

## Quarterly Research Digest on Voluntary Medical Male Circumcision for HIV Prevention

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### Combination HIV prevention

1. Sibanda, E. L., et al. **Comparison of community-led distribution of HIV self-tests kits with distribution by paid distributors: a cluster randomised trial in rural Zimbabwean communities.** *BMJ Glob Health.* 2021;6(Suppl 4):e005000.

Online at: [https://gh.bmj.com/content/6/Suppl\\_4/e005000.long](https://gh.bmj.com/content/6/Suppl_4/e005000.long).

**BACKGROUND:** We compared community-led versus an established community-based HIV self-testing (HIVST) model in rural Zimbabwe using a cluster-randomised trial.

**METHODS:** Forty village groups were randomised 1:1 using restricted randomisation to community-led HIVST, where communities planned and implemented HIVST distribution for 4 weeks, or paid distribution (PD), where distributors were paid US\$50 to distribute kits door-to-door over 4 weeks. Individual level primary outcomes compared household survey responses by arm 4 months post-intervention for: (1) newly diagnosed HIV during/within 4 months following HIVST distribution, (2) linkage to confirmatory testing, pre-exposure prophylaxis or voluntary medical male circumcision during/within 4 months following HIVST distribution. Participants were not masked to allocation; analysis used masked data. Trial analysis used random-effects logistic regression. Distribution costs compared: (1) community-led HIVST, (2) PD HIVST and (3) PD costs when first implemented in 2016/2017.

**RESULTS:** From October 2018 to August 2019, 27 812 and 36 699 HIVST kits were distributed in community-led and PD communities, respectively. We surveyed 11 150 participants and 5683 were in community-led arm. New HIV diagnosis was reported by 211 (3.7%) community-led versus 197 (3.6%) PD arm participants, adjusted OR (aOR) 1.1 (95% CI 0.72 to 1.56); 318 (25.9%) community-led arm participants linked to post-test services versus 361 (23.9%) in PD arm, aOR 1.1 (95% CI 0.75 to 1.49). Cost per HIVST kit distributed was US\$6.29 and US\$10.25 for PD and

community-led HIVST, both lower than 2016/2017 costs for newly implemented PD (US\$14.52). No social harms were reported.

**CONCLUSIONS:** Community-led HIVST can perform as well as paid distribution, with lower costs in the first year. These costs may reduce with programme maturity/learning.

**TRIAL REGISTRATION NUMBER:** PACTR201811849455568.

2. Jewell, B. L., et al. **Predicting HIV incidence in the SEARCH Trial: a mathematical modeling study (abstract).** *J Acquir Immune Defic Syndr.* 2021;87(4):1024-31.

Online at:

[https://journals.lww.com/jaids/Abstract/2021/08010/Predicting\\_HIV\\_Incidence\\_in\\_the\\_SEARCH\\_Trial\\_A.3.aspx](https://journals.lww.com/jaids/Abstract/2021/08010/Predicting_HIV_Incidence_in_the_SEARCH_Trial_A.3.aspx).

**BACKGROUND:** The SEARCH study provided community-based HIV and multidisease testing and antiretroviral therapy (ART) to 32 communities in East Africa and reported no statistically significant difference in 3-year HIV incidence. We used mathematical modeling to estimate the effect of control arm viral suppression and community mixing on SEARCH trial outcomes.

**SETTING:** Uganda and Kenya.

**METHODS:** Using the individual-based HIV modeling software EMOD-HIV, we configured a new model of SEARCH communities. The model was parameterized using demographic, HIV prevalence, male circumcision, and viral suppression data and calibrated to HIV prevalence, ART coverage, and population size. Using assumptions about ART scale-up in the control arm, degree of community mixing, and effect of baseline testing, we estimated comparative HIV incidence under multiple scenarios.

**RESULTS:** Before the trial results, we predicted that SEARCH would report a 4%-40% reduction between arms, depending on control arm ART linkage rates and community mixing. With universal baseline testing followed by rapidly expanded ART eligibility and uptake, modeled effect sizes were smaller than the study was powered to detect. Using interim viral suppression data, we estimated 3-year cumulative incidence would have been reduced by up to 27% in the control arm and 43% in the intervention arm compared with a counterfactual without universal baseline testing.

**CONCLUSIONS:** Our model suggests that the active control arm substantially reduced expected effect size and power of the SEARCH study. However, compared with a counterfactual "true control" without increased ART linkage because of baseline testing, SEARCH reduced HIV incidence by up to 43%.

