

Quarterly Research Digest on Voluntary Medical Male Circumcision for HIV Prevention

1. Doyle, A. M., et al. **Who are the male sexual partners of adolescent girls and young women? Comparative analysis of population data in three settings prior to DREAMS roll-out.** *PLoS One* 2018;13(9): e0198783.
Online at: <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0198783>

BACKGROUND: The DREAMS (Determined Resilient Empowered AIDS-free, Mentored and Safe) Partnership aims to reduce HIV incidence among adolescent girls and young women (AGYW, 15-24y) with a core package of evidence-based interventions. Some interventions, including voluntary HIV counselling and testing and circumcision, will be targeted at the male sexual partners of AGYW. A priority of DREAMS is to characterise the male partners for effective targeting.

METHODS: Using population-based data (2010-2015) in three DREAMS impact evaluation settings in Kenya and South Africa, we describe the demographic characteristics and sexual behaviour of male partners reported by AGYW, and the characteristics of males who report sexual activity with AGYW.

RESULTS: In all settings, over 90% of recent male partners reported by AGYW were aged <35 years. Median ages of spousal and non-spousal partners were 29 and 23 years respectively in uMkhanyakude (rural South Africa) and 21 and 20 years respectively in Nairobi (urban Kenya). Most males reporting an AGYW partner had never been married (89%) and many were in school (39%). Most male partners reported only 1 AGYW partner in the past year; in Gem (rural Kenya) and Nairobi 25%-29% reported 2+(AGYW or older female) partners. Concurrent partners were reported by 16% of male partners in Gem and 3-4% in uMkhanyakude. Two thirds of male partners in Gem reported testing for HIV in the past 6 months and under half in uMkhanyakude reported testing for HIV in the past year. Almost all (96%) partners in Nairobi were circumcised, compared to 45% in Gem and 43% in uMkhanyakude.

CONCLUSIONS: With almost all AGYW's sexual partners aged 15-34 years, this is an appropriate target group for DREAMS interventions. Encouraging young men to reduce their number of partners and concurrency, and uptake prevention and treatment services such as HIV testing, circumcision and ART is crucial in the effort to reduce HIV among both AGYW and young men.

2. Katisi, M., et al. **Exploring the roots of antagonism in the safe male circumcision partnership in Botswana.** *PLoS One* 2018;13(9): e0200803.
Online at: <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0200803>

BACKGROUND: Partnerships in global health and development governance have been firmly established as a tool to achieve effective outcomes. Botswana implements Safe Male Circumcision (SMC) for HIV prevention through a North-South partnership comprising the local Ministry of Health, US Centers for Disease Control and Prevention (funded by PEPFAR) and Africa Comprehensive HIV/AIDS Partnership (funded by the Bill and Melinda Gates Foundation). The SMC partnership experienced significant antagonism and the aim of this paper is to illuminate the actions and processes in the SMC program that contributed to that antagonism.

METHODS: Methods used to gather data include observation of the partners' planning and strategic meeting in 2012, in-depth interviews with lead officers at national level, focus group discussions with district officers and implementers, younger male officers and old community members as recipients of the service.

RESULTS: The findings reveal that the partnership experienced antagonism during operational processes and as the ultimate outcome. Target setting, financial power of the North, superficial ownership given to the South, ignoring local traditional realities results in antagonism. Three roots of antagonism have been identified: 1. therapeutic domination-medical expertise given with arrogance; 2. iatrogenic violence-good intentions that cause unintended harm; 3. the Trojan horse-Reckless acceptance of the gift as well as deceptive power positioned under the pretext of benevolence.

CONCLUSION: The three roots of antagonism; therapeutic domination, iatrogenic violence and the Trojan horse, constitute attitudes, hidden intentions and unintended consequences that influence program implementation and cause harm at different levels. Examples of therapeutic domination and the Trojan horse have highlighted the need for vigilance at the stage of establishing a partnership, to prevent more powerful partners from developing and applying hidden agendas and to strengthen accountability from the local partner. Iatrogenic violence has highlighted the need for partnership interventions to prevent good partner intentions accidentally producing bad outcomes.

