving services at VMMC sites (wait time/total time = 0.63). Wait time as a percentage of total time was highest at OH sites, followed by fixed sites and then OL sites, although differences between SPM were not statistically significant.

- Longer duration of counseling session was associated with higher quality counseling. The average time in minutes of group counseling was 36.1 minutes for clients receiving the highest quality, 34.6 minutes for clients receiving medium quality, and 25.2 minutes for clients receiving lower quality. This difference was statistically significant for clients receiving high vs. low quality.

This same pattern was observed for individual and 48-hour follow-up counseling (longer duration of session = higher quality), but not post-operative counseling.

- In terms of summary efficiency measures, there was a potential pattern wherein shorter total time, and more active time relative to wait time, was related to higher quality, but these associations did not reach statistical significance.

Client outcomes in relation to quality and efficiency

- Uptake of HIV testing was high. Only 7% of the VMMC clients surveyed declined to take the HIV test. The most important reasons for not testing among these participants were having previously tested and knowing their HIV status (10 clients who declined), and not being prepared to test for HIV on the day of VMMC (4 clients who declined).

- All six clients who tested positive for HIV during the observations were linked to care and treatment services. In half of these cases, the counselor introduced the client to the provider that they were referred to, or set up a time to do so. The low HIV prevalence among clients observed in this study is typical to that of most VMMC settings.

- Client satisfaction was high, with 100% of clients reporting to "agree" or "strongly agree" that they would recommend both the facility they visited and the counselors they saw to friends. Client satisfaction was statistically significantly higher among clients of OL facilities than clients of OH or fixed facilities. This supports evidence from the observations of higher quality counseling at OL sites. Clients who reported that they received higher quality and more efficient services also tended to be more satisfied with the facilities and their counselors.

- Clients at OL sites demonstrated greater retention of information than clients at fixed and OH sites, particularly with respect to HIV prevention knowledge retention. The trend was similar for the number of messages recalled, although the relationship was not statistically significant.

- Higher quality of counseling was associated with greater retention of HIV prevention information.

- Higher efficiency was related to greater retention of HIV prevention information, perhaps via longer counseling sessions, but the relationship was not statistically significant.

- Repeated messaging (e.g., across multiple counseling stations) may be beneficial for recall of the message related to partial protection of VMMC and the behavioral intention of abstinence.

- There were no statistically significant relationships or consistent patterns between exposure to messages, quality of counseling, efficiency of service delivery, and behavioral intention items. The exception to this rule is exposure to abstinence messaging: repeated exposure appears to be related to recall of the abstinence message and intention to practice abstinence.

Integration, coordination, and referral across services

- In IDIs, providers noted that the government system for HIV referrals is underutilized because of shortcomings including problems with the referral card and the intended procedure for making a referral. To compensate for these gaps, several providers described the creation of a unique referral system within their own facility or organization. However, the use of unique methods of making and documenting referrals was reported to ultimately serve as a barrier to coordination across organizations.

- Overwhelmingly, providers reported that follow-up of referrals is a major shortcoming in the established system and a significant challenge to providing health care to their clients. One promising strategy that emerged during IDIs was the use of technology, namely phones[1] to make referrals and follow-up with clients.

- Referrals from HTC to VMMC services do not appear to be happening on a consistent and uniform basis. Reasons for the lack of referrals can be attributed to: 1) the absence of clear and enforced policies among HTC providers on making referrals to VMMC; 2) a lack of information among HTC counselors about VMMC services; and 3) mixed information on the costs of VMMC as barriers to referrals. Many HTC providers also suggested that a perception of low quality service delivery and clients sharing negative experiences with their community were deterrents to making referrals.

- Several participants in the IDIs noted that education, training, and staff development would increase the likelihood that HTC and other health service providers make referrals to the VMMC program. It was also suggested that in order to strengthen integration and referral systems, communication between and within health facilities must be improved.

Recommendations

OL sites serve as the optimal mechanism for achieving high quality counseling for HIV testing within VMMC service sites in Tanzania. The enthusiasm and high morale that accompanies outreach activities may be an important reason for the higher quality counseling observed at OL sites. However, the potential benefits of the *esprit de corps* at outreach sites seems to diminish once a certain client load is surpassed, leading to the lower levels of quality observed in higher volume outreach sites. It is important to match the supply of personnel with client load to mitigate the potential impact on counseling quality. Areas for improvement in counseling for PITC include the consent process across all site types, and confidentiality in fixed and OH settings. Additional training for counselors in these areas is important. Clients at all VMMC sites spend approximately twice as much time waiting for services as they do receiving them, although this was not related to overall quality. However, longer counseling sessions were related to higher quality, again highlighting the need to have sufficient personnel and site infrastructure to accommodate the client load. The current referral system for HIV services as a whole should be revised. The established system of referral cards poses challenges for follow-up

[1] It is not clear from interviews if participants are referring to landlines or mobile phones. However, landlines are not typically available outside of large health centers, while cell phone use is common throughout the regions. Hence, it is likely that providers are using mobile phones.

documentation and may inadvertently reveal client's HIV status. Referrals from HTC services to VMMC could be improved through additional education and communication about the benefits of VMMC and availability of services to providers. This should be addressed at the national level. Solutions to the current problems with referrals across services will require collaboration across HIV service systems and accountability through policies and reporting requirements.

Conclusions

It is feasible to achieve quality counseling and efficient service delivery for PITC in the context of VMMC. Quality is most likely to be achieved in outreach settings with low client loads, where a positive *esprit de corps* exists among service providers and the client load allows for sufficient duration of counseling sessions. Quality counseling can achieve higher client retention of HIV prevention knowledge. It is particularly important to ensure that consent and confidentiality for HIV testing are maintained in the VMMC context, and there is room for improvement in this area. There is a need for a revised referral system in the HIV service system as a whole. Referrals for HIV prevention services for HIV-negative clients in addition to CT for PLHIV should be emphasized as important, especially from HTC to VMMC services. Changes to the referral system, including the movement towards shared confidentiality, are needed and should be informed by providers already implementing innovative strategies to serve their clients.

INTRODUCTION

HIV testing and counseling (HTC) is part of the World Health Organization's (WHO) recommended minimum package of services for Voluntary Medical Male Circumcision (VMMC) (WHO, 2007). HIV testing as a component of VMMC services provides the potential benefit of reaching more men with testing services in the 14 priority countries hardest hit by the HIV epidemic in eastern and southern Africa, and selected for scale-up of VMMC. HIV diagnosis is clinically relevant for HIV sero-positive clients with low CD4 counts, as it may be beneficial for these patients to postpone or forego the circumcision procedure (Kigozi et. al., 2013). HIV testing is also important to ensure counseling on abstinence during the period after VMMC to prevent onward transmission (WHO, 2007; WHO/UANIDS, 2008; Kigozi et. al., 2013). While there is general support for the integration of these two services, there is a gap in existing evidence of how integration is implemented in practice, and the challenges this may present for counseling and the efficient implementation of VMMC services.

HIV and HTC/VMMC in Tanzania

The prevalence of HIV among adults (15-49 years) in Tanzania is 5% (6% among women and 4% among men) (Tanzania Commission for AIDS [TACAIDS] et al., 2013). Within Tanzania, the Njombe and Iringa regions have the highest HIV prevalence, estimated at 15% and 9%, respectively (TACAIDS, 2013). Consistent with research on the protective effect of male circumcision (Gray et. al., 2008; Bailey et. al., 2008; Auvert et. al., 2008), HIV prevalence is slightly lower among men in Tanzania who report they have been circumcised compared to those who have not (3% and 5%, respectively) (TACAIDS, 2013).

In Tanzania, 62% of women and 42% of men have ever been tested for HIV and received the HIV test result (TACAIDS, 2013). Tanzania is not unique in this gender bias in testing. Population-based surveys in ten of the 14 priority countries for VMMC scale-up show that only 40% of people living with HIV (PLHIV) knew their HIV status at the time of the surveys, and that men are generally less likely to have tested than women (WHO, 2010a). Inclusion of HIV testing as part of health services typically accessed by women, for example during prenatal visits as part of prevention of mother to child transmission, is one reason why more women than men have been tested. The scale-up of VMMC in Tanzania provides a similar opportunity to reach more men with HIV testing services by combining testing with a male-focused health service.

In Tanzania the WHO's minimum package for the provision of VMMC for HIV prevention has been adopted, and over 527,000 VMMCs have been performed as of July 2013 (National AIDS Control Program, July 2013). The VMMC package includes client education, individual counseling, physical exam to screen for STIs and other relative or absolute contraindications, provision of HIV testing and counseling, medical circumcision, post-operative counseling, and condom provision (WHO, 2010b). As part of the individual counseling session, providers encourage clients to test for HIV on an opt-out basis prior to the circumcision procedure. Because HIV testing is offered as provider initiated testing and counseling (PITC), counseling sessions are condensed. However, they are still required to include consent, confidentiality, and HIV testing and prevention information through pre-test and post-test

sessions (WHO, 2007). In Tanzania, adoption of PITC in health care settings allows for group pre-test counseling, followed by individual consent prior to the test.

The Government of Tanzania (GoT) has been in the process of scaling-up PITC for HIV nationally since 2008 (TACAIDS, 2013). The Maternal and Child Health Integrated Program (MCHIP) supports the GoT in the training of PITC providers and overall mentoring and supervision of staff, including capacity building in monitoring and evaluation (M&E) and policy-related activities in VMMC sites in Iringa and Njombe. All regional and district hospitals, health centers, and most dispensaries country-wide offer PITC on an opt-out basis. A major challenge of the HIV testing program in Tanzania is numerous gaps in services due to frequent nation-wide stock-outs of HIV test kits over the past several years. Uptake of HIV testing among VMMC clients has been high over the past three years (98.6% in 2011, 93.6% in 2012, and 80.1% in 2013 to date (MCHIP/Tanzania)). The decline in HIV testing uptake in 2013 is due to a nation-wide a stock-out of HIV test kits during the year.

VMMC services in the Iringa and Njombe regions of Tanzania are provided by the GoT and supported technically and financially by MCHIP with funding from USAID. Sites in Iringa and Njombe have offered VMMC, including opt-out PITC, since 2009. There are 12 fixed VMMC sites in these regions (seven in Iringa and five in Njombe) that provide routine services on a continuous basis. The program also sends VMMC teams to provide outreach services at additional health facilities that do not offer VMMC as part of their routine service delivery. Throughout the life of the program, MCHIP has supported the GoT in the provision of services at 66 outreach sites in Iringa and 70 outreach sites in Njombe. As of early August 2013, more than 100,000 clients in Iringa and 69,000 clients in Njombe have been provided safe, free VMMC services (MCHIP, 2013).

Study objectives and aims

In an effort to address the gaps in evidence regarding HTC/VMMC integration, this study examined current integration practices for HTC/VMMC, as well as mechanisms to support quality, efficiency, and linkages between services in Tanzania. Specifically, the study focused on the integration of PITC with VMMC services in Iringa and Njombe, two neighboring regions of Tanzania with a high prevalence of HIV compared to the remainder of the country. Examining HTC/ VMMC integration within this context aims to identify barriers and best practices that may serve as an example for other countries targeted for VMMC scale-up.

The specific aims of the study were as follows:

1. To describe current protocols and practices for the integration of PITC as part of VMMC in fixed and outreach facilities in relation to international and national standards.
2. To determine provider, site, and system level factors associated with quality of PITC and efficiency of integrated service delivery.
3. To assess coordination, communication, and referral processes across PITC and VMMC service delivery systems.
4. To identify potential mechanisms for increasing integration and referral between VMMC, HTC, and care and treatment (CT) services.

As a secondary aim, the study also sought:

1. To determine the relationship between the environment of PITC and client outcomes including: uptake of HIV testing, retention of information, HIV-related behavioral intentions, and successful linkages to HIV referral services including care and treatment.

METHODS

Overview

A cross-sectional study using quantitative and qualitative research methods was conducted between January 15 and April 16, 2013. The quantitative portion of the study captured descriptive information through facility assessments, provider surveys, provider-client counseling observations, a client flow analysis, and client surveys. The qualitative portion of the study included in-depth interviews (IDIs) with HTC service providers (both inside and outside the VMMC program), and current and former VMMC clients segmented by HIV sero-status. Data collection for the quantitative and qualitative data was concurrent. **Table 1** presents a summary of data collection methods and study participants (Appendix A).

Research setting

The research team coordinated its data collection with planned VMMC service delivery activities in the Iringa and Njombe regions. The period of data collection coincided with a period of lower volume of VMMC due to agricultural activities, school being in season, and a preference for VMMC during the colder months of June, July, and August. MCHIP's ongoing demand creation activities for clients over 18 years old played a role in reaching VMMC clients who were age-eligible for the research study. All surveys and client IDIs were conducted in Kiswahili. Several provider interviews were conducted in English.

Research team and training

The research team was composed of four interviewers who were responsible for conducting observations, surveys, and IDIs at the selected health facilities. All interviewers had previous experience in HIV/AIDS research; one of the interviewers was a certified nurse.

Training of the field research team lasted two weeks and included classroom training in quantitative and qualitative research methods as well as practice with the data collection instruments in the field. The research coordinator supervised data collection at all health facilities. Feedback was provided to the interviewers on a weekly basis.

Quantitative methods

Quantitative sampling and data collection

Eleven VMMC service sites were selected out of the 25 sites in operation in the Iringa and Njombe regions during the period of data collection. Both fixed and outreach sites were selected to facilitate comparison across site types. Unique aspects of sites were considered in site selection; for example, one study site was targeted towards older men and allowed only male providers. Sites with a higher number of clients meeting the age of eligibility for the study were also prioritized.

Eligibility for VMMC clients was restricted to those seeking VMMC services at study sites during the period of data collection who were 15 years of age or older, and those capable of providing informed consent. For clients 15-17 years of age, client assent and guardian consent was obtained. Written

consent and assent was obtained from clients and guardians. At the majority of sites, all eligible clients were invited to participate. Each client was recruited into the study on the day of his circumcision procedure. After providing consent, clients participated in the provider-client observations that same day. Clients were asked to complete a survey when they returned to the site for their 48-hour follow-up counseling. Upon their return and completion of the survey, they were provided remuneration in the amount of 6,000 Tsh. (= USD 3.70) to cover costs of transportation and compensate them for the time spent completing study activities.

All HTC/VMMC counselors at study sites on the days of data collection were invited to participate in the study (all counselors were over 18 years of age). Fifty-nine providers completed surveys, after providing verbal consent. Providers who worked at multiple study sites were asked to complete a shortened version of the survey after their first interview. No providers declined participation.

Data was collected via paper surveys during one-on-one interviews conducted in private settings at study sites. Data was entered into a database format using Microsoft Access version 14.0 (© Microsoft Corporation) and transferred to STATA version 12.1 (© StataCorp LP) for analysis.