### Cost and cost-effectiveness

1. Mangenah, C., et al. **Relative efficiency of demand creation strategies to increase voluntary medical male circumcision uptake: a study conducted as part of a randomised controlled trial in Zimbabwe.** *BMJ Glob Health.* 2021;6(Suppl 4):e004983.

Online at: [https://gh.bmj.com/content/6/Suppl\\_4/e004983.long](https://gh.bmj.com/content/6/Suppl_4/e004983.long).

**BACKGROUND:** Supply and demand-side factors continue to undermine voluntary medical male circumcision (VMMC) uptake. We assessed relative economic costs of four VMMC demand creation/service-delivery modalities as part of a randomised controlled trial in Zimbabwe.

**METHODS:** Interpersonal communication agents were trained and incentivised to generate VMMC demand across five districts using four demand creation modalities (standard demand creation (SDC), demand creation plus offer of HIV self-testing (HIVST), human-centred design (HCD)-informed approach, HCD-informed demand creation approach plus offer of HIVST). Annual provider financial expenditure analysis and activity-based-costing including time-and-motion analysis across 15 purposively selected sites accounted for financial expenditures and donated inputs from other programmes and funders. Sites represented three models of VMMC service-delivery: static (fixed) model offering VMMC continuously to walk-in clients at district hospitals and serving as a district hub for integrated mobile and outreach services, (2) integrated (mobile) model where staff move from the district static (fixed) site with their commodities to supplement existing services or to recently capacitated health facilities, intermittently and (3) mobile/outreach model offering VMMC through mobile clinic services in more remote sites.

**RESULTS:** Total programme cost was \$752 585 including VMMC service-delivery costs and average cost per client reached and cost per circumcision were \$58 and \$174, respectively. Highest costs per client reached were in the HCD arm-\$68 and lowest costs in standard demand creation (\$52) and HIVST (\$55) arms, respectively. Highest cost per client circumcised was observed in the arm where HIVST and HCD were combined (\$226) and the lowest in the HCD alone arm (\$160). Across the three VMMC service-delivery models, unit cost was lowest in static (fixed) model (\$54) and highest in integrated mobile model (\$63). Overall, economies of scale were evident with unit costs lower in sites with higher numbers of clients reached and circumcised.

**CONCLUSIONS:** There was high variability in unit costs across arms and sites suggesting opportunities for cost reductions. Highest costs were observed in the HCD+HIVST arm when combined with an integrated service-delivery setting. Mobilisation programmes that intensively target higher conversion rates as exhibited in the SDC and HCD arms provide greater scope for efficiency by spreading costs.

**TRIAL REGISTRATION NUMBER:** PACTR201804003064160.

## Enhancing uptake of VMMC

1. Mavhu, W., et al. **Innovative demand creation strategies to increase voluntary medical male circumcision uptake: a pragmatic randomised controlled trial in Zimbabwe.** *BMJ Glob Health.* 2021;6(Suppl 4):e006141.

Online at: [https://gh.bmj.com/content/6/Suppl\\_4/e006141.long](https://gh.bmj.com/content/6/Suppl_4/e006141.long).

**INTRODUCTION:** Reaching men aged 20-35 years, the group at greatest risk of HIV, with voluntary medical male circumcision (VMMC) remains a challenge. We assessed the impact of two VMMC demand creation approaches targeting this age group in a randomised controlled trial (RCT).

**METHODS:** We conducted a 2x2 factorial RCT comparing arms with and without two interventions: (1) standard demand creation augmented by human-centred design (HCD)-informed approach; (2) standard demand creation plus offer of HIV self-testing (HIVST). Interpersonal communication (IPC) agents were the unit of randomisation. We observed implementation of demand creation over 6 months (1 May to 31 October 2018), with number of men circumcised assessed over 7 months. The primary outcome was the number of men circumcised per IPC agent using the as-treated population of actual number of months each IPC agent worked. We conducted a mixed-methods process evaluation within the RCT.

**RESULTS:** We randomised 140 IPC agents, 35 in each arm. 132/140 (94.3%) attended study training and 105/132 (79.5%) reached at least one client during the trial period and were included in final analysis. There was no evidence that the HCD-informed intervention increased VMMC uptake versus no HCD-informed intervention (incident rate ratio (IRR) 0.87, 95% CI 0.38 to 2.02;  $p=0.75$ ). Nor did offering men a HIVST kit at time of VMMC mobilisation (IRR 0.65, 95% CI 0.28 to 1.50;  $p=0.31$ ). Among IPC agents that reported reaching at least one man with demand creation, both the HCD-informed intervention and HIVST were deemed useful. There were some challenges with trial implementation; <50% of IPC agents converted any men to VMMC, which undermined our ability to show an effect of demand creation and may reflect acceptability and feasibility of the interventions.