3. Bautista-Arredondo, S., et al. **Influence of supply-side factors on voluntary medical male circumcision costs in Kenya, Rwanda, South Africa, and Zambia.** *PLoS One* 2018;13(9): e0203121.
Online at: <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0203121>

BACKGROUND: In this study, we described facility-level voluntary medical male circumcision (VMMC) unit cost, examined unit cost variation across facilities, and investigated key facility characteristics associated with unit cost variation.

METHODS: We used data from 107 facilities in Kenya, Rwanda, South Africa, and Zambia covering 2011 or 2012. We used micro-costing to estimate economic costs from the service provider's perspective. Average annual costs per client were estimated in 2013 United States dollars (US\$). Econometric analysis was used to explore the relationship between VMMC total and unit cost and facility characteristics.

RESULTS: Average VMMC unit cost ranged from US\$66 (SD US\$79) in Kenya to US\$160 (SD US\$144) in South Africa. Total cost function estimates were consistent with economies of scale and scope. We found a negative association between the number of VMMC clients and VMMC unit cost with a 3% decrease in unit cost for every 10% increase in number of clients and we found a negative association between the provision of other HIV services and VMMC unit cost. Also, VMMC unit cost was lower in primary health care facilities than in hospitals, and lower in facilities implementing task shifting.

CONCLUSIONS: Substantial efficiency gains could be made in VMMC service delivery in all countries. Options to increase efficiency of VMMC programs in the short term include focusing service provision in high yield sites when demand is high, focusing on task shifting, and taking advantage of efficiencies created by integrating HIV services. In the longer term, reductions in VMMC unit cost are likely by increasing the volume of clients at facilities by implementing effective demand generation activities.

4. Davis, S. M., et al. **Progress in voluntary medical male circumcision for HIV prevention supported by the US President's Emergency Plan for AIDS Relief through 2017: longitudinal and recent cross-sectional programme data.** *BMJ Open* 2018;8(8): e021835.

Online at: <https://bmjopen.bmj.com/content/8/8/e021835.long>

OBJECTIVE: This article provides an overview and interpretation of the performance of the US President's Emergency Plan for AIDS Relief's (PEPFAR's) male circumcision programme which has supported the majority of voluntary medical male circumcisions (VMMCs) performed for HIV prevention, from its 2007 inception to 2017, and client characteristics in 2017. **DESIGN:** Longitudinal collection of routine programme data and disaggregations.

SETTING: 14 countries in sub-Saharan Africa with low baseline male circumcision coverage, high HIV prevalence and PEPFAR-supported VMMC programmes.

PARTICIPANTS: Clients of PEPFAR-supported VMMC programmes directed at males aged 10 years and above.

MAIN OUTCOME MEASURES: Numbers of circumcisions performed and disaggregations by age band, result of HIV test offer, procedure technique and follow-up visit attendance.

RESULTS: PEPFAR supported a total of 15 269 720 circumcisions in 14 countries in Southern and Eastern Africa. In 2017, 45% of clients were under 15 years of age, 8% had unknown HIV status, 1% of those tested were HIV+ and 84% returned for a follow-up visit within 14 days of circumcision.

CONCLUSIONS: Over 15 million VMMCs have been supported by PEPFAR since 2007. VMMC continues to attract primarily young clients. The non-trivial proportion of clients not testing for HIV is expected, and may be reassuring that testing is not being presented as mandatory for access to circumcision, or in some cases reflect test kit stockouts or recent testing elsewhere. While VMMC is extremely safe, achieving the highest possible follow-up rates for early diagnosis and intervention on complications is crucial, and programmes continue to work to raise follow-up rates. The VMMC programme has achieved rapid scale-up but continues to face challenges, and new approaches may be needed to achieve the new Joint United Nations Programme on HIV/AIDS goal of 27 million additional circumcisions through 2020.

5. Reed, J. B., et al. **Lessons from a decade of voluntary medical male circumcision implementation and their application to HIV pre-exposure prophylaxis scale up.** *Int J STD AIDS* 2018; 956462418787896. [Epub ahead of print]

Online at:

http://journals.sagepub.com/doi/abs/10.1177/0956462418787896?url_ver=Z39.88-2003&rfr_id=ori:rid:crossref.org&rfr_dat=cr_pub%3dpubmed

Oral pre-exposure prophylaxis (PrEP) has the ability to curb HIV incidence worldwide and bring us closer to ending the HIV epidemic. Scale up of PrEP service delivery has many similar challenges to those faced by voluntary medical male circumcision (VMMC) services roll-out. This article outlines ten important lessons learned during the scale up of VMMC services in sub-Saharan Africa and their application to current oral PrEP implementation efforts to promote faster expansion for public health impact.