Quantitative data collection instruments

Five instruments were developed for quantitative data collection including a facility assessment, observation tool, client flow analysis, provider survey, and client survey. The facility assessment and observation tool were used to capture counseling practices for the evaluation of the two main study outcomes of quality and efficiency. Items from the provider and client surveys were used to examine quality and efficiency relative to provider characteristics and client outcomes. The facility assessment and observation tools were developed from instruments in the WHO guidance document, "A Handbook for Improving HIV Testing and Counseling Services" (WHO, 2010c), and adapted for the Tanzanian context based on instruments from the National AIDS Control Program (NACP) and discussions with local implementers.

Independent variables

A number of variables were explored in relation to the outcome measures described. In order to capture differences in quality and efficiency across different types of VMMC service delivery, a variable was constructed for **service provision model (SPM).** Three categories of service provision models were determined: fixed, outreach low (OL), and outreach high (OH). Fixed sites are based on the standard PEPFAR definition[2] (PEPFAR, 2013). Outreach sites were categorized as OL or OH based on the average number of clients on days when data collection occurred at the site and the daily client load during the week prior to data collection.

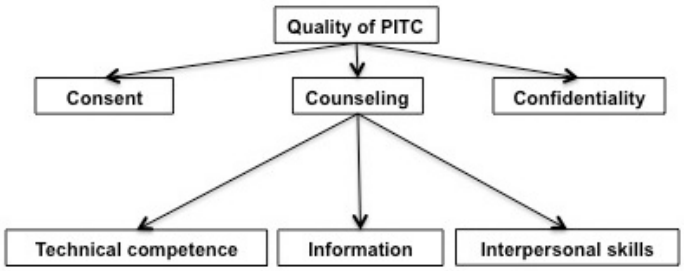
[2] ***Fixed sites*** are permanent structures located in or near existing healthcare facilities such as public and private hospitals and large health centers. These sites operate on a continuous basis. Dedicated space within fixed sites is permanently available to provide VMMC services. ***Outreach sites*** are similar to fixed sites in that they capitalize on existing permanent structures. However, the structures used by outreach sites are modified from their primary purpose to accommodate the VMMC package. For example, smaller dispensaries, health centers, schools, and community centers may serve as outreach sites through the reorganization of the facility or the addition of space using tents or prefabricated structures. Additional personnel is sent to the outreach site to support the VMMC package of services.

Outcome measures

Quality outcome measures

The measure of quality used in this study was constructed based on WHO guidelines for HTC service provision that requires adherence to the "3Cs" or core principles of consent, confidentiality, and counseling (WHO, 2007)[3]. Counseling was further elaborated based on the Bruce-Jane framework for quality to include the following domains: 1) information given to clients about HIV prevention and information given to clients about the HIV test; 2) interpersonal communication skills; and 3) technical competence (Bruce, 1990). **Figure 1**, below, depicts the components of quality measured in this study.

Figure 1: Depiction of quality components



Data used to characterize quality were collected from the observation tool. Observers at each counseling station noted whether a client received specific messages related to HIV testing, HIV prevention, and VMMC. Observers also rated the counselor's interpersonal communication skills on a four-point Likert scale ranging from "limited" (=1) to "excellent" (=4).

Consent, confidentiality, and technical competence were represented by individual observation items. Most items in these domains appeared in the observation tool as dichotomous exposure variables (i.e., yes/no). For these items, an overall item score of "exposed" was assigned if the client received the message at one or more stations.

Scales were constructed to measure information given to clients about HIV prevention (seven items, Cronbach's alpha=.87), information given to clients about HIV testing (five items, Cronbach's alpha=.69) and interpersonal skills (six items, Cronbach's alpha=.77). Mean scores were calculated for each scale. The mean scores from each scale was combined to create an overall quality of counseling measure (18 items, Cronbach's alpha=.77). For details on scale development see **Appendix B**.

[3] At the time study instruments were developed the "3Cs" were recommended by the WHO. During the process of data collection, new recommendations were released that shifted to the use of "5Cs" with the addition of correct test results, and connection/linkage to prevention, care and treatment. For more information on the "5Cs" please see the WHO document, "Service Delivery Approaches to HIV Testing and Counseling (HTC): A Strategic HTC Programme Framework," published in 2012 and available at URL: http://www.who.int/hiv/pub/vct/htc_framework/en/index.html.

Quality scores were also constructed for each of the four counseling stations (group, individual, post-operative, 48-hour follow-up) used to provide counseling at VMMC sites in Tanzania. These scores were constructed from the same items used for the overall quality scales. Because the items related to information about testing were not observed during post-operative and 48-hour follow-up counseling, scores for those stations do not include the five items about HIV testing. The six items capturing interpersonal skills were re-scaled on a 0 to 1 scale. The station-specific interpersonal skill score was specified as the mean of the re-scaled items within each counseling station. Similarly, the station-specific information scores were the means of their respective items. Station-specific overall quality was constructed by taking the mean of the information and interpersonal scale scores. For details on station-specific scale characteristics see **Appendix B**.

Additional quality scores were constructed with the provider as the unit of analysis. Because different providers facilitate each counseling station (rather than moving through the stations with clients), the provider quality score was constructed using the station-specific quality measures. To obtain the provider level quality score at each station, each provider was assigned an average of the station-specific quality scores he or she received across clients at each station. Both scores for information and interpersonal skill and overall quality station scores were assigned at this level. Providers were then assigned an average of their quality scores across all counseling stations. See **Appendix B** for details on provider-level quality score characteristics.

Efficiency outcome measure

Efficiency measures were created using start and end times collected via the client flow analysis tool. Observers recorded start and end times for each counseling session as well as the time when the client entered the facility. Surgery start and end times were transcribed from records kept by the VMMC service providers. The length of each session was calculated as the difference between start and end times. Wait times between sessions were calculated as the difference between the end time of one session (or the time when the client entered the facility) and the start time of the subsequent session. As data collection and cleaning revealed questionable data quality for surgery start and end times, a total time between the end of individual counseling and the beginning of post-operative counseling, less the mean surgery time at the facility, was used (rather than three separate measures of wait time between individual counseling and surgery, active surgery time, and wait time between surgery and post-operative counseling).

Time spent between services and receiving services was aggregated in four efficiency summary measures (**Table 2**). Times for follow-up services were excluded from the summary measures. "Active time" was specified as the sum of the time spent in group, individual and post-operative counseling, and the mean time for surgery at the facility. "Wait time" was specified as the sum of the time spent between entering the facility and starting group counseling (or individual counseling for clients who skipped group and proceeded straight to individual counseling), the time between ending group counseling and starting individual counseling, and the time between ending individual counseling and starting post-operative counseling (less the mean surgery time at the facility). "Total time" was calculated as the difference between when the client entered the facility and the end time of post-

operative counseling. Finally, the "efficiency ratio" was expressed as the wait time as a proportion of the total time.

Client outcome measures

Quality and efficiency were explored in relation to three client outcomes: client satisfaction, retention of information, and HIV-related behavioral intentions.

Overall client satisfaction and sub-scales were constructed from 15 items in the client survey. All 15 items were measured on a four-point Likert scale ranging from "strongly agree" to "strongly disagree," with higher scores correlating with more favorable responses. The overall client satisfaction measure had a Cronbach's alpha of .93. Sub-scales included client satisfaction with the counselor (11 items, Cronbach's alpha=.90) and client satisfaction with the facility (four items, Cronbach's alpha=.84). The final scales were specified as the mean score across component items.

Client retention of information is represented by two different indices: the number of messages retained and an HIV prevention knowledge retention score. The number of messages retained index was specified as the total number of messages the client was able to recall from the VMMC counseling. The average number of messages recalled was 3.4 (SD 2.4, min 0, max 16). The HIV prevention knowledge retention score was created from four items measuring the client's knowledge about ways to prevent HIV transmission. Participants were asked to describe ways to prevent HIV transmission, and were then prompted for items not mentioned. All items were recoded so that a spontaneous response was assigned more value (=2) than a prompted response (=1). The final index is the sum of all four responses. The final index has a mean of 5.9 (SD 1.1, min 2, max 8).

In addition, relationships between exposure to individual messages and retention of corresponding information as well as behavioral intention and exposure to individual messages were explored. Exposure to the message was characterized in two different ways: dichotomous exposure (i.e., exposed/not exposed over the entire counseling experience) and cumulative exposure (i.e., number of times exposed over the four counseling stations).

Quantitative data analysis

Standardized sampling weights based on the inverse probability of selecting participants from the pool of all eligible clients on a given sampling day were calculated and applied for all client level analyses. Homogeneity at the facility level was accounted for by the use of empirically derived standard error estimates. All tests of statistical significance were two-tailed and conducted at the 0.05 level of significance.

Univariate and bivariate regression analyses were conducted. Chi-square tests were used to detect statistically significant relationships between categorical variables, and linear regression was used for continuous outcome variables. The lowest quality tertile and the lowest efficiency tertile were specified reference categories in respective analyses that used them as predictors. For analyses involving SPM, fixed sites served as the reference category. Reference categories for client and provider characteristics are noted in the data tables.

Qualitative methods

Qualitative sampling and data collection

For the qualitative portion of the study, IDIs were conducted with 30 HIV service providers and stakeholders, and 30 clients. Semi-structured field guides with open-ended questions were used to facilitate the interviews. Additional questions and probes were incorporated based on responses from participants as the data collection progressed. Interviewers completed interview summaries to facilitate this process. Interviews were recorded, transcribed, and translated from Kiswahili to English for analysis. Qualitative and quantitative data collection was concurrent.

HIV service providers and stakeholders selected for IDIs were recruited from different HTC settings to ensure that a range of views were represented in responses. Specifically, interviews were conducted with five government health officials, two program officers, ten HTC providers from civil society organizations or non-governmental organizations (NGOs), six counseling providers at HTC/VMMC sites, one VMMC provider, three HIV care and treatment centers (CTC) providers, and three peer educators who promote HTC/VMMC services. All providers included in the study sample were identified by the research coordinator with help from MCHIP VMMC staff. In general, they were selected based on their availability and experience with the VMMC program. The six HTC/VMMC providers were selected from sites external from the quantitative sample with the exception of two participants. Providers from the site were interviewed during quantitative data collection at outreach health facilities with HTC or care and treatment (CT) services. No compensation was given to providers, following the custom for research in Tanzania.

For IDIs conducted with HIV-positive clients (n=12), the sample selection strategy included identifying clients who had known their status for varying lengths of time. Providers at VMMC sites were asked to contact the research team if there was an eligible HIV-positive client. Health providers referred HIV-positive clients to the study who learned their status while quantitative data collection at sites was ongoing. In addition, health providers at CTCs contacted persons previously diagnosed as HIV-positive when seeking VMMC to schedule interviews for the research study. For HIV-negative participants (n= 18), clients at VMMC sites who were not included in the quantitative sample were interviewed for the qualitative sample[4]. Clients were interviewed at the health facility or at another more convenient time. Clients were provided remuneration in the amount of 9,000 Tsh. (= USD 5.60) to cover costs of transportation and compensate them for the time spent completing study activities. All persons invited to participate did so.

Qualitative data analysis

After the completion of data collection, codes were developed *a priori* based on the objectives of the research. The codes were hierarchical in nature and included modules relating to the research questions (quality, integration, referrals). A codebook outlining each code and definition was developed and shared with members of the data collection team and revised based on their feedback (i.e., the code

[4] This includes clients who were missed for recruitment into the quantitative part of the study when the team arrived after service provision began, or a client returning to the site because of complications related to VMMC but not seeking the procedure on the day of sampling for the quantitative study.

"Follow-up Improve" was used for any mention of mechanisms to improve referral follow-up). One member of the research team applied codes to segments of text representing each concept using the software program Atlas.ti version 7.0.82 (© ATLAS.ti GmbH, Berlin). A selection of interviews was checked by another study team member to ensure accurate application of the codes. Meetings were held with the coder and other team members to discuss emerging themes as the coding progressed. Quotations for each code were reviewed and summarized in relation to specific research questions by the coder and presented to other team members to aggregate and synthesize main themes in relation to the research questions.

Ethics

Ethical approval was granted by the National Institute for Medical Research in Tanzania and the Tulane University Biomedical Review Board. No adverse events or deviations from protocol occurred.

RESULTS

A total of 601 eligible clients were served by the program on sampling days. Of these clients, 109 (18%) were excluded from participation because they did not have a guardian present to provide consent for participation in a research study. Three clients invited to participate declined. Ninety-two (92) eligible clients were not invited to participate because their counseling session began prior to the arrival of the study team at the site, or because they arrived as guardians and later decided to get circumcised. A total of 397 VMMC clients agreed to be in the study and participated in provider-client observations; 307 observations were complete across all counseling stations[5]. A total of 320 clients returned for their 48-hour follow-up counseling and completed surveys.

Results are presented in the following sections:

- Protocols and practices for HTC at VMMC service sites (Research aim 1)
- Quality of counseling (Research aim 2)
- Efficiency of service delivery (Research aim 2)
- Client outcomes in relation to quality and efficiency (Secondary aim)
- Integration, coordination, and referral across services (Research aims 3 and 4)

Results section 1: Protocols and practices for HTC at VMMC service sites

Overview of service delivery

In the Iringa and Njmobe regions of Tanzania, VMMC services are offered through fixed and outreach service delivery models. All VMMC providers are GoT staff working for the Ministry of Health and Social Welfare of Tanzania. VMMC services are provided on a continuous basis at hospitals and health centers that serve as fixed VMMC sites. Fixed sites have a lower daily client load compared to outreach sites. They also have permanent staff trained to provide VMMC services. VMMC providers at fixed sites rotate through VMMC services at the discretion of the Facility in Charge. During routine service delivery periods, VMMC is provided two or three days per week at fixed sites[6]. During data collection for the current study, peer educators were used to motivate clients at fixed sites.

In contrast to fixed sites are outreach sites. At outreach sites, VMMC services are temporarily extended to facilities that do not normally have the capacity to provide VMMC services. Health centers, health dispensaries, and other places that have an established structure are transformed into sites that can provide VMMC. This is accomplished by the addition of external health personnel, and in some cases, changes to the layout of the facility, and provision of commodities such as medical supplies and equipment. Outreach sites usually operate during periods referred to as "VMMC campaigns," although they may also operate in non-campaign periods. During outreach activities, medical personnel from the fixed sites travel to outreach sites to perform the VMMC service. Additional demand creation activities

[5] In some cases, clients skipped group counseling because there were not enough clients to form a group. Those observations were still considered complete if the client was observed in individual, post-operative and follow-up counseling.

[6] At fixed sites in Tanzania, services are not offered every day of the week but on specific days as is customary for other forms of health service provision. This differs slightly from the standard PEPFAR definition of fixed sites. During non-routine periods, services may be offered during more days.

(radio advertisements, peer education, etc.) are also conducted during outreach activities to motivate clients from the surrounding areas to attend the outreach site. Given the distance of outreach sites to city centers in Iringa and Njombe, medical personnel are housed within or near the site for the duration of the outreach (approximately 2-4 week periods). As per regional policy, health providers work in the VMMC program in their overtime hours, and therefore receive extra duty pay for providing these services. When working away from their home site, they also receive per diem for food and living expenses.

