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WHO
TeleECHO™ Sessions

Preventing HIV through Safe Voluntary Medical Male Circumcision for Adolescent Boys and Men in Generalized HIV Epidemics: recommendations and considerations

21, 24, 25 August 2020

World Health Organization Africa

COVID-19 RESPONSE

WORLD HEALTH ORGANIZATION REGIONAL OFFICE FOR AFRICA SUPPORTS THE COVID-19 RESPONSE

Project ECHO

21 August 2020 Session 1

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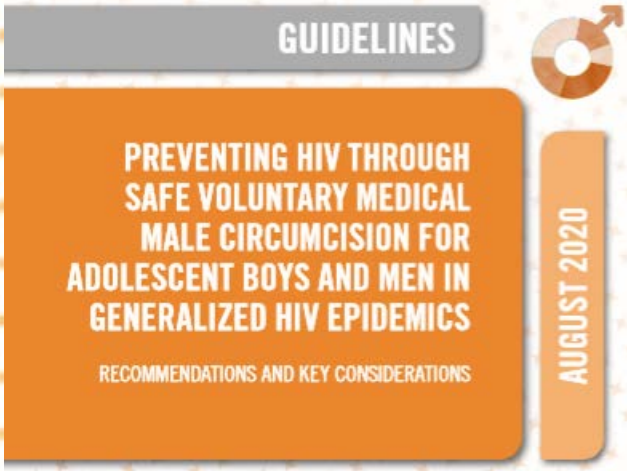

Overview of Guideline development process

and

HIV prevention through voluntary medical male circumcision

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Agenda

Agenda		
Part 1: Moderator Fabian Ndenzako		
Time (2 hours)	**Topic and presenter**	**Additional recordings**
14.30 – 14.40 (10 minutes)	Opening remarks – **Frank Lule and Meg Doherty**	WHO Guideline development process and GRADE methodology - **Rebekah Thomas** Modelling impact of VMMC in combination prevention - **John Stover**
14.40 – 14.50 (10 minutes)	Overview of recommendations – **Julia Samuelson**	
14.50 – 15.05 (10 minutes)	Evidence on the impact of medical male circumcision on HIV prevention for men, women and communities - **Tim Farley**	
15.05 – 15.15 (10 minutes)	Questions and Answers	
Break 15.15 – 15.25 (10 minutes) 		

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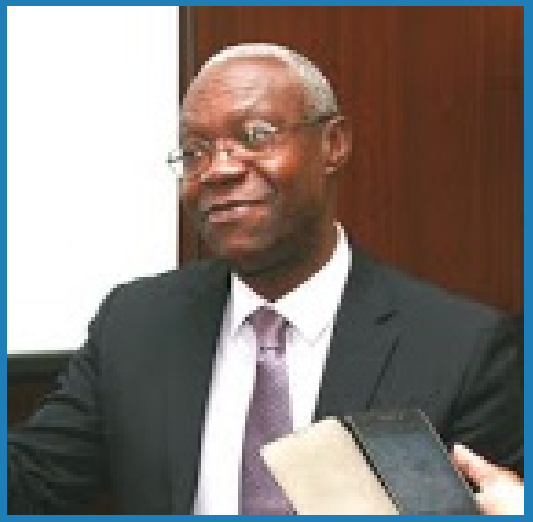
Learning Objectives of teleECHO series

- To disseminate the 2020 WHO VMMC guidelines
- To present the evidence and other factors for recommendations and considerations in the guidelines
- To catalyze discussions for better understanding of the recommendations and considerations, programmatic and operational challenges and potential solutions towards implementation of the guidelines

