P18.04 A NOVEL ANALYTIC FRAMEWORK TO INVESTIGATE VOLUNTARY MEDICAL MALE CIRCUMCISION PROGRAM EFFICIENCY GAINS THROUGH SUB-POPULATION PRIORITISATION: INSIGHTS FROM APPLICATION TO ZAMBIA

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Introduction Countries in sub-Saharan Africa are scaling-up voluntary male medical circumcision (VMMC) as an HIV intervention. Emerging challenges in these programs call for increased focus on program efficiency (optimising impact while minimising cost). A novel analytic approach was developed to determine how sub-population prioritisation can increase program efficiency, as applied to Zambia.

Methods A population-level mathematical model was constructed describing the HIV epidemic and impact of VMMC programs (Age-Structured Mathematical (ASM) model). The model stratified the population according to sex, circumcision status, age group, sexual-risk group, HIV status and infection stage. A three-level conceptual framework was also developed to determine the maximum epidemic impact and program efficiency through sub-population prioritisation, based on age, geography, and risk profile.

Results In the baseline scenario, achieving 80% VMMC coverage by 2017 among males 15–49 years, 12 VMMCs are needed per HIV infection averted (effectiveness), the cost per infection averted (cost-effectiveness) is $1,089, and the number of infections averted is 306,000. Through age-group prioritisation, effectiveness ranged from 11 (20–24 age-group) to 36 (45–49 age-group) circumcisions per infection averted. Cost-effectiveness ranged from $888 (20–24 age-group) to $3,300 (45–49 age-group). Circumcising age groups 10–14, 15–19 or 20–24 achieved the largest HIV incidence rate reduction. Prioritising age groups 15–24, 15–29 or 15–34 achieved the greatest program efficiency. Through geographical prioritisation, effectiveness ranged from 9 to 12 circumcisions per infection averted. Prioritising Lusaka, the province with the highest HIV prevalence, achieved the highest effectiveness. Through risk-group prioritisation, prioritising highest risk groups achieved the highest effectiveness, with only one VMMC per infection averted, while prioritising the lowest risk group required 80 times more VMMCs.

Conclusion Epidemic impact and efficiency of VMMC programs can be improved by prioritising males in age group 15–34, geographical areas with higher HIV prevalence than the national and high sexual-risk groups.

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P18.05 CONTRIBUTION OF BIOMARKERS TO THE VALIDATION OF SELF-REPORTED CONDOM USE IN A TREATMENT AS PREVENTION AND A PRE-EXPOSURE PROPHYLAXIS DEMONSTRATION STUDY AMONG FEMALE SEX WORKERS

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Introduction The phenomenon of condom migration remains a major concern whenever a new HIV prevention approach is being considered to strengthen the existing preventive arsenal. We are currently measuring the baseline condom use at the recruitment visit of an on-going demonstration study on pre-exposure prophylaxis (PrEP) and treatment as prevention (TasP), involving female sex workers (FSWs) in Cotonou, Benin, West Africa.

Methods During the recruitment visit, data on unprotected sex were collected through face-to-face interviews, from the first 112 FSWs with available biomarker results, recruited as of February 28, 2015. In addition, vaginal samples were tested for prostate-specific antigen (PSA) and Y chromosome DNA (Yc-DNA) PCR tests, to validate the self-reported unprotected sex. Additional biomarkers include gonorrhoea and chlamydia testing using nucleic-acid amplification tests and urine pregnancy tests. Performance parameters of the self-reported unprotected sex were calculated using combined results of all biomarkers as gold standard for recent semen exposure.

Results The prevalence of recent self-reported unprotected sex with all types of sexual partners was 31.2% (35/112) vs. 51.8% (58/112) according to the combined biomarkers ($p = 0.003$, McNemar test). Using the combined biomarkers as gold standard, the sensitivity and specificity of self-reported unprotected sex were 34.5% and 72.2%, respectively. The prevalences of gonorrhoea and chlamydia at the recruitment visit were 8.0% (9/112) and 6.2% (7/112), respectively. Either infection was present in 16 participants (14.3%), out of whom 10 were positive for PSA or Yc-DNA PCR. The pregnancy test was positive for two participants of whom one was positive for both PSA and Yc-DNA PCR.

Conclusion These results confirm the questionable validity of self-reported condom use among FSWs. They underscore the need of supplementing self-reported data by biomarkers to improve data reliability. These early results are part of the baseline data that will be subsequently used to look for condom migration.

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