Determinants Of Voluntary Medical Male Circumcision Uptake Among Adults In Luo Nyanza

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ABSTRACT

Introduction: Randomized controlled trials have demonstrated that Medical Male Circumcision offers up to 60% efficacy in the prevention of heterosexual HIV transmission. The Luo community of Kenya do not practice traditional male circumcision and have been reporting the highest HIV prevalence rates in Kenya. However, despite the concerted efforts to reach as many eligible males as possible, the response has been below expectation particularly adults. We sought to determine the extent of uptake and the factors associated with low uptake of Voluntary Medical Male Circumcision among adult men in Luo Nyanza.

Methods: The study was a descriptive, cross sectional study with qualitative and quantitative components targeting men aged 18 years and above. A total 384 respondents were interviewed using structured questionnaires and two Focus Group Discussions conducted. Data was organized and presented using quantitative techniques; the Chi square, Z-test and Mann Whitney U-test were used for testing for significance.

Results: The study found that only 58% of adult men had undergone circumcision while the remaining 42% had not. VMMC uptake was found to be highest among single respondents (74.8%) and least among polygamous married respondents (30.0%), p-value <0.001, it was also highest among respondents with 0 - 2 children (56.6%) and least (29.8%) among respondents with more than 5 children, p-value=0.017. The unemployed also had the highest uptake (73.3%) and least among self employed (52.2%), p-value=0.006.

Conclusion: Circumcision was still unpopular among adults in Luo Nyanza and a significant proportion of adult men have not opted for circumcision. Age, marital status, number of children, occupation and income are the key factors influencing the uptake of circumcision. There is a linear decline in circumcision uptake with increase in age. In order to accelerate the uptake of VMMC, intervention that targets the older males needs to factor in the household related factors and the roles and responsibilities of such men at different age groups.

Keywords: AIDS, HIV, Luo Nyanza, Male Circumcision, Voluntary Medical Male Circumcision.

Acronyms And Abbreviation

AE - Adverse Events
ART - Anti Retroviral Therapy
AVAC - AIDS Vaccine Advocacy Coalition
CDC - Centers for Disease Control
CD4 - Cluster of Differentiation type 4 Cells
CNS - Citizen News Service
DMPP - Decision Making Priority Program Tool
HIV - Human Immunodeficiency Virus
HPTN - HIV Prevention Trials Network
HTC - HIV Testing and Counseling
KNC - Kenya National Census
LSHTM - London School of Hygiene and Tropical Medicine
MC - Male Circumcision
MSM - Men Having Sex with Men
NGOs - Non Governmental Organizations
PEPFAR - President's Emergency Plan for AIDS Relief
QA - Quality Assurance
RCT - Randomised Control Trial
STI - Sexually Transmitted Infections
UNAIDS - Joint United Nations Programme on HIV/AIDS
USD - United States Dollar
VMMC - Voluntary Medical Male Circumcision
WHO - World Health Organization

Operational Definitions

Adults - The males who have at least celebrated their 18th birthday and beyond.
AIDS - Acquired Immunoodeficiency Syndrome is a collection of symptoms and infections resulting from the specific damage to the immune system caused by HIV in the human.
HIV - Human Immunodeficiency Virus is a retro virus that can lead to AIDS.
Luo Nyanza - The geographical location that had up to September 2010 been known as Nyanza Province, specifically the current four counties of Kisumu, Siaya, Homa Bay and Migori.
Male Circumcision - The surgical removal of the fore skin; which is a common practice worldwide that is performed for cultural, religious social and medical reasons.
Voluntary Medical male circumcision - The concerted efforts and services offered through government and partners support to promote the willingness and acceptance of male circumcision as a HIV prevention strategy.
1.0 Introduction
This chapter discusses an overview of Male Circumcision followed by a discussion on the background of the study.

1.1 Overview Of VMMC
Male circumcision (MC) is the surgical removal of the foreskin. It is a worldwide practice that is commonly performed for reasons as varied as cultural, religious, and medical (Marcé, 1997). There are however many communities that do not practice MC. In such communities, any effort to introduce the practice is seen as an imposition on other cultures on their people. However, after several observational studies were made between from as early as 1980 and 2007, it has been shown that communities that traditionally circumcised had lower prevalence rates of HIV compared to traditionally non-circumcising ones (Herman-Roloff, Otieno, Agot, Ndinya-Achola, & Bailey, 2011).

Voluntary Medical Male Circumcision (VMMC) is a medical strategy recognized by the WHO as part of a larger prevention strategy against HIV. The joint United Nations program on HIV and AIDS (UNAIDS) and the World Health Organization (WHO) recommend safe voluntary medical male circumcision as an important additional strategy for the prevention of heterosexually acquired HIV infection in men in areas with high HIV prevalence rates and low levels of male circumcision (Bailey, Plummer, & Moses, 2001). Communities from different parts of the world practice male circumcision for different cultural, religious or medical reasons that can sound alien to other communities, hence implementation of VMMC has been shown to reduce HIV infection by a significant 60% (Auvert et al., 2005). Mathematical modeling has also shown that VMMC coverage of 80% can achieve an 80% reduction in HIV prevalence rates in Eastern and Southern Africa by 2015 (WHO/UNAIDS, 2012).

Why Voluntary Medical Male Circumcision
As an additional strategy in the fight against HIV/AIDS, VMMC has been shown to reduce HIV infection by a significant 60% (Auvert et al., 2005). Therefore, when applied besides other protective strategies such as condoms, use of HTC, it can help in reducing the burden of care and treatment besides reducing new infections. The catch up phase of VMMC implementation targets reaching as many sexually active uncircumcised men as possible within the shortest time. When 80% (203 million circumcisions) coverage of VMMC can be achieved among priority countries with high HIV prevalence rates in Eastern and Southern Africa by 2015, then about 3.4 million new infections can be averted by 2015 and 2025 (WHO/UNAIDS, 2012).

VMMC implementation targets reaching as many sexually active uncircumcised men as possible within the shortest time. Mathematical modeling has also shown that VMMC coverage of 80% can achieve an 80% reduction in HIV prevalence rates in Eastern and Southern Africa by 2015 (WHO/UNAIDS, 2012). Therefore, the role and benefits of VMMC in the fight against HIV/AIDS cannot be overemphasized. What is important is the sustainability of the process across the demographic profile of the targeted populations.

Chapter One introduces the study then discusses an overview and background to the proposed study. This will be followed by a review of the literature on VMMC in chapter two. Chapter three discusses the research problem and will include a justification of the study, research questions, objectives and hypothesis statement. Chapter four is the methodology and will entail a discussion of the study area, study design, study population, the sampling process and the sources of data for the study. Chapter five presents the study results followed by a discussion of the results in chapter six. The study conclusions and recommendations are presented in Chapter seven.

1.2 Background information
Combating HIV/AIDS, malaria and other diseases was the 6th Millennium development goal. It aimed at halting and beginning to reverse the spread of HIV/AIDS by 2015. Different strategies have since been adopted in order to achieve this objective. In Kenya, the prevalence rates of HIV/AIDS is not uniform across the population. Just like other Eastern and Southern countries, the prevalence rates have been observably higher in communities that do not practice traditional Male Circumcision. The Luo ethnic community in Kenya, like their Nilote brothers; Turkana, Teso and Pokot do not practice traditional Male Circumcision. These communities have registered high HIV prevalence rates compared to those that practice traditional MC. Hence WHO/UNAIDS recommended VMMC as an additional strategy in fighting HIV/AIDS in these regions. Luo Nyanza is therefore a priority region in Kenya (Auvert et al., 2005). It is projected that by achieving an 80% VMMC coverage among males 15 to 49 years old by 2025, then a significant number of new HIV infections will be averted (Macintyre et al., 2014).

Voluntary Medical Male Circumcision for HIV prevention has been widely popularized in Kenya, more so in Luo Nyanza. Various factors are known to determine how members of the Luo community have responded to this Public Health intervention. Since its inception, the ministry of health has since adopted different strategies to not only promote the uptake towards the realization of National targets but also towards the realization of other HIV prevention strategies. The National Male Circumcision Task Force was therefore established as an advisory body for the Ministry of Health. The government took up an ambitious plan to circumcise, by partnering with stakeholders, 860,000 men between 2008 and 2013. This involved adoption of the Joint Strategic Action Framework and WHO/UNAIDS recommendations including free-of-charge service approach, training nurses and clinical officers as surgeons to address human resource shortage and the integration of other HIV prevention strategies; condom distribution, safe sex promotion, HIV Testing and Counseling, STI screening and treatment (WHO/UNAIDS, 2012). This is a priority exercise for traditionally non-circumcising communities that have high HIV prevalence rates at the same time. By December 2011, only 340,958 men had been circumcised with Luo Nyanza accounting for 82.1% of this number. Only 14.9% of them were aged 25 years and above (CDC, 2012).

Accessibility of Healthcare
Accessibility to services has been one of the factors that influence how well or otherwise communities utilize health services. It may be defined by the average number of consultations or the share of the relevant population receiving a given service. The probability that someone will receive healthcare if necessary is termed as access, and if this equals 100% then access is 100%. The lower the probability, the lower the access (Savedoff, 2009). Urban and peri urban populations have for a long time enjoyed better and frequent access to health services compared to their rural counterparts. Marginalized communities like the Turkana of Northern Kenya view with suspicion government owned programs (Macintyre et al., 2014). In such poverty stricken communities, peoples' priorities may not favor uptake of Health interventions such as VMMC unless the health message is packaged appropriately. Long distances to facilities, socio-cultural barriers in using services, the cost of the travel and long
waiting time at the facilities are some of the barriers that need to be studied further in relation to VMMC uptake. Hence the need to continually and consistently address such obstacles where and when they are identified is an essential prerequisite for all VMMC health interventions in order to boost coverage.

**Providers approaches in boosting coverage**

With the aim of winning more men to increase coverage, many implementing partners have adopted varying strategies. Transport to and from facilities is freely provided besides free drinks during post anesthesia recovery time. It is not clear; however, whether these approaches offer potential motivation to informed VMMC service seeking behavior for HIV prevention or for the enticements alone. Different demand creation approaches will definitely yield different perceptions that boost or hinder uptake across different age groups e.g use of public address systems.

**The Household related dimensions to uptake rates**

The decision to get circumcised or not can be a household's collective bargain, taking into account the various implications or stakes involved. Sometimes the head of the household, the man, who is also at the centre of decision making as to whether he or his son can get circumcised may face the dilemma of hard choices. Initial uptake studies have pointed at the fear of losing household income during recovery period as one of the deterents of uptake (Herman-Roloff et al., 2011). As to whether this is a genuine concern or an excuse is yet to be ascertained. Sometimes the head of the household or his son(s) is the main bread winner in the family e.g. men from the fishing industry along Lake Victoria. They may be shying off from circumcision while fearing economic losses that might arise from complications due to contact with water. More research is actually needed on VMMC complications rates among the fishing communities.

Varying perceptions on VMMC outcome may also influence uptake rates. Some men have natural phobia for pain and injections. Story sharing among peers, about intra-operative or post operative pain may be discouraging whether reported with exaggeration or accurately to an uncircumcised man. This would cause fear whether unfounded or not, hence the need to make health related benefits of the procedure a priority among service seekers.

Studies have also shown that some men seek circumcision for reasons other than HIV prevention. VMMCs is known to protect female partners from cervical cancers, genital warts, penile cancers and also improvement of penile hygiene besides myths such as improved sexual pleasure. (Yang et al., 2012).

**Service delivery factors**

Service providers and their attitude at work can influence a community's service seeking behavior. It begins from gender related issues in service delivery; whether a man will be comfortable to expose himself naked before a female service provider, whether there is enough assurance that client information will be kept confidential by the service provider e.g. during HTC. The facility setting can also determine whether a man may opt or not to seek services at facilities closer to his homo area due to the sensitivity of the procedure and stigma that may be associated with it. During the procedure some men may still ask whether the procedures' rooms provide confidentiality. Some men may opt not to seek services at the same facilities as their little sons.

**Cultural issues and Stigma**

One of the major challenges that was faced in the roll out of VMMC in Nyanza was how to package the information in a community that does not practice traditional MC. It risked being seen as an introduction of alien cultures to the Luo community. Among the Turkana, the practice is seen as an introduction of the cultural practice of the traditional enemies (Macintyre et al., 2014). The age related stigma associated with the practice was another barrier identified in the study with older men viewing VMMC as targeting children not adults. In Luo Nyanza, it took the intervention of the Luo council of elders, stakeholders and local political leaders to unpack the cultural view about MC in view of the high HIV prevalence rates in the region (NRHS, 2011).

**HIV Prevention methods besides VMMC**

Although male circumcision has been shown to provides partial protection of about 60% against HIV to men, women can only benefit indirectly from this intervention. It has been emphasized that other HIV intervention strategies be promoted and practiced as well. Adults who have for a long time declined circumcision for unclear reasons point out to the fact that circumcision is for younger people and that they no longer need it because they are no longer at risk. Some men even argue that they are in faithful relationships or using condoms. (L'engle, Lanham, Loolpapit, & Oguma, 2014). This is a potential barrier for uptake of VMMC services among men as it points out to inadequate or misinformation on the need to combine HIV prevention strategies.

2: Literature Review

This is a discussion of the Literature on Voluntary Medical Male Circumcision as a strategy for the prevention of HIV transmission.

2.1 Background of Male Circumcision

Circumcision is a worldwide practise that is recognized and practised in fulfillment of two main obligations; religion and culture. Specific and experienced members of religious and cultural systems who are not health professionals are entrusted with the duty. These are usually done outside the formal medical settings. These circumcisions are accompanied by ceremony (WHO, 2009b) Among the Muslim and Jewish religious practices, all males should be circumcised as a religious obligation. In Islam, males are circumcised at infant or pubescent stage. Traditionally, circumcision is performed on adolescents and young men for transition into manhood. Boys are educated about their duties responsibilities as adult members of the society (Bailey et al., 2001). Very little literature is available about what exactly is taught during such initiation ceremonies, mostly considered as secret and confidential, nor the safety and complications from the whole process (Marck, 1997). An initiate is expected to demonstrate courage and bravery during circumcision and anyone who shows cowardice is often derided and belittled. Although the actual removal of the foreskin is the climax, it is usually a small component of the whole ceremony (Bailey et al., 2001).

Traditionally special knives were used, and the foreskin removed. In clinical settings, there is a lot of emphasis on standardizing the procedure to make it as safe as possible. The randomized clinical trials recommended the removal of the inner foreskin up to a few millimeters to the glans thus leaving the glans fully exposed (WHO, 2009b).
Low uptake of Voluntary Medical Male Circumcision

Different countries have registered low uptake of VMMC services among the target populations. Some regions have registered much lower uptake levels than others especially among men 18 years old and above. There is very little literature available on utilization VMMC, especially among the older men who are prime targets for the intervention in the priority countries (Sabone et al., 2013).

One year after the launch of the national VMMC program for HIV prevention, an acceptability study was conducted among men in Nyansha, Kenya. The primary barriers to acceptability, the study reveals, were time away from work, cultural and religious factors, possible adverse events and post surgical abstinence period. Facilitators of uptake on the other hand included, hygiene, social pressure, protection from STIs, improved sexual satisfaction and pleasure. (Herman-Roloff et al., 2011). The study concluded that, in order to increase uptake; misconceptions about MC should be dispelled, peer mobilizers, religious leaders and women groups be involved and the relevance of MC be increased among men already practising an HIV prevention method (Herman-Roloff et al., 2011). The study did not however suggest ways of dispelling these misconceptions.

The results of the above study are obtained from focus group discussions only. From its’ discussions, the study generated purely qualitative data. It ignores the quantitative aspects and determinants that also play a role in circumcision decision making such as a man’s age, his level of education, his occupation, his household roles and responsibilities. The conclusions are also made outside the possible influences of Public Health policies on circumcision. Being purely qualitative, Focus Group Discussion, the researchers may have included women in the discussion groups so that issues pertaining to the influence and roles of women in circumcision be discussed. The fact that many men have since evaded the "cut" may as well point to the deficiencies in the conclusions made by similar studies.

The above study was conducted in three (Kisumu East, Kisumu West and Nyando), out of eight districts (now sub-counties since 2010) in Luo Nyansha where VMMC is actively ongoing. The results were therefore qualitatively representative in the exercise due to homogeneity in the demographic profile.

Acceptability among the adult men in Turkana Tribe of Kenya

Among the Turkana ethnic community in Kenya, Macintyre et al examine the acceptability of VMMC among older men prior to a planned service roll out. The study begins by an admissions by the research team that in many communities older men, 25 years and above have not come out for circumcision and the reasons are not well understood. This is in agreement with the study at hand. After conducting 20 Focus Group Discussions and 69 indepth interviews among older men, both circumcised and uncircumcised and their partners in the rural urban and peri urban Turkana, Macintyre et al report their findings thus. Facilitators to circumcision are found to be; stigma of not being circumcised, protection from HIV and cleanliness. Barriers to uptake on the other hand include; stigma associated with MC, perception that married men are at lower risk for HIV, cultural norms and lack of Health infrastructure (Macintyre et al., 2014). Among the Turkana community where VMMC has also been introduced as one of the HIV/AIDS intervention measures, the low uptake of VMMC among older men was studied and published. The study explores the unique meaning of circumcision to the Turkana. The MC culture is an initiation practice of their neighbors, who are their enemies like the Pokot, Samburu and Marakwet. Therefore circumcision would be like leaving their traditions for a different one. The older men are also expected to be the custodians of culture and are therefore expected to uphold the communities culture (Macintyre et al., 2014). They viewed VMMC as an inappropriate practice for men, especially older men. They were perceived not to be at risk of acquiring HIV unlike young men therefore do not need circumcision. Service delivery concerns, the remoteness of Turkana county, and cynicism about government programs as explored in the study are barriers for older men getting circumcised. Respondents in the study described Turkana as a neglected county whose programs, including VMMC may not be beneficial (Macintyre et al., 2014).