The protocol for the provision of PITC/VMMC counseling is the same at fixed and outreach sites. Counseling is usually provided by nurses, but may also be facilitated by assistant medical officers or clinical officers depending on demands at the site. Clients are registered upon entrance to the facility and then move through a series of four counseling stations. Clients receive counseling from several different counselors as they move through the stations. Counselors generally remain at one station, but on rare occasions may serve multiple stations throughout the day depending on demands at the facility.

After registration, clients participate in a group counseling session. This session generally includes about 10 clients, although this varies depending on client load and the age of clients. Next, clients are counseled individually in a private area and offered the HIV test. In some cases, clients are sent straight to individual counseling if few clients are available for group counseling. This happens more often at fixed sites. After individual counseling and testing the circumcision surgery is performed, followed by one-on-one post-operative counseling. The next counseling session occurs when clients return to the site 48-hours after the procedure to check the progress of wound healing and for bandage removal[7].

Information provided during counseling about VMMC and PITC is integrated and provided in a complementary way as clients move through the counseling stations. Most information about PITC is provided at the two pre-operative counseling stations (group and individual). Counselors use standardized educational materials to deliver counseling messages including flip charts as visual aids for prevention messages and penile models for condom demonstrations. It is recommended that group sessions are divided by the age of clients to better facilitate appropriate counseling messages for young people who are not yet sexually active.

Quantitative findings

Out of the 11 study sites, three sites were classified as fixed, five as outreach low (OL), and three as outreach high (OH) service provision models (SPM), based on the PEPFAR definition and their average client load on data collection days and in the week prior to data collection (**Table 3** in **Appendix A**). For fixed sites the average client load was 5 (range 2-8) clients per day on data collection days, and 8 (range 5-14) clients per day in the week prior to data collection. For OL sites the average client load was 18 (range 7-37) clients per day on data collection days, and 148 (range 52-390) clients per day in the week prior to data collection. For OH sites the average client load was 71 (range 62-78) clients per day on data

[7] The final opportunity for counseling occurs for clients who return to the site seven days after the initial surgery. Fewer clients return for the seven day surgery compared to the 48-hour counseling. For this reason, and logistics related to data collection, only four counseling stations were included in the current study (group, individual, post-operative, and 48-hour follow-up).

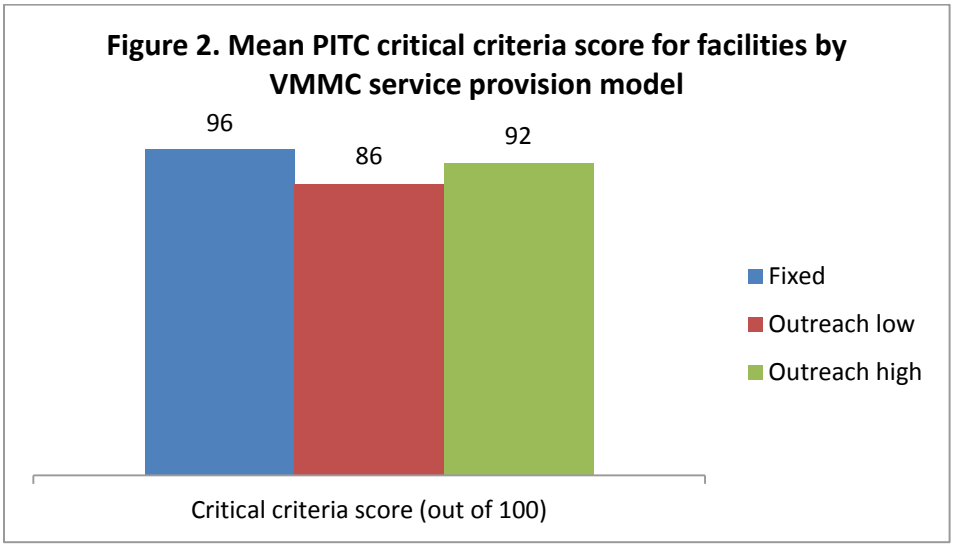
collection days, and 389 (range 372-420) clients per day in the week prior to data collection. Providers at OL sites reported counseling an average of 21 (range 2-60) clients per day, while providers at OH sites reported counseling 46 (range 8-85) clients per day, over the course of the current outreach. In contrast, most providers (80%) at fixed sites reported counseling less than 10 clients per day during the previous two weeks.

Five sites were health dispensaries, three were hospitals, and three were health centers. Eight sites were part of organizations run by the government, two by faith-based organizations, and one by a non-governmental organization. One OL site was active during a previous campaign; otherwise all outreach sites were active for the first time during the current campaign. The median number of days in operation as a VMMC site prior to data collection was higher for fixed sites (960, range 655-1316) compared to outreach sites (16, range 13-18 OL[8]; 11, range 7-15 OH).

In **Table 4**, the median number of personnel and cadre are summarized by SPM. Approximately 4-5 personnel provide counseling for PITC/VMMC in fixed, OL, and OH sites. Almost all counselors were nurses followed by clinical officers and assistant medical officers in both fixed and outreach settings. Providers were on average 38.6 (21-59) years old, and mostly women (80%). These provider characteristics were similar across SPM.

The sites were evaluated for the adequacy of existing structures (human resources, availability of guidelines and protocols, infrastructure, safety issues, and information systems), and key processes to support the provision of PITC services. A PITC critical criteria score was developed for each study site based on the WHO example assessment tool. In **Figure 2**, below, the mean PITC critical score within each SPM is presented. Overall, all the sites performed well in relation to the criteria, with scores ranging from 86-96 out of a possible 100.

Figure 2. Mean PITC critical criteria score for facilities by VMMC service provision model



[8] Excludes the one OL site active during a previous campaign, but not providing services between campaigns.

Table 5 displays the percent of facilities within each SPM meeting each item of the critical criteria score. All sites had at least two HTC-trained counselors available on the assessment day with the exception of one fixed site. All sites also had the test kits for HIV and reagents available and within the expiry date, as well as appropriate laboratory stock items and methods of disposal on the day of the assessment. There was some variation in availability of items needed for data management and surveillance reporting. One OL site did not have either the VMMC Counseling and Testing Follow Up register or the Service Register available and maintained daily. One OL site did not have the surgical theatre register available and maintained daily, while four OL and one OH site did not have the National HIV Testing and Counseling Register available and maintained daily. Few sites within any SPM performed additional tests or referred to a laboratory in the case of an indeterminate result (only two fixed sites met this standard). In Tanzania, the national policy for indeterminate tests is to retest with a different manufactured test, and if the same result is seen the client should be asked to test again in two weeks. Not meeting this standard in most cases was due to failure to use another test.

Results section 2: Quality of counseling

In this section, results from the observation of provider-client counseling sessions are summarized for quality including consent, confidentiality, and counseling (including technical competence, information given about HIV prevention, information given about the HIV test, and interpersonal skill).

Quality of consent

The first two criteria for consent were observed at group and individual counseling stations, and were considered met if they occurred at either station (**Table 6**). For 66% of the clients observed the counselor in either group or individual counseling explained that the HIV test is optional. For 59% of clients observed the counselor in either group or individual counseling explained that a client who declines the HIV test can still get circumcised. Proper consent[9] was observed during the individual counseling session, and required that clients 18 years of age and older provided consent, and that clients under 18 provided assent and had guardian consent to perform the test. The provider followed the proper consent procedure in 66% of observations. Differences across SPM were not statistically significant.

Quality of confidentiality

Confidentiality of counseling at fixed, OL, and OH sites is described in (**Table 7**). The first criterion was that the provider show respect for client privacy and confidentiality. This was considered met if all counselors across the four stations met this standard for the client. This criterion was met for 65% of clients, although this differed across SPM. Providers were more likely to show respect for client confidentiality at OL sites (87%) compared to fixed (56%) and OH sites (58%). The second criterion was that the provider explained that the HIV test is confidential. This was observed during individual counseling. In 66% of all observations, the provider explained that the test was confidential. This also happened more often in OL sites (57%) compared to fixed (38%) or OH sites (23%), although the difference was not statistically significant.

[9] Consent refers specifically to the HIV test; consent for VMMC was a separate procedure.

Quality of counseling

In **Table 8** the results related to technical competence are presented. The first criterion for this construct was that counselors appropriately document information in the National VMMC Registrar, and was considered met if it occurred in group, individual or follow-up counseling. This criterion was met for 92% of the clients observed. The second criterion was that the provider at the individual counseling station clearly explained the meaning of the test result. This occurred for 93% of the clients observed. This was less likely to occur at OL (77%) sites compared to both fixed (96%) and OH sites (99%). The final criterion for technical competence was that the counselor asked about recent HIV testing and receipt of the result. This was observed during the individual counseling session, and occurred for only 38% of the clients observed. This criterion was met for clients more often in OL sites (57%) compared to fixed (34%) and OH sites (31%), although the difference was not statistically significant.

Table 9 presents results related to information given to clients about HIV prevention. For each item, the criteria were considered met if the information was shared at any of the four counseling stations. For the majority of clients, at least one counselor provided the client with key information about HIV prevention. This includes a counselor explaining the importance of abstinence (92%), being faithful to one partner (94%), reducing the number of sexual partners (87%), and wearing condoms (99%) for HIV prevention. In 89% of client observations a counselor explained how VMMC reduces HIV acquisition for men. In 100% of observations, a counselor explained that VMMC gives only partial protection from HIV. A counselor explained how HIV is transmitted in 67% of client observations. There was no statistically significant difference across SPM in the percentage of observations wherein the counselor provided information about HIV prevention.

Other items related to HIV prevention messaging were also explored, but not included in the composite score for information given to clients because communication of the message depended on whether the client was sexually active or had a current sexual partner. For 74% of clients a counselor conducted a condom demonstration and for 58% a counselor gave the client condoms.

Results related to information about the HIV test are presented in **Table 10**. These criteria were considered met if they were discussed by a counselor at either the group or individual counseling session. Counselors performed well in certain messaging about the HIV test, but could use improvement in several areas. For the majority of clients, a counselor explained why the HIV test was a recommended part of VMMC (86%), the clinical and prevention benefits of knowing your HIV status (75%), and the window period (67%). In 45% of client observations a counselor explained the different possible outcomes of the test. In only 24% of client observations a counselor explained an indeterminate outcome and what it means. However, the one client observed with an indeterminate test was correctly given a referral to test again, following national policy.

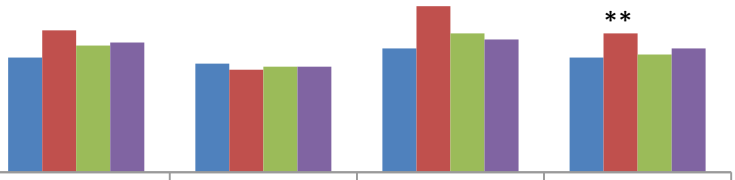
In **Table 11** results related to interpersonal communication are presented. In order for these criteria to be met, all counselors seen by the client had to meet the requirement. For 84% of clients observed all counselors exhibited a non-judgmental approach. For 57% of clients observed, all counselors provided a warm reception or greeting. Clients were more likely to have counselors who exhibited a non-judgmental approach at OL sites (95%) compared to fixed (71%) or OH sites (84%). For 41% of clients

observed, all counselors who attended to the client demonstrated adequate counseling skill by paraphrasing, using appropriate body language, asking and answering questions, and summarizing information. For 34% of the clients observed, all counselors who attended to the client checked for understanding. For 24% of clients observed, all counselors who attended to the client demonstrated client-centered skills by listening to patient ideas and concerns. For 25% of the clients observed, all counselors who attended to the client encouraged questions and client participation. Clients observed at OL sites were more likely to have counselors who met these criteria as compared to fixed or OH sites, although this difference was not statistically significant.

A global measure of counseling as excellent or good was also captured (**Table 12**). For 57% of clients observed, the observer rated that all counselors who attended to the client demonstrated excellent or good counseling skill and interpersonal communication.

A composite measure of quality was constructed to include the three domains: information about HIV prevention, information about HIV testing, and interpersonal skill. **Figure 3**, below, presents mean scores[10] for the overall quality measure and each domain. Following the pattern suggested by several individual items, OL sites had the highest overall quality mean score of all SPM, and a statistically significantly higher overall quality mean score when compared to fixed sites (0.46 OL vs. 0.38 fixed). This pattern is also present for the domains of information related to HIV prevention and interpersonal skill, although the difference is not statistically significant. Mean scores for the information about HIV testing domain are similar across SPM.

Figure 3. Mean quality scores by VMMC service provision model



	Information: HIV prevention	Information: HIV testing	Interpersonal skill	Overall
Fixed	0.38	0.36	0.41	0.38
Outreach low	0.47	0.34	0.55	0.46
Outreach high	0.42	0.35	0.46	0.39
All sites	0.43	0.35	0.44	0.41

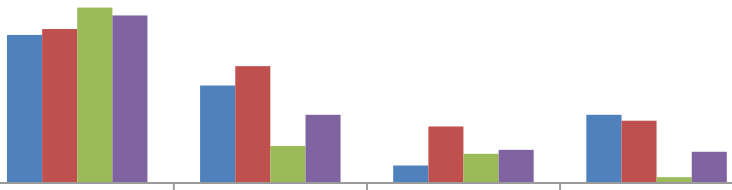
Reference, fixed sites; **p<0.01

[10] Mean scores were calculated by averaging client-level quality scores at the facility level. Mean facility scores were averaged to allow for comparison across fixed, OL, and OH sites.

Quality was also assessed for each counseling station (**Table 13**). Analysis of quality by station and SPM again indicates that OL sites outperform other site types. For group counseling, the mean score for overall quality was highest for OL sites, and statistically significantly higher when compared to fixed sites. In group counseling, differences were also observed for the interpersonal skill domain, so that a higher level of quality was experienced at OL and OH sites compared to fixed sites. In individual counseling the mean score for overall quality and the domain of interpersonal skill was higher for OL sites compared to other sites, and borderline statistically significantly higher ($p<0.10$) when compared to fixed sites. OH sites performed poorly in individual counseling when compared to other site types, and had a statistically significantly lower mean score for the information about HIV testing domain when compared to fixed sites. For post-operative counseling, OL sites outperformed fixed sites for the domain of information about HIV prevention and the overall quality measure. The mean quality score for interpersonal skill was higher at OH sites compared to fixed sites. Finally, for 48-hour follow-up counseling, OL sites performed better than other sites for each domain and the overall quality measure. The mean score for overall quality was borderline statistically significantly higher ($p<.10$) at OL sites compared to fixed sites. OH sites had the lowest mean score across the domains and for overall quality. This difference was statistically significant, indicating a lower overall quality at OH sites compared to fixed sites for 48-hour follow-up counseling.