**CONCLUSION:** This RCT did not show evidence of an effect of HCD-informed demand intervention or HIVST on VMMC uptake. Findings will inform future design and implementation of demand creation evaluations.

**TRIAL REGISTRATION NUMBER:** PACTR201804003064160.

2. Msungama, W., et al. **Sexually transmitted infections (STI) and antenatal care (ANC) clinics in Malawi: effective platforms for improving engagement of men at high HIV risk with voluntary medical male circumcision services.** *Sex Transm Infect.* 2021;97(5):345-50.

Online at: <https://sti.bmj.com/content/97/5/345.long>.

**INTRODUCTION:** Voluntary medical male circumcision (VMMC), an effective HIV prevention programme for men, is implemented in East and Southern Africa. Approximately 50% of VMMC clients are aged below 15 years. More targeted interventions to reach older men and others at higher short-term HIV risk are needed.

**METHODS:** We implemented a quality improvement project testing the effectiveness of an active referral-based VMMC recruitment approach, targeting men attending STI clinics and those escorting partners to antenatal care (ANC) clinics, at Bwaila Hospital in Lilongwe, Malawi. We compared the proportions aged older than 15 years among men who received VMMC following referral from STI and ANC clinics with those among men referred from standard community mobilisation. We also analysed referral cascades to VMMC.

**RESULTS:** In total, 330 clients were circumcised after referral from STI (242) and ANC (88) clinics, as compared with 3839 other clients attributed to standard community mobilisation. All clients from ANC and STI clinics were aged over 15 years, as compared with 69% from standard community mobilisation. STI clinics had a higher conversion rate from counselling to VMMC

than ANC (12% vs 9%) and a higher contribution to total circumcisions performed at the VMMC clinic (6% vs 2%).

**CONCLUSIONS:** Integrating VMMC recruitment and follow-up in STI and ANC clinics co-located with VMMC services can augment demand creation and targeting of men at risk of HIV, based on age and STI history. This approach can be replicated at least in similar health facilities with ANC and STI services in close proximity to VMMC service delivery.

## Impact and coverage

1. Hines, J. Z., et al. **HIV Incidence by male circumcision status from the population-based HIV impact assessment surveys-eight sub-Saharan African countries, 2015-2017.** *J Acquir Immune Defic Syndr.* 2021;87(Suppl 1):S89-S96.

Online at:

[https://journals.lww.com/jaids/Fulltext/2021/08011/HIV\\_Incidence\\_by\\_Male\\_Circumcision\\_Status\\_From\\_the.11.aspx](https://journals.lww.com/jaids/Fulltext/2021/08011/HIV_Incidence_by_Male_Circumcision_Status_From_the.11.aspx).

**BACKGROUND:** Male circumcision (MC) offers men lifelong partial protection from heterosexually acquired HIV infection. The impact of MC on HIV incidence has not been quantified in nationally representative samples. Data from the population-based HIV impact assessments were used to compare HIV incidence by MC status in countries implementing voluntary medical MC (VMMC) programs.

**METHODS:** Data were pooled from population-based HIV impact assessments conducted in Eswatini, Lesotho, Malawi, Namibia, Tanzania, Uganda, Zambia, and Zimbabwe from 2015 to 2017. Incidence was measured using a recent infection testing algorithm and analyzed by self-reported MC status distinguishing between medical and nonmedical MC. Country, marital status, urban setting, sexual risk behaviors, and mean population HIV viral load among women as an indicator of treatment scale-up were included in a random-effects logistic regression model using pooled survey weights. Analyses were age stratified (15-34 and 35-59 years). Annualized incidence rates and 95% confidence intervals (CIs) and incidence differences were calculated between medically circumcised and uncircumcised men.

**RESULTS:** Men 15-34 years reporting medical MC had lower HIV incidence than uncircumcised men [0.04% (95% CI: 0.00% to 0.10%) versus 0.34% (95% CI: 0.10% to 0.57%), respectively; P value = 0.01]; whereas among men 35-59 years, there was no significant incidence difference [1.36% (95% CI: 0.32% to 2.39%) versus 0.55% (95% CI: 0.14% to 0.67%), respectively; P value = 0.14].

**DISCUSSION:** Medical MC was associated with lower HIV incidence in men aged 15-34 years in nationally representative surveys in Africa. These findings are consistent with the expected ongoing VMMC program impact and highlight the importance of VMMC for the HIV response in Africa.