The study concludes that men and women were generally supportive but the challenge is on how to overcome the barriers and that packaging VMMC as a biomedical strategy against HIV is a major communication strategy in the roll out (Macintyre et al., 2014). As to whether this study’s findings translate into high uptake among older men or not is yet to be established by future studies, unlike the Nyansha study whose conclusions were made one year after roll out. Only culture comes out as a common denominator both in Turkana and Nyansha as a determinant of VMMC uptake. Both the Turkana and the Luo communities are nilotes who do not practice traditional MC and are the current target communities in the roll out. HIV/AIDS prevalence rates are also proportionately high compared to traditionally circumcising communities. Therefore low uptake among older men is a cause of worry to the Public Health sector.

Change of strategy to boost uptake in Tanzania

Just like Kenya and other 13 countries where the VMMC roll out phase is being implemented, uptake among older men in Tanzania had not been any better. A study by Kundi et al in Shinyanga and Simiyu regions where MC rates were low alongside high HIV prevalence rates points out to Cultural and attitudinal barriers to uptake. From October 2010 to September 2012, 65 812 circumcisions had been done in Tanzania out of which a paltry 7.1% were aged above 20 years. (Kundi et al., 2014). It points out to the intentions of this proposed study, alongside similar experiences in other priority regions.

Intra health partnered with Tanzania Youth Alliance in 2012 to conduct a demand creation initiative for older men using mobile texting method, in which text message services targeting men 20 years and above were developed in line with the national VMMC booklet. The services entailed intensive social mobilization and community sensitization targeting men above 20 years of age using text messages. During the 9 months of implementation, the project recorded a 25% increase in circumcisions for men aged 20 years and above (Kundi et al., 2014). Self reported SMS referral for VMMC suggest the effectiveness of this undertaking. In Iringa and Njombe regions in Tanzania, the government realized that uptake of VMMC among older men is equally a challenge. During the VMMC 3 years scale up period, it was realized that until the year 2012, a whopping 85% of all the MCs averaged 16 years of age. Only about 15% of all men circumcised were above 19 years. This was despite the fact that men had a positive attitude towards VMMC. (Plotkin et al., 2013). However, the barriers identified are unique. Social and personal barriers, including unwillingness to attend services alongside younger people were identified as key obstacles among older men of Iringa and Njombe regions. These men also viewed VMMC as an inappropriate practice for men, especially
after puberty, marriage and having had children. Additionally, men in this study identify fear of spouse’s infidelity during the wound healing period, loss of income and the fear of pain due to post surgical erections as other reasons for not seeking VMCC. This study recommends the need to address the adult-specific barriers and even creating friendly adult only centers for VMCC. (Plotkin et al., 2013).

The determinants of uptake in Rwanda
Rwanda is a traditionally non-circumcising and also a priority country for the scale up of MC for HIV prevention. Majority of the population are Christians who view MC as a Muslims practice. The national HIV prevalence is 3% and only 9% of men aged 15-59 are circumcised (Gasasira et al., 2012). A study conducted in the year 2012 to determine the factors that motivate or demotivate men to circumcise or allow their sons do so made the following findings as prohibitory; men reported that they were too old to for circumcision, whereas willingness was associated with young age, those residing in Eastern province, marital status and knowledge that MC protects against HIV. The study concluded that many younger people were willing to get circumcised (Gasasira et al., 2012). The researchers admit that there is knowledge gap regarding the perception and willingness to undergo MC by older non traditionally circumcising Rwandan men.

Acceptability among the rural Zulu population, South Africa
The Zulu community around Hibla and Mtubatuba in Kwa Zulu Natal, South Africa abandoned traditional MC by the orders of traditional Chief Shaka (Mark et al., 2012). A study by Mark et al. in 2012 was conducted in this region to assess the acceptability of MC as a biomedical strategy against HIV in a largely adult population. The study showed little association between circumcision and its health benefits among this population (Mark et al., 2012). The survey results in the study showed medium acceptability while Focus Group Discussion showed lower acceptability. Older people suggested that it is important for faithfulness between couples to be emphasized at the expense of circumcision. This points out to the general lack of information on the importance of circumcision on biomedical prevention. The older men cited reasons other than biomedical relevance of MC unlike the younger men who actually supported MC for protection against HIV and STIs. Culture did not pose as a barrier to MC in this community unlike the previous cases in Turkana, Kisumu and Tanzania. Women could not influence a Zulu man’s choice to circumcise unlike the Luo man in the Kisu. Female service providers and doctor surgeons for VMCC were identified as other potential barriers to uptake. (Mark et al., 2012)

Previous acceptability studies in India
Various studies have been conducted on the general acceptability of VMCC among traditionally non-circumcising communities in the world. Many generalizations have also been made. A study done in Pune, India among uncircumcised men 18 years and above on the acceptability of MC showed that the fear of pain (Krupp, 2011), up to 71.3% of respondents, was the main obstacle for acceptability, followed by cultural barriers (40.9%), fear of stigma (29.5%), fear of medical complications (27.2%). The main motivators for acceptability in this study was improved penile hygiene (96.6%), followed by HIV/STI prevention at (91.2%) (Krupp, 2011). Then main weakness of this study was that the sample was non random making generalizability difficult. Its results however, vary from another study conducted in Chandigarh, India on acceptability among men aged 19 to 59 years, where, belief and deep rooted perceptions about MC came out as the main challenge to implementing services such as MC (Kharwal & Bharat, 2013).

The Influence of leaders and peers on demand creation for VMCC
"Since telling my story about being circumcised, nine of my friends and family have been circumcised." These were the words in 2012 of Angelo Kaggwa, a 29-year-old Ugandan and a program coordinator with AVAC, sharing his personal experience with male circumcision at an International AIDS Conference satellite symposium entitled, Call to Action for Voluntary Male Medical Circumcision for HIV Prevention. AVAC is an advocacy consortium like the other programs creating demand for VMCC. “It took me eight years to do it since first considering it. I was worried about pain and about wound healing period,” Kaggwa said. The VMCC projects, put in place measures to tap as many uncircumcised people as possible (Adams, 2012).

The current practice within VMCC programs is the formation of teams that are deployed to “rich fields,” to perform as many “cuts” as possible so that the donor targets can be met. Different approaches are employed to achieve this; free transport for ferrying of clients to and from service delivery centres, giving them a bottle of soda and an under pant after the procedure, public address systems and caravans complete with loud music inviting clients, chiefs barazas as podium for circumcision calls (Mahler et al., 2011).

Circumcision for HIV prevention is however a voluntary undertaking made out an individual’s informed choice for HIV prevention purposes (WHO/UNAIDS, 2010). How much then do actions such that of Kaggwa and programs contribute in empowering the communities so that a decision to take VMCC is informed and voluntary? To what extent do these communities, men and women understand that VMCC is a strategy to control the spread of HIV, that even after the service they still will practice safe sex practices for risk reduction? If a man underwent circumcision just because his big brother went, or because he was enticed by free transport, soda, public address system etc, or because his peers had been cut, or because the chiefs baraza emphasized so, what then assesses change and sustainability of behaviour that should accompany uptake of VMCC? More research needs to be done in this aspect of VMCC.

The worries about pain and wound healing as stated by Mr. Kaggwa are explained during the counseling process preceding circumcision. But these remain critical worries, among other issues to many men who haven’t been circumcised, thus raising the critical question of how much the community is empowered and informed so that the HIV prevention efforts can be given precedence despite the pain or similar worries.

The Known determinants of Uptake of Male Circumcision in the world
Religion
In the Jewish religion, infants are circumcised on the 8th day as a mark of the covenant in the Biblical book, the Torah, as an outward manifestation of this covenant between the Jews and God. (Yang et al., 2012). The practice has since continued among all the modern Jewish newborns in Israel, United Kingdom, Northern Ireland and the Great Britain. Muslims are the largest religious group that practice male circumcision in line with the Abrahamic faith, and Islam has greatly influenced peoples choice of MC in many parts of the world It is known as “tahera”, meaning purification and one is expected to have been circumcised in order to lawfully make
As Islam was spreading in the early 7th Century, male circumcision was widely spreading among traditionally non-circumcising communities. In some regions such as Rakai District in Uganda where the RCT for HIV was carried out in 2006, Islam became a determinant of MC with 90% Muslims against 4% non-Muslims circumcised. (Wilcken, Miro-Nakayima, Hizaamu, Keil, & Balaba-Byansi, 2010). In Mwanza region of the North-West Tanzania, the non-circumcising culture of the people here has influenced the Muslim practice of MC with 74% MC prevalence among the Sukuma community (UNAIDS, 2007). There is no specific age for MC among the Muslims. Among the Hindu and Buddhist religions, the stand on MC is neutral. The Coptic Christians in Egypt and the orthodox Christians on Ethiopia, MC is as old as the these traditional religions. However, in modern Christian practices MC is not expressly recommended (UNAIDS, 2007).

Ethnicity

In sub Saharan Africa and other traditional communities of the world, MC has been practiced for reasons other than religion. In any one country, prevalence of MC can vary dramatically by ethnicity (Marc, 1997). In Kenya for example, although 84% of all men are circumcised, the prevalence is much lower among the Luo and Turkana (14% and 40% respectively) No history of traditional male circumcision has ever been documented to exist though men had their six lower teeth removed (UNAIDS, 2007). Similarly, other River Lake Nilotes such as the Jopadhola, and Acholi of Uganda and Southern Sudan from where the Luos migrated do not practice MC. In many cultures, the practice is a right of passage to manhood, though sometimes is a sign of endurance and bravery. More often than not it is associated with masculinity, self identity, spirituality and social cohesion as boys of the same age group get circumcised at the same time. Ethnicity is thus a major determinant of MC. (Marc, 1997) In some communities it is the norm and those who are uncircumcised are derided and even forcefully circumcised, beaten or bullied as it is among the Yao of Malawi, the Luanda and the Luvale in Zambia, the Xhosa of South Africa and the Bagisu of Uganda. The Luo’s in Kenya have reported that they are continuously discriminated against because of their circumcision status (WHO/UNAIDS, 2010).

Social determinants

Social and health related reasons are major determinants of modern MC for social desirability and the desire to conform as motivators for MC. (Marc, 1997) In Denver, United States of America, 90% of circumcised men are reported in a survey to have chosen to circumcise their children mainly for social, cultural, spirituality and social cohesion as boys of the same age group get circumcised at the same time. Ethnicity is thus a major determinant of MC. (Marc, 1997) In some communities it is the norm and those who are uncircumcised are derided and even forcefully circumcised, beaten or bullied as it is among the Yao of Malawi, the Luanda and the Luvale in Zambia, the Xhosa of South Africa and the Bagisu of Uganda. The Luo’s in Kenya have reported that they are continuously discriminated against because of their circumcision status (WHO/UNAIDS, 2010).

Socioeconomic Status

It has been shown that socio economic factors influence the uptake Male Circumcision especially in the countries with more recent uptake of the practice, especially the English speaking industrialized Nations (UNAIDS, 2007). Between the 19th and 20th century, MC was mostly practiced among the rich at about 74% and 57% in private and non private health facilities by the year 1953. This has recently been seen to replicate in Australia and even the USA where low prevalence rates are seen among the poor immigrants (UNAIDS, 2007). In the Sub Saharan Africa, MC is not consistent with socioeconomic status with some countries such as Tanzania and Ethiopia’s showing consistency with this association whereas Lesotho’s is contradictory. (UNAIDS, 2007)

Knowledge that Circumcision helps prevents HIV

In the year 2012, UNAIDS estimated that a total of 35.3 million people were living with HIV globally. This is a higher figure compared to the previous years, it shows that more people are receiving anti retroviral therapy. New HIV infections declined from 3.4 million in 2001 to 2.3 million. The total number of HIV/AIDS related deaths was 1.6 million. The number of people receiving ARVS was 9.7 million among the low and middle income countries (WHO/UNICEF/UNAIDS, 2013). According to 2013 UNICEF statistics, South Africa, for example, has one of the highest HIV prevalence’s in the world with Heterosexual transmission as the main mode of transmission of the virus. VMMC is therefore one of the main strategies adopted in reducing HIV transmission in the sub Saharan Africa. (Scott, Weiss, & Vlijmo, 2005).

Other determinants: Perceived health and sexual benefits beyond HIV

Different surveys have shown that among the English speaking industrialized nations and the traditionally non-circumcising sub Saharan Africa, MC is associated with improved penile hygiene and reduced risk for infection. Similar studies in the USA, Ghana, Kenya, Botswana, Zimbabwe, Zambia and Republic of Korea confirm the same association as the driving force behind seeking MC. (UNAIDS, 2007) In a Philippines, 11% of boys surveyed indicated that they opted for the MC because women like to have sex with circumcised men. Another study in Nyanza, Kenya showed that 55% of uncircumcised men believed that women enjoyed sex more with circumcised men and this association is a stronger predictor for VMMC than other determinants. Similar studies that yielded similar observations have been conducted in Uganda(Wilcken et al., 2010), North west Tanzania, Westonaria,South Africa and Southern Nigeria. (UNAIDS, 2007)

The Direct and indirect Benefits of VMMC

Voluntary Medical Male Circumcision (VMMC) is indirectly beneficial for women, said Cindra Feuer. "If we lower the HIV rate in a community then women also benefit from VMMC indirectly." This is because it only directly protects transmission from female to male partner it doesn’t protect against HIV transmission from male to female partner (WHO/UNAIDS, 2012).

VMMC also reduces transmission risk of human papilloma virus (HPV) and Herpes. "If a man is circumcised he is less likely to transmit HPV and herpes to the woman. HPV is the biological agent causing penile cancer in men and cervical cancer in women. Herpes and HPV can also facilitate HIV infection; it is a great benefit to reduce these risks of HIV, HPV and Herpes by VMMC (PIEGO, 2009). VMMC has been found to reduce the risk of herpes simplex virus-2, human papilloma virus in men and their female partners, and is associated with a reduction in the risk of genital ulcer disease and genital cancers in both men and women. (Njeuhmeli et al., 2011). A man is expected to abstain from sex for six weeks after circumcision. This allows for full healing to occur thereby reducing further risk of infection during this period (PIEGO, 2009).
In another study on ecologic analysis of religion, male circumcision and infectious disease in 118 developing countries male circumcision was also strongly associated with lower HIV prevalence among countries with primarily heterosexual HIV transmission, but not among countries with exclusively homosexual or injection drug use HIV transmission. These findings strengthen the reported biological link between MC and some sexually transmitted infectious diseases, including HIV and cervical cancer (Drain, Halperin, Hughes, Klausner, & Bailey, 2006).

Another major turning point in HIV prevention research was when HPTN 052 study results were announced in the year 2011. The HPTN 052 study had found that early initiation of antiretroviral therapy (ART) substantially reduced the risk of HIV transmission within serodiscordant couples (Boily, M. Desai K. Gumel, 2012). So if a man is seronegative and the woman is seropositive for HIV, then she should go for early initiation of ART and if man goes for circumcision there is an added benefit in terms of reducing the risk of contracting HIV. These HIV prevention strategies are viewed as different strategies such as early initiation of ART, male circumcision, condom promotion, among others and they should be thought of as a package and different individuals can be offered different options or combinations (Boily, M. Desai K. Gumel, 2012).

2.2 VMMC procedure and service delivery factors

Information on accessibility and availability of services

When health services are available, they become accessible to the would be clients. Although inaccessibility can have different facets, physical inaccessibility affects demand for services such as VMMC. In many settings, lack of accessibility to services has often hindered uptake even when demand is present. In Shinyanga Tanzania increased accessibility to VMMC for adults men was enhanced through mobile texting services (Kundi et al., 2014). During a two year period only 7.1% of all circumcisions constituted men above 20 years of age. After the introduction of the free mobile text services to men of this age and above making available information to services has often hindered uptake even when demand is present. In Shinyanga Tanzania increased accessibility to VMMC for adults men was enhanced through mobile texting services (Kundi et al., 2014).

Quality Assurance and safety of service

Due to constraints in human resource for health (HRH), and the urgent need to scale up VMMC service delivery in priority countries, the WHO in collaboration with implementing partners authorized the training of nurses and clinical officers to undertake VMMC surgical procedures. A prospective cohort study conducted in health facilities in Nyanza ascertained the quality of service delivery among clients circumcised by these cadres (Frajzyngier, Odingo, Barone, Perchal, & Pavin, 2014). Therefore, should an older person elect to undergo VMMC or fail to do so on the basis of quality and safety of services, there is sufficient scientific safety that is guaranteed. Overall, the adverse events reported in the study were similar to those reported in ordinary clinical setting (Frajzyngier et al., 2014).