Opening remarks

Meg Doherty
Director
WHO Global HIV, Hepatitis and STIs Programmes



Frank Lule
Medical Officer
WHO AFRO
HIV Treatment and Care

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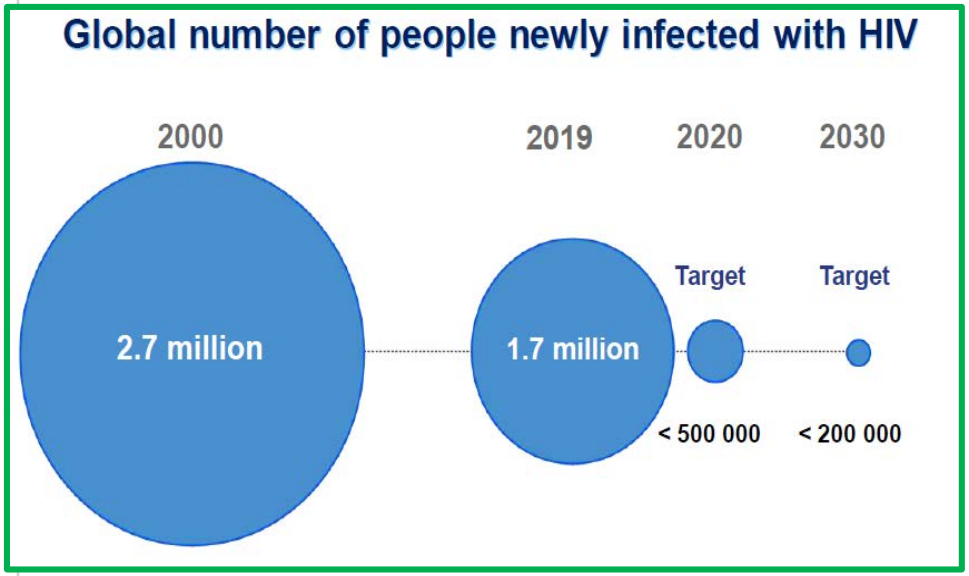
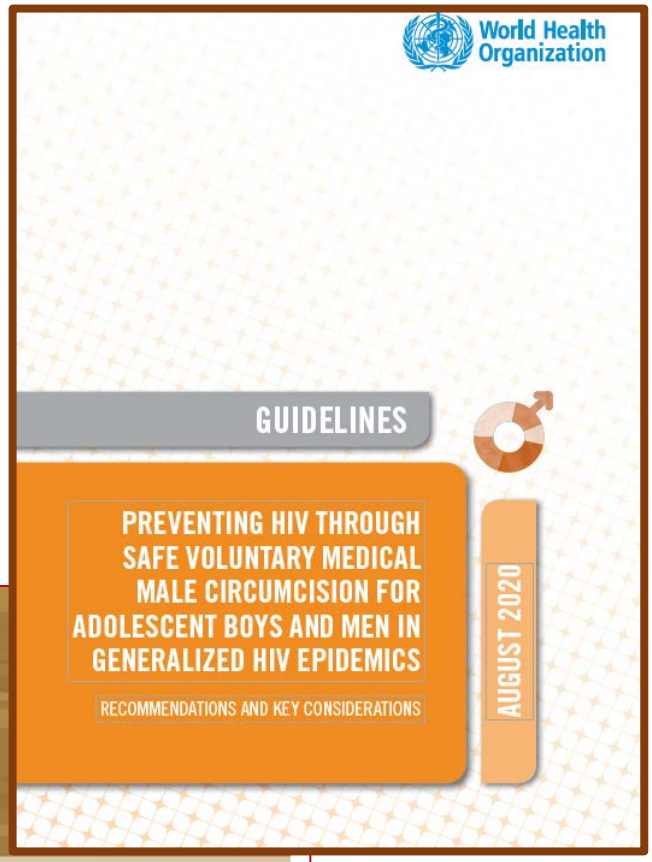
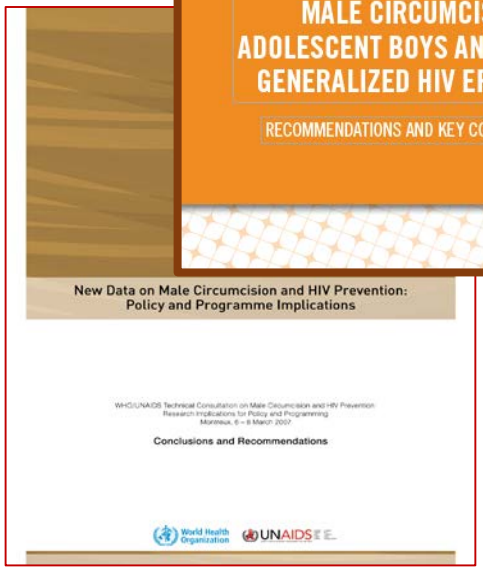
New WHO guidance







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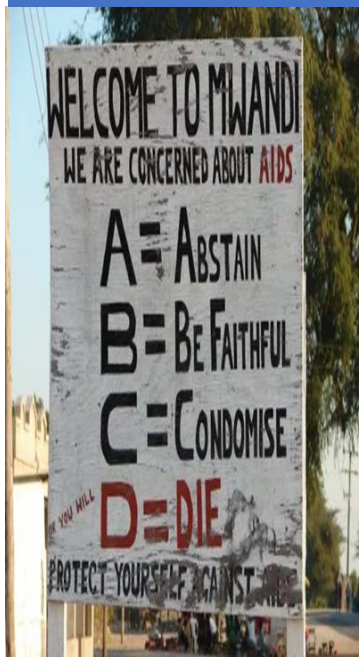
Evolving Landscape to Prevent Heterosexually Acquired HIV in Generalized Epidemics

1980s



2007

- Safer sex education
- Condom use
- Voluntary medical male circumcision (VMMC)
- Post-exposure prophylaxis (PEP)

VMMC and combination prevention

2020

- Comprehensive sexuality education
- Male and female condom use
- VMMC
- Post exposure prophylaxis
- HIV medications before exposure: Pre- Exposure Prophylaxis (PrEP)
- HIV treatment and viral suppression: secondary prevention effect