Differences in counseling quality for each station across SPM was also measured using a global item based on observer-rating of overall counseling quality. In Figure 4, below, the percent of client observations rated as "excellent" by the observer for each counseling station and SPM are displayed. A higher percentage of clients had individual counseling sessions rated as "excellent" at OL sites compared to other site types. OH sites had the lowest percentage of 48-hour follow-up sessions rated as excellent compared to other site types. These differences were statistically significant.

Figure 4. Observer-rated 'excellent' counseling, by counseling station and VMMC service provision model

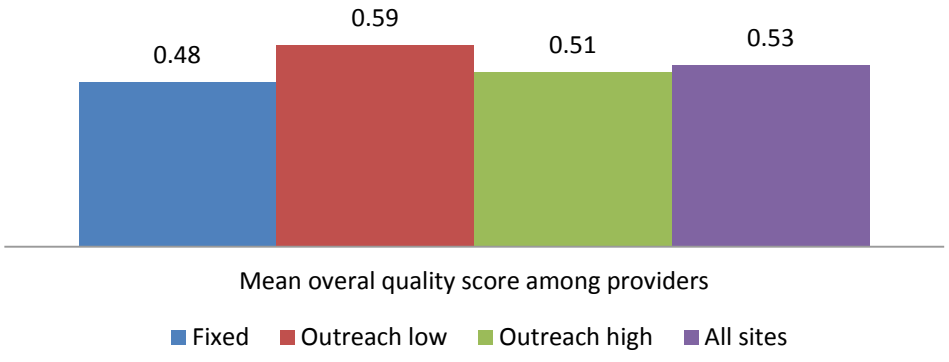


	Group	Individual*	Post-operative	48 hour follow-up**
Fixed	76%	50%	9%	35%
Outreach low	79%	60%	29%	32%
Outreach high	90%	19%	15%	3%
All sites	86%	35%	17%	16%

*p<0.05, **p<0.01

Mean quality scores were also calculated at the provider level by averaging the overall quality score across all client observations for each provider. The mean overall quality score among providers was higher at OL sites compared to other site types, although this difference is not statistically significant (**Figure 5**).

Figure 5. Mean overall quality score among providers by VMMC service provision model (n=52)



Provider characteristics were examined in relation to the provider-level quality score [results not shown]. Providers who were certified to provide HTC had a higher mean quality score compared to providers who were not certified (0.44 vs. 0.56, n=56 providers). Providers in the age category 35-44 had a higher mean quality score compared to providers under 35 years old (0.46 vs. 0.62, n=58 providers). Other characteristics examined include provider sex, technical qualification, weeks providing VMMC counseling, number of campaigns/outreaches in which they participated, participation in trainings, last time counseling was observed, access to a supervisor, and burnout, but no statistically significant differences in provider quality mean score were observed. A lack of statistically significant findings for these descriptive characteristics may be due to the small number of providers in the analysis.

Results section 3: Efficiency of service delivery

In this section, results of the client flow analysis are presented and assessed across SPM, and in relation to the quality of counseling.

In **Table 14** the average total time, active time, and wait time in minutes that clients spent at VMMC sites on the day of the circumcision procedure is presented. The average total time spent at the VMMC site on the day of the circumcision procedure for all clients across study sites was 216.4 minutes (3.6 hours), starting from when the client arrived at the clinic to the end of their post-operative counseling. The duration of time was trending towards being statistically significantly ($p<0.10$) longer at OH sites compared to fixed sites (222.1 minutes vs. 208.5 minutes). The majority of client time was spent in wait time between entry into the clinic, counseling stations, and the circumcision procedure. Average wait time for clients across all study sites was 149.6 minutes. Active time refers to time spent receiving counseling or the circumcision procedure, and was an average of 69.1 minutes across all study sites.

The average active time was slightly shorter, and the wait time slightly longer, at OH sites compared to fixed sites, although this difference was not statistically significant.

An efficiency ratio was calculated for each client to describe wait time as a percentage of total time[11] (**Figure 6**). Clients spent almost twice as much time waiting for services as compared to receiving services at VMMC sites. Wait time as a percentage of total time was highest at OH sites, followed by fixed sites and the OL sites, although differences between SPM were not statistically significant.

Figure 6: Wait time as a percent of total time at all VMMC study sites (n=348)

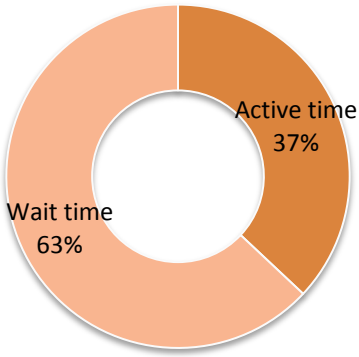


Table 15 displays the average duration in minutes at each of the counseling stations and wait time between stations. There are several notable findings. First, the average wait time between when a client entered the facility and the beginning of their group counseling sessions was statistically significantly shorter at OH sites compared to fixed sites (56.7 minutes vs. 87.7 minutes; 61.8 minutes across all sites). A possible reason for this delay at fixed sites is that providers may have to wait for a sufficient number of clients to arrive before beginning a group session, whereas there is a constant flow of clients to the group session at OH sites. Providers at fixed sites may also work in other areas at the health facility and therefore cannot immediately start group counseling when a VMMC client arrives.

The average time spent in group counseling was 31.4 minutes across all sites. This was significantly higher at OL sites compared to fixed sites (46.9 minutes vs. 26.5 minutes). Clients waited an average of 60.4 minutes between the end of group counseling and the beginning of individual counseling. This was trending towards being statistically significantly ($p<.10$) longer at OL and OH sites compared to fixed sites (90.1 minutes at OL, 56.6 minutes at OH vs. 38.0 at fixed sites). A possible reason for the longer wait time for OL compared to fixed sites could be the additional client load at OL sites, but similar amount of time spent in individual counseling and number of counseling personnel as fixed sites (thus creating a bottleneck at individual counseling). The longer wait time between OH and fixed sites might

[11] Active time and wait time presented in **Figure 6** are based on averages across clients, whereas the wait time/total time was calculated for each client and then averaged across clients. For this reason, dividing the wait time by the total time presented in the table does not equal the calculated wait time/total time.

also be a function of client load and personnel, though individual counseling sessions at OH sites tend to be much shorter than at fixed sites. The longer wait time between group and individual counseling for OL compared to OH sites may be due to the shorter duration of individual counseling sessions at OH compared to OL sites, allowing more clients to move through this station at OH sites in a shorter amount of time. While the average individual counseling session was 15.9 minutes in duration across all sites, the average duration at OH sites was only 11.5 minutes. This is significantly different than the average individual counseling time at fixed sites (11.5 minutes at OH vs. 23.0 minutes at fixed).

Average counseling time in minutes was examined in relation to quality of counseling (**Table 16**). Tertiles of the overall quality measure were created for comparison (high, medium, low). A longer duration of group counseling was associated with higher quality of group counseling. The average time in minutes of group counseling was 36.1 minutes for clients receiving the highest quality, 34.6 minutes for clients receiving medium quality, and 25.2 minutes for clients receiving lower quality. This difference was statistically significant for clients receiving high vs. low quality[12]. The same pattern was observed for individual counseling sessions. The average duration of individual counseling was 20.8 minutes for clients receiving high quality counseling, 17.4 minutes for clients receiving medium quality counseling, and 11.2 minutes for clients receiving lower quality counseling. This difference was statistically significant for clients receiving high and medium quality versus lower quality counseling. The same pattern was also observed for 48-hour follow-up counseling. The average counseling duration among clients receiving high quality was 6.8 minutes, medium quality was 5.4 minutes, and lower quality was 3.6 minutes. This difference was statistically significant for clients receiving high and medium quality versus lower quality. However, the pattern was not observed for post-operative counseling.

The average duration of post-operative counseling was 11.0 minutes for clients receiving high quality counseling, 10.9 minutes for medium quality, and 13.0 minutes for lower quality counseling. The difference between medium and low quality was trending towards statistical significance ($p<0.10$). One reason for the difference in relationship between duration and quality for the post-operative counseling session could be because this station follows the actual circumcision procedure and having just been circumcised may influence client-provider interaction in a way not related to counseling skill. For example, the counselor may have to take vital signs, or facilitate other client-specific activities related to the procedure that affect the duration of the session. The type of information exchanged during this counseling session is also related specifically to management of the physical aspects of the medical procedure in contrast to group and individual counseling sessions.

Efficiency summary measures were also examined by tertile of quality. A potential pattern emerged wherein shorter total time, and more active time relative to wait time, is related to higher quality, but these associations did not reach statistical significance [results not shown].

[12] The ranking of low, medium, and high is used as a relative measure constructed from data in this study, and does not imply the provision of low quality services at sites in relation to an objective standard.

Results section 4: Client outcomes in relation to quality and efficiency

This section presents results exploring five different dimensions related to client outcomes: uptake of HIV counseling and testing services, linkages to care and treatment for HIV-positive clients, client satisfaction, retention of information, and behavioral intention. Results in the section are gleaned from the client survey and observation tool.

The average age of clients participating in the study was 22 years (15-64). Most clients were Christian (95%), with only 5% reporting Muslim religion. Most clients had never been married (85%).Of those clients who had never been married, only 43% had ever had a girlfriend. A minority (16%) reported having children. Half (52%) of the clients were full or part time students.

Uptake of HIV testing

Of the 320 clients participating in the client survey, 22 (7%) declined to be tested for HIV. Of these, nearly half (10 clients) reported to have refused testing because they had previously been tested and knew their status. The second most important reason for not testing was that the client was not prepared to test for HIV on the day of VMMC (reported by four clients as the main reason for not testing). Three clients reported to not have tested because they did not want to know their HIV status, and two additional clients reported concern that a positive HIV test might delay their ability to get the circumcision procedure. No clients reported not to have tested because of facility factors (e. g., non-availability of test kits, lack of trust in knowledge of the provider or in the accuracy of the test).

Linkages to care and treatment

A total of 1.5% of clients observed during individual counseling and testing, tested HIV-positive for the first time during their VMMC visit. Observation of their individual counseling sessions revealed that all new positives (n=6) were explained clinical and treatment options and were linked to care and treatment services. In most cases (n=3) the counselor introduced the client to the provider that they were referred to, or set up a time to do so. The other clients had an appointment set up for them (n=1), received a written referral (n=1) or were told where to go to receive services (n=1). One client received an additional referral for support services for orphans and vulnerable children.

There were seven additional clients who had previously tested positive for HIV who also received VMMC and counseling services. All but one HIV-positive client participating in the survey (92%) reported to be “very likely” to seek care and treatment in the next six months. One client reported that it was “not at all likely” that he would seek care or treatment because his faith did not allow him to do so.

Client satisfaction

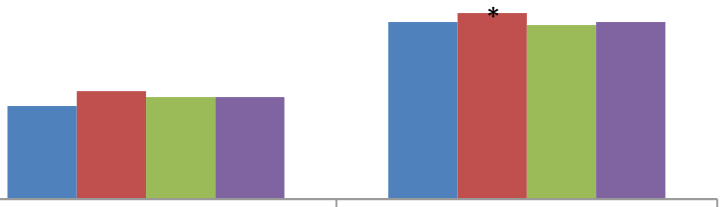
Overall client satisfaction was high, with 100% of clients reporting to “agree” or “strongly agree” that they would recommend both the facility they visited and the counselors they saw to friends (**Table 17**). Clients generally felt that they had been treated with dignity and respect and felt comfortable with their counselors. Only 90% of clients felt that they did not have sufficient time to ask questions. Clients were also generally satisfied with facility cleanliness, privacy, and waiting space. None of the items were significantly different between SPM.

Mean scores for the clients' level of satisfaction (calculated based on a 4-point likert scale of "strongly agree," – "strongly disagree") are shown in **Table 18**. The overall client satisfaction score was highest among OL sites (mean= 3.8, p<.01), followed by OH sites (mean=3.6, p<.05) as compared to fixed sites (mean=3.5). Scores for client satisfaction with counselors (based on items 1-11 from Table 17) and client satisfaction with facility (based on items 12-15 from Table 17) followed the same trend, with OL sites scoring statistically significantly higher than fixed and OH sites. Higher quality services were also associated with increased client satisfaction. Clients whose observations scored in the highest quality tertile also had the highest mean satisfaction scores (overall mean=3.7, p<.05). A positive association between higher efficiency scores and increased client satisfaction was also trending towards statistical significance (p<.10).

Retention of information

Client retention of information was measured by two different indices: Number of messages retained and HIV prevention knowledge retention. In Figure 7, mean scores for each index is presented by SPM. The mean score for the first index was 3.4, while the second index centered on a mean of 5.9. OL sites performed slightly better than other sites, with mean scores of 3.6 and 6.2 for the two indices, respectively. The mean score for HIV prevention knowledge retention is statistically significantly higher at OL sites compared to fixed sites (6.2 vs. 5.9).

Figure 7. Retention of information: Mean scores by VMMC service provision model



	Number of messages retained (n=319)	HIV prevention knowledge retention score (n=318)
Fixed	3.1	5.9
Outreach low	3.6	6.2
Outreach high	3.4	5.8
All sites	3.4	5.9

Reference, fixed sites; *p<0.05

Client retention of information appeared to be related to quality and efficiency as well. As overall counseling quality increased, the number of messages retained increased (clients who received high quality counseling recalled an average of 3.7 messages, while those in the lowest quality tertile recalled an average of 3.0 messages), though results were not statistically significant. With respect to HIV prevention knowledge retention, those in the middle and high quality tertiles had significantly higher scores than those in the lowest quality tertile (6.0 and 6.1 in the middle and high quality tertiles,

respectively, compared with 5.7 in the low quality tertile). Similarly, as efficiency increased, information retention increased. Though the efficiency results from both indices were not statistically significant, this trend may be a function of clients at higher efficiency sites experiencing more active time (e. g., longer counseling sessions).

Retention of the partial protection message was significantly related to quality as well, with the percent of respondents recalling the message increasing as counseling quality increased (48% in the lowest quality tertile, 60% in the middle quality tertile, and 75% in the highest quality tertile). While the observation data revealed that all clients were exposed to the partial protection message, retention appears to increase with increasing exposure. Of those exposed once, 49% recall the message, while 76% of those exposed to the partial protection message at all four counseling stations spontaneously recall the message (consistent with the pattern of increasing retention, 59% of those exposed twice, and 63% of those exposed three times recall the message). Though not statistically significant, these findings suggest that repeated messaging around key themes may be beneficial for information retention.

