

Quarterly Research Digest on Voluntary Medical Male Circumcision for HIV Prevention

1. Lebina, L., et al. **PrePex circumcision surveillance: Adverse events and analgesia for device removal.** *PLoS One* 2018;13(3): e0194271.
Online at: <http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0194271>

BACKGROUND: The PrePex medical male circumcision (MMC) device is relatively easy to place and remove with some training. PrePex has been evaluated in several countries to assess feasibility and acceptability. However, several studies have reported pain associated with removal.

OBJECTIVE: To assess safety of PrePex and whether analgesia administered prior to removal reduces pain experienced by participants.

METHODS: A multi-site non-randomized, prospective cohort study in which adult (18-45 years old) males requesting PrePex device male circumcision, were enrolled in six South African clinics from July 2014 to March 2015. Participants were routinely provided with analgesia shortly after the surveillance commenced following a protocol review. Analgesia regimen for device removal depended on medication availability at clinics.

RESULTS: Of 1023 enrolled participants who had PrePex placed, 98% (1004) had the device removed at a study clinic. Their median age was 25 (IQR: 21-30) years. HIV seropositivity was 3.6% (37/1023). Nurses placed and removed half of all devices. Adverse events were experienced by 2.4% (25/1023) of participants; 15 required surgical intervention: device displacement (5/14), early removals (3/14), self-removals (5/14) and insufficient skin removed (2/14). Majority (792: 79%) of participants received analgesia. Most received either paracetamol-codeine (33%), lidocaine (29%) or EMLA and Oral Combination (28%). A lower proportion of participants who received any analgesia (except for lidocaine) prior to PrePex removal experienced severe pain compared to those who received no analgesia (16.6% vs. 29%: $p = 0.0001$).

CONCLUSION: Reported adverse events during this PrePex active surveillance were similar to previous reports and to those of surgical circumcision. Pain medication provided prior to removal is effective at decreasing severe pain during PrePex device removal.

2. 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 Mar 22: 1-12. [Epub ahead of print]

Online at:

<https://www.tandfonline.com/doi/abs/10.1080/09540121.2018.1453921?journalCode=caic20>

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.

3. Hinkle, L. E., et al. **Bleeding and blood disorders in clients of voluntary medical male circumcision for HIV prevention - Eastern and Southern Africa, 2015-2016.** *MMWR Morb Mortal Wkly Rep* 2018;67(11): 337-339.

Online at:

https://www.cdc.gov/mmwr/volumes/67/wr/mm6711a6.htm?s_cid=mm6711a6_w

Male circumcision reduces the risk for female-to-male human immunodeficiency virus (HIV) transmission by approximately 60% (1) and has become a key component of global HIV prevention programs in countries in Eastern and Southern Africa where HIV prevalence is high and circumcision coverage is low. Through September 2017, the President's Emergency Plan for AIDS Relief (PEPFAR) had supported 15.2 million voluntary medical male circumcisions (VMMCs) in 14 priority countries in Eastern and Southern Africa (2). Like any surgical intervention, VMMC carries a risk for complications or adverse events. Adverse events during circumcision of males aged ≥ 10 years occur in 0.5% to 8% of procedures, though the majority of adverse events are mild (3,4). To monitor safety and service quality, PEPFAR tracks and reports qualifying notifiable adverse events. Data reported from eight country VMMC programs during 2015-2016 revealed that bleeding resulting in hospitalization for ≥ 3 days was the most commonly

reported qualifying adverse event. In several cases, the bleeding adverse event revealed a previously undiagnosed or undisclosed bleeding disorder. Bleeding adverse events in men with potential bleeding disorders are serious and can be fatal. Strategies to improve precircumcision screening and performance of circumcisions on clients at risk in settings where blood products are available are recommended to reduce the occurrence of these adverse events or mitigate their effects (5).