WHO’s minimum package for VMMC

All VMMC programs should offer WHO minimum package of services. The WHO specifies that VMMC must be part of a comprehensive package of services including:

- Providing male and female condoms and promoting their correct, consistent use
- Promoting safer sex practices and risk reduction counseling
- MC surgery (surgical removal of the foreskin). (PEPFAR, 2010)

In addition to WHO minimum package of services, PEPFAR also recommends:

- Active links of HIV-positive clients from MC sites to the HIV care and treatment.

VMMC represents a rare, valuable opportunity to provide HIV testing and counseling (HTC) to men and, if necessary, to link them to care. When men seek VMMC services, it provides an ideal opportunity to address some aspects of sexual and reproductive health. Additionally, because many of the males accessing VMMC services are adolescents, VMMC provides a forum to educate young males about a variety of sexual health issues (Schor & Fund, 2011). HTC in the facility and in the community can contribute to demand creation for VMMC services. It is important to capitalize on this opportunity by ensuring that HTC facilities are referring eligible clients for VMMC services (PEPFAR, 2010).

As part of the WHO-recommended minimum package of services, PITC should be offered as part of the VMMC program. Service delivery points should adhere to WHO guidance on PITC, including the minimum standards of pre-test information, informed consent, post-test counseling based on serostatus, maintaining confidentiality, and use of point-of-care rapid HIV testing algorithms, as appropriate. In addition, it is important-as part of the WHO minimum package of services-to develop strong linkages to HIV care and treatment for clients who test HIV-positive. QA systems for HTC components should be in place to ensure high-quality HTC services in these settings, including systematic laboratory-based HTC results validation procedures. (PEPFAR, 2010)

Men who test HIV-positive as part of the VMMC program should be referred promptly to a care and treatment site for evaluation and appropriate antiretroviral therapy (ART), when clinically indicated (PEPFAR, 2010). This may require that sites develop and implement novel mechanisms to facilitate and confirm successful linkage to care (e.g., escorting clients from the VMMC center to the ART center, or enabling staff to register clients for ART at the VMMC center). The limits of the protective benefits of VMMC should be explained to HIV-positive men and their partners, and if a client requests VMMC anyway (for reasons other than HIV prevention) and is healthy enough and is clinically fit, VMMC should be made available to him. (PEPFAR, 2010). It is especially important for program staff to follow up actively with males whose circumcision procedure has been deferred because of an STI. It is crucial that VMMC programs develop routine systems to follow up with these males, who show evidence of having had unprotected sex, to ensure that they return to the VMMC facility for circumcision immediately following their STI treatment. VMMC programs should also give particular priority to HIV-negative males in HIV-discordant partnerships. (PEPFAR, 2010)

Scaling up VMMC for HIV prevention

There have been numerous efforts put in place to enhance rapid uptake of VMMC in line with the UNAIDS 2011 - 2015 strategy on HIV/AIDS, the WHO Global Health Sector Strategy on HIV/AIDS 2011 - 2015 and the PEPFAR 5 year strategy on HIV/AIDS. The Joint Strategic Action Framework 2011 - 2016 articulates a framework for use among Ministries of Health
and diverse country, regional and global stakeholders to accelerate uptake of VMMC for HIV prevention among priority countries in Eastern and Southern Africa (WHO/UNAIDS, 2012). The framework intends to guide key stakeholders to collaborate and coordinate country efforts to own and expand VMMC coverage and to contribute to getting to zero new infections. Scaling up of VMMC is important in reducing the future burden of HIV in Eastern and Southern Africa. The urgency to Scale up is born out of continuing large numbers of new infections in Sub-Saharan Africa and the effectiveness of VMMC in reducing female to male sexual transmission (WHO/UNAIDS, 2012).

The Framework has outlined key strategies for the acceleration of the "catch up" phase (i.e. efforts to provide safe VMMC services performed by trained medical personnel under WHO standards to uncircumcised adult men) and the "sustainability phase" (i.e. efforts to offer routine MC to infants and adolescents). Scaling up of VMMC is therefore meant to encompass both the catch up and sustainability phases. The catch up phase aims to rapidly achieve optimum coverage of MC among adult men in age groups that are likely to be sexually active. Unlike the sustainability phase, the immediate priority is reaching out to men who are currently at risk of exposure to HIV during heterosexual intercourse therefore "getting to zero" new infections (WHO/UNAIDS, 2012).

By the end of the year 2010, Nyanza province had recorded the highest success in VMMC scale up efforts in Eastern and Southern Africa with 230,000 circumcisions having been done. This represented 27% of the MC's needed nationally and 62% of MC's needed in the province. Zambia and South Africa had recorded 80,000 and 130,000 respectively, which is much lower than those recorded in Nyanza alone. Among the priority countries, a total of 500,000 males had been circumcised by the end of 2010. This represents 2.7% of the approximated 20 million circumcisions needed (Samuelson & Dickson, 2011).

The June 2011 meeting on HIV/AIDS at the UN General Assembly saw a Political Declaration made in which it was reiterated the insistence of member states that "prevention must constitute the cornerstone of the global HIV and AIDS response," plus to "promote Medical MC where HIV prevalence is high and MC rates are low." Therefore Scale up of MC would lead to achieving the Political Declaration's global goal of reducing the number of new infections by 50% by 2015. The 2011 - 2015 UNAIDS strategy is about intensifying partnerships to revolutionize HIV prevention through improved efficiency and focus. The WHO Global Health Strategy on HIV/AIDS 2011 - 2015 recognizes safe Medical MC as a strategy for prevention in high prevalence settings.

### Male Circumcision Target Countries

![Geographic distribution of HIV and male circumcision prevalence](https://example.com/figure1.png)

**Figure 1**: Geographic distribution of HIV and male circumcision prevalence

**Doi**: 10.1371/journal.pmed.1001132.g001, 2010.s

### Progress of VMMC services among priority countries

The process of prioritizing VMMC in 13 countries of Eastern and Southern Africa that are known to be having low MC coverage and high HIV prevalence informed the VMMC scale up in sub-Saharan Africa. These countries are Kenya, Uganda, Botswana, South Africa, Lesotho, Malawi, Mozambique, Namibia, Rwanda, Swaziland, Tanzania, Rwanda and...
Zimbabwe. In these countries, different approaches in service delivery have been adopted in line with the joint strategic action framework (WHO/UNAIDS, 2012) including; health-facility-based services integrated into routine activities, stand-alone MC Service sites; outreach and mobile services; and mass campaigns.

All the priority countries have adopted at least the minimum service package recommended by WHO/UNAIDS, which includes STI management, HIV testing and counseling, condom promotion, and safer sex education. Most countries have conducted national training for service providers and some countries have extensively expanded training for healthcare providers, often using a mixed-cadre team-training approach (UNAIDS, 2010).

It is noticeable that by the end of the year 2010 the statistics in response to uptake varies from country to country. From the table below, Kenya had registered the highest number of VMMC performed through 2010. This success was attributable to different factors including a high level of political commitment both at the national level and in focal provinces; additional health-care providers were mobilized through innovative mechanisms; to address the human resource gap, e.g. using retired personnel who were reimbursed for their services; the government changed policy in 2009 allowing nurses to perform MCs. It did put Kenya ahead of the other 12 priority country where these challenges were still the stumbling blocks to the success in scale up.

During 2010-2012, approximately 1,020,424 males were circumcised at CDC-supported sites in the nine countries. The total number of VMMCs has increased each year: 137,096 VMMCs performed in 2010 (seven countries), 347,724 in 2011 (eight countries), and 535,604 in 2012 (nine countries). CDC-supported VMMC programs in Kenya and Uganda performed the most VMMCs during these years: 386,752 and 205,812, respectively (CDC, 2013). The Ministry of Health, with support from the Male Circumcision Consortium, had learnt from practical experience and through operations research, both of which inform programming nationally.

Despite overcoming these many challenges that were still facing the priority countries Kenya's biggest challenge was how to reach the target population.

The largest proportion of the 232,287 MCs that had been performed through 2010 were among the 15 to 19 years age bracket (CDC, 2013). A CDC report of 2012 outlined the progress in by summarizing the Kenyan perspective. Upto December 2011, a total of 340,958 MGs had been circumcised in 260 CDC-supported sites. Among those figures 280,713 (82.3%) were conducted in Nyanza Province out of which 273,115 (80.1%) of participants were aged ≥ 15 years, and another 49,162 (14.4%) were aged ≥ 25 years. Adults aged ≥ 25 years increased from about 5,938 (11.9%) to a paltry 2,4945 (14.9%) within 3 years (CDC, 2012). Providing MC services to males aged ≥25 years was a key challenge to reaching the 80% national target among males between 15-49 years by the end of 2013 (CDC, 2012).

Table 1: Progress of MC

<table>
<thead>
<tr>
<th>Country</th>
<th>VMMC Prevalence</th>
<th>Age Specifics 15-49y</th>
<th>HIV Prevalence</th>
<th>Country Challenges</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kenya</td>
<td>86%</td>
<td>(unavailable)</td>
<td>6.3%</td>
<td>Reaching the Target Group (most MGs in 15 to 19 age bracket)</td>
</tr>
<tr>
<td>Uganda</td>
<td>25%</td>
<td>(unavailable)</td>
<td>6.4%</td>
<td>Health System constraints, Limited political commitment</td>
</tr>
<tr>
<td>Botswana</td>
<td>11%</td>
<td>88% 58%</td>
<td>17.6%</td>
<td>Limited human Resource, poor Coordination, Logistics</td>
</tr>
<tr>
<td>S. Africa</td>
<td>42%</td>
<td>(Unavailable)</td>
<td>18%</td>
<td>Inadequate commodities, Human Resource</td>
</tr>
</tbody>
</table>

The impact of VMMC on the Long term Cost of HIV/AIDS care/treatment

In order to inform policies and goals in 13 priority countries in eastern and southern Africa, where VMMC is currently on scale up the Decision Makers Priority Program Tool (DMPPT) was developed by the UNAIDS and USAID. This tool was used to estimate the impact and cost of scaling up VMMC using updated country specific data. (Njeuhmeli et al, 2011).

Although this tool was used to model for the 13 countries, in Kenya it was applied specifically in Nyana province. Therefore the results it yielded for Kenya are also specific to Nyana province. The development application of the tool involved the use of epidemiological and demographic data from household survey data. The cost of performing one VMMC ranges from USD 65.85 to 95.15 based on WHO considerations. (Njeuhmeli et al, 2011). According to the survey and modeling results using the DMPPT, scaling up of VMMC up to 80% coverage by 2015 would result into a total of 20.34 million VMMCs and an extra 8.42 million between 2016 and 2025 to maintain 80% coverage. This will avert 3.36 million new infections through 2025 (Njeuhmeli et al, 2011).

The research model showed that this scale up will cost a total of USD 2 billion between 2011 and 2015 but eventually save a total of USD 16.51 billion in form of averted treatment and care costs. It suggests too, that the rapid scale up would result in substantial reduction of HIV infections among the 12 countries and Nyana province. Health system costs will also be reduced through averted HIV care costs. (Njeuhmeli et al, 2011).
Cost effectiveness of VMMC

A one-time intervention, medical male circumcision provides a cost effective life-long partial protection against HIV as well as other sexually transmitted infections. (Gasasira et al., 2012) It has been met though, with a host of ethical, legal and human rights challenges. There are also concerns on how to package VMMC information to avoid misconceptions, false sense of security, safety, ethics and need for continual engagement at the community level. In such situations, the campaign is affected by lack of proper information leading to rumors, fears, misconceptions, of facts and sometimes political interference (Owusu-Danso, 2006).

To the society at large, Male Circumcision has been shown to have both cost related health and social benefits. It is the latest additional strategy that people can be used to protect themselves from HIV infection. Thus several Random Control Trial Studies were conducted in Kenya, Uganda and South Africa showed a 60% efficacy of Male circumcision as a HIV prevention strategy (Yang et al., 2012). This means that being circumcised can dramatically reduce a man's risk of HIV infection besides other STI's (Castellsagué X et al., 2002), but it also means- that male circumcision does not provide complete protection against HIV. That is why it is critical to ensure that male circumcision is perceived as an addition to and not a replacement for other effective HIV prevention measures (Auvert et al., 2005) To ensure that they are protected against HIV Infection, circumcised men and their partners must continue to practice the 'ABC's of safe sex; abstinence, being faithful to one uninfected partner, and correct and consistent use of condoms.

Role of the WHO in VMMC

The WHO recommends a VMMC service delivery package that consists of screening and treatment of Sexually Transmitted Infections (STI's); HIV counseling and testing; risk reduction counseling and condom use; decreasing the number of multiple and concurrent sexual partners; and promoting other positive behavior changes relevant to HIV prevention and ensuring active referrals of HIV positive men to care and treatment program (PEPFAR, 2010)

This approach follows the WHO recommendation, 'The Male Circumcision Quality assurance: a guide to enhancing the safety and quality of services'; that states that a minimum package of HIV prevention services should be offered, and that male circumcision is not just the surgical procedure (UNAIDS, 2008).

The government of Kenya adopted the Male circumcision as part of the comprehensive strategies to reduce risks of HIV infection in line with the goals of the political declaration on AIDS and the Declaration of Commitment on HIV to make available to the community HIV related goods, services and information (UNAIDS, 2010). Because its protective effect is partial, it is provided as part of the minimum package of the comprehensive HIV prevention and risk reduction strategies and as part of a broader male sexual and reproductive health promotion program (NACC/NASCOP, 2012). This includes making available all effective sexual and reproductive health options accessible to all communities and individuals in an acceptable manner. The service providers will ensure that the process of providing male circumcision services is safe and voluntary. They will also ensure that the principle of informed consent, including accurate an sufficient information that is understandable to the client; assessment of capacity of the clients and the audience to understand given information; confidentiality; assurance of non coercion and assisting those categorized in law as children to make informed decision (PEPFAR, 2010)

According to studies, achieving 80% of male circumcision coverage by 2015 and maintaining thereafter would avert more than 20% new HIV infection in priority countries of East and Southern Africa by 2025. Achieving this benchmark will meet 80% of the estimated demand for medical male circumcision (CDC, 2012). This is an equivalent of 20 million circumcisions. An additional 8.4 million circumcisions between 2015 and 2025 are needed to sustain the 80% coverage. However, as at March 2012 only 8% coverage had been achieved among the priority counties targeted. This paints a picture of non achievement of the 80% coverage by 2015 which presents a major missed opportunity in the war on HIV (AVAC, 2013).

Kenya's approach and experience

Kenya's strategy proposes a phased approach, with the initial phase (three to five years) aiming to increase the proportion of Kenyan boys and men ages 15 to 49 who are circumcised from 84% to 94% by 2013. These goals were based on mathematical modeling studies suggesting that the impact of male circumcision on Kenya's epidemic will be greatest if most of the eligible men can be reached as quickly and as safely as possible (Njeuhmeli et al., 2011). The focus will be expanding access to male circumcision where the percentage of men who are circumcised is low and the prevalence of HIV is high. This will be primarily in selected districts of Nyanza, Western, Rift Valley and Nairobi provinces. Reaching 80% of uncircumcised boys and men aged 15 to 49 in Nyanza by 2013 would prevent an estimated 900,000 infection among men and women over 20 years (CDC, 2012).

The formal adoption of male circumcision as a medical intervention against HIV by the government of Kenya was initially met with resistance mainly from elders in traditionally non-circumcising communities (L'engle et al., 2014). In Nyanza, the Luo Council of elders initially came out strongly in condemnation of the promotion of male circumcision considering it to be an affront on the Luo culture. But they were also concerned with the potential for risk compensation and how best the messages would be packaged to avoid chances of misconceptions. Subsequently, after discussions and proper presentation of facts, the council supported the initiative. There has been an upsurge of young men willing to undergo male circumcision in both government and private facilities although others still feel that it is not necessary (L'engle et al., 2014). It is against this background that the study to assess the factors leading to the low uptake.

Table 2: Long term cost implications of VMMC in Luo Nyanza

<table>
<thead>
<tr>
<th>Cost of scale up 2011 to 2025</th>
<th>Cost per HIV infection averted 2011 to 2025</th>
<th>Net savings 2011 to 2025</th>
<th>Net savings per HIV infection averted</th>
</tr>
</thead>
<tbody>
<tr>
<td>$36.38 million</td>
<td>US $660</td>
<td>US $371.23</td>
<td>US $6740</td>
</tr>
</tbody>
</table>

(Njeuhmeli et al., 2011).

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of VMMC among men aged 18 years and above will be undertaken.

**VMMC and the long term community level "Herd immunity"**

Biologically, all the inner foreskin of the uncircumcised foreskin is not only prone to abrasions and tears but also very rich in HIV target cells (CD4 and T cells). Circumcision therefore removes this vulnerability of the individual making a circumcised male less susceptible to HIV-type 1 and less infectious. (Auvert et al., 2005). However, the efficacy and effectiveness of VMMC on the general population was reached in the RCT's based on individual level effectiveness under ideal circumstances. Determining the efficacy of MC is more complex because MC can have different individual-level efficacies, reflecting differing biological/clinical protective mechanisms conferred to individuals directly against HIV or indirectly against other STIs (Nagelkerke, Moses, de Vlas, & Bailey, 2007).