2. Amusa, L., et al. **Association of medical male circumcision and sexually transmitted infections in a population-based study using targeted maximum likelihood estimation.** *BMC Public Health.* 2021;21(1):1642.

Online at: <https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-021-11705-9>.

**BACKGROUND:** Epidemiological theory and many empirical studies support the hypothesis that there is a protective effect of male circumcision against some sexually transmitted infections (STIs). However, there is a paucity of randomized control trials (RCTs) to test this hypothesis in the South African population. Due to the infeasibility of conducting RCTs, estimating marginal or average treatment effects with observational data increases interest. Using targeted maximum likelihood estimation (TMLE), a doubly robust estimation technique, we aim to provide evidence of an association between medical male circumcision (MMC) and two STI outcomes.

**METHODS:** HIV and HSV-2 status were the two primary outcomes for this study. We investigated the associations between MMC and these STI outcomes, using cross-sectional data from the HIV Incidence Provincial Surveillance System (HIPSS) study in KwaZulu-Natal, South Africa. HIV antibodies were tested from the blood samples collected in the study. For HSV-2, serum samples were tested for HSV-2 antibodies via an ELISA-based anti-HSV-2 IgG. We estimated marginal prevalence ratios (PR) using TMLE and compared estimates with those from propensity score full matching (PSFM) and inverse probability of treatment weighting (IPTW).

**RESULTS:** From a total 2850 male participants included in the analytic sample, the overall weighted prevalence of HIV was 32.4% (n = 941) and HSV-2 was 53.2% (n = 1529). TMLE estimates suggest that MMC was associated with 31% lower HIV prevalence (PR: 0.690; 95% CI: 0.614, 0.777) and 21.1% lower HSV-2 prevalence (PR: 0.789; 95% CI: 0.734, 0.848). The propensity score analyses also provided evidence of association of MMC with lower prevalence of HIV and HSV-2. For PSFM: HIV (PR: 0.689; 95% CI: 0.537, 0.885), and HSV-2 (PR: 0.832; 95% CI: 0.709, 0.975). For IPTW: HIV (PR: 0.708; 95% CI: 0.572, 0.875), and HSV-2 (PR: 0.837; 95% CI: 0.738, 0.949).

**CONCLUSION:** Using a TMLE approach, we present further evidence of a protective association of MMC against HIV and HSV-2 in this hyper-endemic South African setting. TMLE has the potential to enhance the evidence base for recommendations that embrace the effect of public health interventions on health or disease outcomes.

3. Crocetto, F., et al. **Impact of sexual activity on the risk of male genital tumors: a systematic review of the literature.** *Int J Environ Res Public Health.* 2021;18(16):8500.

Online at: <https://www.mdpi.com/1660-4601/18/16/8500>.

Most cancers are related to lifestyle and environmental risk factors, including smoking, alcohol consumption, dietary habits, and environment (occupational exposures). A growing interest in the association between sexual activity (SA) and the development of different types of tumors in both men and women has been recorded in recent years. The aim of the present systematic review is to describe and critically discuss the current evidence regarding the association between SA and male genital cancers (prostatic, penile, and testicular), and to analyze the different theories and biological mechanisms reported in the literature. A comprehensive

bibliographic search in the MEDLINE, Scopus, and Web of Science databases was performed in July 2021. Papers in the English language without chronological restrictions were selected. Retrospective and prospective primary clinical studies, in addition to previous systematic reviews and meta-analyses, were included. A total of 19 studies, including 953,704 patients were selected. Case reports, conference abstracts, and editorial comments were excluded. Men with more than 20 sexual partners in their lifetime, and those reporting more than 21 ejaculations per month, reported a decreased risk of overall and less aggressive prostate cancer (PCa). About 40% of penile cancers (PCs) were HPV-associated, with HPV 16 being the dominant genotype. Data regarding the risk of HPV in circumcised patients are conflicting, although circumcision appears to have a protective role against PC. Viral infections and epididymo-orchitis are among the main sex-related risk factors studied for testicular cancer (TC); however, data in the literature are limited. Testicular trauma can allow the identification of pre-existing TC. SA is closely associated with the development of PC through high-risk HPV transmission; in this context, phimosis appears to be a favoring factor. Sexual behaviors appear to play a significant role in PCa pathogenesis, probably through inflammatory mechanisms; however, protective sexual habits have also been described. A direct correlation between SA and TC has not yet been proven, although infections remain the most studied sex-related factor.

4. Odoyo-June, E., et al. **Prevalence of male circumcision in four culturally non-circumcising counties in western Kenya after 10 years of program implementation from 2008 to 2019.** *PLoS One*. 2021;16(7):e0254140.

Online at: <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0254140>.