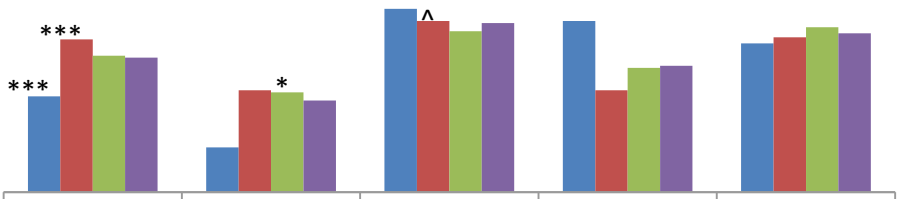
Behavioral Intention

Behavioral intention was explored through five individual survey items (**Figure 8** – higher values indicate less risky behavioral intention). The first measured respondents' behavioral intentions around the six-week abstinence period. Clients at both OL and OH sites were significantly more likely than clients at fixed sites to indicate that they were not at all likely to have sex in the next 6 weeks (75% and 67%, respectively, compared to 47% at fixed sites). Clients at outreach sites were also more likely to indicate that they would practice abstinence for the next 6 months: nearly 50% of clients at both OL and OH sites indicate they are not at all likely to have sex in the next six months compared with 22% at fixed sites (the difference between OH and fixed sites is statistically significant)[13].

While outreach clients were more likely to indicate that they would practice abstinence, they were less likely to indicate they will have sex with only one partner in the next six months, or that they will reduce their number of partners in the next six months, though these results are not statistically significant.

[13] The relationships described between SPM and abstinence in the next 6 weeks and next 6 months remain when controlling for client age.

Figure 8. Behavioral intention by VMMC service provision model



	How likely are you to have sex in the next 6 weeks? (n=319)~	How likely are you to have sex in the next 6 months? (n=318)~	How likely are you to have sex with only one partner in the next 6 months? (n=185)#	How likely are you to reduce your number of sexual partners in the next 6 months? (n=32)#	In the next 10 times you have sex, how likely are you to use a condom every time? (n=185)#
Fixed	47%	22%	90%	84%	73%
Outreach low	75%	50%	84%	50%	76%
Outreach high	67%	49%	79%	61%	81%
All sites	66%	45%	83%	62%	78%

~Percent of respondents who indicate they are not at all likely to engage in behavior

#Percent of respondents who indicate they are very likely to engage in behavior

^ p<0.10 * p<0.05 ***p<0.001

Relationships between the behavioral intention items and quality and efficiency did not appear to fall into any intelligible pattern. For some items, behavioral intention even tended toward riskier behavior as quality and efficiency increased. On the other hand, the data suggest that increasing exposure to abstinence messages leads to a greater intention to engage in abstinence or delay of sex. While 37% of respondents who were exposed to an abstinence message one time were not at all likely have sex in the next six months, 80% of those exposed four times were not at all likely to do so (consistent with the pattern, 49% of those exposed to the message twice and 57% of those exposed to the message three times were not at all likely to have sex in the next six months). While this trend is highly significant, the same relationship is not evident with exposure to "be faithful" or condom messages.

Results section 5: Integration, coordination, and referral across services

This section explores results from IDIs conducted to explore referrals and integration across the HIV service system as a whole. Referrals for HIV prevention and ancillary services were explored in addition to care and treatment for PLHIV. Particular attention was given to links across HIV testing and VMMC services. HIV-positive clients[14] who accessed VMMC services were interviewed, but did not discuss referrals as a major issue. Therefore, findings are largely based on provider and stakeholder perspectives. Providers are noted as an "HTC provider" if they work in HTC services outside of VMMC

[14] HIV-positive clients who accessed VMMC services were a mix of persons who knew their status prior to seeking services, and clients testing positive for the first time when seeking VMMC.

sites, and as a "VMMC/HTC provider" if they provide counseling within VMMC sites. HIV peer educators and government officials within the HIV system were also interviewed.

First, provider perspectives on overarching issues related to referrals in the HIV system as a whole are presented. Next, issues specific to referrals from VMMC to other HIV services, and then from HTC services to VMMC are described. Recommendations to improve referrals are also presented. Data from the observation tool and the provider survey is included as a complement to qualitative findings.

Overarching challenges to referrals within the HIV system as a whole

Providers participating in the IDIs noted several shortcomings to the established government system for HIV referrals leading to underutilization. Several providers noted that the use of referral cards in the current government system might inadvertently identify a client as HIV-positive. Providers also noted frequent stock outs of the card, namely in sites outside of fixed facilities. Finally, providers suggested that the process of having the client return the detachable portion of the card to the referring provider is flawed, since patients have no clear incentive to do so. Several providers described the creation of a unique referral system within their own facility or organization to overcome shortcomings of the established system. One provider described this as follows:

> There are forms that we designed ourselves, (not the government forms) in order to help us instead of writing a lot of information, but at least this form will direct you in several issues. We do record our referrals and keep the records. We send the original document to the hospital where the client is going and remain with the copy for our own records. (CT Provider)

Another provider described an adaptation that assisted with the monitoring of successful referrals that might also be considered for the established referral system.

> Our counselors use referral forms in which there is a part to be completed by someone who received the referral. At first we used to advise clients to come with that referral form as a means to receive the feedback, but they were not bringing the feedback. Initially one would refer 20 clients but receive feedback for only two to three clients. Therefore we have decided that there should be a contact person. Hence once referrals have been received, at the end of the month we go there to collect the referral feedback. This has helped to reduce the cost as well as to have an effective referral reports. (HTC Provider)

Adaptations to the established referral system may provide intermediate solutions within organizations. However, the use of unique methods of making and documenting referrals ultimately serves as a barrier to coordination across organizations. One provider described this problem as follows:

> Within MC services we fail due to gaps in our referral system. The referral cards we are using are not recognized by other units, they need us to use the standard ones. (HTC/VMMC Provider)

Overwhelmingly, providers across different types of HIV services reported that follow-up of referrals is a major shortcoming in the government system, and a significant challenge to providing health care to

their clients. One promising strategy that emerged during IDIs was the use of technology, namely phones to make and follow-up on referrals. One provider described this as follows:

> We give out our phone numbers and if the client has a phone we also ask for their number, so we do follow them up. When you follow them up, they take it as a caring act from the service provider. (Peer Educator)

Providers also report using phones to contact service providers and let them know who to expect. This was frequently coupled with meeting clients at appointments and escorting them to the providers. One provider described this as follows:

> We have a certain procedure that we use in most cases. When we confirm that this person is going for the service today, we talk to the service providers and inform them of the people that are going to their facility because we have their numbers. In most cases we go to the health facilities to receive the clients after they have confirmed that they are going for the service because many of them do not know where the services are provided. Many do call to ask for directions when they reach the health facilities. (Peer Educator)

However, it was also acknowledged that escorting clients was more feasible in an integrated setting, and that distance between facilities can pose a challenge. This was noted by one participant as follows:

> In our district there are arrangements, if a person is HIV+ he gets the referral form to CTC and the provider escorts him. In some of the areas it is much easier since the one who is giving referrals is the one doing CTC registration. (Government official in HIV program)

Providers participating in the IDIs also discussed challenges to referrals not related to the referral system. These included distance and transportation cost, and cost of services. One provider described the issue of cost and transportation as follows:

> I fail to link a client because sometimes the services are available too far for the clients to reach... The client can accept (referrals) if he knows that we pay for him but if he has to pay for himself he will not attend the referral. (HIV CT Provider)

Responses from the survey that was administered to providers also supports cost of transportation as a barrier. However, the survey responses also indicate client need and compliance as factors that would influence a provider's decision to make a referral. Among participants in the provider survey who responded that they never or rarely make referrals (66 out of 71 surveys), the main reasons for not making referrals included the perception that the clients did not need them (71%), and that clients were unlikely to go (18%). In a separate question, providers most often attributed potential client noncompliance with referrals, to the clients not having money for transport (50%), the client not seeing it as important (47%), and the client not being emotionally ready (24%).

Discussions about referrals consistently centered on linkage to care for PLHIV, with probing required by interviewers for participants to discuss referrals for HIV-negative clients. Once asked specifically about referrals for these clients, almost all providers described making referrals for future testing because of

the "window period" for detecting a recent HIV infection. Most providers also described giving the client condoms or providing information on where they can get them. Providers also counseled HIV-negative clients on "ABC" messaging (abstinence, be faithful, and use condoms). In three cases providers reported that they talked to clients about the importance of partner testing in delivering the ABC message[15]. One provider described this as follows:

> We always advise them to follow the ABC program in their lives. For the youth we advise them to abstain, be with one faithful and tested partner or use condoms. For the married ones we advise them to be faithful or use condoms. In most cases I do advise the youth that if you get a partner or you want to marry be free to come and test anytime and come with your partner as well. (HTC Provider)

A few providers suggested a lack of referrals for HIV-negative clients because the providers did not see it as necessary, as noted in the provider survey as well. As one provider stated:

> If he is HIV-negative why would he need to get linked to other services? (VMMC Provider)

In trainings for PITC, it is recommended that referrals be made for HIV-negatives, but the responsibility of identifying places that provide these services is left to the individual organization. In the description of training counselors for PITC, one program officer described his as follows:

> So a provider is supposed to have like a structure in his facility setting, so he is able to test and he is able to know in [the] surrounding, which types of services, if someone is positive, if someone has some emotion or psychosocial problem, or sometime with some family issues, where he's supposed to link them. (HTC Program Officer)

While referral for HIV-negative clients is included in PITC of trainings, it is not emphasized as a top priority, according to study participants. Rather, it is eclipsed by the emphasis on linkage to care for HIV-positives. One government official noted this as follows:

> Even when there are meetings, people do not talk about referrals for the people who have been found to have no infection. However, keeping a negative status also requires skills and enough support…even when you are negative you also need counseling and linkage with people who will help you out, but in most cases we underrate it. (Government official in HIV program)

Most participants identified provider attitudes and knowledge about where to send clients as the main barriers to making referrals for HIV-negative clients. In terms of attitudes, this included the perception that healthy clients would not follow-up on referrals. As one provider stated:

> If you tell them to go somewhere, very few do respond, because they already believe that they do not have HIV, so when you tell them to go for other services they will not care. And it's those

[15] See Appendix XX for a supplementary analysis on the feasibility of partner testing through VMMC programs based on the client survey.

> same types of people that end up involving themselves in risky behavior and it's because they ignored other services and considered them time wasting when asked to. (HTC Counselor)

Providers also described limited access to services due to distance, time, and quality as concerns that would deter an HIV-negative client from seeking preventative health services. Providers in integrated settings (for example a larger hospital of health center), or in positions where they themselves provided multiple services, were more likely to discuss referral to other services including family planning, STI, TB, nutrition, maternal and child health, microfinance, legal services, and youth education. Increasing referrals made for HIV-negative clients was not described as an insurmountable task, but one that would require ongoing communication across programs to keep providers up-to-date on events and services available to clients in the area.

Referrals from the perspective of HIV-positive clients

The majority of the HIV-positive IDI participants reported that they had not received any referrals as part of the HIV diagnosis and service experience. However, most of the clients interviewed were receiving CT services. Six of the 12 HIV-positive clients were engaged in CT services, while four of the clients had just recently received their diagnosis and were about to enter treatment. Clients also discussed getting helpful information from counselors. It is possible that verbal referrals are being made for clients, but that clients perceive a referral as occurring only when it is written or formally documented.

Three of the 12 HIV-positive IDI participants discussed experience with referrals. One client described using a written referral form when travelling to seek services.

> There was a time for example that I had travelled, so I was given an introduction letter from here. When I got there and it was time for my treatment, because I had the letter, I was able to get the service required. (HIV-positive client, 42 years old**)**

Another client discussed being escorted to the CT services along with receiving a written referral.

> I did an HIV test. I was found positive and he brought me and registered me on the same day at the treatment center. I began taking the drugs they give, but I did not have the proper registration card. I was using the referral paper he gave me. (HIV-positive client, 28 years old)

Referrals from VMMC to other HIV-related services

According to provider IDIs, referrals from VMMC to other services most often occur when additional health conditions are evident such as a client who is HIV-positive, or in need of care related to other STIs or TB. This was also indicated by providers participating in the survey who reported that the most common types of referrals needed by clients at the VMMC facility included medical services for PLHIV (80%), STI testing (41%), and surgical services (45%)[16]. Overwhelmingly, most providers reported that HIV-positive clients from all facility types (HTC, VMMC, Home-Based Care) are being referred to CT

[16] Note: This was a "mark all that apply" response option so percentages will not sum to 100

services. Some providers saw no barriers in this process. One provider from VMMC services described this as follows:

> There are no barriers because we try our best so that we should not be stigmatizing them, we care for them and we take them to where they should be taken. (VMMC/HTC Provider)

Results of the client observations also confirm that providers within the VMMC system try to link HIV-positive clients to care to the degree possible. As noted in results section 4, counselors for all six clients who tested positive during observations made linkages to care and treatment services. In addition to referrals for HIV-positive clients, many VMMC providers made referrals for future testing during the observations, although this was not a clear area of concern raised by providers during the IDIs. In 81% of observations the counselor recommended the client test again for HIV in the next 12 months[17]. In neither the provider survey nor the IDIs was there an indication that providers within the VMMC program perceived referrals to services providing ancillary care as necessary or feasible (for example social support services for HIV-positive clients, or HIV prevention education for HIV-negative clients). It is possible that for HIV-positive clients, providers perceive that social support and ancillary services will be provided once the client is linked into CT services, so that the emphasis is placed on the initial link to CT.

Some VMMC providers participating in the IDIs reported the challenge posed by a lack of material resources for written referrals and linking clients who are HIV-positive to treatment and care. One VMMC provider discussed this challenge within the context of outreach settings as follows:

> You may find that there is no formal linkage system. I don't know the reason for this, but sometimes in our outreach sites, even the forms you would need for referrals cannot be found. As for me, I usually carry some to the outreach site just in case they will not be distributed so we can still be able to refer. You might test a person HIV+ but you cannot refer them properly to CTC if you do not have a referral letter form. We used to have these forms in the earlier days, where we used to do circumcisions in the hospitals and these forms are readily available. But I don't know what happened these days. (VMMC/HTC Provider)

Referrals from HTC to VMMC

According to providers participating in the IDIs, referral from HTC to VMMC services has not been happening on a consistent and uniform basis. Results from the survey conducted with VMMC providers also suggest low referrals from HTC to VMMC; 88% of VMMC providers said they never or rarely received referrals from other organizations or facilities. One participant noted this deficit as follows:

> Referrals and linkages are there. But it is not so much strengthened. The referral and linkage which I see comes from male circumcision to other services especially for those who are found to have some problems. But, not the other way that ok we are talking with a client who is not circumcised then I will refer him to male circumcision. I don't think that one is really taking

[17] There were only two cases where the client reported ongoing sexual risk behavior and the counselor failed to recommend testing in the next 12 months in accordance with WHO guidelines.