6. Ucar, T., et al. **The activity and discussion points of #Circumcision through Twitter; a microblogging platform.** *Int J Impot Res* 2018; 30(5):249-52.

Online at: <https://www.nature.com/articles/s41443-018-0058-y>

OBJECTIVES: Our objective was to elucidate the discussion points of circumcision on social media (SoMe) by looking at the Twitter activity.

MATERIAL AND METHODS: Twitter searched for #circumcision hashtag via www.tweetarchivist.com, www.twitonomy.com, www.symplur.com. Total tweet numbers, most influencers, top users were documented. Tweets including female circumcision were excluded. The contents of the tweets were classified into four subgroups (medical, religious, social, and political) by two independent reviewers. All kinds of tweet activities were statistically analyzed.

RESULTS: A total of 9795 users generated 15,989 tweets about circumcision in a 1 month period. Mean daily tweet activity was 532 for #circumcision. The content analysis revealed that 2224 (15.8%) medical, 1133 (8.0%) religious, 323 (2.2%) social and 10,470 (74.0%) political tweets have been sent out by the users. Contributors originated from 174 countries from 6 continents. Media organizations were accounted for 52% of the top 25 influencers in circumcision hashtag. The most common hashtags accompanying #circumcision were #HIV (4.9%), #babiesgoherpes (3.3%), #muslim (1.8%), #malegenitalmutilation (1.6%) respectively.

CONCLUSIONS: There is an increasing discussion about circumcision through SoMe . Our results provided that the discussion points are mostly driven by the media and the activists. The political tweets have been found to be the center of the discussion. SoMe usage should be increased by medical professionals for true information of the public.

7. Rosenberg, M. S., et al. **Are circumcised men safer sex partners? Findings from the HAALSI cohort in rural South Africa.** *PLoS One* 2018;13(8): e0201445.
Online at: <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0201445>

INTRODUCTION: The real-world association between male circumcision and HIV status has important implications for policy and intervention practice. For instance, women may assume that circumcised men are safer sex partners than non-circumcised men and adjust sexual partnering and behavior according to these beliefs. Voluntary medical male circumcision (VMMC) is highly efficacious in preventing HIV acquisition in men and this biological efficacy should lead to a negative association between circumcision and HIV. However, behavioral factors such as differential selection into circumcision based on current HIV status or factors associated with future HIV status could reverse the association. Here, we examine how HIV prevalence differs by circumcision status in older adult men in a rural South African community, a non-experimental setting in a time of expanding VMMC access.

METHODS: We analyzed data collected from a population-based sample of 2345 men aged 40 years and older in a rural community served by the Agincourt Health and socio-Demographic Surveillance System site in Mpumalanga province, South Africa. We describe circumcision prevalence and estimate the association between circumcision and laboratory-confirmed HIV status with log-binomial regression models.

RESULTS: One quarter of older men reported circumcision, with slightly more initiation-based circumcisions (56%) than hospital-based circumcisions (44%). Overall, the evidence did not suggest differences in HIV prevalence between circumcised and uncircumcised men; however, those who reported hospital-based circumcision were more likely to test HIV-positive [PR (95% CI): 1.28 (1.03, 1.59)] while those who reported initiation-based circumcision were less likely to test HIV-positive [PR (95% CI): 0.68 (0.51, 0.90)]. Effects were attenuated, but not reversed after adjustment for key covariates.

CONCLUSIONS: Medically circumcised older men in a rural South African community had higher HIV prevalence than uncircumcised men, suggesting that the effect of selection into circumcision may be stronger than the biological efficacy of circumcision in preventing HIV acquisition. The impression given from circumcision policy and dissemination of prior trial findings that those who are circumcised are safer sex partners may be incorrect in this age group and needs to be countered by interventions, such as educational campaigns.