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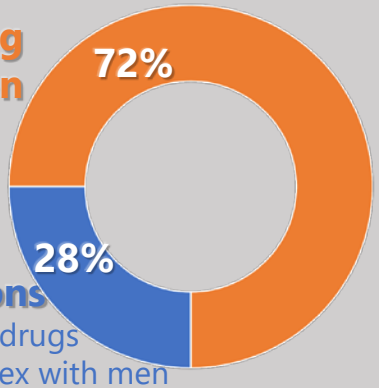
HIV in East and Southern Africa

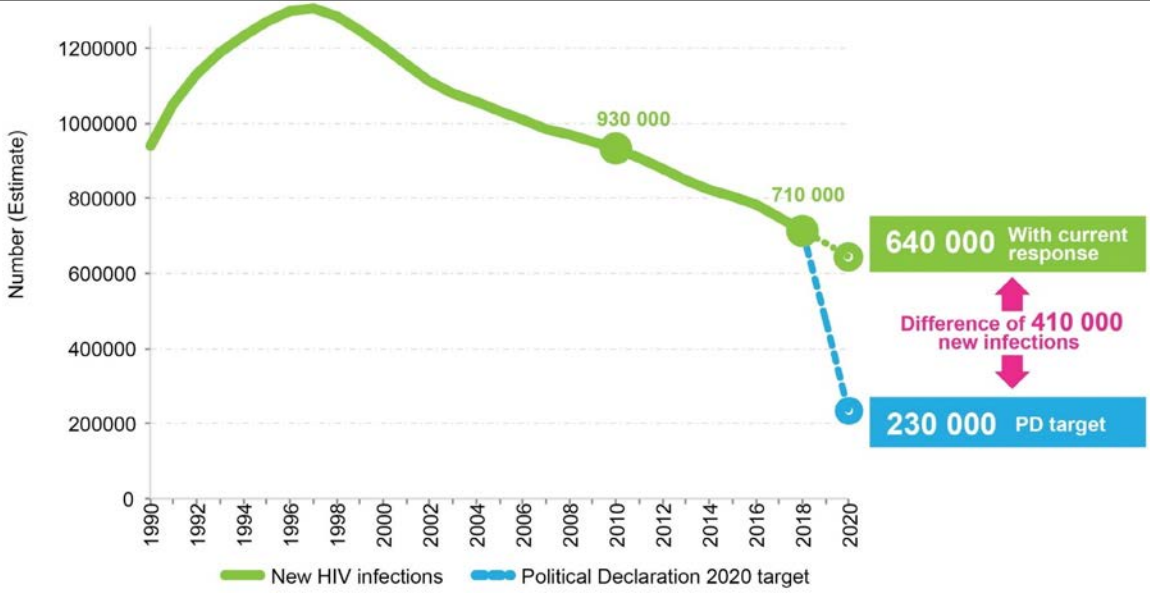
Proportion of new infections by population group, 2019



Key populations

- People who use drugs
- Men who have sex with men
- Sex workers
- Clients of sex workers
- Partners of people from key populations

Annual number of HIV infections 1990-2019 and gap to 2020 target



Source: Prepared by RST ESA SI Hub based on UNAIDS Estimates 2019

The ESA region will not reach the Political Declaration Target for new HIV infections among adults in 2020 and likely 2030.

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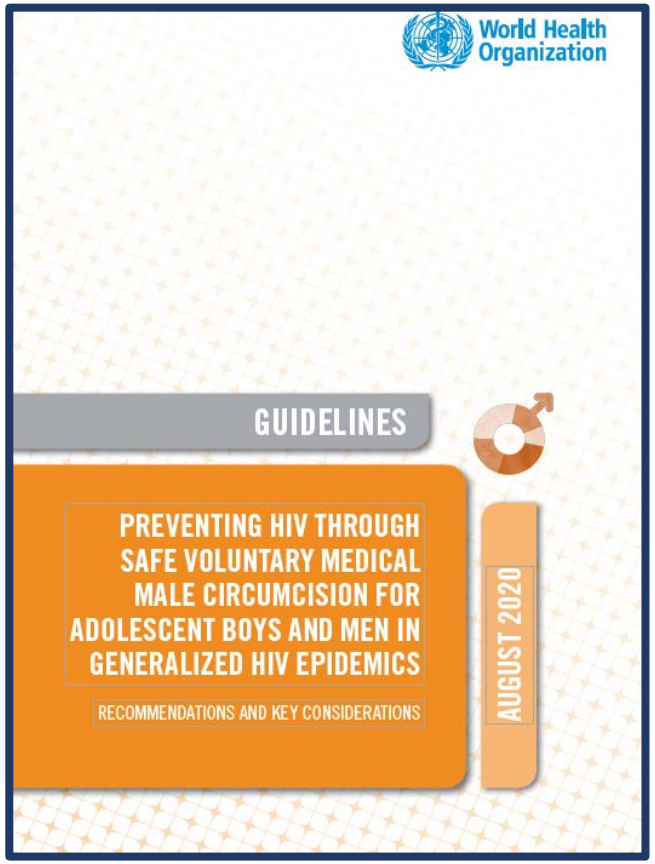
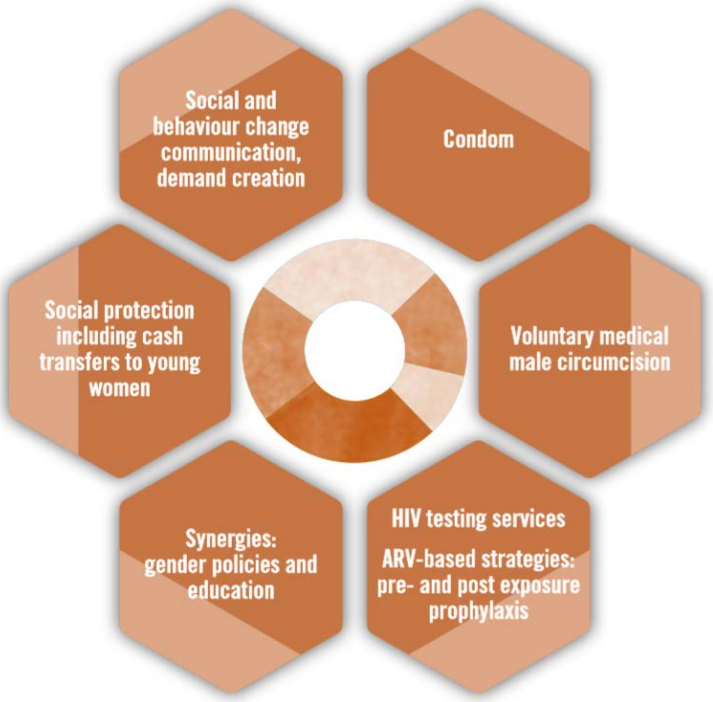
Goal of new WHO HIV prevention guidelines