**INTRODUCTION:** Kenya started implementing voluntary medical male circumcision (VMMC) for HIV prevention in 2008 and adopted the use of decision makers program planning tool version 2 (DMPPT2) in 2016, to model the impact of circumcisions performed annually on the population prevalence of male circumcision (MC) in the subsequent years. Results of initial DMPPT2 modeling included implausible MC prevalence estimates, of up to 100%, for age bands whose sustained high uptake of VMMC pointed to unmet needs. Therefore, we conducted a cross-sectional survey among adolescents and men aged 10-29 years to determine the population level MC prevalence, guide target setting for achieving the goal of 80% MC prevalence and for validating DMPPT2 modelled estimates.

**METHODS:** Beginning July to September 2019, a total of 3,569 adolescents and men aged 10-29 years from households in Siaya, Kisumu, Homa Bay and Migori Counties were interviewed and examined to establish the proportion already circumcised medically or non-medically. We measured agreement between self-reported and physically verified circumcision status and computed circumcision prevalence by age band and County. All statistical were test done at 5% level of significance.

**RESULTS:** The observed MC prevalence for 15-29-year-old men was above 75% in all four counties; Homa Bay 75.6% (95% CI [69.0-81.2]), Kisumu 77.9% (95% CI [73.1-82.1]), Siaya 80.3% (95% CI [73.7-85.5]), and Migori 85.3% (95% CI [75.3-91.7]) but were 0.9-12.4% lower than DMPPT2-modelled estimates. For young adolescents 10-14 years, the observed prevalence ranged from 55.3% (95% CI [40.2-69.5]) in Migori to 74.9% (95% CI [68.8-80.2]) in Siaya and were 25.1-32.9% lower than DMMPT 2 estimates. Nearly all respondents (95.5%) consented to

physical verification of their circumcision status with an agreement rate of 99.2% between self-reported and physically verified MC status (kappa agreement p-value<0.0001).

**CONCLUSION:** This survey revealed overestimation of MC prevalence from DMPPT2-model compared to the observed population MC prevalence and provided new reference data for setting realistic program targets and re-calibrating inputs into DMPPT2. Periodic population-based MC prevalence surveys, especially for established programs, can help reconcile inconsistencies between VMMC program uptake data and modeled MC prevalence estimates which are based on the number of procedures reported in the program annually.

5. Hines, J. Z., et al. **Prevalence of voluntary medical male circumcision for HIV infection prevention – Chokwe District, Mozambique, 2014-2019.** *MMWR Morb Mortal Wkly Rep.* 2021;70(26):942-46.

Online at: [https://www.cdc.gov/mmwr/volumes/70/wr/mm7026a2.htm?s\\_cid=mm7026a2\\_w](https://www.cdc.gov/mmwr/volumes/70/wr/mm7026a2.htm?s_cid=mm7026a2_w).

Male circumcision is an important preventive strategy that confers lifelong partial protection (approximately 60% reduced risk) against heterosexually acquired HIV infection among males (1). In Mozambique, the prevalence of male circumcision was 51% when the voluntary medical male circumcision (VMMC) program began in 2009. The Mozambique Ministry of Health set a goal of 80% circumcision prevalence among males aged 10-49 years by 2019 (2). CDC analyzed data from five cross-sectional surveys of the Chokwe Health and Demographic Surveillance System (CHDSS) to evaluate progress toward the goal and guide ongoing needs for VMMC in Mozambique. During 2014-2019, circumcision prevalence among males aged 15-59 years increased 42%, from 50.1% to 73.5% (adjusted prevalence ratio [aPR] = 1.42). By 2019, circumcision prevalence among males aged 15-24 years was 90.2%, exceeding the national goal (2). However, circumcision prevalence among males in older age groups remained below 80%; prevalence was 62.7%, 54.5%, and 55.7% among males aged 25-34, 35-44, and 45-59 years, respectively. A multifaceted strategy addressing concerns about the safety of the procedure, cultural norms, and competing priorities that lead to lack of time could help overcome barriers to circumcision among males aged  $\geq 25$  years.

6. Morris, B. J., et al. **Male circumcision and prostate cancer: a meta-analysis revisited.** *Can J Urol.* 2021;28(4):10768-76.

Online at: <https://www.canjurol.com/abstract.php?ArticleID=&version=1.0&PMID=34378513>.

**INTRODUCTION:** The relationship between circumcision and prostate cancer has been controversial. A recently published meta-analysis contradicted previous meta-analyses of male circumcision and prostate cancer risk. Our aim was to conduct a de novo meta-analysis and critically evaluate this recent paper published by Van Howe.