8. Davis, S. M., et al. **Circumcision status at HIV infection is not associated with plasma viral load in men: analysis of specimens from a randomized controlled trial.** *BMC Infect Dis* 2018;18(1): 350.
Online at: <https://bmcinfectdis.biomedcentral.com/articles/10.1186/s12879-018-3257-8>

BACKGROUND: Male circumcision provides men with approximately 60% protection from acquiring HIV infection via heterosexual sex, and has become a key component of HIV prevention efforts in sub-Saharan Africa. Possible mechanisms for this protection include removal of the inflammatory anaerobic sub-preputial environment and the high concentration of Langerhans cells on the inside of the foreskin, both believed to promote local vulnerability to HIV infection. In people who do acquire HIV, viral load is partially determined by infecting partner viral load, potentially mediated by size of infecting inoculum. By removing a portal for virion entry, prior male circumcision could decrease infecting inoculum and thus viral load in men who become HIV-infected, conferring the known associated benefits of slower progression to disease and decreased infectiousness.

METHODS: We performed an as-treated analysis of plasma samples collected under a randomized controlled trial of male circumcision for HIV prevention, comparing men based on their circumcision status at the time of HIV acquisition, to determine whether circumcision is associated with lower viral load. Eligible men were seroconverters who had at least one plasma sample available drawn at least 6 months after infection, reported no potential exposures other than vaginal sex and, for those who were circumcised, were infected more than 6 weeks after circumcision, to eliminate the open wound as a confounder. Initial viral load testing indicated that quality of pre-2007 samples might have been compromised during storage and they were excluded, as were those with undetectable or unquantifiable results. Log viral loads were compared between groups using univariable and multivariable linear regression, adjusting for sample age and sexually transmitted infection diagnosis with 3.5 months of seroconversion, with a random effect for intra-individual clustering for samples from the same man. A per-protocol analysis was also performed.

RESULTS: There were no viral load differences between men who were circumcised and uncircumcised at the time of HIV infection (means 4.00 and 4.03 log₁₀ copies/mL respectively, $p = .88$) in any analysis.

CONCLUSION: Circumcision status at the time of HIV infection does not affect viral load in men.

TRIAL REGISTRATION: The original RCT which provided the samples was ClinicalTrials.gov trial NCT00059371.

9. McGillen, J. B., et al. **The emerging health impact of voluntary medical male circumcision in Zimbabwe: An evaluation using three epidemiological models.** *PLoS One* 2018;13(7): e0199453.
Online at: <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0199453>

BACKGROUND: Zimbabwe adopted voluntary medical male circumcision (VMMC) as a priority HIV prevention strategy in 2007 and began implementation in 2009. We evaluated the costs and impact of this VMMC program to date and in future.

METHODS: Three mathematical models describing Zimbabwe's HIV epidemic and program evolution were calibrated to household survey data on prevalence and risk behaviors, with circumcision coverage calibrated to program-reported VMMCs. We compared trends in new infections and costs to a counterfactual without VMMC. Input assumptions were agreed in workshops with national stakeholders in 2015 and 2017.

RESULTS: The VMMC program averted 2,600-12,200 infections (among men and women combined) by the end of 2016. This impact will grow as circumcised men are protected lifelong, and onward dynamic transmission effects, which protect women via reduced incidence and prevalence in their male partners, increase over time. If other prevention interventions remain at 2016 coverages, the VMMCs already performed will avert 24,400-69,800 infections (2.3-5% of all new infections) through 2030. If coverage targets are achieved by 2021 and maintained, the program will avert 108,000-171,000 infections (10-13% of all new infections) by 2030, costing \$2,100-3,250 per infection averted relative to no VMMC. Annual savings from averted treatment needs will outweigh VMMC maintenance costs once coverage targets are reached. If Zimbabwe also achieves ambitious UNAIDS targets for scaling up treatment and prevention efforts, VMMC will reduce the HIV incidence remaining at 2030 by one-third, critically contributing to the UNAIDS goal of 90% incidence reduction.

CONCLUSIONS: VMMC can substantially impact Zimbabwe's HIV epidemic in the coming years; this investment will save costs in the longer term.