A research conducted in Botswana and Kenya’s Nyanza province in 2007 by Nagelkerke et al. tried to ascertain the long term impact of VMMC for HIV prevention in high prevalence areas in Africa. The results showed male circumcision programs resulted in large and sustained decline in HIV prevalence over time among both for men and women. Men benefited somewhat more than women, but prevalence among women was also reduced substantially. With 80% male circumcision uptake, the reductions in prevalence ranged from 45% to 67% in the two “countries”, and with 50% uptake, from 25% to 41%. It would take over a decade for the intervention to reach its full effect (Nagelkerke et al., 2007)

The study concluded that large-scale uptake of male circumcision services in African countries with high HIV prevalence, and where male circumcision is not now routinely practised, could lead to substantial reductions in HIV transmission and prevalence over time among both men and women (Nagelkerke et al., 2007).

**The WHO Recommended VMMC Procedures**

Adult and adolescent Male circumcision is performed using one of the following three procedures. Each procedure is dependent upon the providers preference, skill and desired outcome. They are the dorsal slit, sleeve resection and forceps guided MC, all of which have been used in low resource settings depending on training and skill. The forceps guide and sleeve resection were employed during the RCT in Kenya, Uganda and South Africa. A local anaesthetic agent, usually 1% lidocaine (3mg/kg body weight), is used alongside the preoperative and postoperative analgesic (JPIEGO, 2009).

**Forceps guided Male Circumcision**

It is a simple procedure that can be used in clinical settings with limited resources and can be learnt by surgeons and assistants who are new to surgery. This stepwise procedure can be performed by a surgeon without an assistant. The main disadvantage of the procedure is that it leaves about 0.5 to 1 cm of mucosal foreskin proximal to the corona. The greatest risk in performing this procedure is that the glans can partly be sliced off especially when it gets grabbed under the forceps (JPIEGO, 2009).

**Dorsal slit method of MC**

It may require an assistant though it can still be done without one. It requires better skills than the forceps guide method. Risks include the possibility of more foreskin removal from one side than the other resulting in an asymmetric look, sometimes marking a line of incision can go deeper than expected resulting in penile tissue injury. It is often performed by surgeons and urologists. (JPIEGO, 2009)

**Sleeve Resection MC**

The procedure requires better surgical skills than the dorsal slit and forceps guide procedures. The cosmetic results are equally better. It is mostly suited for hospital than clinical settings and requires an assistant to be performed. Also prone to the risk deep incision on the intended suture line. (JPIEGO, 2009).

**3: The Research Problem**

**3.1 Statement of the Research Problem**

VMMC is globally recognized as an effective biomedical intervention against HIV and is currently being scaled up in Eastern and Southern Africa, its uptake particularly in Luo Nyanza region is notably skewed with more younger men below 18 years getting circumcised and fewer men above this age going for the cut. Culturally, the Luo community does not practice male circumcision. Different factors could have been associated with this low response among adult men who are the target population in Luo Nyanza and the persistently high HIV prevalence. Adults represent the most sexually active and high-risk group for HIV infection. Despite global good will, financial inputs and media coverage to promote male circumcision in Luo Nyanza, fewer adults are taking up the initiative to circumcise compared to the younger, mainly school going boys.

Luo Nyanza, despite the ongoing male circumcision intervention, contribute to more than double the national HIV prevalence rates. This is a sharp contrast of the prevalences in counties whose communities practice traditional male circumcision. Yet the region pioneered VMMC for HIV prevention in Eastern, Central and Southern Africa. This is a pointer to the effect that VMMC for HIV prevention in Luo Nyanza may not realize the projected benefits, that is, HIV prevention. The catch up phase of VMMC scale up among non circumcised men could have reduced the high HIV prevalence rates considerably in the region. There are numerous concerted service promotion campaigns besides the fact that these services are currently free of charge to attract eligible men in Luo Nyanza. These campaigns seem to bear little fruit in attracting adult men for circumcision. According to a CDC progress report, until the end of 2012, only 14.4% (49,162 men) of all VMMCs done in Luo Nyanza were aged 25 years and above (CDC, 2012).

Different acceptability studies in Nyanza have pointed out to a general acceptability among men (Herman-Roloff et al., 2011) without focussing on the age-specific prevalence rates. Besides the availability of the VMMC services in the region, the set national targets for the region and original goal may not be realized. This study is therefore an exploration on this skewed uptake. The general observation that fewer older men aged 18 years and above have come forward to receive free VMMC for HIV prevention has been associated with different factors. These are summarised in the following model to include; Accessibility to VMMC, Providers approaches to VMMC, the other available strategies for HIV prevention, Public health policy on VMMC, Service delivery factors related to VMMC, Significant Cultural dimensions to VMMC, Household income and medical decision making dimensions, Varying perceptions and health related factors associated with VMMC.

**3.2 Study Conceptual Framework**

The Health service delivery factors and cultural factors that are at play among the older men are the independent variables

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while the outcome i.e circumcision status (circumcised or not) is the dependent variable.

**Independent variables**

Access to VMMC services, Luo cultural belief systems, policy on VMMC, providers approach strategies, service delivery factors and household related factors. However, the variables that were found to be directly significant, and investigated by the study were; household related factors of marital status, occupation and number of children, providers approach especially focus in institutions mobilization, Luo cultural belief systems, policy on VMMC which included free services and HTC.

**Dependent variables**

Circumcision status of the individual (Circumcised and Uncircumcised)

**i. Accessing VMMC**

Although the services have been made available at most public and private health facilities, including outreach, some regions in Luo Nyanza exist within far and difficult terrains that may hinder complete access to services. There are regions, as well that are inaccessible during rainy seasons due to poor state of roads making services accessible only during dry seasons. Therefore those men who live in these regions may be unwilling to sacrifice their time or money for transport to and from facilities. They may opt to use such time in activities that earn them direct family income other than give in to the hectic option of seeking VMMC. This could also be true for the minors, 18 years and below whether in school or not who may want VMMC but the decision to do so depends on the parent and the economic role that the minor plays in the family. In these circumstances therefore, utilization of VMMC whether it is offered for free or not, whether it is effective against HIV or not, whether there is public health or political goodwill or not, whether it is a painful procedure or not, it may not matter to a common man born and brought up in this environment.

**ii. The influence of ingrained Luo Cultural belief system.**

In most cultures, sexuality and issues related to it are treated with utmost secrecy. Very little is known to a second or third party, unless peer influence comes into play, thus we see more younger boys teasing their peers who have not been circumcized and we have noted more circumcisions among them than the more secretive and culturally sensitive men. Older men have been known to be custodians of culture. Cultural practices are an ingrained part of peoples belief systems that it is sometimes difficult to separate ones' beliefs from and the justification for that belief. The Luo cultural identification practice was the removal of six lower teeth. Though not practiced nowadays, many men still recognize it as a symbol of their cultural identification. Older men who are also the custodians of Luo cultural belief systems may find it quite stigmatizing to fully embrace Male Circumcision without considering it as an alien culture. Issues about sexuality are also very sensitive and confidential, discussed only when real need to do so is warranted.

Therefore, however scientific VMMC may be justifiable for HIV prevention no one has explored the inseparable aspect of Luo culture and the justification against it from individuals and its' implications in rolling out scientific interventions such as VMMC. This could be a determinant of low uptake of Male circumcision for HIV prevention.

**iii. Policy on VMMC**

In order to promote uptake rates, VMMC services are offered at no fees in all public health facilities. There is also the integration of VMMC with HTC services in order to boost testing rates. These are done with the support of partners. There is need, however to assess and ascertain the implications of offering free services to a community especially for medical interventions such as VMMC and HTC that are not of emergency in nature and whose projected effectiveness is not 100%. This can be important in situations where the risks are as modifiable as it is in sexual behaviour and only partial protection is guaranteed, 60 % for VMMC. Perhaps these gaps can contribute to the current trend of low uptake.

**iv. Providers approach and service delivery factors**

Social mobilization through print and electronic media, free transport to and from facilities, outreach clinics in potential areas and clinical review for both complicated and uncomplicated cases are some of the strategies employed by providers. The main aim of these strategies is to reach as many men in the shortest time as possible and so meet the donors demands in justifying expenditure. The risk of employing these strategies is the fact that over relying on them may be a cause of dissatisfaction among adult men. In their consideration, they may think that to empower the communities with knowledge on VMMC should be more urgent followed by how to take care of their immediate economic challenges. Such views may lead to a negative attitude against VMMC where providers and participants are viewed by the community as ands who have little to do. The influence carried by those who have participated can also be negative. They might exaggerate the levels of pain and privacy hence inflict fear on those yet to go for VMMC. The fact that some surgeons are females may also hinder or at times lure men to.

### 3.3 Variables

<table>
<thead>
<tr>
<th>Factors attributed to low uptake</th>
<th>Uptake of VMMC by adults in</th>
<th>Circumcision status of (Circumcised/Uncircumcised)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Independent Variables</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Accessibility to VMMC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Providers' strategies</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Service delivery factors</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Government facility/NGOs and Quality)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other health benefits besides HIV prevention</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Household related factors</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

How to Cite this Article: Joseph Omolo Saye "Determinants Of Voluntary Medical Male Circumcision Uptake Among Adults In Luo Nyanza" Pinnacle Medicine & Medical Sciences ISSN: 2360-9516, Vol. 5 (1), 2018, Article ID pmms_281, 1245-1283, 2018.
3.4 Justification of the study

This study seeks to identify and understand the specific factors that affect the willingness of men who are 18 to 59 years and to embrace VMMC. Since this target group is the sexually active age and forms a bigger target group for VMMC, an increase in number of those taking up the service will result in a reduction of new HIV infections. The study will bring more insight into the barriers that hinder uptake of the service among men 18 years and above in Nyanza since it has been appreciated that Nyanza province constitutes 80.1% of all VMMCs done up to 2011 and only 14% of these were aged above 18 years (CDC, 2012). Hence, there is a need to explore the barriers to uptake among this age group has informed the decision to undertake this research, study findings will help policy makers put in place measures that will enhance service uptake. It also plays an important role in informing the Non Governmental Organizations and Public Health Facilities providing VMMC services on how to improve and expand the VMMC services to make them more accessible to these men who form the biggest bulk of the target group. This is because despite the efforts that are already in place, and besides cost effectiveness analyses that have been done, their uptake is low and the National targets and benefits out of VMMC may not be realized as projected by 2015 (UNAIDS, 2007)

3.5 Research Questions

i. What proportion of eligible men 18 years and above have been circumcised?
ii. What is the extent of the effect of household related factors in determining a man’s choice to circumcise?
iii. In what forms do provider approaches to promote VMMC exist and how can they be addressed to promote participation of adult men?
iv. To what extent do the Luo socio cultural norms and belief systems influence informed decision making on VMMC?
v. How effective is the Public health policy on VMMC in improving uptake among men aged 18 years nd above?

3.6 Objectives of the Study

General Objective

The main objective of the study was to determine the factors associated with the low uptake of VMMC for HIV prevention among men who are 18 years old and above in Luo Nyanza.

Specific Objectives

i. To determine the extent of uptake of VMMC among eligible men aged 18 years and above in Luo Nyanza.
ii. To determine the level of influence of household related factors on uptake of VMMC.
iii. To examine the the approaches to promoting VMMC employed by providers in promoting VMMC.
iv. To assess the level to which socio cultural norms and belief systems inflence informed decision making on VMMC.
v. To propose recommendations for improving participation in VMMC.

3.7 Study Hypotheses

The Public health policy to provide free of charge VMMC services does not influence the participation of men in VMMC.
The fact that VMMC confers 60% protection against HIV does not influence men’s participation in VMMC.

4: Methodology

4.1. Introduction

This chapter describes the study area, study population, study design, sampling method, sample size, sampling procedure, sources of data, methods of data collection, methods of data analysis and ethical considerations.

4.2. Study area

Background information of the study area

The name Nyanza, according to Wikipedia is derived from the Bantu word Nyasa which means lakes. Therefore Luo
Nyanza region is demographically occupied by the Luo speaking River Lake Nilotes who do not practice traditional MC. Nyanza in an economic hub, with sugarcane farming as a major economic activity, the majority of sugar industries in Kenya are found in Nyanza.

The research was conducted in Kisumu county, one out of the four counties that form Luo Nyanza. Kisumu county was selected randomly through simple random sampling process and results generalized for the entire Luo Nyanza region. This generalization is informed by the fact that HIV prevalence in the Luo Nyanza is almost uniform across the entire ethnic profile throughout the counties, VMMC programs are also evenly provided by the same organizations working throughout the four counties. The results of the study are therefore generalizable based on these facts.

The population of interest here were adult Luo men in the four respective counties of Luo Nyanza. Luo Nyanza has a total population of 3,692,177 out of which 1,780,222 are males. The four counties’ populations are Kisumu 968,908 with 474,769 males; Siaya 842,308 with 398,652 males; Homa Bay 963 794 with 462 454 males; Migori 1 028 579 with 499 290 males. (KNBS, 2010)

Specifically, the study was conducted at the locational level within the divisions that make up the respective sub counties of Kisumu East, Kisumu West, Nyando, Muhoroni and Nyakach Sub counties of Kisumu county. This locational level data collection gave a more representative profile of Kisumu as a representative county.

Reasons for the choice of the study area

Many international and local NGO’s offering preventive and interventional HIV/AIDS programs operate in Nyanza because of high prevalence rates of the disease. The Random Controlled Trial on male circumcision was also conducted in Kisumu, Nyanza which is a priority region for VMMC interventions recommended by WHO.

4.3. Study Design

The study design was descriptive cross sectional, with qualitative and quantitative data collection methods. Quantitative data was collected through filling in of the survey questionnaire to establish circumcision status, knowledge and ranking of MC as method of HIV prevention. The questionnaire explored emerging issues of knowledge and factors influencing attitude, acceptance or rejection of MC among adult men.

Two FGDs were conducted to obtain qualitative data that explored some of the issues about MC that emerged during the administration of the questionnaire.

4.4 Study population and unit of analysis

The target group for the study were men who had attained 18 years and above who are of the Luo ethnic community, whether they were living in Kisumu county or not but were present on the day of data collection. Households without adult men or with non Luos as the desired characteristics were skipped.

The unit of analysis was the individual man aged 18 years and above. This is because the aim of the study is to capture the determinants of uptake of VMMC according to individual men as a HIV prevention strategy and factors which influence their participation in the same.

The study assumed that the entire population in Luo Nyanza is homogenous in the distribution of the population, socio-cultural issues and practices. Therefore the sampling process was designed to capture the true characteristics of the entire population at every step of the stratification process as follows hereunder;

4.5 Sampling

4.5.1 Multi stage sampling frame

1. Kisumu county was picked by Simple Random Sampling as the representative county

2. Stratification of the county population into respective administrative sub counties followed i.e (Kisumu East, Kisumu West, Nyando, Muhoroni and Nyakach Sub Counties)

3. A cross sectional multistage sampling in each of the 5 sub counties was made so as to target 384 households, with 304/5 = approx. 77 households per sub county

4. The 77 homes per sub county population was stratified into divisions/estates so that only (77 households/number of divisions/estates = approx. 38 homes) were targeted in each of the Administrative divisions/estates

5. A starting point/household, the primary sampling unit, was selected at random.

6. Male household member aged 18 years and above was be identified for interview by informed consent( Homes without the desired characteristics were skipped). Followed by consecutive clustered homes selection upto a maximum of 10 interviews per sublocation.

4.5.2 Sample size determination

Due the scarcity of literature available on low uptake of VMMC and the fact that study results are going to be generalized as representative for the entire Nyanza region, the sample size was calculated using the following Cochran’s formula since the target population is greater than 10 000.

\[
 n_o = \frac{Z^2 \times p \times q}{e^2}
\]

Where:

- \( n_o \) is the desired sample size (for target population greater than 10,000)
- \( Z \) is the standard normal Deviate at the required confidence interval set at 95% (1.96)
- \( p \) is the estimated proportion of the target population that has the characteristics being measured
- \( q \) is the proportion of the target population estimated not to have the characteristic being measured (\( q = 1 - p \))
- \( e \) is the level of precision set at 5% (0.05)

When there is no estimate available of the proportion of the target population who has the characteristics under study, 50% will be used as \( p \).

Substituting thus;

\[
 1.96 \times 1.96 \times 0.5 \times 0.5 = 384.16
\]

\[
 0.05 \times 0.05
\]

The sample size that was used in this study is 384 men. Total for the county = 384 respondents
4.5.3 Sampling procedure

Using convenient and random sampling, men were interviewed in the selected divisions to assess why they have accepted or rejected VMMC. The participants were sampled consecutively with only one adult man per homestead interviewed. The next 4 homesteads were skipped and every 5th consecutive homestead was visited until desired 10 interviews were done.

4.6 Sources of data

Primary data was collected using:

- Written questionnaires with closed ended questions for respondents’ perceived determinants.
- 2 Focus group discussions, 1 in Kabong'o with 12 participants and 1 Rabuor with 12 participants as well.

4.7 Data collection

i. Written questionnaire: Two enumerators administered the questionnaires and recorded the responses in written form.

ii. Focus Group Discussions: Additional qualitative data was gathered through Focus Group Discussions. This was done at the later stages of the study in order to ventilate on some the critical issues that arose during the questionnaire administration. Data collection started with a FGD of mixed adult age groups. Each FGD had between 6 to 12 members and had varying ratios of circumcised and uncircumcised men. This was done until no new data could observably be generated.