4. 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 Mar 29. [Epub ahead of print]
Online at:
https://journals.lww.com/jaids/Abstract/publishahead/Cost_and_Cost_Effectiveness_of_a_Demand_Creation.96711.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 randomised controlled trial was conducted to assess the effectiveness of locally-tailored demand creation activities (including mass media, community mobilisation 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 arm. The Decision Makers' Program Planning Tool was used to estimate the number of HIV infections averted and related cost savings given 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 v. 2901, respectively, in Tabora and 1797 v. 1025 in Njombe. 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 v. 67, respectively) and in Njombe (164 v. 102, respectively). The intervention dominated the control as 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 VMMCs performed.

CONCLUSION: Spending more to address local preferences as a way to increase uptake of VMMC can be cost-saving. This is an open access article distributed under the terms

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5. Marukutira, T., et al. **A tale of two countries: progress towards UNAIDS 90-90-90 targets in Botswana and Australia.** *J Int AIDS Soc* 2018;21(3).
Online at: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5838412/>

UNAIDS 90-90-90 targets and Fast-Track commitments are presented as precursors to ending the AIDS epidemic by 2030, through effecting a 90% reduction in new HIV infections and AIDS-related deaths from 2010 levels (HIV epidemic control). Botswana, a low to middle-income country with the third-highest HIV prevalence, and Australia, a low-prevalence high-income country with an epidemic concentrated among men who have sex with men (MSM), have made significant strides towards achieving the UNAIDS 90-90-90 targets. These two countries provide lessons for different epidemic settings. This paper discusses the lessons that can be drawn from Botswana and Australia with respect to their success in HIV testing, treatment, viral suppression and other HIV prevention strategies for HIV epidemic control. Botswana and Australia are on target to achieving the 90-90-90 targets for HIV epidemic control, made possible by comprehensive HIV testing and treatment programmes in the two countries. As of 2015, 70% of all people assumed to be living with HIV had viral suppression in Botswana and Australia. However, HIV incidence remains above one per cent in the general population in Botswana and in MSM in Australia. The two countries have demonstrated that rapid HIV testing that is accessible and targeted at key and vulnerable populations is required in order to continue identifying new HIV infections. All citizens living with HIV in both countries are eligible for antiretroviral therapy (ART) and viral load monitoring through government-funded programmes. Notwithstanding their success in reducing HIV transmission to date, programmes in both countries must continue to be supported at current levels to maintain epidemic suppression. Scaled HIV testing, linkage to care, universal ART, monitoring patients on treatment over and above strengthened HIV prevention strategies (e.g. male circumcision and pre-exposure prophylaxis) will all continue to require funding. The progress that Botswana and Australia have made towards meeting the 90-90-90 targets is commendable. However, in order to reduce HIV incidence significantly towards 2030, there is a need for sustained HIV testing, linkage to care and high treatment coverage. Botswana and Australia provide useful lessons for developing countries with generalized epidemics and high-income countries with concentrated epidemics.

6. Hancuch, K., et al. **Safer conception among HIV-1 serodiscordant couples in East Africa: understanding knowledge, attitudes, and experiences.** *AIDS Care* 2018 Feb 17: 1-9.
[Epub ahead of print]
Online at:
<https://www.tandfonline.com/doi/abs/10.1080/09540121.2018.1437251?journalCode=caic20>

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.

7. Bailey, R. C., et al. **Field evaluation of the safety, acceptability, and feasibility of early infant male circumcision using the AccuCirc device.** *PLoS One* 2018;13(2): e0191501. Online at: <http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0191501>

BACKGROUND: As countries scale up adult voluntary medical male circumcision (VMMC) for HIV prevention, they are looking ahead to long term sustainable strategies, including introduction of early infant male circumcision (EIMC). Although a number of devices for EIMC are prequalified by the World Health Organization, evaluation of additional devices can provide policy-makers and clinicians the information required to make informed decisions. We undertook a field evaluation of the safety and acceptability of the AccuCirc device in Kisumu County, Kenya.