Maximize HIV prevention impact with safe VMMC services and to guide provision of interventions for the health and well-being of adult men and adolescent boys





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Guideline development and overview of recommendations and considerations

Julia Samuelson
Global HIV, Hepatitis, and STIs Programmes
and
WHO Taskforce on Nursing and Midwifery

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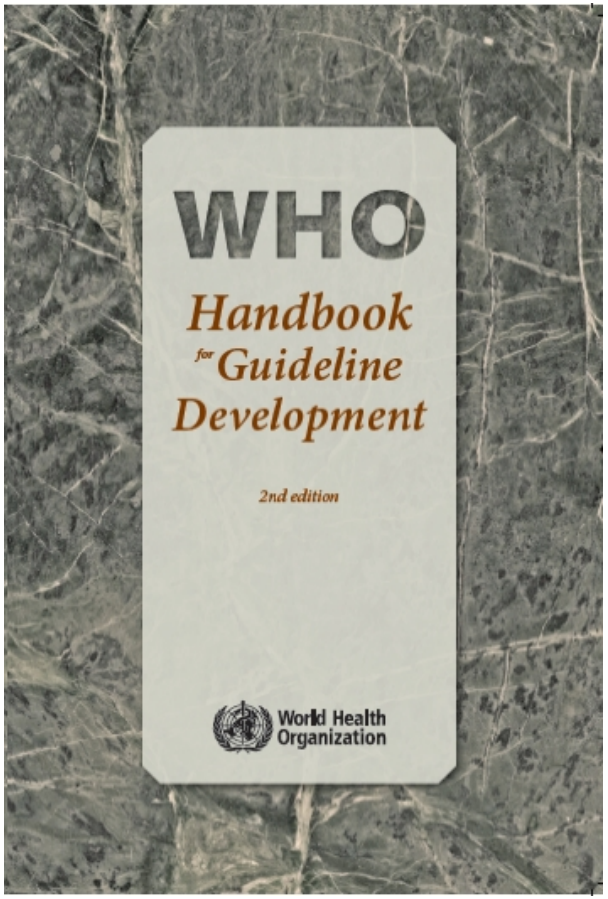
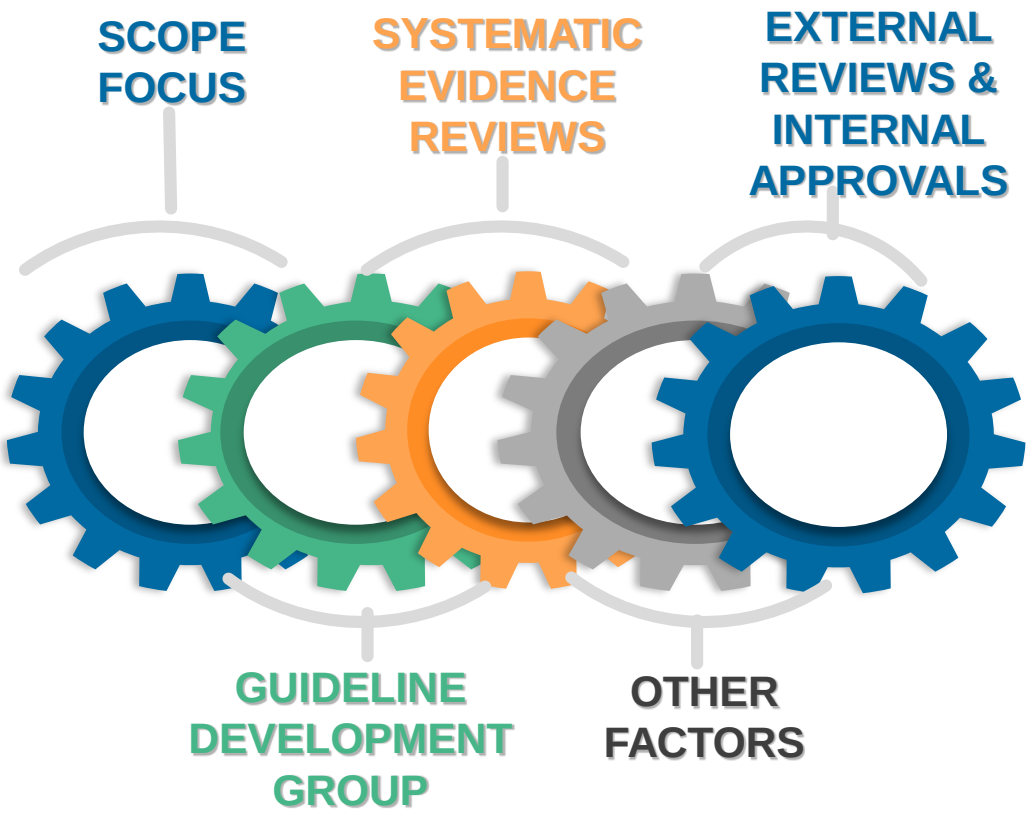
Process of guidelines development