10. Jones, D. L., et al. **Increasing acceptability and uptake of voluntary male medical circumcision in Zambia: implementing and disseminating an evidence-based intervention.** *Transl Behav Med* 2018 Jul. [Epub ahead of print]

Voluntary medical male circumcision (VMMC) uptake in Africa could prevent 3.4 million HIV infections across a 10 year span. In Zambia, however, ~80 per cent of uncircumcised

men report no interest in undergoing VMMC. The Spear & Shield (S&S) intervention has been shown to be more effective than control or observation of only conditions at increasing the number of VMMCs. This study identified predictors of S&S implementation success or failure to create an "early warning" system to enable remedial action during implementation. Participants were n = 48 staff members from 12 community health facilities conducting the S&S program in Lusaka Province, Zambia. Quantitative assessments included demographics, provider attitudes, barriers to research uptake, staff burnout, and organizational readiness. Qualitative interviews were also conducted and quantified for analysis using the Consolidated Framework for Implementation Research (CFIR). Two-thirds (66%) of staff were women with a mean age of 37.67 years (SD = 7.51). Quantitatively, staff performance ($p = .033$) and decreased levels of staff burnout ($p = .025$) were associated with S&S implementation success. Qualitatively, constructs such as improved planning, executing, and self-reflection and evaluation were associated with S&S implementation success ($p = .005$). Identifying these factors facilitated remedial action across health facilities. This study illustrates the utility of the CFIR to guide program decision making in VMMC implementation in the Zambian context. Early identification of challenges to implementation may enable remedial action to enhance the likelihood of program sustainability. Effective monitoring strategies for HIV prevention interventions may thus enhance dissemination, implementation, and sustainability goals to bridge research and practice.

11. Nakyanjo, N., et al. **Women's role in male circumcision promotion in Rakai, Uganda.** *AIDS Care* 2018 Jul: 1-8. [Epub ahead of print]

Medical male circumcision (MMC) has expanded in sub-Saharan Africa, yet uptake remains sub-optimal. We sought to understand women's perceptions of and influence on MMC in Rakai, Uganda. We conducted in-depth interviews with 27 women in fishing and trading communities, including women married to circumcised and uncircumcised men, single women, and sex workers. Data analysis followed a team-based framework approach. All female participants preferred circumcised men because of perceived reduced HIV and sexually transmitted infection (STI) risk, improved penile hygiene, and increased sexual pleasure. Perceived negative aspects included abstinence during wound healing, potentially increased male sexual risk behaviors, fear of being blamed for HIV acquisition, and economic insecurity due to time off work. Participants felt women could persuade their partners to be circumcised, accompany them to the clinic, refuse sex with uncircumcised men, and participate in community MMC activities. Findings support women's important role in MMC acceptance.

12. Grund, J. M., et al. **Effectiveness of an "Exclusive Intervention Strategy" to increase medical male circumcision uptake among men aged 25-49 years in South Africa.** *BMC Public Health* 2018;18(1): 868.

<https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-018-5729-6>

BACKGROUND: South Africa introduced medical male circumcision (MMC) to reduce HIV incidence. Mathematical modeling suggested that targeting MMC services to men aged 20-34 years could provide the most immediate impact on HIV incidence. However the majority of MMCs performed have been among males aged ≤ 25 years. We evaluated an intervention package to increase MMC uptake among men aged 25-49 years.

METHODS: We conducted a pre-post study to compare the proportion of men (aged 25-49 years) presenting for MMC during the formative (Phase 1) and intervention (Phase 2) phases in Ekurhuleni, Johannesburg, South Africa. The intervention included infrastructure changes that separated adults from adolescents at the MMC site, an exclusive men's health club, adult-specific demand generation materials, and discussions with community members.

RESULTS: Overall 2817 enrolled in the study with 1601 from Phase 1 and 1216 in Phase 2. A higher proportion of participants aged 25-49 years accessed MMC in Phase 2 compared to Phase 1 (59.4% vs. 54.9%; Prevalence Ratio = 1.08; 95% Confidence Interval: 1.01-1.15; $p = 0.019$). Participants with multiple partners in the past 12 months in Phase 2 were more likely to access MMC services compared to participants in Phase 1 (unadjusted Odds Ratio, 1.37; 95% CI:1.17-1.61; $p < 0.001$). After adjusting for age, multiple partners remained a risk factor in Phase 2 (adjusted OR, 1.39; 95% CI: 1.18-1.63; $p < 0.001$).