METHODS: Procedures were performed by four trained clinicians in two public facilities. Participants were recruited from surrounding public health facilities through informational talks at antenatal clinics, maternity wards, and maternal neonatal child health clinics. Healthy infants ages 0-60 days, with no penile abnormality, without a family history of bleeding disorder, with current weight-for-age within -2 Z-scores of WHO growth standards, and whose mother was at least 16 years of age were eligible for EIMC. The procedure was performed after administration of a penile dorsal nerve block

using 2% lidocaine and administration of Vitamin K. The mother was given post-operative instructions on wound care and asked to remain in the clinic with the baby for an observational period of one hour, during which a face-to-face questionnaire was administered.

RESULTS: Of 1259 babies screened, 704 were enrolled and circumcised. Median age of the infants was 16 days (IQR: 7-32.5) and of the mothers was 26 years (IQR: 22-30). Median time for the procedure was 19 minutes (IQR: 15-23). There were no serious adverse events (AE), and 20 (2.8%) moderate AEs, all of which were due to bleeding that required application of one to three sutures. There were 22 (3.8%) procedures in which the device did not fully incise the entire circumference of the foreskin and had to be completed using sterile scissors. 89.9% of mothers had knowledge of EIMC, but few (8.1%) had any knowledge of devices used for EIMC. Protection against HIV/AIDS was the most cited reason to circumcise a baby (65.3%), while the baby being ill (38.1%) and pain (34.4%) were the most cited barriers to uptake. 99% of mothers were "very satisfied" or "completely satisfied" with the procedure.

CONCLUSIONS: This evaluation of the AccuCirc device is the largest to date and indicates that the device is safe and acceptable, achieving high levels of parental satisfaction. The AccuCirc device should be considered for WHO prequalification to increase options for safe and sustainable provision of EIMC.

8. Kankaka, E. N., et al. **Sexual risk behaviors following circumcision among HIV-positive men in Rakai, Uganda.** *AIDS Care* 2018 Feb 13: 1-7. [Epub ahead of print]

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.

9. Odoyo-June, E., et al. **Agreement between self-reported and physically verified male circumcision status in Nyanza region, Kenya: Evidence from the TASCO study.** *PLoS One* 2018;13(2): e0192823.

Online at: <http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0192823>

BACKGROUND: Self-reported male circumcision (MC) status is widely used to estimate community prevalence of circumcision, although its accuracy varies in different settings depending on the extent of misreporting. Despite this challenge, self-reported MC status remains essential because it is the most feasible method of collecting MC status data in community surveys. Therefore, its accuracy is an important determinant of the reliability of MC prevalence estimates based on such surveys. We measured the concurrence between self-reported and physically verified MC status among men aged 25-39 years during a baseline household survey for a study to test strategies for enhancing MC uptake by older men in Nyanza region of Kenya. The objective was to determine the accuracy of self-reported MC status in communities where MC for HIV prevention is being rolled out.

METHODS: Agreement between self-reported and physically verified MC status was measured among 4,232 men. A structured questionnaire was used to collect data on MC status followed by physical examination to verify the actual MC status whose outcome was recorded as fully circumcised (no foreskin), partially circumcised (foreskin is past corona sulcus but covers less than half of the glans) or uncircumcised (foreskin covers half or more of the glans). The sensitivity and specificity of self-reported MC status were calculated using physically verified MC status as the gold standard.

RESULTS: Out of 4,232 men, 2,197 (51.9%) reported being circumcised, of whom 99.0% were confirmed to be fully circumcised on physical examination. Among 2,035 men who reported being uncircumcised, 93.7% (1,907/2,035) were confirmed uncircumcised on physical examination. Agreement between self-reported and physically verified MC status was almost perfect, kappa (k) = 98.6% (95% CI, 98.1%-99.1%). The sensitivity of self-reporting being circumcised was 99.6% (95% CI, 99.2-99.8) while specificity of self-reporting uncircumcised was 99.0% (95% CI, 98.4-99.4) and did not differ significantly by age group based on chi-square test. Rate of consenting to physical verification of MC status differed by client characteristics; unemployed men were more likely to consent to physical verification (odds ratio [OR] = 1.48, (95% CI, 1.30-1.69) compared to employed

men and those with post-secondary education were less likely to consent to physical verification than those with primary education or less (odds ratio [OR] = 0.61, (95% CI, 0.51-0.74).