**MATERIALS AND METHODS:** We retrieved data from each of the 12 source studies Van Howe used, then performed a random effects meta-analysis of those data. We critically examined the data and other information in Van Howe's study.

**RESULTS:** Using the same values as Van Howe, we confirmed his finding of a positive association of circumcision with prostate cancer (random effects summary OR = 1.14; 95% CI 0.99, 1.31).



However, our independent meta-analysis found a negative association of circumcision with prostate cancer (random effects summary OR= 0.87; 95% CI 0.76, 1.00;  $p = 0.05$ ). The reason for this critical discrepancy was Van Howe's erroneous transposition of values for circumcised and uncircumcised men in his Table columns, leading to inversion of the result. We further critically evaluated a geographical analysis and cost analysis of circumcision and prostate cancer, as well as claims denying a role for sexually transmitted infections in prostate cancer etiology, finding these too to be misleading.

**CONCLUSIONS:** Van Howe's 2020 meta-analysis was based on erroneous data transposition leading to an inverted outcome. The journal concerned recently corrected his Table. Van Howe's claim of a positive association of circumcision with country-level-age standardized prostate cancer prevalence and his cost analysis were found to be questionable. Our meta-analysis showed that circumcision is associated with lower prostate cancer risk.

### Male circumcision methods, including devices

1. Hohlfeld, A. S., et al. **Circumcision devices versus standard surgical techniques in adolescent and adult male circumcisions: a Cochrane review.** *BJU Int.* 2021 Sep 29. doi: 10.1111/bju.15604. Online ahead of print.

Online at: <https://bjui-journals.onlinelibrary.wiley.com/doi/10.1111/bju.15604>.

**OBJECTIVES:** To assess the effects of device-based circumcisions compared with standard surgical techniques in adolescent and adult males (10 years old and above).

**METHODS:** We performed a comprehensive search with no restrictions to the language of publication or publication status. We included randomised controlled trials (RCTs) of device-based circumcisions compared to standard surgical dissection-based circumcision conducted by health professionals in a medical setting. We reported study results as risk ratios (RR) or mean differences (MD) using 95% confidence intervals (CI) and a random-effects model. We used the GRADE approach to evaluate the overall certainty of the evidence for each outcome.

**RESULTS:** Eighteen trials met the inclusion criteria. These trials did not report severe adverse events (11 trials, 3472 participants). There may be a slight increase in moderate adverse events for devices compared to surgical techniques (RR 1.31, 95% CI 0.55 to 3.10;  $I(2) = 68\%$ ; 10 trials, 3370 participants; low-certainty evidence); this corresponds to 8 more (ranging from 15 fewer to 84 more) moderate adverse events per 1000 participants. We are uncertain about the difference in mild adverse events between groups when devices are used compared to surgical techniques (RR 1.09, 95% CI 0.44 to 2.72;  $I(2) = 91\%$ ; 10 trials, 3370 participants; very low-certainty evidence).

**CONCLUSIONS:** We found no serious adverse events using a circumcision device compared to surgical techniques. Still, they may slightly increase moderate adverse effects, and it is unclear whether there is a difference in mild adverse effects. High-quality trials evaluating this intervention are needed to provide further certainty regarding the rates of adverse events. Clinicians, patients and policymakers can use these results combined with their contextual factors to inform the best approach that suits their healthcare settings.

## Safety and quality

1. Muchiri, E., et al. **Description of adverse events among adult men following voluntary medical male circumcision: findings from a circumcision programme in two provinces of South Africa.** *PLoS One*. 2021;16(8):e0253960.

Online at: <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0253960>.

**BACKGROUND:** Clinical trials showed strong evidence that voluntary medical male circumcision (VMMC) reduces the acquisition of HIV among heterosexual men by up to 60%. However, VMMC uptake in East and Southern Africa remains suboptimal, with safety concerns identified as a barrier to uptake. We investigated the occurrence and severity of adverse events (AEs) in a routine VMMC programme implemented in Gauteng and North West provinces of South Africa.

**METHODS:** We describe the frequency and characteristics of AEs using routinely collected data from a VMMC programme implemented between 01 May 2013 and 31 December 2014. The surgical procedure was provided at fixed clinics and mobile units in three districts. Adult men undertaking the procedure were referred for follow-up appointments where AEs were monitored.