> place, not really in full swing. But the other way from male circumcision to other departments, I am aware it is taking place. (Government official in the HIV program)

One reason for the lack of referrals could be the absence of clear and enforced policies among HTC providers in making referrals to VMMC. One HTC counselor described this as follows:

> Honestly, I have not been instructed to do that. I can't lie. I don't know the reason. Maybe it's something that has not been added to this service. Maybe if I was to be instructed that when providing counseling to someone, you should also talk about male circumcision... But I have never told anyone that if you are not circumcised you should go for circumcision. (HTC Provider)

Some HTC service providers suggested that the lack of a formal system for making referrals to VMMC services is a problem. One HTC provider described this as follows:

> That is a system that we didn't have, but I think it is better if it should have been there. You may tell a person verbally but there is no formal system that you could offer referral cards or referral letters for clients from PITC to MC. (VMMC/HTC Provider)

Instead, HTC providers participating in the IDIs described making verbal referrals that are not easily tracked. These verbal referrals may be counted as "self-referral" at VMMC sites if the client is not probed about health care providers with whom he has discussed VMMC. Indeed, the client may not perceive a discussion with an HTC counselor about VMMC as a referral, especially if there is a gap in time between HTC and his ultimate decision to seek VMMC services. It is noteworthy that in the review of referrals at the 11 VMMC study sites conducted as part of the facility assessment, "self-referral" was the only type of referral documented in registries for clients at fixed sites in the previous 12 months, and during the current outreach at outreach sites. No other form of referral was indicated in registries during those time periods.

HTC counselors also noted a lack of information about VMMC services (the benefit, details of the procedure, as well as logistics of where to go), and mixed information on the costs of VMMC, as barriers to referrals. One HTC provider described confusion over where to refer clients for free VMMC as follows:

> Currently we do not refer our clients for circumcision, we used to refer them. During that campaign period it was free but nowadays you have to pay some amount of money. Nowadays we don't know where (no cost) circumcision services are offered. (HTC Provider)

Many HTC providers participating in the IDIs suggested that a perception of low quality service delivery acted as a deterrent to making referrals. Clients sharing negative experiences with their community might also discourage others from seeking services. One HTC provider described this as follows:

> Another barrier is the clients themselves not having positive attitude towards the referrals. Also, sometimes resources are not enough, they are not available so sometimes you find that when a person goes where you have referred them, there are no services, sometimes there are no reagents, no services, and this discourages the clients. Another barrier is the limited number of

> staff. There are very few service providers yet clients are many, so the clients after waiting for so long, they decide to go away without receiving the services. (HTC Provider)

Another issue noted by several HTC service providers was the requirement of guardians to attend VMMC services with clients under the age of 18 years. Adult clients may also not be comfortable receiving VMMC services around young boys. When the guardians are women, this can lead to embarrassment among other clients. As one provider described:

> Another challenge in the facilities is this requirement for the under 18 year clients to be escorted by the parent/guardian. The majority of such clients are taken by female parents/guardians. In the group counseling session you find women there with these adult male clients. During discussions, the men feel uneasy or shy. This happened recently to a client in his 20s. My client said to me, 'Doctor, I am feeling bad, look at all those women and the children, what do we do?' So I had to ask the VMMC provider to attend my client outside the usual system. This is a challenge that always happens. (Peer Educator)

It was also noted that embarrassment to raise the issue of VMMC with clients seeking other services may prevent referrals, particularly among clients not initially seeking HIV-related health services. One participant noted:

> And, the other thing is actually, ahh, I don't know how to put it. You know someone comes to you with malaria. You manage malaria….Sometimes it becomes a bit tricky or maybe difficult. How are you going to introduce male circumcision to someone who came to you with malaria? (Government official in the HIV program)

Some participants in the IDIs noted that education, training, and staff development would increase the likelihood of HTC and other health service providers making referrals to the VMMC program. Several participants also noted that these types of staff development activities might also work to mitigate job fatigue:

> The health service providers need education…The training brought changes in my work... now that I have additional knowledge, I can refer a person for circumcision. (HTC provider)

Another participant suggested the need for ongoing discussion about the benefits of VMMC with other health care providers:

> Continue talking about VMMC messages to other staff within the hospital. Talk about the advantages of male circumcision and how it works to make them believe that male circumcision has some contribution in HIV prevention. They lack knowledge. They can see the client but cannot refer to the program. We have to continue to talk about VMMC within the facility and to other organizations, maybe during meetings of organizations we have the VMMC team join and talk about male circumcision. Maybe for others it is not their priority. Maybe they are working with family planning, but they are not talking about male circumcision. (Nurse/Facility in Charge)

In addition to trainings and refreshers, it was suggested that providing other types of reminders for staff could help strengthen referrals. Providers report busy work days. For those who do not have VMMC referrals as a specific job responsibility, it is easy to focus on more prioritized job demands:

> You have to remind them over and over again. Otherwise with all referrals, it might not happen. Even with the CTC not just MC… It is like I say. It is the information. If all these leaflets are distributed to the providers' desks then it is like in your face. If a client comes then you remember. If you put up all the placards in the facilities, it does help. (Administrator of HTC Counseling Program)

It was also suggested that in order to strengthen the integration and referral systems, communication between and within health facilities must be improved. This might be accomplished through the development of a joint commission with representatives from the various HIV services to work together on strengthening referral, rather than leaving it to individual programs to manage. For example one provider suggested the following:

> Maybe there could [be] an orientation of the providers to share and plan together how can we refer and get feedback of our referred client. Maybe a team should come together and plan together. (Nurse/Facility in Charge)

The potential for strengthening referral systems was perceived as feasible by most participants. Overall this was seen as a necessary and positive step towards improving services:

> Referrals can be strengthened if there will be willingness for all the people, that is, the one who issues the referral, the client and those in the facility where the referral is being sent. Likewise, there should be a good relationship between the person who issues the referral and the place where the referral is being taken. When the network is good, it becomes very good. (HTC Provider)

DISCUSSION

In this study, key aspects of PITC service provision as a component of VMMC are documented. To date, most literature on HIV testing in the context of VMMC has been limited to reporting on the uptake of testing (Mahler et al., 2011; Lissouba et al., 2010; Herman-Roloff et al., 2009). Little attention has been paid to the nuances of integrated service provision, such as the potential influence on quality and efficiency of services. Findings from this descriptive study make an important contribution towards addressing this gap.

Quality

Quality of services was measured from three different perspectives: a facility assessment, observations of counseling, and client satisfaction. Overall, the data indicate that OL sites serve as the optimal mechanism for achieving high quality counseling for HIV testing within VMMC service sites. The facility assessment primarily evaluated the physical infrastructure, availability of resources, and implementation of processes to support services. All types of SPM performed well with fixed sites scoring slightly higher than outreach sites on the facility assessment. The counseling observations evaluated the actual performance of counselors including the content of information given to clients and interpersonal communication skills. From this perspective, outreach sites with a lower volume of clients outperformed fixed sites and outreach sites with a higher volume of clients on multiple dimensions of quality. This finding was also true when examined from the client perspective. Client satisfaction was higher at OL sites compared to fixed sites and OH sites, and was positively correlated with the overall measure of quality from observations. Moreover, clients who received a higher level of counseling quality were more likely to retain HIV prevention information two days after their counseling.

The enthusiasm and high morale that accompanies outreach activities may be an important reason for the higher quality observed at OL sites. Outreach activities occur as part of larger campaigns that include mobilization activities and build momentum for the outreaches (e. g., radio announcement, posters, peer education). Unlike at fixed sites, there is typically a steady stream of clients for VMMC at outreach sites that may contribute to provider's sense that their work is valued. In many outreach settings providers travel to and live at the outreach site during its operation. While traveling away from home does bear some stress, it also builds a sense of camaraderie among providers living together and working towards a common goal. Providers at outreach sites also enjoy the additional per diems given for travel. These elements combine to develop an *esprit de corps* among providers at outreach facilities that may play an important role in their delivery of counseling services. While the number of clients seen at fixed sites also improves during campaign season, the other elements of this increased motivation do not. Further, providers at fixed sites also work in other areas of the health facility outside of VMMC. This may lead to distraction from VMMC service provision and the feeling of being overstretched. Interestingly, the potential benefits of the *esprit de corps* at outreach sites seems to diminish once a certain client load is surpassed, leading to the lower levels of quality observed in higher volume outreach sites.

While quality at sites was relatively high, there are a few areas for improvement across sites. In terms of infrastructure, the availability of protocols, and in some cases documents and registries, needed for program monitoring were lacking. Another common issue was related to indeterminate results. Most sites did not perform additional tests or refer out to a reference laboratory in the case of an indeterminate result (as noted in the facility assessment). Counselors also seldom discussed the potential for an indeterminate results and what it means with their clients (as noted in the provider counseling observations).

Another important finding across sites is the need to review the process of consent for the HIV test when it is delivered as part of the VMMC package. Currently, clients are instructed that HIV testing is the first step in the VMMC process, which not surprisingly has led to high rates of testing uptake among VMMC clients. It is important that this message is coupled with messages about the voluntary nature of the test, and the ability to get circumcised if testing is declined. In this study, 66% of observed clients had a provider explain that the test is optional, and 59% of observed clients had a provider explain that a client who declines the test can still get circumcised. In addition to being an important quality standard for current VMMC clients, increased volunteerism in relation to the test may also be important for attracting additional VMMC clients as men share their experiences receiving services with others in their communities. In the case that HIV testing may serve as a deterrent to men who want to get circumcised but do not want to take a test for HIV, knowing that the test can be declined may increase the chance that they will seek VMMC services. This may be particularly relevant for older clients (over 18) who are sexually active, and thus may be more anxious about knowing their HIV status.

Additional emphasis should also be placed on confidentiality at fixed and OH sites. During only 56% of observations at fixed sites and 58% of observations at OH sites did the provider treat the client with empathy, dignity and respect, in a way that maintained confidentiality (shows respect for client privacy, maintains a low speaking voice). Similarly, providers explained that the test is confidential during only 38% of observations at fixed sites and 23% of observations at OH sites. Increased provider training on confidentiality is warranted.

Efficiency

It is clear that clients spend a significant amount of time waiting for services across service provision models. Clients spent an average of 216.4 minutes (3.6 hours) at the VMMC facility, with approximately two thirds of this time spent waiting for services. The average wait time and total time was slightly longer at OH sites, although the difference was not statistically significant. This is likely due to a higher client load, but similar number of counseling personnel at OH sites as compared to other sites. A potential pattern emerged indicating that shorter total time, and more active time is related to higher quality, but this was not statistically significant. The data do indicate, however, that longer durations of counseling sessions are related to higher quality counseling. Striking a balance between total time at the facility and counseling sessions that are long enough to achieve high quality requires an appropriate match between the number of counseling personnel, space available for counseling, and client load. This is also important to ensure that longer counseling does not interfere with meeting targets for number of circumcisions performed, and that counselors do not feel rushed through sessions to the

degree that it affects their quality. This issue was particularly relevant at OH sites, where the shortest individual counseling sessions, longest wait times between group and individual counseling, and lowest quality for individual counseling were observed.

Knowledge retention/behavioral intention

There was an association between higher quality counseling and knowledge retention, indicating that achieving higher quality is important for client outcomes. It is interesting to note general trends in information retention versus behavioral intention. With the exception of outcomes associated with abstinence messaging, exposure to prevention messages ("be faithful" and use condoms) has a statistically significant relationship with retention of information, but not with behavioral intention. For abstinence messaging, on the other hand, both retention of information and behavioral intention are statistically significant. This may be because behavior is multifactorial and more complex than retention of information and thus cannot be expected to exhibit consistent and significant relationships with exposure to messages or quality service delivery. It may also be that there is something unique about abstinence messaging.

In relation to abstinence, outreach clients were more likely to indicate they would practice abstinence, but less likely to indicate that they will have sex with only one partner in the next six months, or that they will reduce their number of partners in the next six months, though these results are not statistically significant. Perhaps this is due to the fact that most outreach clients indicate they will practice abstinence, the most low-risk sexual behavior. Those outreach clients who are left over are the minority who engage in higher risk behaviors, and thus do not intend to be faithful or reduce their numbers of sexual partners. In contrast, those at fixed sites are more likely to engage in these latter behaviors as their primary prevention strategies, having ruled out abstinence.

Referrals

Providers across HIV services view referrals as important to their ability to adequately serve clients. In most cases, providers perceived referrals as necessary in relation to medical concerns (care and treatment for PLHIV, STI testing, TB diagnosis and care), rather than for other preventative or ancillary services. However, in the case of PLHIV this may be due to a perception that other forms of support will be encouraged once the client is engaged in care and treatment services. In terms of additional HIV education and prevention messaging for HIV-negative clients in VMMC programs, the young age of clients served, and the low numbers of clients who are sexually active may be a reason why these types of referrals were not noted as important by providers in these settings[18]. Providers tended to make referrals to people they know and organizations where they feel quality services will be delivered. Referral directories and list were absent from the majority of sites studied, although sites reported having a referral system in place. This highlights a need to create formal links across organizations. Escorting clients to services was noted as a method to ensure successful referrals, with this being easier to accomplish in an integrated service setting such as a larger health center. It is important in all settings

[18] Only 49% of clients had ever had sex according to the client survey. This is likely an overestimate of sexual activity for all VMMC clients, since the study sample excluded clients under 15 years of age.

that counselors have up-to-date information about services so that referrals can be made to specific sites, providers, or events rather than as general suggestions that leaves it to the client to identify care options. This is especially important in outreach settings.

Providers also described the use of phones to make referrals, which raises the issue of shared confidentiality of information between providers for PLHIV. During the period of data collection HIV testing policy in Tanzania prohibited sharing of a client's information with a third party without written consent from the client (NACP 2005). At the time of writing, a shift in this policy is under consideration for the revised national HTC strategy that would allow shared confidentiality so that a health care provider may notify another health care provider of a client's HIV test results if they will be directly involved in the care of that client. This shift in shared confidentiality would likely improve referrals for HIV care and treatment. The referral card currently in use might be adapted to facilitate shared confidentiality between providers. However, it should also be noted that some providers in this study expressed concern that these cards may inadvertently reveal client's HIV sero-status to others outside of their care team.

The findings suggest a need to review policies related to referrals so that providers understand what is required of them, how referrals will be monitored, the difference between verbal and written referrals, and the importance of referrals for HIV prevention for persons who are HIV-negative as well as PLHIV. It is also the responsibility of different HIV programs to work together and ensure providers across services have up-to-date information about specific services, their location, and their cost. There is an opportunity to learn from current providers about how these goals may be accomplished.

Strengths and limitations

The main strength of the study was the triangulation of data collection methods and types of research participants that facilitated an in-depth understanding of the research topic from multiple perspectives. Having multiple data sources provided validation and confirmation of the patterns of association of the mechanisms explored. A purposeful sample of sites was selected, so that almost half of all potential sites were included in the study. While this prohibits generalization outside the research study, it allowed for the comparison across service provision models, and the documentation of innovative approaches to VMMC service provision developed as the program progressed (for example, the all-male site to reach clients over 18). The data collection team was experienced in HIV-related research, and the research coordinator had extensive experience working in the VMMC program. Study instruments were developed from international guidelines, but were adapted for the local context through an iterative process of consultation with local stakeholders, piloting, and revision.