CONCLUSIONS: In this Kenyan context, both sensitivity and specificity of self-reported MC status was high; therefore, MC prevalence estimates based on self-reported MC status should be deemed accurate and applicable for planning. However, MC programs should assess accuracy of self-reported MC status periodically for any secular changes that may undermine its usefulness for estimating community MC prevalence in their unique settings.

10. Pan, S. W., et al. **Ethnicity and HIV vulnerabilities among men who have sex with men in China.** *AIDS Care* 2018 Jan 30: 1-6. [Epub ahead of print]

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.

11. Kalichman, S., et al. **Male circumcision for HIV prevention: Awareness, risk compensation, and risk perceptions among South African women.** *Glob Public Health* 2018 Jan 25: 1-9. [Epub ahead of print]

Medical male circumcision (MMC) is a proven method of HIV risk reduction for men in southern Africa. MMC promotion campaigns and scale-up programmes are widely implemented throughout the Republic of South Africa. However, the impact of promoting MMC on women's awareness, beliefs, and behaviours has been understudied. We conducted a self-administered anonymous survey of 279 women receiving health services in an impoverished township located in Cape Town, South Africa. Results showed that two in three women were unaware that male circumcision partially protects men from contracting HIV. Women who were aware of MMC for HIV prevention also endorsed beliefs that male circumcision reduces the need for men to worry about HIV and reduces the need for men to use condoms. Male circumcision

awareness was also related to reduced perceptions of HIV risk among women. Multivariable models showed that women's MMC awareness, circumcision risk compensation beliefs, and risk perceptions were associated with decreased condom use and higher HIV risk index scores defined as number of condomless vaginal intercourse X number of sex partners. These results suggest a need for MMC education efforts tailored for women living in communities with high-HIV prevalence where men are targeted for MMC.

12. Stuart, R. M., et al. **The City of Johannesburg can end AIDS by 2030: modelling the impact of achieving the Fast-Track targets and what it will take to get there.** *J Int AIDS Soc* 2018;21(1).
Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29359533>

INTRODUCTION: In 2014, city leaders from around the world endorsed the Paris Declaration on Fast-Track Cities, pledging to achieve the 2020 and 2030 HIV targets championed by UNAIDS. The City of Johannesburg - one of South Africa's metropolitan municipalities and also a health district - has over 600,000 people living with HIV (PLHIV), more than any other city worldwide. We estimate what it would take in terms of programmatic targets and costs for the City of Johannesburg to meet the Fast-Track targets, and demonstrate the impact that this would have.

METHODS: We applied the Optima HIV epidemic and resource allocation model to demographic, epidemiological and behavioural data on 26 sub-populations in Johannesburg. We used data on programme costs and coverage to produce baseline projections. We calculated how many people must be diagnosed, put onto treatment and maintained with viral suppression to achieve the 2020 and 2030 targets. We also estimated how treatment needs - and therefore fiscal commitments - could be reduced if the treatment targets are combined with primary HIV prevention interventions (voluntary medical male circumcision (VMMC), an expanded condom programme, and comprehensive packages for female sex workers (FSW) and young females).