The mixed group as was expected generated rich data on differing views about VMMC. The different views and perceptions were derived from the discussions.

The interactive responses were moderated by investigator as moderator, recorded and analysed after the discussion.

The data collected was confidential, of good quality, that is, reliable and valid and ethical considerations were observed.

Quality control checks

This involved editing the questionnaires every evening after data collection for the purpose of checking on their completeness and to ensure that there was clarity and consistency in answering the research questions.

4.8 Data analysis and presentation

The process involved:

Sorting data: Entailed the orderly arrangement of the questionnaires and other records for easier processing and analysis. The questionnaires were numbered and arranged in order.

Coding of data: This was done to convert/translate the data into codes and symbols to enable processing in Statistical Package for Social Sciences - version 19.

Data processing: The study utilized the Statistical Package for Social Sciences involved: data entry, verification, validation and output.

Data analysis: The Statistical Package for Social Sciences -version 19 was used as a tool for comparing the characteristics of the circumcised group and the uncircumcised group. Followed by Chi square tests, Z-tests and Mann Whitney U-tests of significance of characteristics.

These entailed output in form of simple frequency distribution tables, pie charts, bar graphs and correlation coefficient diagrams.

The overall information and findings were finally interpreted and synthesized thereby facilitating the writing and composition of the thesis.

4.9 Eligibility Criteria

An inclusion and exclusion criteria was used in the selection of questionnaire respondents as shown below:

Inclusion criteria for questionnaire respondents;

- Willing men of 18 years and above, circumcised or uncircumcised
- Must be of Luo ethnic community, whether residing in Luo Nyanza or outside

Exclusion criteria for questionnaire respondents;

- Individuals below 18 years of age as at the date of the interview
- All females
- Non Luo men

4.10 Study limitations

Information bias

The study relied on verbal information based on recall. Information such as family income and the age at circumcision were the stated estimates, not tangible records. This means that inaccuracy of information could have been encountered in the data collected. Therefore the generalizations of the results from such information may not be as precise but rather relative. Equally, in some instances the clients may have disclosed only the information they were comfortable disclosing.

The Selection Bias for the FGD

The men who participated in the Focus Group Discussion were picked on convenience and availability. Only those who had expressed pertinent concerns during the questionnaire administration were selected to participate in the FGD. Still among these men there were those whose could not be reached on the actual day. Alternative participants had to be selected on convenience. This may have given convenient results for the FGD. The conclusions drawn from the FGD may therefore fall short of the expectations of the researcher.

The Effects of difficult terrain and bad weather

The study was conducted during the rainy season, in the month of April. Some parts of the study area became totally inaccessible due to floods and lack of transport especially the Kano plains of Nyando Sub-county. The enumerators therefore over concentrated their sampling in parts of the subcounty that they could access. This could have resulted into more of uniformity and less variability of data collected in the subcounty and the study area in general.

The effect of Islam and Nomiya church on the results

These are two faiths whose members circumcise teenage boys as a religious obligation. Members of the two faiths were interviewed in this study. The study methodology was indiscriminate, all participants were interviewed based on willingness to participate. Therefore the generalizations from the results of this study could be affected by the religious opinions from the two faiths. This is because their approach to and intention for circumcision are different from the ongoing VMMC.

Minimization of Errors and Biases

The enumerators for the study (2 enumerators) were trained on the process of administering the questionnaire. They had...
to be medical training college graduates who had knowledge of the male circumcision program.

Research assistants were trained on the study objectives and methodology. The participants in the study remained anonymous. Further, the standardized questionnaire was written in English and then translated into Luo language. Pre-testing of the questionnaire was carried out for one week before being used in the actual data collection.

4.11 Ethical considerations

Male circumcision is a personal matter for a man. Any discussion on the matter rarely goes down well with men especially in Luo Nyanza. Such discussions are treated with suspicion particularly among adult men who are usually the custodians of a community’s culture. In order to handle these challenges without appearing to infringe on a man’s private life, all precautions were taken before, during and after the study;

Due to the risk of participants disclosing their personal information, there was voluntary participation in the study. Consent was obtained from participants after introduction of the study by the principal investigator and research assistants. The objective of the study was well explained to participants. There were no monetary benefits accruing from participation and this was explained from the onset. Benefits as well as risks, including approximately 15 minutes time allocation to the study were also explained to participants. The risk of a man disclosing personal information such as circumcision status among others were explained. Participants were assured of confidentiality in handling their personal data and that such information was solely for purposes of the study. Hence, participants were assigned random numbers to ensure anonymity as a measure for confidentiality. There was no space allowed in the questionnaire for participants name. Personal phone numbers were only indicated when a space allowed in the questionnaire for participants name. However, this was done for the sole purposes of follow up activities.

Ethical Research Clearance was obtained from the Kenyatta National Hospital/University of Nairobi Ethics and Research committee. Permission was also be sought from the Kisumu county director of health.

Clearance and consent were obtained from:

- Relevant authorities i.e. Ministry of health through the sub county Medical Officers of Health in Nyakach, Muhoroni, Nyando, Kisumu East and Kisumu West (the pivotal regions of this study) through a formal letter asking a permission to carry out the study in the respective regions.
- Individual participants by signing a consent form

5: Results

This chapter discusses the presentation of the study findings. It begins by presenting the Socio-demographics investigated, followed by results of the findings on the influence of household related factors on uptake, then the approaches to promoting uptake, socio-cultural norms and belief systems and finally the reasons why many men have hesitated to circumcise.

5.1 Socio-demographic characteristics

The study was conducted in all the five sub-counties of Kisumu county in April 2015. A total of 384 respondents were interviewed in the quantitative study. All study participants were categorized by circumcision status.

A total of 204 (53.1%) of the respondents were married monogamous, 147(38.3%) were single, 30 (7.8%) were married polygamous, 2(0.5%) divorced or separated and 1(0.3%) were widowed. It was noted that among the married men also were men who had been widowed but remarried, the study treats them under the married category. Among the married category, a total of 92 men (38.8%) had 1 - 2 children, 86(36.3%) had 3 to 5 children, 47(19.8%) had more than 5 children and 12(5.1%) had no children. Majority 260(67.7%) of the respondents were Protestants. Most 170(44.3%) of the respondents had attained primary level of education. Majority 234(60.9%) of the respondents were self-employed. Most 157(50.8%) of the respondents were earning below Ksh. 10, 000. The mean age of the respondents was 29.70 years with a standard deviation of 10.53 years.

### Table 5.1: Age distribution of the participants

<table>
<thead>
<tr>
<th>Age category</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 25</td>
<td>168</td>
<td>43.8</td>
<td>43.8</td>
<td>43.8</td>
</tr>
<tr>
<td>26 - 35</td>
<td>132</td>
<td>34.4</td>
<td>34.4</td>
<td>78.1</td>
</tr>
<tr>
<td>36 - 45</td>
<td>53</td>
<td>13.8</td>
<td>13.8</td>
<td>91.9</td>
</tr>
<tr>
<td>46 - 55</td>
<td>22</td>
<td>5.7</td>
<td>5.7</td>
<td>97.7</td>
</tr>
<tr>
<td>&gt; 55</td>
<td>9</td>
<td>2.3</td>
<td>2.3</td>
<td>100</td>
</tr>
<tr>
<td>Total</td>
<td>384</td>
<td>100</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

The table 5.1 above is a summary of age distribution of the respondents in the study. The mean age of the respondents is 29.7 years with a standard deviation of 10.53 years.

The oldest participant was 77 years old, however there were fewer men, 9(2.3%), aged above 55 years. The participants in the study therefore, were men in their economic viability ages hence the results of this study were not affected by any factors that could have been associated with extremes of age such as the essence of getting circumcised in old age.

This further implies that the respondents in the study were majorly in their youthful ages, hence, as hypothesised, would have been expected to have undergone circumcision.

### 5.1.1 Age versus circumcision status

<table>
<thead>
<tr>
<th>Undergone VMMC.</th>
<th>&lt; 25</th>
<th>26 - 35</th>
<th>36 - 45</th>
<th>46 - 55</th>
<th>&gt; 55</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Undergone</td>
<td>121</td>
<td>75</td>
<td>18</td>
<td>9</td>
<td>0</td>
<td>223</td>
</tr>
<tr>
<td>Not undergone</td>
<td>47</td>
<td>57</td>
<td>35</td>
<td>13</td>
<td>9</td>
<td>161</td>
</tr>
<tr>
<td>Total</td>
<td>168</td>
<td>132</td>
<td>53</td>
<td>22</td>
<td>9</td>
<td>384</td>
</tr>
</tbody>
</table>

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Age was tabulated against circumcision status and presented in the table above. The median age was preferred as a measure of central tendency because the data set comprised of extreme ages of 55 up to 77 years who only contributed to 5.6% (9) of the respondents. Using the mean age could have affected the interpretation by giving a non-representative average age. The median age of respondents who have undergone VMMC is 24 years while the median age of those who have not undergone VMMC is 30 years. Mann Whitney U test (p-value < .001) indicates that there is significant age difference between those who have undergone VMMC and those who had not. This implies that in this study, those who have undergone VMMC are considerably younger as compared to those who have not. The chart below shows age distributions and circumcision status.

**Figure 5.2:** Box and whisker chart of the ages by circumcision

<table>
<thead>
<tr>
<th>Age in complete years by circumcision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Undergone</td>
</tr>
<tr>
<td>Not undergone</td>
</tr>
</tbody>
</table>

5.1.2 Extent of uptake of VMMC

Only 223 (58.1%) of the respondents have undergone VMMC while 161 (41.9%) have not done so as presented in the chart, Figure 5.2, below. One Sample Binomial test (p-value = 0.02) indicates that the proportion of respondents who had undergone VMMC was significantly higher than the proportion of respondents who had not undergone VMMC.

**Figure 5.3:** Extent of Uptake of VMMC

<table>
<thead>
<tr>
<th>Uptake VMMC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Undergone</td>
</tr>
<tr>
<td>Not undergone</td>
</tr>
<tr>
<td>41.9%</td>
</tr>
<tr>
<td>58.1%</td>
</tr>
</tbody>
</table>

This interpretation appears statistically significant it is also important to note that the projected MC coverage for adults is way below average. Although the study methodology did not carry out any observational study on the participants, they could have been a small number of participants who may have indicated that they were circumcised when actually they were not. This projection is however very minimal and was due to observed participant behaviour at first encounter. After introduction of the study such fears were clarified.

5.1.3 Age at circumcision

The pie chart below, figure 5.3, shows the circumcision status upon attaining 18 years by participants. Majority, 116 (52.0%), of the respondents reports having been circumcised after attaining 18 years while 107 (48.0%) reports having been circumcised before attaining 18 years old. One sample Binomial test (p-value = .395) indicates that the proportion of those who were circumcised while less than 18 years was insignificantly different from the proportion of those circumcised while more than 18 years.

**Figure 5.4:** Age of circumcision

<table>
<thead>
<tr>
<th>Age of circumcision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 18 years</td>
</tr>
<tr>
<td>More than 18 years</td>
</tr>
<tr>
<td>52.0%</td>
</tr>
<tr>
<td>48.0%</td>
</tr>
</tbody>
</table>
The median age of the circumcised respondents is 24 years while the median age of those not yet circumcised is 30 years. Mann Whitney U test (p-value < .001) indicates that there is a significant age difference between those who have undergone VMMC and those who have not. Implying that those who have undergone VMMC are younger in age compared to those who had not undergone circumcision.

5.2 Influence of household related socio demographics on circumcision uptake

5.2.1 The Marital status versus circumcision status

<table>
<thead>
<tr>
<th>Undergone VMMC.</th>
<th>Total</th>
<th>Marital status</th>
<th>Marital status</th>
<th>Single</th>
<th>Divorced/ Separated</th>
<th>Widowed</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Married -</td>
<td>Married -</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Monogamous</td>
<td>Polygamous</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Undergone</td>
<td>102</td>
<td>9</td>
<td>110</td>
<td>1</td>
<td>1</td>
<td>223</td>
</tr>
<tr>
<td>Not undergone</td>
<td>102</td>
<td>21</td>
<td>37</td>
<td>1</td>
<td>0</td>
<td>161</td>
</tr>
<tr>
<td>Total</td>
<td>204</td>
<td>30</td>
<td>147</td>
<td>2</td>
<td>1</td>
<td>384</td>
</tr>
</tbody>
</table>

As shown in the table above, VMMC uptake is highest among single respondents (74.8%) and least among polygamous married respondents (30.0%). There is a significant difference (Chi-square test p-value < .001) in VMMC uptake among respondents' marital status, in that uptake among single respondent is higher compared to polygamous married respondents. Married monogamous respondents had average uptake rates.

5.2.2 The Number of children versus circumcision status

Table 5.4: Number of children and circumcision status

<table>
<thead>
<tr>
<th>Number of children</th>
<th>Undergone VMMC</th>
<th>Not undergone VMMC</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 - 2</td>
<td>52(56.5%)</td>
<td>40(43.5%)</td>
</tr>
<tr>
<td>3 - 5</td>
<td>42(48.8%)</td>
<td>44(51.2%)</td>
</tr>
<tr>
<td>More than 5</td>
<td>14(29.8%)</td>
<td>33(70.2%)</td>
</tr>
<tr>
<td>None</td>
<td>5(41.7%)</td>
<td>7(58.3%)</td>
</tr>
</tbody>
</table>

Uptake of MC is highest (56.5%) among respondents with 0 - 2 children and least (29.8%) among respondents with more than 5 children. VMMC uptake significantly varies (Mann Whitney U test = .017) with number of children a respondent has, implying uptake among respondents with fewer children is higher compared to respondents with many children. Perhaps explainable by the household burden of bringing up larger families, whereby an adult man would put his time into working for the upkeep of the family at the expense of seeking circumcision.

5.2.3 Religion versus circumcision status

Table 5.5: Religion versus circumcision Status

<table>
<thead>
<tr>
<th>Undergone VMMC.</th>
<th>Religion</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Catholic</td>
<td>Protestant</td>
</tr>
<tr>
<td>Undergone</td>
<td>66</td>
<td>150</td>
</tr>
<tr>
<td>Not undergone</td>
<td>49</td>
<td>110</td>
</tr>
<tr>
<td>Total</td>
<td>115</td>
<td>260</td>
</tr>
</tbody>
</table>

VMMC uptake is highest among Muslim respondents (77.8%) and least among Catholic respondents (57.4%). VMMC uptake insignificantly varies (Chi-square test p-value = .479) with respondents' religion. A man's religion has got no effect on his choice to circumcise or not in Luo Nyanza. Those whose circumcisions are influenced by religion are quite few and not for HIV prevention.

5.2.4 Level of education versus circumcision status

Table 5.6: Level of education versus circumcision Status

<table>
<thead>
<tr>
<th>Undergone VMMC.</th>
<th>Level of education</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>None</td>
<td>Primary</td>
</tr>
<tr>
<td>Undergone</td>
<td>4</td>
<td>88</td>
</tr>
<tr>
<td>Not undergone</td>
<td>0</td>
<td>82</td>
</tr>
<tr>
<td>Total</td>
<td>4</td>
<td>170</td>
</tr>
</tbody>
</table>

All the 4 respondents who do not have any formal education, had undergone VMMC while among the 133 who had attained primary education (51.8%) had been circumcised. Superficially, those with highest education levels also have highest proportions of circumcision. But VMMC uptake insignificantly varies (Mann Whitney U test = .060) with respondents' education level. Whether a man has attained education or not does not predict whether they are going to accept or reject circumcision.

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5.2.5 Spouses’ level of education versus circumcision status

The table 5.7 above shows the level of spouses’ education against uptake. Participation in MC is highest among respondents whose spouses do not have any formal education, 4 out of 4 respondents (100%). Participation is however least among respondents whose spouses attained primary education (42.1%). VMMC uptake insignificantly varies (Mann Whitney U test = .195) with respondents spouses’ education level. There is no significant variation in circumcision uptake among men whether their spouses have formal education or not. It means that literacy on the part of the spouse does not have an impact in determining circumcision choice for an adult man in Luo Nyanza.

5.2.6 The type of employment versus circumcision status

Unemployment, self employment, salaried employment and students were tabulated and presented in the figure 5.8 above. Whether a man is circumcised or not depends on his employment status. Uptake is highest among student respondents (75.0%). This is not surprising considering the concerns raised in the Focus Group Discussion that the main focus of the providers is in schools. There is least uptake among self-employed respondents (52.1%). The uptake levels between employment types insignificantly varies (Chi-square test p-value = .006) with respondents’ occupation. The self employed men are the least interested in circumcision understandably due to their fears that circumcision time might compromise their work.

5.2.7 Spouse’s employment versus spousal circumcision status

Among the married whose spouses were employed, the effect on uptake was tabulated and presented in the table 5.9 above. Circumcision uptake is highest among respondents with employed spouses (63.6%) and least among respondents with unemployed spouses (40.0%). VMMC uptake insignificantly varied (Chi-square test p-value = .006) with respondents’ spouse occupation. Employed spouse would be a source of financial stability, unlike the self employed. This, however does not have a significant influence on a man’s choice.