CONCLUSIONS: The "Exclusive Intervention Strategy" was associated with a slight increase in the proportion of participants aged 25-49 years accessing MMC services, and an increase in those with HIV risk behaviors, during the intervention phase. These findings may provide important insights to overcoming barriers for accessing MMC services among men aged 25-49 years.

TRIAL REGISTRATION: The study is registered at ClinicalTrials.gov , number NCT02352961 .

13. Liu, A. Y., et al. **High background in ELISpot assays is associated with elevated levels of immune activation in HIV-1-seronegative individuals in Nairobi.** *Immun Inflamm Dis* 2018;6(3): 392-401.

Online at: <https://onlinelibrary.wiley.com/doi/full/10.1002/iid3.231>

INTRODUCTION: Spontaneous interferon-gamma (IFN γ) released detected by enzyme-linked immunospot (ELISpot) assays may be a biological phenomenon. Markers of immune activation levels were assessed as correlates of high background among individuals in Kenya.

METHODS: Couples concordantly seronegative for HIV-1 were enrolled. IFN-gamma ELISpot assays were conducted and negative control wells were categorized as having either high or low background (≥ 50 and < 50 SFU/10⁶ peripheral blood mononuclear cells [PBMC], respectively). PBMC were stained for CD4, CD8, and immune activation markers (CD38 and HLA-DR) and analyzed using flow cytometry. Proportions of activated T-cells were compared between those with low and high background by Mann-Whitney U test. Correlates of background SFU and immune activation were assessed using regression models.

RESULTS: Among 58 individuals, 14 (24%) had high background. Frequencies of CD4(+) CD38(+) HLA-DR(+) and CD8(+) CD38(+) HLA-DR(+) cells were higher in individuals with high background compared to those with low background ($P = 0.02$). Higher background SFU was associated with history of sexually transmitted infections ($P = 0.03$), and illness in the past 3 months ($P = 0.005$), in addition to increased levels of activated CD4(+) and CD8(+) cells (P range = 0.008-0.03). Female gender and male circumcision decreased levels of CD4(+) and CD8(+) immune activation (P range = 0.002-0.03). Additionally, higher background SFU and activated CD4(+) and CD8(+) cells were individually associated with positive ELISpot responses to HIV-1 peptide pools (P range = 0.01-0.03).

CONCLUSIONS: These findings suggest that increased basal immune responses may be a biological mechanism contributing to higher background ELISpot SFU. Systematic exclusion of data from individuals with increased background in IFN-gamma release assays may bias results in population-based studies.

14. Carrasco, M. A., et al. **Systematic review of the effect of economic compensation and incentives on uptake of voluntary medical male circumcision among men in sub-Saharan Africa.** *AIDS Care* 2018;30(9): 1071-1082.

Online at:

<https://www.tandfonline.com/doi/full/10.1080/09540121.2018.1453921?scroll=top&needAccess=true>

Voluntary medical male circumcision (VMMC) prevalence in priority countries in sub-Saharan Africa, particularly among men aged ≥ 20 years, has not yet reached the goal of 80% coverage recommended by the World Health Organization. Determining novel strategies to increase VMMC uptake among men ≥ 20 years is critical to reach HIV epidemic control. We conducted a systematic review to analyze the effectiveness of economic compensation and incentives to increase VMMC uptake among older men in order to inform VMMC demand creation programs. The review included five qualitative, quantitative, and mixed methods studies published in peer reviewed journals. Data was

extracted into a study summary table, and tables synthesizing study characteristics and results. Results indicate that cash reimbursements for transportation and food vouchers of small nominal amounts to partially compensate for wage loss were effective, while enrollment into lotteries offering prizes were not. Economic compensation provided a final push toward VMMC uptake for men who had already been considering undergoing circumcision. This was in settings with high circumcision prevalence brought by various VMMC demand creation strategies. Lottery prizes offered in the studies did not appear to help overcome barriers to access VMMC and qualitative evidence suggests this may partially explain why they were not effective. Economic compensation may help to increase VMMC uptake in priority countries with high circumcision prevalence when it addresses barriers to uptake. Ethical considerations, sustainability, and possible externalities should be carefully analyzed in countries considering economic compensation as an additional strategy to increase VMMC uptake.

15. Torres-Rueda, S., et al. **Cost and cost-effectiveness of a demand creation intervention to increase uptake of voluntary medical male circumcision in Tanzania: spending more to spend less.** *J Acquir Immune Defic Syndr* 2018;78(3): 291-299.