More details available in Handbook, Guidelines Annex, and additional recording on Clearinghouse on Male Circumcision for HIV Prevention

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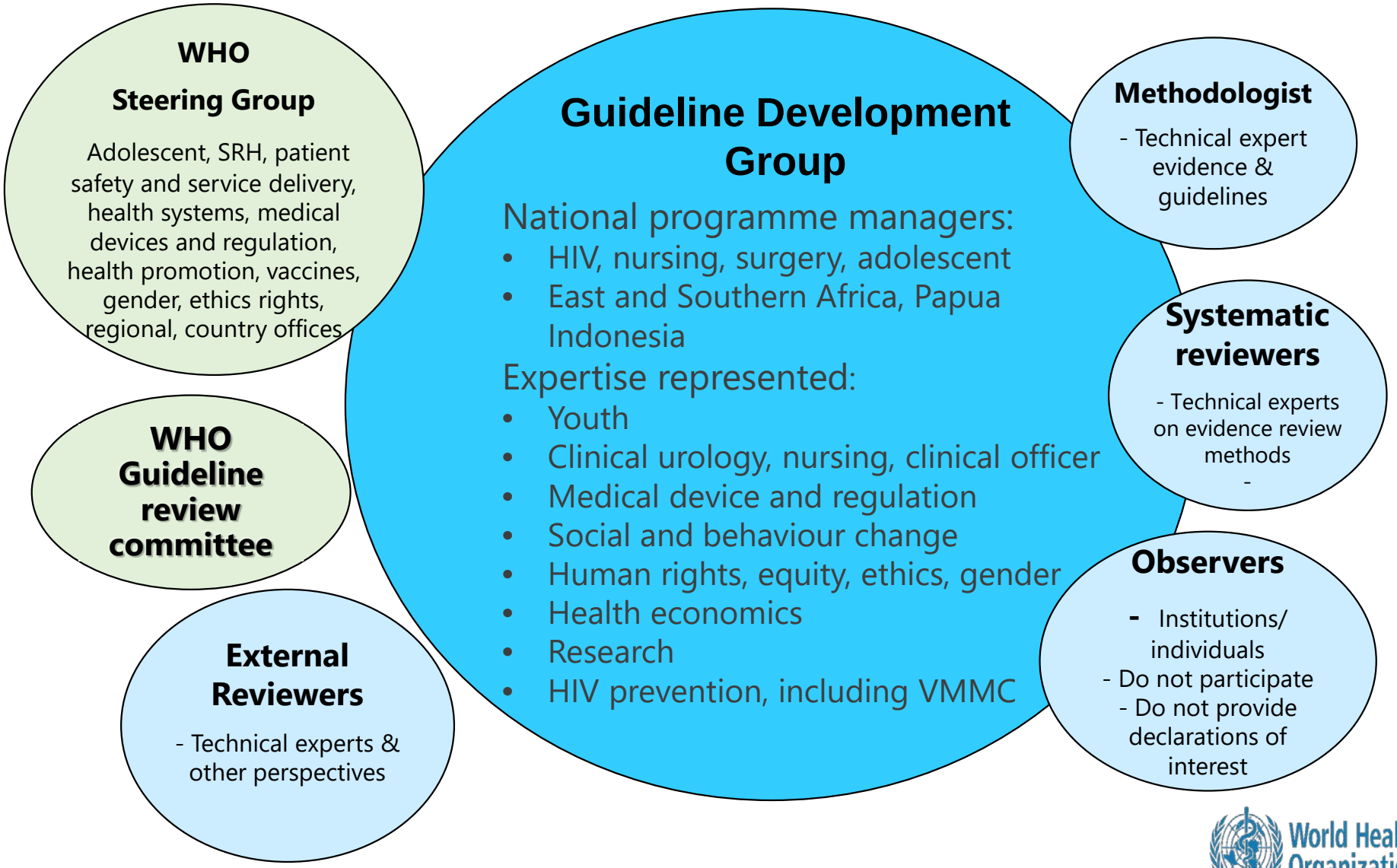
Contributors to WHO guidelines - THANK YOU