5.2.8 a) Monthly Income versus circumcision status

The income ranges and uptake were presented in table 5.10 above. VMMC uptake is highest among respondents earning monthly income above Ksh. 50 000 (57.1%) and least among respondents earning less than Ksh. 10 000 monthly (53.5%). VMMC uptake insignificantly varies (Mann Whitney U test = .748) with respondents’ monthly income level. Individuals earning higher amounts of monthly income appear to have responded well to male circumcision compared to those earning less. This can be associated with family stability, lesser personal attention required in fending for family needs hence paying attention to the call for circumcision. The same results would apply for spouses earning above Kshs 50 000 as shown in the table below, where an additional household income can possibly translate to more resources available to the family hence better attention to the call for circumcision.

How to Cite this Article: Joseph Omolo Saye "Determinants Of Voluntary Medical Male Circumcision Uptake Among Adults In Luo Nyanza" Pinnacle Medicine & Medical Sciences ISSN: 2360-9516, Vol. 5 (1), 2018, Article ID pmms_281, 1245-1283, 2018.
5.2.8 b) Spouses' monthly Income versus circumcision status

<table>
<thead>
<tr>
<th>Undergone VMMC.</th>
<th>Spouse's monthly income range</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Below 10000</td>
<td>Between 10000 and 50000</td>
</tr>
<tr>
<td>Undergone</td>
<td>48</td>
<td>26</td>
</tr>
<tr>
<td>Not undergone</td>
<td>41</td>
<td>30</td>
</tr>
<tr>
<td>Total</td>
<td>89</td>
<td>56</td>
</tr>
</tbody>
</table>

The income levels of the spouses were tabulated and presented in the table 5.11 above. VMMC uptake is highest among respondents whose spouses earn monthly income above Ksh. 50000 (55.6%) and least among respondents whose spouses earn between Ksh. 10000 and 50000 monthly (53.5%). VMMC uptake insignificant varies (Mann Whitney U test = .513) with respondents' spouses monthly income level.

5.2.9 The Influence of fathers on their sons' circumcision

Majority 359(93.5%) of the respondents would allow their sons to be circumcised as presented in the table 5.12, also in Figure 4.4 below. Hygiene and the need to reduce HIV/STIs infection risks is cited as the most common motivation (80.5%) for allowing son to be circumcised while the need to be like his father was the most cited reason (32.0%) for not allowing son to be circumcised. Likelihood Ratio Chi-square test (p-value = .126) indicates that reasons for allowing or not allowing son to be circumcised insignificantly vary.

<table>
<thead>
<tr>
<th>Table 5.12: Reasons for allowing or not allowing son to be circumcised</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allow son to be circumcised? Total (% N = 384)</td>
</tr>
<tr>
<td>Allow (% N = 359)</td>
</tr>
<tr>
<td>---------------------------------------------------------------</td>
</tr>
<tr>
<td>Hygiene; Reduce HIV/STI infection risk</td>
</tr>
<tr>
<td>Child's choice</td>
</tr>
<tr>
<td>Modernization</td>
</tr>
<tr>
<td>Like father like son</td>
</tr>
<tr>
<td>He is still young</td>
</tr>
<tr>
<td>Fear</td>
</tr>
<tr>
<td>No benefits</td>
</tr>
<tr>
<td>Religious reasons</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

Both majority of fathers who have undergone 218(97.8%) and those who have not 141(87.6%) would similarly allow their sons to be circumcised. Z-test (p-value < .001) indicates that fathers who have undergone VMMC are significantly more likely to allow their sons to be circumcised. Although different reasons are cited for circumcising one's sons, majority of the interviewed men would allow their sons to go for circumcision.

Figure 5.5: Father's circumcision versus son's circumcision
The table 5.3 below summarises the socio-demographics that were investigated in the study.

<table>
<thead>
<tr>
<th>Household characteristics</th>
<th>Undergone VMMC</th>
<th>Not undergone VMMC</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marital status</td>
<td></td>
<td></td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Married - Monogamous</td>
<td>102 (50.0%)</td>
<td>102 (50.0%)</td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>110 (74.8%)</td>
<td>37 (25.2%)</td>
<td></td>
</tr>
<tr>
<td>Married - Polygamous</td>
<td>9 (30.0%)</td>
<td>21 (70.0%)</td>
<td></td>
</tr>
<tr>
<td>Divorced/Separated</td>
<td>1 (50.0%)</td>
<td>1 (50.0%)</td>
<td></td>
</tr>
<tr>
<td>Widowed</td>
<td>1 (100.0%)</td>
<td>0 (0.0%)</td>
<td></td>
</tr>
</tbody>
</table>

| Number of children        |                |                   | 0.017   |
| 1 - 2                     | 52 (56.5%)     | 40 (43.5%)        |         |
| 3 - 5                     | 42 (48.8%)     | 44 (51.2%)        |         |
| More than 5               | 14 (29.8%)     | 33 (70.2%)        |         |
| None                      | 5 (41.7%)      | 7 (58.3%)         |         |

| Religion                  |                |                   | 0.479   |
| Protestant                | 150 (57.7%)    | 110 (42.3%)       |         |
| Catholic                  | 66 (57.4%)     | 49 (42.6%)        |         |
| Muslim                    | 7 (77.8%)      | 2 (22.2%)         |         |

| Level of education        |                |                   | 0.06    |
| Primary                   | 88 (51.8%)     | 82 (48.2%)        |         |
| Secondary                 | 101 (60.8%)    | 65 (39.2%)        |         |
| College/tertiary          | 30 (68.2%)     | 14 (31.8%)        |         |
| None                      | 4 (100.0%)     | 0 (0.0%)          |         |

| Spouses’ level of education |                |                   | 0.195   |
| None                       | 4 (100.0%)     | 0 (0.0%)          |         |
| Primary                    | 56 (42.1%)     | 77 (57.9%)        |         |
| Secondary                  | 35 (47.9%)     | 38 (52.1%)        |         |
| College/tertiary           | 16 (66.7%)     | 8 (33.3%)         |         |

| Occupation                 |                |                   | 0.006   |
| Self employed              | 122 (52.1%)    | 112 (47.9%)       |         |
| Unemployed                 | 55 (73.3%)     | 20 (26.7%)        |         |
| Employed (Salaried)        | 34 (57.6%)     | 25 (42.4%)        |         |
| Student                    | 12 (75.0%)     | 4 (25.0%)         |         |

| Spouse occupation          |                |                   | 0.072   |
| Unemployed                 | 32 (40.0%)     | 48 (60.0%)        |         |
| Self employed              | 58 (47.9%)     | 63 (52.1%)        |         |
| Employed (Salaried)        | 21 (63.6%)     | 12 (36.4%)        |         |

| Monthly income range       |                |                   | 0.748   |
| Below 10000                | 84 (53.5%)     | 73 (46.5%)        |         |
| Between 10000 and 50000    | 80 (55.2%)     | 65 (44.8%)        |         |
| Above 50000                | 4 (57.1%)      | 3 (42.9%)         |         |

| Spouse's monthly income range |                |                   | 0.513   |
| Below 10000                  | 48 (53.9%)     | 41 (46.1%)        |         |
| Between 10000 and 50000      | 26 (46.4%)     | 30 (53.6%)        |         |
| Above 50000                  | 5 (55.6%)      | 4 (44.4%)         |         |

5.3 Approaches to promoting VMMC employed by providers in promoting VMMC

5.3.1 HIV Testing and Counseling

All (45) respondents who think that HIV should not be tested during VMMC cite the possibility that testing discourages those who fear testing. Majority (293) of those who think that HIV to be tested during VMMC cite the need to knowing their status as presented in the table 5.14 below.

<table>
<thead>
<tr>
<th>Reason for testing/not testing during VMMC</th>
<th>Frequency</th>
<th>Percent (N = 384)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Discourages those who fear</td>
<td>45</td>
<td>11.7</td>
</tr>
<tr>
<td>Protect service provider from infection</td>
<td>23</td>
<td>6</td>
</tr>
<tr>
<td>Government requirement</td>
<td>23</td>
<td>6</td>
</tr>
<tr>
<td>Know own status</td>
<td>293</td>
<td>76.3</td>
</tr>
</tbody>
</table>
5.3.2 Implementing the policy of "Male circumcision at no cost on the user"

Majority 348 (90.6%) of the respondents think that VMMC services should be offered for free while 36 (9.4%) think that it should be offered at a cost. Most 186 (53.4%) of those who think that it should be offered for free cite affordability of the services. Most 23 (63.9%) of those who think that it should be offered at a fee cite benefit to be circumcised person alone as in the table 5.15 below.

<table>
<thead>
<tr>
<th>Reason</th>
<th>Should VMMC be charged?</th>
<th>Total (% N = 384)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Free of charge (% N = 348)</td>
<td>At a cost (% N = 36)</td>
</tr>
<tr>
<td>Affordability</td>
<td>186 (53.4%)</td>
<td>3 (8.3%)</td>
</tr>
<tr>
<td>Enhance uptake</td>
<td>137 (39.4%)</td>
<td>10 (27.8%)</td>
</tr>
<tr>
<td>The sole beneficiary</td>
<td>25 (7.2%)</td>
<td>23 (63.9%)</td>
</tr>
</tbody>
</table>

5.3.3 The choice of service provider as possible determinant of choice for circumcision

Majority 200 (52.1%) of the respondents think that VMMC should be offered by the government while 184 (47.9%) think that it should be offered by NGOs. Government is chosen majorly (53.0%) because of accessibility while NGOs majorly (66.3%) is chosen because of better quality service and equipment as the reason for preference. The figure 5.16 below is a summary of the reasons given.

<table>
<thead>
<tr>
<th>Reason for VMMC provider choice:</th>
<th>VMMC provider choice.</th>
<th>Total (% N = 384)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Government (% N = 200)</td>
<td>NGOs (% N = 184)</td>
</tr>
<tr>
<td>Equipped/Better service quality</td>
<td>70 (35.0%)</td>
<td>122 (66.3%)</td>
</tr>
<tr>
<td>Accessibility</td>
<td>106 (53.0%)</td>
<td>38 (20.7%)</td>
</tr>
<tr>
<td>Fringe benefits</td>
<td>13 (6.5%)</td>
<td>19 (10.3%)</td>
</tr>
<tr>
<td>Affordability</td>
<td>11 (5.5%)</td>
<td>5 (2.7%)</td>
</tr>
</tbody>
</table>

5.4 Socio cultural norms and belief systems that influence circumcision uptake

As presented in the table 5.17 below, benefits awareness has contributed to 51.1% of the respondents being motivated to get circumcised. The table therefore summarises this proportion of men and their motivation to circumcise and were able to understand and explain the concept of 60% protection.

<table>
<thead>
<tr>
<th>Circumcision motivation</th>
<th>Frequency</th>
<th>Percent (N = 384)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benefits awareness created</td>
<td>114</td>
<td>51.1%</td>
</tr>
<tr>
<td>Circumcised by peer influence</td>
<td>48</td>
<td>21.5%</td>
</tr>
<tr>
<td>Improve hygiene; reduce HIV/STI infection risk</td>
<td>24</td>
<td>10.8%</td>
</tr>
<tr>
<td>Parental influence</td>
<td>15</td>
<td>6.7%</td>
</tr>
<tr>
<td>Medically recommended after a sickness</td>
<td>15</td>
<td>6.7%</td>
</tr>
<tr>
<td>Church influence</td>
<td>7</td>
<td>3.1%</td>
</tr>
</tbody>
</table>

5.4.1 Perception on whether circumcision has benefits or not

Majority of both respondents who have undergone VMMC (97.8%) and those who have not (76.4%) think that VMMC had benefits. Z-test (p-value < .001) indicates that respondents who have undergone VMMC are more aware of its benefits as compared to respondents who have. Respondents majorly (77.4%) cite penile hygiene improvement as the main benefits of VMMC.

5.4.2 Perception on adverse effects of circumcision

Majority of both respondents who have undergone VMMC (64.6%) and those who have not undergone VMMC (64.6%) think that VMMC has adverse effects. Z-test (p-value = .996) indicates that knowledge of VMMC adverse effects absence was similar among circumcised and non-circumcised respondents. Poor wound healing and wound complications are the most cited (38.2%) adverse effects of VMMC. Refer to Table 5.8 below.
5.5 Reasons why many men have hesitated to circumcise

5.1.1 Responses from the FGD

During the Focus Group Discussions, it emerged that men have very interesting reasons as to why they have not fully embraced the ongoing male circumcision in Luo Nyanza. Participants were drawn from all the four subcounties of Kisumu county. They consisted of adult men who had been identified during questionnaire administration. These men had shown keener interest on issues that were of concern to them about male circumcision in Luo Nyanza. Although many questions were asked and exhaustively discussed, there is particular interest on the reasons given as to why adults have hesitated to circumcise.

The sitting arrangement for the FGD

One participant posed.

"According to my opinion, circumcision is for children. They actively recruit during school holidays, picking and dropping children. As a father, I did not have an idea that my son was going to be circumcised. I realized at a later date when he appeared uncomfortable and in pain. I asked him and he clarified that he had been collected by 'Jonyange' (the circumcisers) who came to their school before they closed and mobilized them for circumcision. I am not the first to encounter this scenario, many parents will confirm to you, with similar sentiments. Circumcision is for Children not adults."

Another participant observed;

"I do not understand why they prefer to treat adults in the same way they treat children. I would be ashamed to sit on the same bench with my son awaiting circumcision on the same day. Why would I even go for circumcision at the same facility with my son. I think that issues on reproductive health and sexuality are sensitive to each parent. Since they have not considered a better way of handling our concerns, it will remain a children’s intervention."

Although participants gave and described different reasons that contribute to delayed uptake of MC, fear of pain is cited as the major reason (43.8%) why men still hesitate to...
circumcise followed by fear of losing family income (19.5%). Cultural/mythical beliefs about circumcision (19%), lack of knowledge on circumcision (15.9%). About 7.8% still do not see the need to circumcise while about 8.6% think they are too old to circumcise. Refer to the table 5.19 below.

Table 5.19: Reasons for hesitating to circumcision

<table>
<thead>
<tr>
<th>Reason for hesitance</th>
<th>Frequency</th>
<th>Percent (N = 384)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Afraid of complications</td>
<td>14</td>
<td>3.6%</td>
</tr>
<tr>
<td>Age factor</td>
<td>33</td>
<td>8.6%</td>
</tr>
<tr>
<td>Cultural/mythical beliefs</td>
<td>73</td>
<td>19.0%</td>
</tr>
<tr>
<td>Fear of inexperienced/female personnel</td>
<td>15</td>
<td>3.9%</td>
</tr>
<tr>
<td>Fear of abstinence during healing</td>
<td>10</td>
<td>2.6%</td>
</tr>
<tr>
<td>Fear of pain</td>
<td>168</td>
<td>43.8%</td>
</tr>
<tr>
<td>Fear of testing</td>
<td>5</td>
<td>1.3%</td>
</tr>
<tr>
<td>Lack of knowledge</td>
<td>61</td>
<td>15.9%</td>
</tr>
<tr>
<td>See no need</td>
<td>30</td>
<td>7.8%</td>
</tr>
<tr>
<td>Fear of family income loss during prolonged healing</td>
<td>75</td>
<td>19.5%</td>
</tr>
</tbody>
</table>

5.5.2 Knowledge on the Process of circumcision as a possible determinant of uptake

Although some men still had false perceptions about the circumcision procedure, majority showed accurate understanding of the process as depicted in the table 5.20 below.

Table 5.20: The VMMC process

<table>
<thead>
<tr>
<th>VMMC process</th>
<th>Frequency</th>
<th>Percent (N = 384)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before VMMC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Counseling; education on post operation care</td>
<td>170</td>
<td>44.3%</td>
</tr>
<tr>
<td>Unaware</td>
<td>153</td>
<td>39.8%</td>
</tr>
<tr>
<td>Counseling; HTC</td>
<td>39</td>
<td>10.2%</td>
</tr>
<tr>
<td>Premedication</td>
<td>13</td>
<td>3.4%</td>
</tr>
<tr>
<td>Can’t remember</td>
<td>9</td>
<td>2.3%</td>
</tr>
<tr>
<td>During VMMC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anesthesia injection; removal of foreskin;</td>
<td>228</td>
<td>59.4%</td>
</tr>
<tr>
<td>No idea</td>
<td>151</td>
<td>39.3%</td>
</tr>
<tr>
<td>Removal of foreskin</td>
<td>5</td>
<td>1.3%</td>
</tr>
<tr>
<td>After VMMC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not aware</td>
<td>123</td>
<td>32.0%</td>
</tr>
<tr>
<td>Bandaging; analgesics; Discharge</td>
<td>119</td>
<td>31.0%</td>
</tr>
<tr>
<td>Bandaging; analgesics; follow up</td>
<td>72</td>
<td>18.8%</td>
</tr>
<tr>
<td>Wound care; abstinence information</td>
<td>57</td>
<td>14.8%</td>
</tr>
<tr>
<td>Given fare</td>
<td>13</td>
<td>3.4%</td>
</tr>
</tbody>
</table>

The Medical Male Circumcision Procedure

i. Administration of anaesthesia

ii. Ligating/tying up bleeders
individual is a crucial factor in decision making and also in determining and defining roles and responsibilities for members. Some of these roles and responsibilities would come hand in hand with gender.

In traditional societies, communities had age sets whereby people born at around the same time would undergo traditional initiations together before taking up defined roles in the community (WHO/UNAIDS, 2010). In modern societies, the age of an individual is counted in calendar years. A track on ones age is maintained for purposes of transitioning from one societal level to another. The permanent physiological and behavioural changes that occur in our bodies from birth onwards are also tagged with age.