RESULTS: If current programmatic coverage were maintained, Johannesburg could expect 303,000 new infections and 96,000 AIDS-related deaths between 2017 and 2030 and 769,000 PLHIV by 2030. Achieving the Fast-Track targets would require an additional 135,000 diagnoses and 232,000 people on treatment by 2020 (an increase in around 80% over 2016 treatment numbers), but would avert 176,000 infections and 56,500 deaths by 2030. Assuming stable ART unit costs, this would require ZAR 29 billion (USD 2.15 billion) in cumulative treatment investments over the 14 years to 2030. Plausible scale-ups of other proven interventions (VMMC, condom distribution and FSW strategies) could yield additional reductions in new infections (between 4 and 15%), and in overall treatment investment needs. Scaling up VMMC in line with national targets is found to be cost-effective in the medium term.

CONCLUSIONS: The scale-up in testing and treatment programmes over this decade has been rapid, but these efforts must be doubled to reach 2020 targets. Strategic investments in proven interventions will help Johannesburg achieve the treatment targets and be on track to end AIDS by 2030.

13. Ngcobo, S., et al. **The quality of voluntary medical male circumcision done by mid-level workers in Tshwane District, South Africa: A retrospective analysis.** *PLoS One* 2018;13(1): e0190795.
Online at: <http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0190795>

BACKGROUND: Voluntary medical male circumcision (VMMC) reduces the acquisition of human immunodeficiency virus (HIV) in heterosexual men by up to 60%. One HIV infection is averted for every 5 to 15 VMMCs. To conduct VMMCs in large populations, large numbers of trained healthcare professionals are needed. Countries in Sub-Saharan Africa have a high burden of HIV and a shortage of healthcare professionals, creating a healthcare conundrum. To bridge this gap, South Africa launched a new cadre of mid-level medical worker called Clinical Associates (CA). We assessed the ability of CAs to perform circumcisions of adequate quality and their subsequent usefulness to meet the demands of VMMCs in a population with a high HIV burden.

METHODS: We conducted a retrospective analysis, reviewing patient files (n = 4850) of surgical VMMCs conducted over a 16-month period. Patient files were sourced from clinics and hospitals that provided free VMMCs in Tshwane district in South Africa.

FINDINGS: Clinical associates performed 88.66% of the circumcisions and doctors performed the remaining 11.34% (p < 0.001). The number of adverse events did not differ between the two groups. Data on intra-operative adverse events were available for 4 738 patients. Of these, 341 (7.2%) experienced intra-operative adverse events. For the whole sample, 44 (8.1%, n = 543) adverse events occurred during circumcisions done by doctors and 297 (7.1%, n = 4195) occurred during circumcisions done by CAs (p = 0.385). Clinical associates performed circumcisions in shorter times (duration: 14.63 minutes) compared to doctors (duration: 15.25 minutes, t = -7.46; p < 0.001). Recorded pain, bleeding, swelling, infection and wound destruction did not differ between clients circumcised by CAs and doctors. This study is limited by the use of data from a single district.

CONCLUSIONS: Clinical associates contribute to the demands for high numbers of VMMCs in Tshwane district, South Africa. Clinical associates perform VMMCs at a clinical standard that is comparable to circumcisions performed by doctors.

15. Feldacker, C., et al. **Implementing voluntary medical male circumcision using an innovative, integrated, health systems approach: experiences from 21 districts in Zimbabwe.** *Glob Health Action* 2018;11(1): 1414997.
Online at: <https://www.tandfonline.com/doi/full/10.1080/16549716.2017.1414997>

BACKGROUND: Despite increased support for voluntary medical male circumcision (VMMC) to reduce HIV incidence, current VMMC progress falls short. Slow progress in VMMC expansion may be partially attributed to emphasis on vertical (stand-alone) over more integrated implementation models that are more responsive to local needs. In 2013, the ZAZIC consortium began implementation of a 5-year, integrated VMMC program jointly with Ministry of Health and Child Care (MoHCC) in Zimbabwe.

OBJECTIVE: To explore ZAZIC's approach emphasizing existing healthcare workers and infrastructure, increasing program sustainability and resilience.

METHODS: A process evaluation utilizing routine quantitative data. Interviews with key MoHCC informants illuminate program strengths and weaknesses.