**RESULTS:** A total of 7,963 adult men were offered the VMMC service with 7,864 (98.8%) met the age and consent requirements for inclusion in a research follow-up after the surgical procedure and were followed-up for potential AEs. In total, 37 (0.5%) patients reported AEs post-surgery with infection [11 (29.7%)] and excessive bleeding [11 (29.7%)] commonly reported AEs. In terms of severity, 14 (37.8%) were classified as mild, 13 (35.1%) as moderate, and 10 (27.0%) as severe. Further, 32 (86.5%) of the AEs were classified as definitely related to the surgical procedure, with 36 (97.5%) of all AEs resolving without sequelae.

**CONCLUSION:** The VMMC programme was able to reach adult men at high risk of HIV acquisition. Reported AEs in the programme were minimal, with the observed safety profile comparable to clinical trial settings, suggesting that VMMC can be safely administered in a programmatic setting.

2. Mutanekelwa, I., et al. **Prevalence and correlates of voluntary medical male circumcision adverse events among adult males in the Copperbelt Province of Zambia: a cross-sectional study.** *PLoS One*. 2021;16(9): e0256955.

Online at: <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0256955>.

**BACKGROUND:** Voluntary Medical Male Circumcision (VMMC) is a key intervention in HIV/AIDS. Improving VMMC program uptake in Zambia requires careful monitoring of adverse events (AE) to inform program quality and safety. We investigate the prevalence of VMMC AE and their associated factors among adult males in Ndola, Copperbelt Province, Zambia.

**METHODS:** We performed a cross-sectional study using secondary clinical data collected in 2015 using two validated World Health Organisation/Ministry of Health reporting forms. We reviewed demographics and VMMC surgical details from 391 randomly sampled adult males aged  $\geq 18$  years at Ndola Teaching Hospital, a specialised VMMC fixed site in Zambia. Non-parametric tests

(Fisher's exact test or Chi-square depending on assumptions being met) and logistic regression were conducted to determine the relationships between associated factors and VMMC AE.

**RESULTS:** The overall VMMC AE prevalence was 3.1% (95% CI 1.60%- 5.30%) and most AEs occurred postoperatively. In decreasing order, the commonly reported VMMC AE included; bleeding (47.1%), swelling (29.4%), haematoma (17.6%), and delayed wound healing (5.9%). There was an inversely proportional relationship between VMMC volume (as measured by the number of surgeries conducted per VMMC provider) and AEs. Compared to the highest VMMC volume of 63.2% (247/391) as reference, as VMMC volume reduced to 35.0% (137/391) and then 1.8% (7/391), the likelihood of AEs increased by five times (aOR 5.08; 95% CI 1.33-19.49;  $p = 0.018$ ) and then sixteen times (aOR 16.13; 95% CI 1.42-183.30;  $p = 0.025$ ) respectively.

**CONCLUSIONS:** Our study found a low prevalence of VMMC AEs in Ndola city, Copperbelt Province of Zambia guaranteeing the safety of the VMMC program. We recommend more surgically proficient staff to continue rendering this service. There is a need to explore other high priority national/regional areas of VMMC program safety/quality, such as adherence to follow-up visits.

3. Nyengera, T., et al. **Quality of service and continuous quality improvement in voluntary medical male circumcision programme across four provinces in South Africa: longitudinal and cross-sectional programme data.** *PLoS One.* 2021;16(8):e0254850.

Online at: <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0254850>.

**BACKGROUND:** Recent studies in the Sub-Saharan countries in Africa have indicated gaps and challenges for voluntary medical male circumcision (VMMC) quality of service. Less has focused on the changes in quality of service after implementation of continuous quality improvement (CQI) action plans. This study aimed to evaluate the impact of coaching, provision of standard operating procedures (SOPS) and guidelines, mentoring and on-site in-service training in improving quality of VMMC services across four Right to Care (RTC) supported provinces in South Africa.

**METHOD:** This was a pre- and post-interventional study on RTC supported VMMC sites from July 2018 to October 2019. All RTC-supported sites that were assessed at baseline and post-intervention were included in the study. Data for baseline CQI assessment and re-assessments was collected using a standardized National Department of Health (NDoH) CQI assessment tool for VMMC services from routine RTC facility level VMMC programme data. Quality improvement support was provided through a combination of coaching, provision of standard operating procedures and guidelines, mentoring and on-site in-service training on quality improvement planning and implementation. The main outcome measure was quality of service. A paired sample t-test was used to compare the difference in mean quality of service scores before and after CQI implementation by quality standard.