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PICO and GRADE for key questions and evidence

P: population
I: intervention
C: comparator
O: outcomes

Grading the 1) quality of evidence and informing
2) strength of recommendations.

Evidence retrieval, assessment, synthesis

Appraise certainty of the body of evidence

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Evidence-to-decision framework

Recommendation:	
Population:	
Intervention:	
Factor	Decision
Quality of the evidence	☐ High ☐ Moderate ☐ Low ☐ Very low
Balance of benefits versus harms	☐ Benefits clearly outweigh harms ☐ Benefits and harms are balanced ☐ Potential harms utweigh potential benefits
Values and preferences of outcomes among key stakeholders	☐ No major variability ☐ Major variability
Resource and cost implications Financial economic	☐ Less resource-intensive ☐ More resource-intensive
Health systems, feasibility	
Other factors: human rights, ethics, equity, acceptability	
Magnitude of problem, societal implicaitons	
Overall strength of the recommendation: (strong or conditional)	

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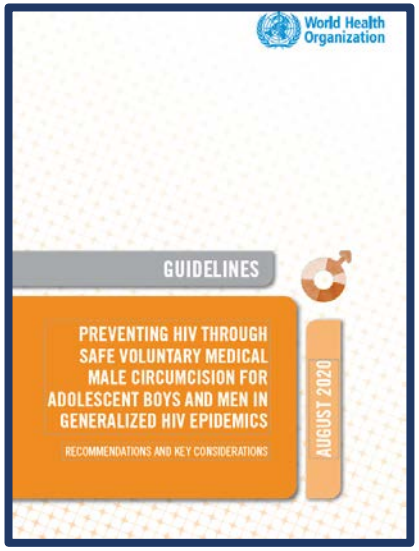
Purpose and scope of new guidance

Purpose: to maximize HIV prevention impact with safe voluntary male circumcision services and guide sustainability with a focus on adolescent boys' and men's health and well-being.

Objectives:

- Update earlier recommendations
  - 2007: Male circumcision to reduce risk of heterosexually acquired HIV infection
  - 2013: conditional recommendation on use of device-based methods

- Review evidence and other factors on
  - Younger adolescent boys considerations
  - Enhancing uptake among men
  - Sustaining services with adolescent focus



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Overview: recommendations and key considerations

Recommendation

VMMC should **continue to be promoted as an additional efficacious HIV prevention intervention in combination prevention for adolescents 15 years and older and adult men** in generalized epidemics to reduce the risk of heterosexually acquired HIV infection. *Strong recommendation, high quality evidence*

Considerations

For decisions on offering VMMC to adolescents ages 10 through 14 years, considerations are noted including safety, human rights, public health impact, local context

Recommendations

The use of WHO **prequalified male circumcision devices** is recommended as additional methods of male circumcision in the context of HIV prevention for males ages 15 years and older. *(conditional recommendation, moderate quality evidence)*

For adolescents under 15 years, use in keeping with decisions on whether to offer VMMC to adolescent ages 10 through 14 years *(conditional recommendation, low quality evidence)*

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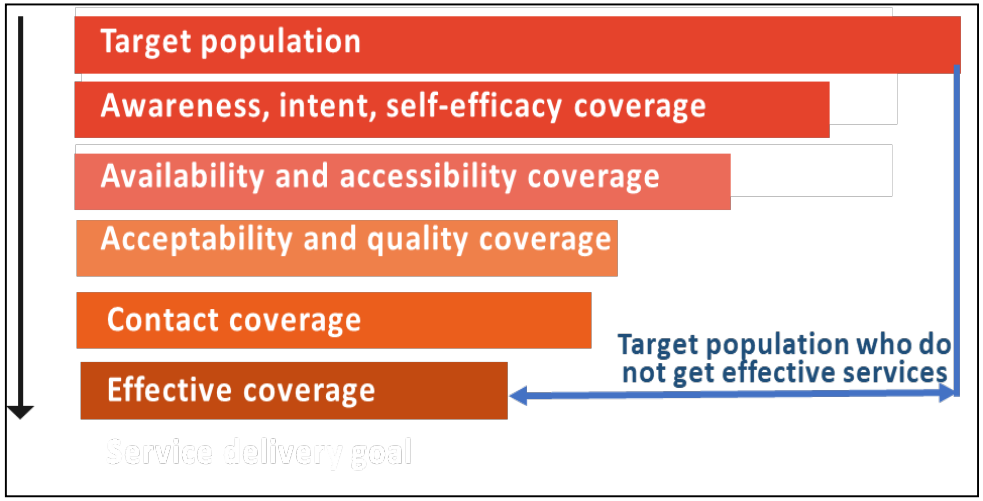
Overview: key considerations on enhancing uptake with evidence-based interventions