METHODS: A process evaluation utilizing routine quantitative data. Interviews with key MoHCC informants illuminate program strengths and weaknesses.

RESULTS: In start-up and year 1 (March 2013-September, 2014), ZAZIC expanded from two to 36 static VMMC sites and conducted 46,011 VMMCs; 39,840 completed from October 2013 to September 2014. From October 2014 to September 2015, 44,868 VMMCs demonstrated 13% increased productivity. In October, 2015, ZAZIC was required by its donor to consolidate service provision from 21 to 10 districts over a 3-month period. Despite this shock, 57,282 VMMCs were completed from October 2015 to September 2016 followed by 44,414 VMMCs in only 6 months, from October 2016 to March 2017. Overall, ZAZIC performed 192,575 VMMCs from March 2013 to March, 2017. The vast majority of VMMCs were completed safely by MoHCC staff with a reported moderate and severe adverse event rate of 0.3%.

CONCLUSION: The safety, flexibility, and pace of scale-up associated with the integrated VMMC model appears similar to vertical delivery with potential benefits of capacity building, sustainability and health system strengthening. These models also appear more adaptable to local contexts. Although more complicated than traditional approaches to program implementation, attention should be given to this country-led approach for its potential to spur positive health system changes, including building local ownership, capacity, and infrastructure for future public health programming.

16. Sharma, S. C., et al. **Male circumcision for the prevention of human immunodeficiency virus (HIV) acquisition: a meta-analysis.** *BJU Int* 2018;121(4): 515-526.

We aimed to assess male circumcision for the prevention of human immunodeficiency virus (HIV) acquisition in heterosexual and homosexual men using all available data. A systematic literature review was conducted searching for studies that assessed male circumcision as a method to prevent HIV acquisition in homosexual and/or heterosexual men. PubMed, Embase, Cochrane Central Register of Controlled Trials (CENTRAL) and

ClinicalTrials.gov were searched in March 2017. A random effects model was used to calculate a pooled risk ratio (RR) and its associated 95% confidence interval (CI). In total, 49 studies were included in this meta-analysis. The overall pooled RR for both homosexual and heterosexual men was 0.58 (95% CI 0.48-0.70), suggesting that circumcision was associated with a reduction in HIV risk. Circumcision was found to be protective for both homosexual and heterosexual men (RR: 0.80, 95% CI 0.69-0.92 and 0.28, 95% CI 0.14-0.59, respectively). Heterosexual men had a greater RR reduction (72% compared with 20% for homosexual men). There was significant heterogeneity among the studies ($\chi^2 = 1378.34$, $df = 48$; $I^2 = 97\%$). This meta-analysis shows that male circumcision was effective in reducing HIV risk for both heterosexual and homosexual men.

17. Cho, H., et al. **School support as structural HIV prevention for adolescent orphans in Western Kenya.** *J Adolesc Health* 2018;62(1): 44-51.

Online at: [http://www.jahonline.org/article/S1054-139X\(17\)30398-1/fulltext](http://www.jahonline.org/article/S1054-139X(17)30398-1/fulltext)

PURPOSE: Using a clustered randomized controlled trial design, we evaluated whether support to keep Kenyan orphaned adolescents in school reduces the risk of HIV infection.

METHODS: Participants included 835 orphaned boys and girls in grades 7 and 8 (mean age at the baseline = 15 years) in western Kenya. Primary schools (N = 26) were randomized to the study condition. Intervention participants received school uniforms, payment of tuition when they transitioned into high school, and nurse visits to monitor school absenteeism and provide assistance to stay in school. Annual surveys were conducted from 2011 through 2014, and HIV and herpes simplex virus 2 (HSV-2) biomarker data were collected at the baseline and the end line. Data were analyzed using survey logistic regression or generalized estimating equations controlling for age, gender, and socioeconomic status.