In legal frameworks, the rights, privileges and responsibilities of citizens are outlined. For example, in the British Common Law adopted in Kenya, marital age is 18 years and any marriage before this age is considered illegal if one party is older or null and void if both parties are minors. Any person below 18 years of age is a minor who needs parental consent on certain critical issues such as Male Circumcision. Male Circumcision cannot be offered to a minor without parental consent. This means that the success or failure of the VMMC uptake among minors solely rests with parents. In this study, it was established that among the respondents who had undergone circumcision, 48% (107 men) did so before attaining 18 years of age. This implies that age is a determining factor in circumcision. Thereby points to the less than expectation response in an intervention that has been lauded as a success in the region. Between the year 2008 and 2011, the overall prevalence of Male circumcision was 48.2% (CDC, 2012). This comparison points out to a minimal success on uptake, The Socio-cultural norms and belief systems that influence uptake, The Socio-cultural norms and belief systems that influence uptake rates, approaches to promoting uptake and finally the The Socio-cultural norms and belief systems that influence uptake rates.

6.0 Introduction

This study assesses the participation of adult men in the Voluntary Medical Male Circumcision for HIV prevention in Luo Nyanza where scale-up efforts were ongoing. Study participants categorization under circumcised and non circumcised groups and the factors associated with the choices in either group are explored. Knowledge of the existence, risks associated with and the potential benefits of male circumcision have been analyzed alongside various interrelated factors in order to establish the determinants of participation of these categories of men in the intervention.

6.1 The extent of Uptake of Voluntary Medical Male Circumcision among adults in Luo Nyanza.

This cross sectional study in a predominantly non -circumcising community reveals an above average prevalence of circumcision among adults. Nearly half of circumcised group also revealed that they got circumcised when they were below 18 years of age. This implies that age is a determining factor in circumcision. Thereby points at the less than expectation response in an intervention that has been lauded as a success in the region. Between the year 2008 and 2011, the overall prevalence of Male circumcision was 48.2% (CDC, 2012). This comparison points out to a minimal success achieved between 2011 and 2015 especially among the target population.

It is also noted that those who have undergone circumcision are significantly younger compared to those who haven't. Implying that parents would permit their sons to get circumcised yet decline being circumcised. Those in their youthful ages appear to respond better to the intervention than their older counterparts. This brings out age as a determining factor in circumcision. The older a man gets the lesser the chances of him choosing to get circumcised.

6.1.1. The implication of discussing age as a determinant of VMMC uptake

In different societies and cultural contexts, the age of an individual is a crucial factor in decision making and also in participation of these categories of men in the intervention. It presents the a discussion on the extent of uptake among adults in Luo Nyanza where scale-up efforts were ongoing. Study participants categorization under circumcised and non circumcised groups and the factors associated with the choices in either group are explored. Knowledge of the existence, risks associated with and the potential benefits of male circumcision have been analyzed alongside various interrelated factors in order to establish the determinants of participation of these categories of men in the intervention.

6: Discussion Of The Results

This chapter is a discussion of the results as presented in the previous chapter. It presents the a discussion on the extent of uptake of VMCC, the influence of household related factors on uptake, The Socio-cultural norms and belief systems that influence uptake rates, approaches to promoting uptake and finally the The Socio-cultural norms and belief systems that influence uptake rates.
would give consent as their sons go for circumcision while largely remaining uncircumcised.

Any public health intervention that targets the mature males in the society such as Male Circumcision needs to factor in the household related factors associated with roles and responsibilities of such men at different age groups. Although this study looks in general at factors that play a role in decision making about accepting or rejecting male circumcision, age as hypothesised variable for men who have attained 18 years and above in Luo Nyanza appears to be a major determinant.

6.2 The influence of household related factors on circumcision

The circumcision rates are highest among unmarried respondents and lowest among married polygamous respondents, those who are married with fewer children have significantly higher circumcision rates compared to those married with more children. Two factors can be attributed to this variation. Either, the male heads of households have more family responsibilities that expand as more children are born, or the essence of circumcision for HIV prevention is lost as a man advances in age at family level. This finding compares well with a similar one in Iringa and Njombe, Tanzania (Plotkin et al. 2013), where they reported fear of losing income and fear of marital infidelity during healing as main obstacles for taking up circumcision services. Men’s roles and responsibilities as well as the obligations to provide for the families makes it difficult for the above groups to seek the services.

It points out to the fact that most providers have been less successful at circumcising adults. It shows as well that there is an inverse proportionality between the size of the household and a man’s willingness to circumcise. It can be interpreted as well that older men, tend to be conservative and less adaptive to change unlike young people. Which means that despite the higher risks that one would be exposed to due to multiple sexual partners, this category of men have not yet bought the idea of using HIV prevention strategies such as male circumcision.

Another key household factor that is significantly associated with uptake of Male circumcision is a man’s occupation. Self employed men have the least uptake rates among the employed categories. Many men in this category associate male circumcision with pain, protracted periods of healing, complications and loss of valuable income equivalent of time wasted. They therefore see male circumcision as waste of time other than a beneficial medical intervention for HIV prevention. Their concern perhaps border on how to compensate participants for the loss of time.

6.3 Approaches to promoting VMMC as employed by providers

6.3.1 Focus in institutions

Providers of circumcision services tend to focus on institutions in order to circumcise as many men as possible. This has not helped in improving uptake among adults because they are not comfortable being transported or circumcised alongside their sons. This brings out the essence of privacy in circumcising adults. In many traditionally circumcising communities, male circumcision is performed during school holidays when the teenagers are available and the designers of the scale up approaches of Voluntary Medical Circumcision must have borrowed a lot from this traditional approach as a way of boosting uptake.

6.3.2. Explaining the 60% partial protection as a promotion strategy

Although VMMC has been documented and recommended by the WHO as one among many interventions in the fight against HIV, there is very little literature available on the analysis of whether the target populations fully comprehend what it means when we say that VMMC will confer 60% protection against HIV after circumcision. It is therefore imperative that service providers and researchers try to extract what this partial protection actually mean to the target population. In their study on “Understanding partial protection and HIV risk behaviour following VMMC roll out in Kenya,” L’engle et al. were driven by the then valid concern that many men do not have adequate understanding of 60% protection. Their study is however geared more towards incising on the false perception, then, that VMMC could confer 100% protection from HIV during the roll out. The study documents that many men in the target population can describe partial protection as the need to continue using other protective measures against HIV. Many could use the terms “60% protection or not 100% effective.” Others are able to explain how MC reduces HIV transmission; through reduced contact skin bruising. The study concludes that participants demonstrated good understanding of the 60% partial protection. (L’engle et al., 2014)

6.3.3 The hypothesis on 60% protection

Concerning the 60% protective effect of circumcision, a hypothesis is stated as follows; The fact that VMMC confers 60% protection against HIV does not influence men’s participation in VMMC. In order to test this hypothesis, participants who are aware of benefits of VMMC were interviewed. Their perception regarding the 60% protection against HIV was considered against VMMC uptake. Among the 218 respondents who are aware of benefits of Circumcision and had undergone the same, majority 177(81.2%) think that it offers 60% protection against HIV. Similarly, among the 123 respondents who are aware of benefits of Circumcision and have not undergone the same, majority 123(70.7%) think that it offers 60% protection against HIV. There is a significant association (Chi-square test p-value = .027) between VMMC uptake and perception that VMMC offers 60% protection against HIV. Therefore the hypothesis; The fact that VMMC confers 60% protection against HIV does not influence men’s participation in VMMC is rejected.

In the quantitative data, there is a significant association (Chi-square test p-value = .027) between VMMC uptake and perception that VMMC offers 60% protection against HIV. Therefore the hypothesis; The fact that VMMC confers 60% protection against HIV does not influence men’s participation in VMMC is rejected.

6.4 The Socio-cultural norms and belief systems that influence uptake rates

Circumcision is still seen as alien among some participants as alien and should not be introduced to the Luo community. A study in Turkana by Macynentre et al showed equal resistance from a section of participants. Within the two groups of circumcised and uncircumcised men, there is a common agreement on what the exact physiological barrier to circumcision is. Fear of pain. Among other obstacles pain was ranked top. It is also suspected that these group consisted of those who are not perhaps aware that male circumcision is performed under anaesthesia. They believe therefore that it would inflict unnecessary pain on them. Even when
anaesthesia is used, some still believe that some level of pain will be felt hence the fear of pain. Cultural and mythical beliefs also play considerable role. This proportion of men still adhere to the tradition that Luo men should never be circumcised, and that this culture should be preserved without introducing alien cultures to the Luo society.

Lack of knowledge on the benefits of VMMC constitute of believers who argue that it has no benefit at all. They view the intervention with suspicion. They argue that it is a way of getting donors' money at the expense of the community. Their arguments include concerns such as where the foreskin is taken after circumcision and that this has never been explained. These facts can be associated with the fear of pain that is seen as a major deterrent for delayed decision to circumcise.

6.4.2 The policy on free services and HTC

Contrary to previous opinion that fear of HIV testing and counseling could be discouraging adult men from getting male circumcision, the study reveals that it does not. This means that HIV testing and counseling has a wider acceptance in the study population. This means that, fear of HIV counseling and testing is not a deterrent, therefore not a determinant of adult men's willingness to undergo VMMC. HTC can also be used as an entry point by providers in trying to reach out to adult men for Male circumcision.

The same argument goes for the policy on providing VMMC services free of charge where 90.6% of the respondents think that the services should be offered for free. However, a critical analysis of this appreciation may indicate that people sometimes attach little value to free services. Hence, perhaps the reason why many adult men still view this free male circumcision at face value. No wonder, then the study showed that majority of men would significantly allow their sons to circumcise. This perhaps, is due to the low income levels in the study population, hence they see free services as a burden off their shoulders.

7: Conclusion And Recommendations

This chapter discusses the main conclusions of the study and the recommendations that were made.

7.1 Conclusion

Those who have undergone VMMC in Luo Nyanza were much younger than those who had not, with a significant proportion of this group having been circumcised before they were 18 years. This shows that circumcision rates among adult men is still very low compared to that of teenagers. Therefore, for the purposes of understanding the male circumcision prevalence among the adults of reproductive age in this region, these findings are crucial. Moreno, in a region with the highest prevalence rates of HIV in Kenya. Coupled the fact that HIV is largely heterosexually transmitted this uptake rate of male circumcision is very low if VMMC is to offer its' 60% effectiveness and succeed as an intervention for HIV prevention.

It is important to take age factor into consideration when designing health interventions in Luo Nyanza. The implementation of these interventions should should be done in such a way that there is constant evaluation of the bearing that age takes into the outcome. Therefore the male circumcision program designers and the implementers have to involve adults in the community right from the onset. Otherwise they will feel left out in the consecutive programmatic stages. The consequence could lead to low utilisation of such interventions. There should not be a blanket approach, with an assumption that a peoples' health is at risk and programs appear beneficial. The chances of success can be increased if the age factor is considered.

There is need, therefore to stratify interventions according to age. This is crucial for mop up exercises such as community mobilization activities. The health messages should also be packaged while taking age into consideration. This is particularly essential for interventions that are not only culturally sensitive such as male circumcision, but also those that are for voluntary participation.

A man's marital status determines his participation in male circumcision in Luo Nyanza. This is also true for the family size and number of children in the household. Therefore, we can conclude and say that one of the determinants of the success of an intervention such as voluntary male circumcision is a man's marital status and the size of the household. If a man has married and equally with a bigger family size, then his chances of getting involved in interventions such as male circumcision are reduced considerably. In order for such men to benefit from similar programs, the design, implementation and evaluation of the interventions should take this determinant into account.

The type and nature of occupation of an adult man in Luo Nyanza determines whether he will undergo circumcision or not. Very few self employed men would opt to circuncise majorly because their jobs demanded their physical presence and energy, especially those in the "jua-kali" sector. Therefore fear of losing income while seeking or healing from circumcision play a key obstructive role among those not seeking the service. So, health interventions that would interfere with a man's source of daily income will face serious implementation challenges in Luo Nyanza.

The government and international community policy of providing free male circumcision services as a way of scaling up uptake has played a key role in influencing those who have participated in VMMC. It is therefore a key tool that can sustain the progress of VMMC service delivery in Luo Nyanza. Government facilities are better and attractive alternative among adult men in providing VMMC services compared to the current situation where NGOs are the main providers. Majority of adult men in Luo Nyanza have faith in government hospitals and personnel arguing that these facilities are static and accessible unlike NGOs that they say are seasonal. This should however be accompanied by medical supplies and quality improvement in service delivery.

Adult men in Luo Nyanza circumcised or not, know and appreciate that VMMC is beneficial both in preventing heterosexual HIV transmission and other related benefits. The biggest concern is that those promoting this intervention tend to over employ resources and time on easy targets, and specifically schools, thereby creating a notion that VMMC is for teenagers. This therefore, has discouraged the adult men from getting circumcised.

7.2 Recommendations

1. Implementers of the voluntary medical male circumcision should stratify the program based on age. This should create different age strata that take into consideration the concerns of adult men. The sensitivity of doing male circumcision in a common fashion for both adults and children should be addressed through community forums.

2. In order to promote the participation of adult men in the VMMC services, the information on its health benefits should be packaged in such a way that the men get to understand the role of anaesthesia in the surgical procedure. This should entail an emphasis that the
procedure is a life saving option for the entire community and should not be ignored because of perceived other than experienced pain.

3. Information, Education and Communication (IEC) on VMMC should cover the latest prevalence rates of HIV in Luo Nyanza in order to help the adult men understand and appreciate the need to circumcise for HIV prevention. Such IEC should specifically target married men who assume that they are safe from HIV by virtue of being married, with statistics of the HIV transmission trends among married men.

4. The ministries of Health of the county and national governments should liaise with the local VMMC service providers in designing adult friendly VMMC services.

5. Those that fear losing family income when seeking or healing from VMMC should, within program budgets be adequately and transparently compensated for the lost time in order to promote coverage.

6. Government hospitals, health centres and dispensaries in Luo Nyanza should be used as main VMMC delivery points for adults and be seen to be owned by the government other the NGOs because the locals have more faith in them than the NGOs. This must be accompanied by the assurance of quality and commodity supplies for service delivery improvement. Integration of VMMC service delivery between these governments and the NGOs should also be promoted.

7. Conduct further research: There is need to conduct further research on the impact of the VMMC intervention in Luo Nyanza in order to create a clearer picture on the tangible progress and implications of the intervention for the region. This will help in the revision of policies on VMMC.

Sexual behaviour patterns among the circumcised and uncircumcised groups should also be studied in order to help in the design of adult male circumcision services.

Bibliography


Appendix 1: Budget

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How to Cite this Article: Joseph Omolo Saye "Determinants Of Voluntary Medical Male Circumcision Uptake Among Adults In Luo Nyanza" Pinnacle Medicine & Medical Sciences ISSN: 2360-9516, Vol. 5 (1), 2018, Article ID pmmms_281, 1245-1283, 2018.
Appendix 2: Plan Of Activities (Nov. 2013 to Nov. 2015)

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Appendix 3. Informed consent

Instructions

(Provide a detailed explanation as stipulated below before filling in the questionnaire).

Purpose: You are being requested to take part in a research study.

My name is ------------------------------- (Name of interviewer) from ------------------------------- I would like you to grant me permission to give you a brief explanation about this study.

Do you agree?

Yes ☐ No ☐

If yes, proceed with the explanation; if no thank the patient and let him go.

Voluntary Medical Male Circumcision is the surgical removal of the inner foreskin by trained Medical professional. This practice has been recommended by the World Health Organization as one of the most effective strategies in the prevention of heterosexual acquired HIV transmission especially among communities that do not practice traditional male circumcision. However, the implementation of this program is currently facing challenges in reaching the target group thereby posing a threat to realizing the long term benefits of reducing new HIV infections and the burden of care and treatment. We are interested in:

- The socio cultural barriers, if any, that hinder the uptake of VMMC in this region.
- The determining factors for and against uptake, and for motivating one’s son to undergo VMMC.

The study is aimed at improving knowledge and practices on Voluntary medical male circumcision for HIV prevention. It is also useful in advocating for improvement of policies for VMMC in the country.

Alternative to participating in the study

An alternative to participating in this study is non participation.

If you choose not to participate, you will not be questioned further and you have the right to withdraw from the study at any time without any explanation to the research staff.

The decision not to take part in the study will have no impact on the future treatment and care you receive from this health center or any other health institution.

Potential risks

The major risk associated with this interview is a breach of confidentiality. We will work to minimize this by not including your name on any note resulting from interview or any summary of the interview. Data records relating to your participation will remain confidential to the interviewer and the principal researcher. All the data obtained about you as an individual will be considered privileged and held in confidence; you will not be considered in any presentation of the results. The consent form and the questionnaires will be maintained in a secure location until all the data are analyzed. The consent forms will be destroyed upon implementation of the study. We are optimistic the study will be useful to you and the interview will take a maximum 20 minutes.

For information or answers to questions concerning your right as a research subject, you may contact.

JOSEPH SAYE
SCHOOL OF PUBLIC HEALTH
UNIVERSITY OF NAIROBI
P. O. BOX 30197 NAIROBI.
0723 569 626

NB: If there is any part of this consent explanation that you can not understand, ask the interviewer before signing.