Findings should be considered in light of study limitations. In several cases, low power may have led to a lack of statistical associations in patterns observed in the data. While a census of counseling providers was taken at study sites, this number was still low and may have affected our ability to detect associations between provider characteristics and quality. As in all respondent research, there is the possibility of social desirability bias, which may have influenced responses related to behavioral intentions as well as others. Some potential clients were missed at study sites that opened prior to the arrival of the research team due to travel conditions in the rural regions where the study was

conducted. Findings related to linkage and referrals for PLHIV are limited by the small percentage of clients who tested positive during observations. This is reflective of the low HIV prevalence among VMMC clients in this region. Nevertheless, this study presents new information about key aspects of PITC service provision within the context of VMMC programs, thereby addressing an important gap in information about HIV services.

Conclusions

It is feasible to achieve quality counseling and efficient service delivery for PITC in the context of VMMC. High quality is most likely to be achieved in outreach settings with low client loads, where an *esprit de corps* exists among service providers, and the client load allows for sufficient duration of counseling sessions. High quality counseling can achieve higher client retention of HIV prevention knowledge. It is particularly important to ensure that consent and confidentiality for HIV testing are maintained in the VMMC context, and there is room for improvement in this area. There is a need for a revised referral system in the HIV service system as a whole. Referrals for HIV prevention services for HIV-negative clients in addition to CT for PLHIV should be emphasized as important, especially from HTC to VMMC services. Changes to the referral system, including the movement towards shared confidentiality, are needed and should be informed by providers already implementing innovative strategies to serve their clients.

RECOMMENDATIONS

Programmatic and policy recommendations

1. ***Increase the number of counseling personnel at OH sites:*** It is important to ensure adequate personnel and space for counseling to reduce wait times and allow enough time to provide quality counseling. Accomplishing this goal is not without challenge; it requires the ability to accurately forecast client load, and access to sufficient resources and personnel.

2. ***Emphasize consent and confidentiality in counselor trainings:*** It is imperative that counselors within the VMMC program are directed, trained, and supervised to present testing for HIV to all clients as optional and have the skills to provide confidential counseling.

3. ***Provide ongoing education and information about VMMC to HTC providers outside the VMMC program:*** HTC counselors outside the VMMC program must understand the benefits of VMMC, and must be able to pass this message along to their clients. It is also important that there is clear and up-to-date information available to HTC counselors about VMMC, the cost, and locations where they can direct clients for these services. Equipping HTC providers with the skills to discuss VMMC and overcome any potential embarrassment about the topic is essential.

4. ***Revise policies and establish a formal system to support referrals:*** In order for referrals from HTC to VMMC to increase, HTC providers must understand referral to VMMC to be a standard and required component of the counseling messages for HIV testing. Training manuals and protocols should be adapted accordingly by the GoT. A formal system for monitoring referrals from HTC to VMMC should be established that, at a minimum, includes the number of referrals to VMMC as a metric of performance in quarterly and annual reporting. This is particularly important given the potential for referrals from the HTC program to be older age clients who have been slow to come forward for VMMC. Ideally, this would also include a mechanism for following-up on successful referrals. In order to accomplish the latter, a joint commission that includes stakeholders and providers across HIV services should be established to identify a successful referral strategy and revise the strategy as necessary. This would require support from the national government.

5. ***Provide counselors with specific and up-to-date information about accessible HIV services:*** Counselors in both the HTC and VMMC service systems would benefit from information about places, providers, and events accessible to their clients for HIV services. This information would assist providers in linking PLHIV to CT and ancillary services, and also linking HIV-negative clients to future testing, partner testing, and community based prevention activities. VMMC services may serve as an opportunity to engage more men and youth in HIV prevention activities if providers are equipped with the information to facilitate these links.

6. ***Ensure a continuous supply of HIV test kits:*** A significant problem in Tanzania is the stock-out of HIV test kits. In the year prior to the current study there was a national shortage of HIV tests for an eight-month period. Another stock-out occurred at the time that data collection began for this study. HIV tests were not available at all VMMC sites in operation at the time of the study, nor outside of the VMMC program. One possible benefit of PITC/VMMC integration is the potential to create a norm of testing among young clients, and to support ongoing testing for clients. Most (60%) of the clients observed in this study were first time testers, and in 81% of observations the counselor recommended that the client test again in the next 12 months. While messaging about future testing is being accurately delivered, it is not clear that clients can feasibly complete these referrals. Barring future stock-outs of HIV test kits, it remains critical to ensure that counselors can make realistic recommendations for testing, for example, by providing information on the location of testing services.

7. ***Provide repeated messaging through sequential counseling stations:*** There is some evidence that repeated exposure to messaging as clients move through the four counseling stations may lead to greater retention of information. This was true for the message about the partial protection provided by VMMC against HIV acquisition. Exposure to information from multiple counselors may also increase the perception among clients of normative support for the methods of HIV prevention being promoted.

Research recommendations

The findings from this study point to several areas where further research is warranted:

1. ***Defining "referrals" from the client and provider perspective:*** One of the issues that emerged through the exploration of the referral process was the different interpretation among providers, and potentially clients, of what constituted a referral. From the provider perspective, a referral was warranted chiefly for biomedical concerns, and the mechanism for making a referral could vary from verbal to written. From the client perspective, a referral was perceived to have occurred only when written documentation was supplied. Upon registration at the VMMC sites, all clients are queried about referrals; out of the 11 study sites, all clients were documented as "self-referrals" (this is also true when monitoring data was reviewed for the past 12 months at fixed sites). An examination of the meaning of the term "self-referral" is needed to clarify what this indicator is actually measuring, perhaps through the use of cognitive interviewing. This may lead to recommendations for how providers might probe clients to achieve a more accurate assessment of verbal referrals.

2. ***Exploring a contextually appropriate mechanism for obtaining consent:*** Another issue that occurred during the study was the challenge in obtaining consent from guardians for service provision. It is current policy for both HIV testing and VMMC that a guardian must accompany a client under the age of 18 to services and provide consent. The first question that might be explored is the cutoff age of 18, which may be incongruent with local norms related to adulthood status. Further, the communal nature of the cultural setting may also indicate that a

representative from the community rather than a legal guardian would be appropriate for the provision of consent for minors.

3. ***Determining the effect of PITC/VMMC integration on future testing behavior:*** As noted previously, a substantial proportion of VMMC clients are young and testing for HIV for the first time when they are circumcised. While a drawback of the young age and lower sexual activity level of clients has been a low HIV detection rate through VMMC programs, it does provide the potential benefit of establishing a norm of HIV testing as a preventative and ongoing behavior. Further research might document the long-term effects of early exposure to testing through VMMC, and the possibility that it might lead to ongoing testing over the life course.

4. ***Examining the potential deterrent effect of PITC/VMMC integration:*** A serious concern related to the integration of services is the potential for HIV testing to deter VMMC clients who do not wish to test for HIV. The current study was limited in the ability to capture this potential deterrent effect because clients were interviewed at the point of service delivery, and thus had already chosen to seek VMMC services. A community-based sample of men who have not yet sought VMMC services should be queried to sufficiently examine this important topic.

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APPENDIX A:
TABLES

Table 1: Summary of data collection methods and study participants

Method	Participants
Facility assessments	11 facilities
Provider-client counseling observations	307 complete observations across all stations 296 Group counseling observations 392 Individual counseling observations 388 Post-operative observations 314 48-hour follow-up observations
Provider surveys	71 surveys (59 unique providers)
Client surveys	320 participants
Provider in-depth interviews	30 participants
Client in-depth interviews	30 participants

Table 2: Summary of efficiency measures

Scale	Mean	SD	Min	Max
Active time (n=397)	72.0	20.0	28.7	157.7
Wait time (n=362)	148.8	92.8	5.8	505.7
Total time (n=366)	217.7	101.1	52	605
Efficiency ratio (n=348)	0.63	0.16	0.09	0.89

Table 3: Characteristics of study sites

Service provision model	Client load per day, in the week prior to data collection	Average client load (on data collection days)	Type of facility	Type of ownership	Median days in operation as a VMMC site
Fixed	14	8	Health Center	Government	960
Fixed	6	5	Hospital	Government	1316
Fixed	5	2	Hospital	FBO^	655
Outreach low	111	37	Dispensary	Government	18
Outreach low	130	23	Dispensary	Government	14
Outreach low	390	15	Dispensary	Government	13
Outreach low	57	9	Hospital	Government	17
Outreach low	52	7	Health Center	FBO	14[19]
Outreach high	420	78	Health center	Government	15
Outreach high	375	73	Dispensary	Government	7
Outreach high	372	62	Dispensary	NGO^^	11

[19] This outreach site was in operation during a previous campaign but was not active between campaign periods. If the time of activity is counted from the first campaign, the median days is 504.

^FBO = Faith-based organization, ^^NGO = Non-governmental organization

Table 4: Median number of personnel and cadre by VMMC service provision model (SPM)

	Fixed	Outreach low	Outreach high
Median number of personnel providing counseling for HTC or VMMC	4 (3-11)	4 (2-5)	5 (5-10)
Cadre of personnel*			
Percent Nurses	94%	84%	90%
Percent clinical officer	6%	11%	10%
Percent assistant medical officer	0	5%	0
Characteristics of providers**			
Mean age	38.9 (21-56)	39.8 (28-57)	37.4 (26-59)
Percent female	86%	79%	75%

*Data based on facility assessment; **Data based on provider survey

Table 5: Percent of facilities meeting critical criteria by SPM

Criteria	Fixed (n=3)	Outreach low (n=5)	Outreach high (n=3)	All sites (N=11)
Two HTC-trained counselors available today?	67%	100%	100%	91%
Trained counselor able to do rapid tests available?	100%	100%	100%	100%
HIV test kits available?	100%	100%	100%	100%
HIV test kits within expiry date?	100%	100%	100%	100%
Reagent for HIV test kits available?	100%	100%	100%	100%
Reagent for HIV test kits within expiry date?	100%	100%	100%	100%
HIV kits stored at an appropriate temperature (fridge required if above 30 degrees Celsius)?	100%	100%	100%	100%
Gloves available and used for testing?	100%	100%	100%	100%
Sharps container used for disposal of lancets and needles?	100%	100%	100%	100%
Separate, lined bin in testing room for disposal of contaminated waste (gloves, cotton wool, etc.)?	100%	100%	100%	100%
Safe site storage of contaminated waste until disposal?	100%	100%	100%	100%
Pit, incinerator or contractual arrangement in place for disposal of contaminated waste?	100%	100%	100%	100%
VMMC Counseling Testing Follow Up register (old) available and maintained daily, OR Service register (new) available and maintained daily?†	100%	80%	100%	91%
Surgical theatre register available and maintained daily?^	100%	80%	100%	91%
National Testing and Counseling Register available and maintained daily?†	100%	20%	67%	55%

For indeterminate results, additional test performed or referred to laboratory?†	67%	0	0	18%

†Items adapted from WHO tool for Tanzanian context

Table 6: Consent criteria by SPM

Criteria	Fixed	Outreach low	Outreach high	All sites
Explained that test is optional (n=393)	60%	56%	71%	66%
Explained that clients who decline test can still get circumcised (n=393)	62%	43%	66%	59%
Followed the proper consent procedure (n=337)	65%	88%	55%	66%

Table 7: Confidentiality criteria by SPM

Criteria	Fixed	Outreach low	Outreach high	Total
Treated client with empathy, dignity and respect (shows respect for client privacy and confidentiality, maintains low speaking voice)* (n=397)	56%	87%	58%	65%
Explained that test is confidential (n=393)	38%	57%	23%	66%

* $p<0.05$

Table 8: Counseling: Technical competence by SPM

Criteria	Fixed	Outreach low	Outreach high	All sites
Counselor appropriately document information in National VMMC Service Register (n=397)	88%	98%	91%	92%
Provider clearly explain the meaning of the test result?** (n=346)	96%	77%	99%	93%
Counselor asked about recent testing for HIV and receipt of test result (n=390)	34%	57%	31%	38%

** $p<0.01$

Table 9: Counseling: Information about HIV prevention by SPM

Criteria	Fixed	Outreach low	Outreach high	All sites
Prevention: abstinence (n=397)	87%	92%	93%	92%
Prevention: being faithful to one sexual partner (n=397)	96%	98%	92%	94%
Prevention: reducing the number of sexual partners (n=397)	88%	99%	81%	87%
Prevention: wearing condoms correctly and consistently (n=397)	100%	99%	99%	99%
Explained how VMMC reduces risk of HIV acquisition (n=397)	88%	92%	88%	89%
Explained that for HIV-negative men, VMMC gives only partial protection against their acquisition of HIV and	99%	100%	100%	100%

requires use of other prevention strategies to protect themselves (n=397)				
Explained the ways HIV is transmitted (n=397)	50%	63%	72%	67%

Table 10: Counseling: Information about HIV testing by SPM

Criteria	Fixed	Outreach low	Outreach high	Total
Explained why the test is recommended as part of VMMC (n=393)	88%	89%	84%	86%
Explained the clinical and prevention benefits of testing and knowing one's HIV status (n=393)	78%	63%	79%	75%
Explained the window period clearly (n=393)	60%	62%	72%	67%
Explained the different possible outcomes of the test (positive, negative) and what they mean (n=393)	62%	60%	36%	47%
Explained an indeterminate outcome and what it means (n=393)	15%	35%	21%	24%

Table 11: Counseling: Interpersonal communication† by SPM

Criteria	Fixed	Outreach low	Outreach high	All sites
Exhibited non-judgmental approach* (n=397)	71%	95%	82%	84%
Provided warm reception, greeting and/or introduction (n=397)	52%	61%	56%	57%
Demonstrated adequate counseling skills (paraphrasing, body language, asking/answering questions, summarizing) (n=397)	34%	52%	38%	41%
Checked for understanding (n=397)	24%	47%	31%	34%
Demonstrated client-centered skills (listens to patient ideas and concerns) (n=396)	33%	40%	15%	24%
Encouraged questions and client participation (n=397)	32%	35%	18%	25%

†Percentage rated excellent or good versus some or limited by observer, * $p<0.05$

Table 12: Overall observer rating of counseling as excellent or good

	Fixed	Outreach low	Outreach high	All sites
Overall rating of counseling skill and interpersonal communication by observer (n=397)	54%	67%	54%	57%

Table 13: Mean quality scores by station and SPM

SPM	Information: HIV Prevention	Information: HIV Testing[20]	Interpersonal skill	Overall quality
Group counseling (n=296)				
Fixed	0.81	0.32	0.83	0.65
Outreach low	0.89	0.32	**0.90***	**0.70****
Outreach high	0.73	0.38	**0.89***	0.67
All sites	0.77	0.36	0.88	0.67
Individual counseling (n=390)				
Fixed	0.62	0.51	0.74	0.62
Outreach low	0.72	0.52	**0.82^**	**0.68***
Outreach high	0.53	**0.37***	0.68	0.52
All sites	0.59	0.43	0.72	0.58
Post-operative counseling (n=386)				
Fixed	0.24	--	0.57	0.41
Outreach low	**0.46^**	--	0.68	**0.57^**
Outreach high	0.39	--	**0.73****	0.56
All sites	0.38	--	0.69	0.54
48-hour follow-up counseling (n=314)				
Fixed	0.22	--	0.65	0.44
Outreach low	0.30	--	0.69	**0.50^**
Outreach high	0.14	--	0.53	**0.34***
All sites	0.20	--	0.60	0.40

Reference, fixed sites; ^p<0.10*p<0.05, **p<0.01

Table 14: Average client minutes in active time, wait, and total time by SPM

	Fixed	Outreach low	Outreach high	All sites
Total time (n=366)[21]	208.5 (181.5-235.6)	209.3 (2.2-416.4)	**222.1^** (205.2-239.0)	216.4 (172.8-260.0)
Active time (n=397)	70.9 (51.1-90.7)	74.1 (38.3-109.8)	66.3 (53.6-79.0)	69.1 (61.4-76.7)
Wait time (n=362)	141.3 (100.9-181.7)	139.2 (-36.8-315.2)	156.9 (130.4-183.4)	149.6 (112.0-187.3)

Reference: fixed sites; ^p<0.10

[20] The domain of information about HIV testing is not presented for post-operative and 48-hour counseling because these items were only assessed during group and individual counseling.