Systematic reviews:

- Reorient **service delivery approaches**;
- **Use of economic compensation only** after consideration of broader context and engagement of community

Case studies



Awareness, knowledge, intent and self-efficacy	
Individual-level barriers	• lack of or inadequate information on VMMC benefits and the procedure • incorrect information or myths about VMMC • the fact that VMMC provides only partial protection • risk prioritization: limited perception of HIV risk, and HIV prevention not their priority concern • for older men, circumcision to reduce HIV risk not of value *(103, 138)* • unclear level of benefit for bisexual men • uncertainty or hesitance
Community/ household-level barriers	• limited social cohesion, family support • limited partner support

Interventions addressing these barriers

- Home visits by lay counsellors to HIV-negative men and support for clinic linkage *(137, 301)*
- mHealth – SMS messages to HIV-negative men including follow-up after home visits and referrals *(301, 335, 336)*
- dedicated and trained interpersonal communication agents (a component of multiple studies)
- information provided on health and wellness (for example, general HIV prevention, improved hygiene, HPV reduction and cervical cancer risk reduction for female partners) *(38, 298, 306)* (Case 6)
- offering VMMC onsite to clients at sexual health clinics *(337)*
- education and mobilization through sporting groups and using educational games *(124, 137)* (Cases 1, 9)
- peer promotion by circumcised men *(124, 137, 302, 306)* (Cases 1, 2, 4)
- partner engagement in sexual and reproductive health education *(302, 306)*
- engagement of partners, family members and peers *(301)* (Case 6)
- engagement of religious leaders *(338)* (Case 6)
- diverse multimedia and mass communication *(302)*

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Transition to sustainable services to maintain high coverage with focus on older adolescents

Health Systems Building Blocks Framework

Building block	Component
 Finance	• Resource allocation and mobilization • Purchasing of services • Financial risk protection
 Health workforce	• Health workforce planning • Pre-service and continuing education • Management, support and supervision
 Strategic information	• Data collection and management • Data quality • Data analysis and use • Safety monitoring
 Supplies and equipment	• Norms and standards • Procurement, supply and distribution • Quality of VMMC supplies and equipment
 Leadership and governance	• Programme leadership and coordination • Accountability, oversight and regulation • Inter-sectoral coordination • Health sector plans and policies
 Service delivery	• Access (strategic planning of health services) • Reorienting service delivery models • Empowering and engaging people • Safety and quality
Critical enablers	
• Adolescent leadership, co-produced health services, local ownership and participation • Community engagement and empowerment • Multisectoral partnerships • Enabling laws and policies	

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Evidence on the impact of medical male circumcision on HIV prevention for men, women and communities

Tim Farley
Sigma3 Services

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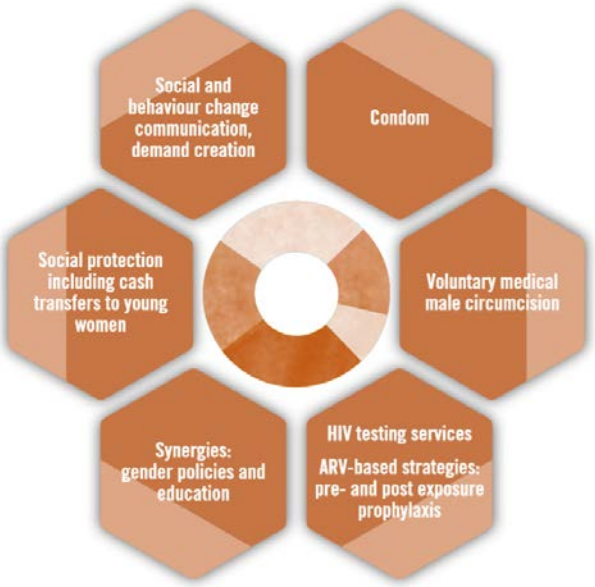
Updated recommendation on Voluntary Medical Male Circumcision (VMMC) for HIV prevention

VMMC should **continue to be promoted as an additional efficacious HIV prevention intervention in combination prevention for adolescents 15 years and older and for adult men** in generalized epidemics to reduce the risk of heterosexually acquired HIV infection.