Online at:

https://journals.lww.com/jaids/fulltext/2018/07010/Cost_and_Cost_Effectiveness_of_a_Demand_Creation.5.aspx

BACKGROUND: Although voluntary medical male circumcision (VMMC) reduces the risk of HIV acquisition, demand for services is lower among men in most at-risk age groups (ages 20-34 years). A randomized controlled trial was conducted to assess the effectiveness of locally-tailored demand creation activities (including mass media, community mobilization, and targeted service delivery) in increasing uptake of campaign-delivered VMMC among men aged 20-34 years. We conducted an economic evaluation to understand the intervention's cost and cost-effectiveness.

SETTING: Tanzania (Njombe and Tabora regions).

METHODS: Cost data were collected on surgery, demand creation activities, and monitoring and supervision related to VMMC implementation across clusters in both trial arms, as well as start-up activities for the intervention arms. The Decision Makers' Program Planning Tool was used to estimate the number of HIV infections averted and related cost savings, given the total VMMCs per cluster. Disability-adjusted life years were calculated and used to estimate incremental cost-effectiveness ratios.

RESULTS: Client load was higher in the intervention arms than in the control arms: 4394 vs. 2901 in Tabora and 1797 vs. 1025 in Njombe, respectively. Despite additional costs of tailored demand creation, demand increased more than proportionally: mean costs per VMMC in the intervention arms were \$62 in Tabora and \$130 in Njombe, and in the control arms \$70 and \$191, respectively. More infections were averted in the intervention arm than in the control arm in Tabora (123 vs. 67, respectively) and in

Njombe (164 vs. 102, respectively). The intervention dominated the control because it was both less costly and more effective. Cost savings were observed in both regions stemming from the antiretroviral treatment costs averted as a result of the VMMC performed.

CONCLUSIONS: Spending more to address local preferences as a way to increase uptake of VMMC can be cost-saving.

16. Hancuch, K., et al. **Safer conception among HIV-1 serodiscordant couples in East Africa: understanding knowledge, attitudes, and experiences.** *AIDS Care* 2018;30(8): 973-981.

For HIV-1 serodiscordant couples, HIV-1 exposure and risk of transmission is heightened during pregnancy attempts, but safer conception strategies can reduce risk. As safer conception programs are scaled up, understanding couples' preferences and experiences can be useful for programmatic recommendations. We followed 1013 high-risk, heterosexual HIV-1 serodiscordant couples from Kenya and Uganda for two years in an open-label delivery study of integrated pre-exposure prophylaxis (PrEP) and antiretroviral therapy (ART), the Partners Demonstration Project. We used descriptive statistics to describe the cohort and multivariate logistic regression to characterize women who reported use of a safer conception strategy by their first annual visit. 66% (569/859) of women in the study were HIV-infected and 73% (627/859) desired children in the future. At the first annual visit, 59% of women recognized PrEP, 58% ART, 50% timed condomless sex, 23% self-insemination, and fewer than 10% recognized male circumcision, STI treatment, artificial insemination, and sperm washing as safer conception strategies. Among those recognizing these strategies and desiring pregnancy, 37% reported using PrEP, 14% ART, and 30% timed condomless sex. Women who reported discussing their fertility desires with their male partners were more likely to report having used at least one strategy for safer conception (adjusted odds ratio = 1.91, 95% confidence interval:1.26-2.89). Recognition of use of safer conception strategies among women who expressed fertility desires was low, with ARV-based strategies and self-insemination the more commonly recognized and used strategies. Programs supporting HIV-1 serodiscordant couples can provide opportunities for couples to talk about their fertility desires and foster communication around safer conception practices.

17. Kankaka, E. N., et al. **Sexual risk behaviors following circumcision among HIV-positive men in Rakai, Uganda.** *AIDS Care* 2018;30(8): 990-996.

OBJECTIVE: To determine whether circumcision of HIV-positive men is associated with increased subsequent sexual risk behaviors which may place their female partners at risk.