RESULTS: Intervention and control groups were equivalent at the baseline and did not differ on new HIV or HSV-2 incidence at the end line. The school support intervention increased school retention but had few HIV-related effects, except increased circumcision among male participants and reduced likelihood of transactional sex.

CONCLUSIONS: Despite a strong study design, we found no relative reduction in HIV or HSV-2 infection after 3 years of intervention implementation. New incidence of HIV was lower than expected in this region among youth whose average age at end line was 18 years (range = 14-23). Although support for secondary school promises many benefits for vulnerable youth, our study adds to the growing body of research showing weak evidence for its effectiveness as an HIV prevention.

18. Govender, K., et al. **Risk compensation following medical male circumcision: results from a 1-year prospective cohort study of young school-going men in KwaZulu-Natal, South Africa.** *Int J Behav Med* 2018;25(1): 123-130.

PURPOSE: This study sought to assess risk compensation following voluntary medical male circumcision of young school-going men. Risk compensation is defined as an inadvertent increase in sexual risk behaviors and a corresponding decrease in self-perceived risk for contracting HIV following the application of a risk reduction technology.

METHODS: This study documented the sexual practices of circumcised (n = 485) and uncircumcised (n = 496) young men in 42 secondary schools at three time points (baseline and 6 and 12 months) in a sub-district of KwaZulu-Natal, South Africa. Study participants were aged from 16 to 24 years old.

RESULTS: At the end of the study period, there was no significant difference between the two cohorts concerning learners' perceptions of being at risk of contracting HIV (interaction effect: $b = -0.12$, $p = 0.40$). There was also no significant difference in the number of sexual partners in the previous month (interaction effect: $b = -0.23$, $p = 0.15$). The proportion of learners who have never used a condom decreased significantly over time (time effect: $b = -0.27$, $p = 0.01$), and there was no difference between the circumcised and uncircumcised learners (interaction effect: $b = -0.09$, $p = 0.91$).

CONCLUSIONS: Risk compensation, as evidenced in this study over a 1-year period, was not associated with undergoing voluntary medical male circumcision (VMMC) in our sample of young school-going men. However, it is of concern that at the end of this study, less than half of the sexually active sample in a high-HIV-prevalence community used condoms consistently in the previous month (39% for both study cohorts). The latter underscores the need to view VMMC as a potential entry point for planned HIV and sexuality education interventions targeting young men in this community.

19. Mangombe, K., et al. **Predictors of male circumcision among men aged 15-35 years in Harare, Zimbabwe.** *J Biosoc Sci* 2018;50(2): 193-211.

Medical male circumcision has been recommended by the World Health Organization as part of a comprehensive approach to HIV prevention. Zimbabwe is one of the fourteen sub-Saharan countries that embarked on the Medical Male Circumcision (MMC) programme. However, the country has not yet met male circumcision targets. This paper examines the predictors of male circumcision in Zimbabwe. A cross-sectional survey was conducted on 784 men aged 15-35 years in Harare, Zimbabwe. Negative log-log logistic regression analysis was used to determine the predictors of male circumcision. The main predictors of circumcision were age, employment status, ever tested for HIV, approval of HIV testing prior to circumcision, knowledge about male circumcision and attitudes towards male circumcision. By and large, participants had

good knowledge about male circumcision and viewed HIV prevention with a reasonably positive attitude. The identification of these predictors can be used to scale up the demand for male circumcision in Zimbabwe.

20. Ma, Q., et al. **Chinese Shang Ring male circumcision: a review.** *Urol Int* 2018;100(2): 127-133.
Online at: <https://www.karger.com/Article/FullText/464449>

Chinese Shang Ring adult male circumcision (SC) is a safe and effective procedure which is easy to learn and to perform. By a specially designed small device, male circumcision (MC) can be performed in 5 min. Compared with conventional adult MC (CC), SC has shorter operation time, less blood loss, less pain score, higher appearance satisfaction rate, and lower complication rate. SC was first developed in China. As recent studies have demonstrated that MC reduced the risk of acquiring human immunodeficiency virus (HIV) infection via vaginal intercourse in African countries, SC was introduced into Africa to fight HIV. Other sexually transmitted diseases such as human papillomavirus infection may also be prevented by SC. In conclusion, Chinese Shang Ring, a small device, provides an easy, quick, safe, and effective method to perform adult MC.