[21] Active and wait time presented in this table do not equal total time due to weighting and different number of observations use to calculate each.

Table 15: Average time (minutes) of counseling at each station and wait time between stations, by SPM

	Fixed, Mean (95% CI)	**Outreach low, Mean (95% CI)**	**Outreach high, Mean (95% CI)**	**All sites, Mean (95% CI)**
DAY 1				
Client enters facility – group counseling (n=284)	87.7 (32.5-143.0)	60.8 (29.7-91.9)	**56.7*** (23.9-89.6)	61.8 (47.7-75.8)
Group counseling session (n=296)	26.5 (3.7-49.4)	**46.9**** (38.4-55.4)	28.1 (15.9-40.4)	31.4 (23.6-39.1)
Group counseling – individual counseling (n=290)	38.0 (26.8-49.2)	**90.1**** (57.6-122.7)	**56.6^** (9.3-104.0)	60.4 (41.9-79.0)
Individual counseling session (n=392)	23.0 (12.0-34.1)	21.1 (12.3-30.0)	**11.5***** (10.3-12.6)	15.9 (10.8-20.9)
Individual counseling – post-op counseling (estimated time for circumcision procedure excluded) (n=382)	41.3 (21.0-61.6)	48.4 (4.7-92.1)	47.9 (-3.4-99.2)	46.9 (31.3-62.6)
Post-op counseling session (n=387)	8.6 (-0.9-18.2)	9.4 (5.9-12.9)	13.4 (0.8-26.0)	11.6 (7.4-15.8)
FOLLOW-UP				
Client enters facility – follow-up counseling (n=307)	64.4 (34.5-94.3)	**30.3**** (7.3-53.4)	59.0 (25.3-92.6)	51.8 (35.0-68.6)
48-hour follow-up counseling session (n=314)	5.0 (1.6-8.5)	6.4 (4.1-8.7)	4.3 (1.6-6.9)	5.0 (4.0-6.0)

Reference group Fixed, ^p<0.10, * p<0.05, ** p<0.01;
CI=Confidence interval

Table 16: Average time (minutes) at each counseling station by levels of quality

	Lower quality Mean (95% CI)	**Medium quality Mean (95% CI)**	**Highest quality Mean (95% CI)**
Group counseling session (n=296)	25.2 (19.5-31.0)	34.6 (20.3-48.9)	**36.1**** (31.6-40.5)
Individual counseling session (n=392)	11.2 (10.0-12.3)	**17.4*** (11.5-23.2)	**20.8*** (12.2-29.3)
Post-op counseling session (n=387)	13.0 (6.6-19.4)	10.9^ (6.1-15.7)	11.0 (9.1-12.9)
48-hour follow-up counseling session (n=314)	3.6 (2.9-4.3)	**5.4*** (4.2-6.5)	**6.8***** (6.2-7.5)

Reference category low quality, * p<0.05, ** p<0.01; ***p<0.001
CI=Confidence interval

Table 17: Client satisfaction with counselors and facility by SPM

% of clients who "strongly agree" or "agree" with the following statements:	Fixed (n=70)	Outreach low (n=114)	Outreach high (n=136)	All sites (n=320)
Satisfaction with counselors:				
1. The counselors treated you kindly, with dignity and respect	98%	100%	100%	100%
2. The counselors were easy to talk to	99%	100%	99%	100%
3. The counselors were knowledgeable and able to answer all of your questions	99%	99%	99%	99%
4. The counselors helped you feel comfortable talking about all your concerns and personal issues	97%	98%	99%	98%
5. You felt that the counselors listened to you	99%	100%	99%	99%
6. You felt that your personal issues will remain confidential and private between you and the counselors	99%	96%	90%	93%
7. You felt comfortable discussing HIV, sexually transmitted infections, and sexual health with counselors	99%	97%	93%	95%
8. You felt comfortable asking the counselors about sexual behavior	94%	97%	90%	93%
9. You had sufficient time to ask questions	92%	93%	88%	90%
10. You got all the information you needed from your counselors	98%	98%	99%	98%
11. You would recommend these counselors to friends interested in HIV testing or male circumcision	100%	100%	100%	100%
Satisfaction with facility:				
12. You had enough privacy during the counseling sessions	99%	100%	96%	98%
13. There was adequate waiting space	94%	99%	100%	99%
14. The facility was clean	100%	98%	100%	100%
15. You would recommend this facility to friends	100%	100%	100%	100%

Table 18: Mean client satisfaction scores and regression by SPM, quality tertile, and efficiency tertile

	Client satisfaction with counselors		**Client satisfaction with facility**		**Client satisfaction overall**	
	Mean (95% CI)	Coefficient (Standard error)	Mean (95% CI)	Coefficient (Standard error)	Mean (95% CI)	Coefficient (Standard error)
Overall	3.6 (3.5-3.8)		3.7 (3.6-3.8)		3.7 (3.6-3.8)	
SPM						
Fixed	3.5 (3.3-3.8)	Ref	3.5 (3.3-3.7)	Ref	3.5 (3.3-3.8)	Ref
OL	3.8 (3.6-4.0)	**0.290*** (0.091)	3.9 (3.7-4.0)	**0.359***** (0.066)	3.8 (3.6-4.0)	**0.308**** (0.083)
OH	3.6 (3.6-3.6)	**0.102^** (0.050)	3.7 (3.6-3.8)	**0.216**** (0.048)	3.6 (3.6-3.7)	**0.132*** (0.049)
Quality tertile						
Low	3.6 (3.5-3.7)	Ref	3.6 (3.5-3.8)	Ref	3.6 (3.5-3.7)	Ref
Medium	3.7 (3.5-3.8)	0.079 (0.082)	3.8 (3.7-3.9)	**0.126*** (0.053)	3.7 (3.5-3.8)	0.091 (0.073)
High	3.7 (3.6-3.9)	**0.132*** 0.056	3.8 (3.7-3.9)	**0.165**** (0.045)	3.7 (3.6-3.9)	**0.141*** (0.051)
Efficiency tertile						
Low	3.5 (3.4-3.7)	Ref	3.6 (3.4-3.8)	Ref	3.6 (3.4-3.7)	Ref
Medium	3.7 (3.6-3.7)	0.119 (0.069)	3.8 (3.7-3.8)	**0.170*** (0.076)	3.7 (3.6-3.7)	**0.133^** (0.069)
High	3.8 (3.5-4.0)	**0.219^** (0.114)	3.8 (3.6-4.0)	0.188 (0.114)	3.8 (3.6-4.0)	**0.211^** (0.113)

^ p<0.10 * p<0.05 ** p<0.01 ***p<0.001

APPENDIX B:
SCALE DEVELOPMENT AND CHARACTERISTICS

Development of scales

A series of processes was used to choose items for the scales. For interpersonal skill, seven items were selected into the initial item pool. Only one item was subsequently eliminated because of inadequate variation across observations. Principal components factor analysis was used to confirm adequate correlation between items in the scale. All items load onto a single factor with Eigenvalue 2.9, with factor loadings greater than 0.40. Cronbach's alpha for the final set of items is .77.

For the information scale, an item pool consisting of items related to HTC and HIV prevention was compiled from the observation tool. Of those, items with inadequate variation at all four counseling stations were eliminated. Next, principal components factor analysis was used to suggest statistically meaningful groupings of items. Only after *a priori* justification could be made for those groupings were they accepted. At this stage, messages related to condom demonstration, giving client condoms, talking with a partner about prevention and testing, and VMMC not protecting a partner demonstrated poor correlation with all other messages. Because the study population was found to be relatively low risk (51% had never had sex), elimination of these items was justified. All remaining indicators split very clearly into two scales: one related to information about prevention (seven items) and the other related to information about testing (five items). For the information/prevention scale, all items load onto a primary factor with Eigenvalue 3.97, with factor loadings >0.60. Cronbach's alpha for the final set of items is .87. For the information/testing scale, all items load onto a primary factor with Eigenvalue 2.28, with factor loadings >0.50. Cronbach's alpha for the final set of items is .69.

All items in the interpersonal skill sub-domain scale were dichotomized so that "excellent" and "good" responses received a score of 1 and "some" and "limited" responses received a score of 0. An overall item score of 1 across all counseling stations was assigned only if the excellent/good criterion was met in ALL counseling sessions in which a client participated. The interpersonal skill scale score was specified as the mean of all item scores. The final scale has a mean of 0.45 (SD 0.31, min 0, max 1).

Items in the two information scales appeared in the observation tool as dichotomous exposure variables (yes/no). An overall item score was created for the number of times a client was exposed to the message (i.e., the cumulative exposure) across all counseling stations. Thus, overall item scores for most items ranged from 0 (client was not exposed to message) to 4 (client was exposed to message in all four counseling sessions). For some items, exposure was only recorded in individual and group counseling. In these cases, overall item scores ranged from 0 to 2. Because of the differing scales for overall item scores, all overall item scores were re-scaled on a 0 to 1 scale. The two information scale scores were then constructed by taking the means of their respective re-scaled overall item scores. The final information about HIV prevention scale has a mean of 0.44 (SD 0.17, min 0.07, max 0.86) while the final information about HIV testing scale has a mean of 0.37 (SD 0.20, min 0, max 1).

The overall quality score includes the domains of interpersonal skill, information about HIV prevention, and information about HIV testing. It was specified as the mean of these three domain scale scores. The final overall quality scale ranges from 0.04 to 0.89, with a mean of 0.42 (SD 0.15).

Characteristics of station-specific scales

Station-specific quality scales were constructed from the same items used for the overall quality scales. Because the items related to information about testing were not observed in post-operative and 48-hour follow-up counseling, those stations do not have an information HIV testing sub-domain score. Cronbach's alpha for each scale is presented in Supplementary Table 1.

Supp. Table 1: Cronbach's alpha for station-specific scales

Scale	Cronbach's alpha
Group – interpersonal skill	.69
Group – information/prevention	.77
Group – information/testing	.59
Individual – interpersonal skill	.84
Individual – information/prevention	.81
Individual – information/testing	.60
Post-op – interpersonal skill	.86
Post-op – information/prevention	.83
Follow-up – interpersonal skill	.83
Follow-up – information/prevention	.82

Items in the interpersonal skill scale were re-scaled on a 0 to 1 scale. The station-specific interpersonal skill score was specified as the mean of the re-scaled items within each counseling station. Similarly, the station-specific information scores were the means of their respective items (Supplementary Table 2).

Supp. Table 2: Station-specific information and interpersonal scale characteristics

Scale	Mean	SD	Min	Max
Group – interpersonal skill	0.88	0.12	0.398	1
Group – information/prevention	0.83	0.22	0	1
Group – information/testing	0.38	0.22	0	1
Individual – interpersonal skill	0.74	0.18	0.22	1
Individual – information/prevention	0.62	0.32	0	1
Individual – information/testing	0.46	0.30	0	1
Post-op – interpersonal skill	0.67	0.22	0.06	1
Post-op – information/prevention	0.38	0.32	0	1
Follow-up – interpersonal skill	0.60	0.22	0	1
Follow-up – information/prevention	0.22	0.28	0	1

As with respect to overall quality above, the station score was constructed by taking the mean of the station-specific scores for information and interpersonal skills (Supplementary Table 3).

Supp. Table 3: Station-specific characteristics of overall quality score

Scale	Mean	SD	Min	Max
Group	0.69	0.13	0.334	1
Individual	0.61	0.21	0.07	1
Post-op	0.53	0.23	0.03	1
Follow-up	0.41	0.19	0	1

Provider level quality

To obtain the provider level quality score at each station, each provider was assigned an average of the station-specific quality scores he/she received across clients at each station. Both sub-domain scores and whole station scores were assigned at this level (Supplementary Table 4).

Supp. Table 4: Provider level quality score at each station

Scale	Mean	SD	Min	Max
Group – interpersonal skill	0.88	0.08	0.47	1
Group – information/prevention	0.83	0.17	0.12	1
Group – information/testing	0.37	0.14	0	0.65
Group	0.70	0.10	0.35	0.84
Individual – interpersonal skill	0.75	0.11	0.37	1
Individual – information/prevention	0.62	0.21	0	0.93
Individual – information/testing	0.46	0.21	0.07	0.88
Individual	0.61	0.15	0.17	0.91
Post-op – interpersonal skill	0.67	0.12	0.17	0.96
Post-op – information/prevention	0.38	0.21	0	0.71
Post-op	0.53	0.15	0.08	0.84
Follow-up – interpersonal skill	0.61	0.12	0.19	1
Follow-up – information/prevention	0.22	0.18	0	0.54
Follow-up	0.41	0.11	0.09	0.64

The final level of analysis for the quality outcome was the provider level. Providers were assigned an average of their quality scores across all counseling stations. Both sub-domain and overall quality scores were specified (Supplementary Table 5).

Supp. Table 5: Average provider level scores

Scale	Mean	SD	Min	Max
Provider – interpersonal skill	0.70	0.19	0.19	1
Provider – information/prevention	0.46	0.28	0	0.96
Provider – information/testing	0.40	0.19	0.04	0.73
Provider overall	0.53	0.18	0.09	0.80

Client satisfaction

Overall **client satisfaction** and sub-scales were constructed from 15 items in the client survey. All 15 items were measured on a four-point scale from strongly agree (=1) to strongly disagree (=4). Items were reverse coded for the analysis so that more favorable responses were assigned higher scores. Sub-scales related to client satisfaction with the counselor and client satisfaction with the facility were constructed from subsets of 11 and four items, respectively. Principal components factor analysis was used to confirm adequate correlation between items in the scales. The final scales were specified as the mean score across component items.