METHODS: Newly circumcised and uncircumcised HIV-positive men in the Rakai Community Cohort Study were followed from baseline (July 2013-January 2015) to determine trend in sexual risk behaviors and association of circumcision with subsequent sexual risk behaviors at follow up (February 2015-September 2016). Risk behaviors included sexual activity, alcohol before sex, transactional sex, multiple sex partners, casual sex partners, and inconsistent condom use with casual partners. The association was evaluated using modified Poisson regression, and sensitivity analyses were performed after multiple imputation with chained equations for missing data.

RESULTS: We identified 538 eligible men, of whom 113(21.0%) were circumcised at baseline and 425(79.0%) were uncircumcised. Men in fishing communities were more likely to be circumcised ($p = 0.032$) as well as those exposed to targeted HIV messaging ($p < 0.001$). Overall, 188(34.9%) men were lost to follow up and most were uncircumcised ($p = 0.020$). Among those followed up, behaviors remained largely unchanged with no differences by circumcision status. Transactional sex appeared to be associated with circumcision in unadjusted analyses (PR = 1.58, 95%CI = 1.01,2.48; $p = 0.045$, $p = 0.05$) and adjusted analyses (adj.PR = 1.54, 95%CI = 1.06,2.23; $p = 0.022$). However, the association was no longer significant in sensitivity analyses after accounting for loss to follow up (adj.PR = 1.43, 95%CI = 0.98,2.08; $p = 0.066$). No association with circumcision was observed for other sexual risk behaviors.

CONCLUSION: We found no association between circumcision of HIV-positive men and subsequent sexual risk behavior.

18. Pan, S. W., et al. **Ethnicity and HIV vulnerabilities among men who have sex with men in China.** *AIDS Care* 2018;30(8): 1025-1030.

Ethnic affiliation can define sociocultural boundaries and contribute to the HIV vulnerabilities faced by men who have sex with men (MSM). This study investigated the influence of ethnic affiliation on HIV vulnerabilities among MSM in North China. Our study analyzed a cross-sectional survey of MSM ($n = 398$) in two major North China cities. We examined associations between ethnic affiliation and (a) HIV status, (b) sexual behaviors and experiences, and (c) substance use. Compared to ethnic majority Han MSM: MSM belonging to ethnic minority groups of South China had significantly greater odds of HIV infection (AOR: 7.40; 95% CI: 2.33-23.47) and experience of forced sex (AOR: 3.27; 95% CI: 1.12-9.52). Compared to ethnic majority Han MSM, Ethnic Hui MSM had significantly lower odds of condomless anal sex (AOR: 0.41; 95% CI: 0.21-0.82) and significantly greater odds of circumcision (AOR: 2.62; 95% CI: 1.24-5.51). HIV prevalence and riskier sexual behaviors among MSM in China appear to vary significantly by ethnic affiliation. Current epidemiological practices of aggregating all ethnic minority groups in China into a single category may be masking important interethnic differences in HIV risk, and precluding opportunities for more culturally appropriate interventions.

19. Cummings, B., et al. **Bisexual and bidirectional: assessing the potential for HIV bridging in Mozambique.** *AIDS Behav* 2018;22(7): 2189-2198.

African men who have sex with men (MSM) frequently, and often concurrently, have female partners, raising concerns about HIV sexual bridging. We explored potential HIV transmission in Mozambique from and to female partners of MSM focusing on preferred anal sex role and circumcision status. Data collected in a respondent-driven sampling study of MSM in 2011 in Maputo and Beira. Men who had oral or anal sex with other men 12 months prior completed a questionnaire and consented for HIV testing. Statistical analysis explored demographic/risk characteristics and associations among circumcision status, anal sex with men, sexual positions during anal sex with men and vaginal or anal sex with women. We identified 326 MSM in Maputo and 237 in Beira with both male and female partners 3 months before the study. Of these, 20.8% in Maputo and 36.0% in Beira had any receptive anal sex with men 12 months prior, including 895 unprotected sexual acts with males in Maputo and 692 in Beira. Uncircumcised and exclusively insertive males, 27.7% of the sample in Maputo and 33.6% in Beira, had the most unprotected sex with females: 1159 total acts in Maputo and 600 in Beira. Sexual bridging between MSM and women likely varies geographically and is probably bi-directional, occurring within a generalized epidemic where HIV prevalence is higher among reproductive-age women than MSM. Prevention strategies emphasizing correct and consistent condom use for all partners and circumcision for bisexual men should be considered.