21. Hudson, F. P., et al. **Prevalence and predictors of uncircumcised, Kenyan men's desire for circumcision for their infant sons.** *AIDS Behav* 2018;22(2): 471-478.

Men are key decision makers for their son's circumcision, so understanding their beliefs is important for the uptake of early infant male circumcision in countries in sub-Saharan Africa that have high HIV prevalence. We analyzed men's preferences for circumcising their sons using data from a population-representative survey of 1501 uncircumcised men aged 25-49 years in western Kenya. Most men (59%) reported they would "definitely" want their son circumcised if a son was born to them within the next year. However, only 25% intended to become circumcised themselves. In multivariable Poisson regression models to estimate prevalence ratios, key predictors of the desire to circumcise their sons included knowledge that circumcision reduces HIV acquisition, having a supportive partner, discussing circumcision with the partner, altruism, and intention to be circumcised himself. Focusing on partner dynamics may have the greatest capacity to increase demand since 55% had not talked to their partner about circumcision.

22. Kasprzyk, D., et al. **Identification of key beliefs explaining male circumcision motivation among adolescent boys in Zimbabwe: targets for behavior change communication.** *AIDS Behav* 2018;22(2): 454-470.

Male circumcision (MC) significantly reduces HIV acquisition among men, leading WHO/UNAIDS to recommend high HIV and low MC prevalence countries circumcise 80% of adolescents and men age 15-49. Despite significant investment to increase MC capacity only 27% of the goal has been achieved in Zimbabwe. To increase adoption,

research to create evidence-based messages is greatly needed. The Integrated Behavioral Model (IBM) was used to investigate factors affecting MC motivation among adolescents. Based on qualitative elicitation study results a survey was designed and administered to a representative sample of 802 adolescent boys aged 13-17 in two urban and two rural areas in Zimbabwe. Multiple regression analysis found all six IBM constructs (2 attitude, 2 social influence, 2 personal agency) significantly explained MC intention ($R^2 = 0.55$). Stepwise regression analysis of beliefs underlying each IBM belief-based construct found 9 behavioral, 6 injunctive norm, 2 descriptive norm, 5 efficacy, and 8 control beliefs significantly explained MC intention. A final stepwise regression of all the significant IBM construct beliefs identified 12 key beliefs best explaining intention. Similar analyses were carried out with subgroups of adolescents by urban-rural and age. Different sets of behavioral, normative, efficacy, and control beliefs were significant for each sub-group. This study demonstrates the application of theory-driven research to identify evidence-based targets for the design of effective MC messages for interventions to increase adolescents' motivation. Incorporating these findings into communication campaigns is likely to improve demand for MC.

23. Carrasco, M. A., et al. **Low uptake of voluntary medical male circumcision among high risk men in Malawi.** *AIDS Behav* 2018;22(2): 447-453.

Malawi is one of 14 priority countries for voluntary medical male circumcision (VMMC) initiatives with the lowest VMMC uptake. Using data from a study of 269 men accessing VMMC in southern Malawi and latent class analysis, men were classified based on four risk factors: ever tested for HIV, condom use at last sex, having casual/concurrent sexual partners, and using alcohol before sex. Two distinct classes were identified: 8% of men were classified as high risk, while 92% were classified as low/medium risk. Poisson regression modeling indicated that men who had lower education (risk ratio [RR] 1.07, $p < 0.05$) and were ages 19-26 (RR 1.07, $p < 0.05$) were more likely to be in the high risk group. The low numbers of men in the high risk category seeking services suggests the need to implement targeted strategies to increase VMMC uptake among such high risk men.