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Consent form

The Determinants For And Willigness To Circumcise Among Men In Luo Nyanza, Kenya.

I (Name of volunteer) ---------------------------------------- ID No./Passport No.---------------
certify that I have received detailed explanation about this study including a consent form. I fully understand and accept the objectives of this research which is aimed at improving knowledge, practices and policies on Voluntary medical male circumcision for HIV prevention.

I hereby give permission for research staff to collect personal data from me including sensitive information like my HIV status.

I have been assured that the information shall be confidential and may only be presented as a summary of results of the study. I fully understand that I am free to withdraw from participating in the study at any time without giving any explanation.

I understand I can contact the principal researcher on 0723 569 626 if I have any problem or question.

I voluntarily agree to participate in this study

Signed -------------------------------------- (signature of participant)

Date -----------------------------------------

Appendix 4: Questionnaire

Part One: Introduction

Questionnaire No. -----------------------------
Date -----------------------------------------

I am an MPH student in University of Nairobi and am carrying out a study on The Determinants of participation in Voluntary Medical Male Circumcision among men in Luo Nyanza. This is in partial fulfillment of a Master of Public Health degree of the University of Nairobi. The data collected will be treated with confidentiality and at no time will you be required to identify yourself by name.

I would like you to grant me permission to ask you few questions, do you agree?

Yes ☐ No ☐

If no, end the interview and proceed to the next client.

Part 2: Socio-Demographic Profile

Put a tick in the appropriate box or fill the spaces provided appropriately and correctly.

2.1 What is your age in complete years?

2.2 What is your marital status?
   a) Married - monogamous ☐
   b) Married - polygamous ☐
   c) Single ☐ If single go to 2.4
   d) Divorced / separated ☐
   e) Widowed ☐
   Others specify …………………………………………………….

2.3 How many children do you have?
   a) None ☐
   b) 1 - 2 ☐
   c) 3 - 5 ☐
   d) More than 5 ☐

2.4 What is your religion?
   a) Catholic ☐
   b) Protestant ☐
   c) Muslim ☐
   Others specify …………………………………………………….

2.5 What is your level of education?
   a) None ☐
   b) Primary ☐
   c) Secondary ☐
   d) College / tertiary ☐
2.6 If married, what is your spouse' level of education?
   a) None ☐
   b) Primary ☐
   c) Secondary ☐
   d) College/tertiary ☐

2.7 What is your occupation?
   a) Unemployed ☐
   b) Self employed ☐
   c) Employed (Salaried) ☐
   Others specify ________________________________________________________________

2.8 What is the occupation of your spouse?
   a) Unemployed ☐
   b) Self employed ☐
   c) Employed (Salaried) ☐
   Others specify ________________________________________________________________

2.9 What is the range of your monthly income?
   a) Below 10 000 ☐
   b) Between Kshs. 10,000 - 50,000 ☐
   e) Above 50,000 ☐

3.0 What is the range of your spouse’s monthly income?
   a) Below Kshs. 10,000 ☐
   b) Between Kshs. 10,000 - 50,000 ☐
   c) Above Kshs. 50,000 ☐

**Part 3: Knowledge, Attitude, Beliefs And Willingness To Circumcize**

**Tick appropriately**

3.1 Knowledge and Practice of Circumcision

3.1.1 Have you heard about Voluntary Medical Male Circumcision (VMMC)?
   Yes ☐
   No ☐

3.1.2 Does it have any benefits?
   Yes ☐
   No ☐

If Yes, tick which of the following you believe are the potential benefits
   ☐ It offers up to 100% protection from HIV for men
   ☐ It offers up to 60% protection from HIV for men
   ☐ It protects male partners from getting Herpes genitalis, cervical cancers some STIs
   ☐ It improves penile hygiene

3.1.3 Does VMMC have any adverse effects on the circumcised person?
   Yes ☐
   No ☐

If yes, state briefly the adverse effects________________________________________________

3.1.4 Have you undergone VMMC?
   Yes ☐
   No ☐

If Yes, i) how old were you when you circumcized?
   Yes ☐
   No ☐

ii) What motivated you to circumcise, state briefly:

________________________________________________________________________________

iii) Would you allow your son to circumcize
   Yes ☐
   No ☐
Part 4; Men's Understanding Of The VMMC Procedure/Service Delivery

4.1 Briefly explain what happens;

i) Before one gets circumcised

ii) During circumcision

iii) After circumcision

4.2 Why in your opinion, do many men still hesitate to circumcize?

State briefly

4.3 Should VMMC services be offered by(tick appropriately);

☐ NGO's;

☐ The government;

Thank You And God Bless

Translated version of the Questionnaire (In Luo)

MOKUONGO; NONRO MARI

Ma en Oboke Mar

T a r i k

Chieng Dwe Higa

An japuonjre e mbalariany ma Nairobi, asomo weche ngima kod ler mar jopiny. Kuluwore kod chike mag somo e rang'iny mamalo mag Mbalariany ma Nairobi, atimo nonro ewi "Gigo mamiyo jomadongo machuo dhie kata tamore dhie nyangu mitimo nono maonge chudo. Weche duto ma ibiro wachona e nonroni abiro keto mopandore maonge ng'ato kendo mabiro neno kata winjo, bende ok wabi ndiko kata hulo nyangi kamoro amora e nonro ni.

Mokuongo, mondo ka iyiena to achak kod penjo manok, bende anyalo dhi nyime kod penjo?

Ee ☐ Ooyo ☐

Ka duoko en Ooyo to chung'?

Mar 2; Nonro Mari

Ibiro kiewo ei sanduku kata duoko kaluore kod penjo

2.1 In kod higni adi duto

2.2 Bende isekendo

a) Asekendo, dhako achiel ☐

b) Asekendo, an jadoho ☐

c) Pod ok akendo ☐

d) Ne wawere ☐

e) Jaoda ne otho ☐

Mopogore kod magi

2.3 Bende intie kod nyithindo?

a) aonge gi nyathi ☐

b) 1-2 ☐
2.4 Ilemo e din mane?
   a) Catholic
   b) Protestant
   c) Muslim
   Mopogore kod magi

2.5 Isomo nyaka e rang'iny mane
   a) Onge
   b) Primary
   c) Secondary
   d) College/Mbalariany

2.6 Jaodi osomo nyaka e rang'iny mane
   a) Onge
   b) Primary
   c) Secondary
   d) College/Mbalariany

2.7 Itiyo tich mane?
   a) Onge
   b) Andikora kenda
   c) Ondika(Msahara)
   d) Mopogore kod magi (Mane)

2.8 Jaodi tiyo tich mane
   a) Onge
   b) Ondikore kende
   c) Ondike
   d) Mopogore kod magi (Mane)

2.9 Yuto mari nyalo room nade e dwe achiel
   a) Tin ne Shs. 10 000
   b) Shs. 10 000 - 50 000
   c) Ohingo Shs. 50 000

3.0 Yuto mar jaodi nyalo room nade e dwe achiel
   a) Tin ne Shs. 10 000
   b) Shs. 10 000 - 50 000
   c) Ohingo Shs. 50 000

Mar 3. Weche Mag Nyage Kod Yie Mondo Idhi E Nyange
Kiewu kaka owijnjore

3.1 Weche ma ing’eyo kuom nyange
   3.1.1 Bende isewinjoe ni nitire nyange ma itimo ne ji nono?
     a) Ee
     b) Ooyo

   3.1.2 Bende en kod berne moro amora
     a) Ee
     b) Ooyo

   Ka iyie ni ober, kiewu duto ma ing’eyo ni gin ber mar nyangu
     Ogeng’o kute mag ayaki gi ata malo mia achiel
     Ogeng’o kute mag ayaki gi ata malo piero achiel
     Ogeng’o touché kaka, cancer mar dh od nyuol, abubà, kod touché
3.1.3 Bende nyange ni kod rachne moro maora sache itime kata ka osetime
   a) Ee
   b) Ooyo
   Ka iyie ni nitie rach mar nyange, wachie ni gin mage ma ing’eyo

3.1.4 Bende osetimni nyange
   Ee
   Ooyo
   i) Ka osetimni nyange, ne in ko higni adi kane idhi
      Ne pok achopo higni 18
      Ne asekadho higni 18
   ii) En ang’o mane omiyi mijing’o mar dhi e nyage, wachie
   iii) Bende inyalo chiwo nyathini ma wuowi mondo odhi e nyangu
      Ee
      Ooyo

Wachie matin kuom duoko ni

Mar 4. Gigo Ma Joma Chuo Ong’eyo Kuom Iruok Ma Onego Otim Ka Gidwa Dhi E Mesa Mar Nyangu
4.1 Wachie gima ing’eyo:
   i) Ang’o ma onego tim ne ng’at ma osechopo ma idwaro time nyange
   ii) Gin ang’o gini ma itimo ewi mesa mar nyange
   iii) Gin ang’o gini ma itimo ne ng’atma eka otimne nyange

4.2 Gi pachi iwuon, gin ang’o gini mamiyo chuo madongo oluoro dhi e nyange

4.3 Kaber to iparo ni onego nyange tim kod;
   NGOs
   Sirkal
   Nikech ang’o

Erokamano, Nyasaye Mondo Ogwedhi

Appendix 5: Informed Consent for the FGD

(This is a different informed consent from the previous one administered for the self administered questionnaires because the FGDs will involve totally different kind of audience whose views and opinions are guided by experience in VMMC)

CONSENT FORM 2 (KII/FGD)
A study on The determinants participation in VMMC among men in Luo Nyanza
Investigator And Institutional Affiliations:

<table>
<thead>
<tr>
<th>Joseph Omolo Saye</th>
<th>Principle Investigator</th>
<th>The University Of Nairobi, College of Health Sciences, School of Public Heath.</th>
</tr>
</thead>
</table>

Telephone contact for Principal Investigator: +254723569626

Introduction
I would like to tell you about a study being conducted by a student at the University of Nairobi, School of Public Health to find out if you would like participate. The purpose of this consent form is to give you the information you need will need to help you decide whether or not to participate in the study. Please read or listen to the form as it is read to you carefully. You may ask
questions about the purpose of the research, what we would ask you to do, the possible risks and benefits, your rights as a volunteer, and anything else about the research or this form that is not clear. When all your questions have been answered, you can decide whether you want to be in the study or not. This process is called 'Informed Consent.'

**Why is this study being done?**

You are being asked to take part in this study you/your institution are a key stakeholder in the delivery of Voluntary Medical Male Circumcision (VMMC). The purpose of this study is to collect information about the determinants and willingness to circumcision among men in Luo Nyanza. The men referred to in this study are those aged 18 to 59 years who out of past experience have shown low uptake rates of the service. We hope that this information will help document on the factors that have so far hindered the uptake of this service among the men. This process of this study may not be beneficial to you individually except for providing an opportunity for you to share your knowledge and to contribute to this process. We hope that this research will help provide a clearer understanding of the barriers in addition what these barriers are thought to be so that the existing gaps can be identified and possibly pave way for improvement towards uptake.

**Who takes care of the cost of this study?**

This study is being funded by the student, Principal Investigator in line with the training requirements of the MPH program of the University of Nairobi.

**How many people are taking part in this study?**

About 40 people may participate in this study. This will be determined by the number of stakeholders interviewed and those who come for the focus group discussions and getting enough information from the interviews and discussions. The interviews will involve government officials, program officers, MCincharges, intervention heads, mobilizers and individuals.

**What will happen if you take part in this study?**

You will be interviewed by the principal investigator either in a one to one interview or as part of focus group discussion. I will conduct the interview in English and ask you to share your knowledge.

Because we want you to share knowledge and experiences, we may ask you to share more about your certain topics. This will help to learn from you and, ultimately, this may help improve of VMMC uptake.

The interview will take place in a private room at your office or another quiet location that is convenient to you and me.

If you give your permission, I would like to record the interview using a digital recorder. This will give me a chance to write out the things you say in detail later, as that now I can listen carefully without writing much. As I transcribe, I will not include any names on - this way your information remains confidential. The sound recording will be destroyed after I finish the analysis and the writing of the reports.

**What is the time committed to the study?**

The interview will last 1.5 hours or less for any interview process. We may wish to interview more than once depending on the number of stakeholders interviewed and those who come for the focus group discussions and getting enough information from the interviews and discussions. The interviews will involve government officials, program officers, MCincharges, intervention heads, mobilizers and individuals.

**Is there any alternative to participation?**

If you choose not to participate you will not be affected in any way.

**Other information**

In particular, if you are part of the focus group discussions, others who attend the same discussion will be able to identify you as a participant in the study.

You are free to ask questions to the investigator both before consenting to participate and at any time thereafter.

You can contact the Ethics Review Committee, Kenyatta National Hospital tel. (0202 726300-9) Or email on (uonknh_erc@uonbi.ac.ke) if you have any questions about your right as a participant in the study.

I confirm that I have explained the details of the study to the participant

---

Investigators signature                                                                                                                               Date

______________________________________________________________________________________________________________________________

Investigators Name(printed)                                                                                                                               Date

______________________________________________________________________________________________________________________________

---

**Subject statement**

The study has been explained to me, and I have had the opportunity to ask questions. I voluntarily agree to participate. I understand that the future questions I may have about the study or about my rights, as a subject will be answered by one of the investigators listed on page 1. If I have any questions about my right as a research subject, I can call the research the KNH Ethics Review Committee.

I note the following and tick against what I am willing to accept:

- [ ] I am willing to participate in this study as explained above
- [ ] I am willing for the interview to be audio recorded
- [ ] I am willing to be contacted if further clarification is needed
- [ ] I will receive a copy of this consent form.

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How to Cite this Article: Joseph Omolo Saye "Determinants Of Voluntary Medical Male Circumcision Uptake Among Adults In Luo Nyanza" Pinnacle Medicine & Medical Sciences ISSN: 2360-9516, Vol. 5 (1), 2018, Article ID pmms_281, 1245-1283, 2018.
Appendix 6: Questions for the Focus Group Discussion

The Determinants Of Participation In Voluntary Medical Male Circumcision Among Older Men In Luo Nyanza

Questions For The Focus Group Discussion

1. Why, in your opinion, do many men still hesitate to go for VMMC?
2. Many older men argue that all VMMC focus and resources (These include mobilization, health education targeting schools) target children thereby leaving out adults. Is this true?
3. Many men still believe that VMMC is a non-cultural practice that should not be introduced to them despite it’s’ effectiveness against HIV. How can this be addressed?
4. There are those men who believe that they can go for circumcision yes, but fear losing family income during healing period. Is this a genuine concern and how can it be addressed?
5. What should be done to promote uptake of VMMC for men 18 years and above?

Thank You And God Bless You

Appendix 7: Knh/Uon Erc Letter Of Approval

How to Cite this Article: Joseph Omolo Saye "Determinants Of Voluntary Medical Male Circumcision Uptake Among Adults In Luo Nyanza" Pinnacle Medicine & Medical Sciences ISSN: 2360-9516, Vol. 5 (1), 2018, Article ID pmms_281, 1245-1283, 2018.
Appendix 8: County Directors’ Approval

JOSEPH OMOLO SAYE,
SCHOOL OF PUBLIC HEALTH,
UNIVERSITY OF NAIROBI,
P.O BOX 19676 – 00200.
NAIROBI.

TO
THE COUNTY DIRECTOR OF HEALTH,
KISumu COUNTY,
P.O BOX
KISumu.

20/04/2015.

Dear Sir/Madam,

RE: PERMISSION TO CONDUCT A STUDY ON THE DETERMINANTS OF PARTICIPATION IN VMMC AMONG OLDER MEN IN LUO NYANZA, IN YOUR COUNTY

I am writing to seek permission as stated above. I am a postgraduate student at the School of Public Health, University of Nairobi, doing the above study in Luo Nyanza. This is in partial fulfillment of the requirements for the award of the MPH degree.

The study findings will help in improving uptake and service delivery of VMMC for HIV prevention in Luo Nyanza.

Thanking you in advance for your consideration.

Sincerely

Joseph O. Saye
0723569626

Appendix 8: Map of Nyanza Region
List of supervisors

This thesis has been submitted for examination with our approval as University supervisors:

Prof. Joseph Wang’ombe, BA, MA, PhD.
Professor, School of Public Health,
University of Nairobi

Signed……………………………………………. Date:.........................

Prof. Joyce Olenja, BEd, MPH, Phd.
Professor, School of Public Health,
University of Nairobi.

Signed……………………………………………. Date:.........................

Approval by the Director, School of Public Health, University of Nairobi

Dr. Dismas Ongore, PhD, MPH, Mbchb
Director, School of Public Health,
University of Nairobi.

Signed…………………………………………… Date:.........................

Dedication

To all the communities in Kenya who never practiced traditional male circumcision, but have had to bend and accommodate the practice in order to help the world in fighting the HIV/AIDS scourge.

Acknowledgements

God almighty, for His everlasting mercies and kindness in my life.

My supervisors; Professor Joseph Wang’ombe and Joyce Olenja for invaluable guidance, patience and support during the entire journey.

The Katholischer Akademischer Ausländer-Dienst who made me realize my post graduate academic dreams through invaluable financial support.

To my wife, Elizabeth Mgamb, for her patience and drive in supporting me as a student.

To my son, Mark Ray, for always enduring my inevitable absence from home.