**RESULTS:** A total of 40 health facilities were assessed at both baseline and after CQI support visits. Results showed significant increases for the overall changes in quality of service after CQI support intervention of 12% for infection prevention (95%CI: 7-17;  $p < 0.001$ ) and 8% for male circumcision surgical procedure, (95%CI: 3-13;  $p < 0.01$ ). Similarly, individual counselling, and HIV

testing increased by 14%, (95%CI: 7-20;  $p < 0.001$ ), group counselling, registration and communication by 8%, (95%CI: 3-14;  $p < 0.001$ ), and 35% for monitoring and evaluation, (95%CI: 28-42;  $p < 0.001$ ). In addition, there were significant increases for management systems of 29%, (95%CI: 22-35;  $p < 0.001$ ), leadership and planning 23%, (95%CI: 13-34;  $p < 0.001$ ) and supplies, equipment, environment and emergency 5%, (95%CI: 1-9;  $p < 0.01$ ). The overall quality of service performance across provinces increased by 18% (95%CI: 14-21;  $p < 0.001$ ).

**CONCLUSION:** The overall quality of service performance across provinces was significantly improved after implementation of CQI support intervention program. Regular visits and intensive CQI support are required for sites that will be performing below quality standards.

### Social and behavioural research

1. Nxumalo, C. T., et al. **Healthcare providers' perceptions and understanding of voluntary medical male circumcision in KwaZulu-Natal, South Africa: a qualitative study.** *S Afr Fam Pract (2004)*. 2021;63(1):e1-e6.

Online at: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8424757/>.

**BACKGROUND:** There is compelling evidence that voluntary medical male circumcision (VMMC) reduces the chances of heterosexual transmission of HIV infection. Healthcare workers are among the key influencers in terms of the scale-up of VMMC as they are often involved in mobilisation for uptake. There is a paucity of qualitative research on healthcare workers' experiences, understanding and perceptions of VMMC; particularly in the South African rural primary healthcare context. This study was conducted to examine healthcare workers' perceptions and understanding of VMMC in KwaZulu-Natal, South Africa.

**METHODS:** The study employed a qualitative approach using a phenomenographic design. A purposive sample of 15 doctors, nurses and clinical associates working in 6 different rural clinics in KwaZulu-Natal, South Africa, were interviewed in English in-depth using a semi-structured interview schedule. The interviews were audio-recorded, and transcribed. The results were analysed thematically using phenomenographic data analysis procedures.

**RESULTS:** Categories of description in participants' perceptions and understanding of VMMC emerged. The findings of this study revealed that healthcare workers' perceptions and understanding of VMMC were predominantly influenced by the hegemonic religious and cultural norms associated with male circumcision in KwaZulu-Natal, South Africa.

**CONCLUSION:** The findings of this study suggest that tailored training to address healthcare workers' misperceptions and poor understanding of VMMC is necessary to ensure that they become effective custodians for VMMC implementation.

### Traditional male circumcision

1. Tusa, B. S., et al. **Spatial distribution of traditional male circumcision and associated factors in Ethiopia; using multilevel generalized linear mixed effects model.** *BMC Public Health*. 2021;21(1):1423.

Online at: <https://bmcpublikealth.biomedcentral.com/articles/10.1186/s12889-021-11482-5>.

**BACKGROUND:** Traditional male circumcision (TMC) is primarily associated with a religious or cultural purpose and may lead to complications. To reduce risks of complication and long-term disabilities that may happen from circumcisions that are undertaken in non-clinical settings, information concerning TMC is very important. Therefore, this study is aimed at identifying spatial distribution of TMC and the factors associated with TMC in Ethiopia.

**METHODS:** A secondary data analysis was conducted among 11,209 circumcised males using data from 2016 Ethiopian Demographic and Health Survey (EDHS). Global Moran's I statistic was observed to check whether there was a significant clustering of TMC. Primary and secondary clusters of TMC were identified by fitting Bernoulli model in Kilduff's SaTScan software. Multilevel Generalized Linear Mixed effects Model (GLMM) was fitted to identify factors associated with TMC.

**RESULT:** The spatial distribution of TMC was nonrandom across the country with Global Moran's I = 0.27 ( $p$ -value < 0.0001). The primary clusters of TMC were identified in the southern part of Oromia and Tigray, northern part of SNNPR, Amhara, Gambella and Benishangul regions. Current age, age at circumcision, ethnicity, religion, place of residence, wealth index, media exposure, sex of household head and age of household head were factors associated with TMC in Ethiopia.

**CONCLUSIONS:** The spatial distribution of TMC was varied across the country. This variation might be due to the diversity of culture, ethnicity and religion across the regions. Thus, there is a need to rearrange the regulations on standards of TMC practice, conduct training to familiarize operation technique and general hygiene procedures, and launch cross-referral systems between traditional circumcisers and health workers. While undertaking these public health interventions, due attention should be given to the identified clusters and significant factors.