- *Strong recommendation*
- *High quality evidence*



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PICO 1: Medical male circumcision for HIV Prevention - outcomes to assess

Critical Outcome 1: Incidence of HIV infection in circumcised men

Critical Outcome 2: HIV incidence in female partners of circumcised men

Critical Outcome 3: Rates of moderate, severe, and/or serious adverse events during or following surgery

Other outcomes considered important:

- HIV incidence in community
- Incidence and prevalence of high-risk HPV genotypes in circumcised men
- Risk of acquiring other STIs
- Proportion of men adopting high risk sexual practices following circumcision

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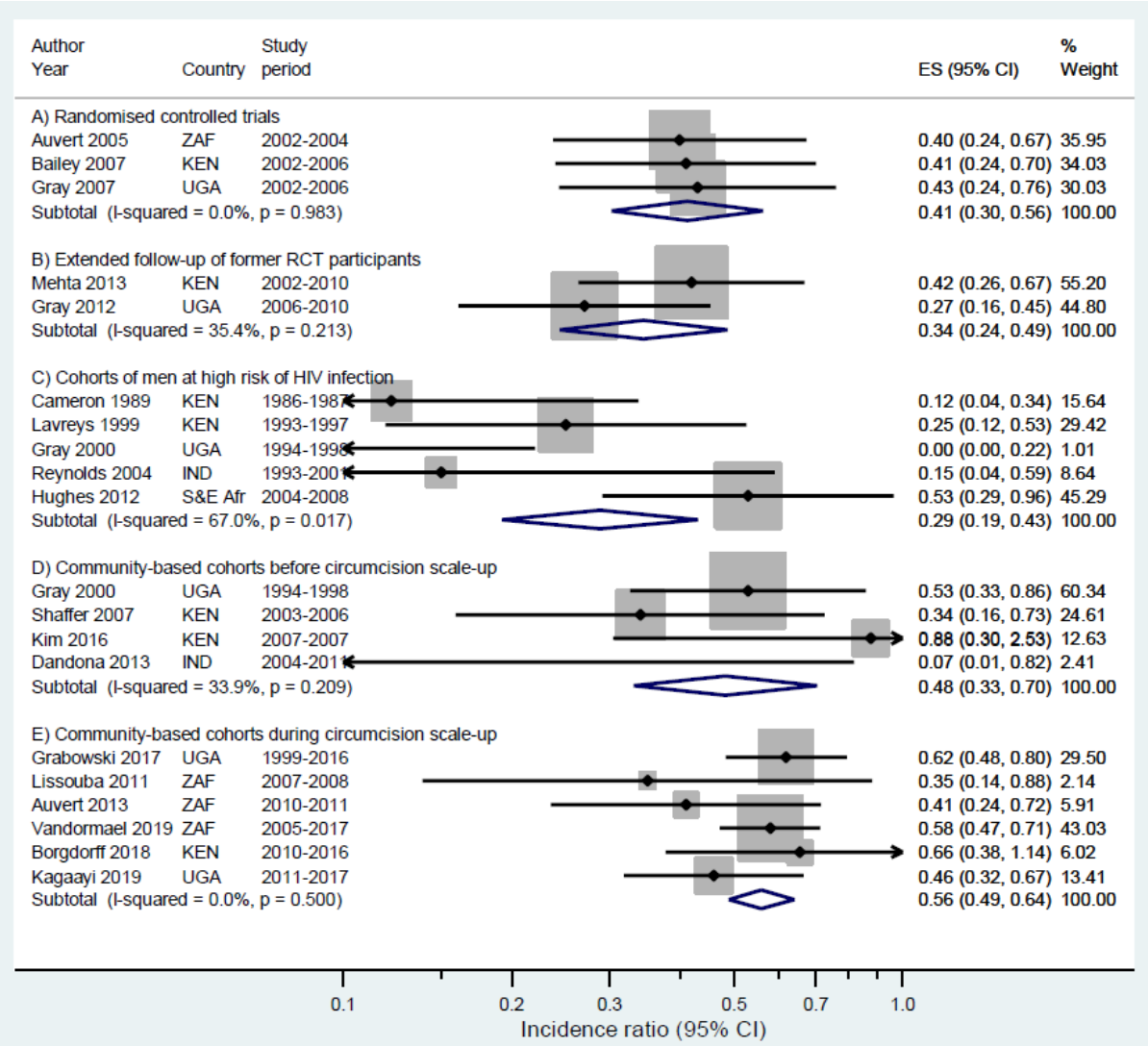
Impact of circumcision on HIV incidence in men



GRADE Evidence Profile

PICO

Does male circumcision reduce the risk of infection in men exposed to HIV through heterosexual intercourse?

Quality of Evidence

A)	RCTs	HIGH
B)	Extended follow-up	HIGH
C)	High risk cohorts	HIGH
D)	Before MC scale-up	HIGH
E)	During MC scale-up	HIGH

Farley *et al*. Impact of male circumcision on risk of HIV Infection in men in a changing epidemic context – Systematic review and meta-analysis. *J Int AIDS Soc*. 2020;**23**(6):e25490. doi: 10.1002/jia2.25490.

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Impact of circumcision on HIV incidence in women

- Women benefit indirectly from VMMC programmes due to lower HIV incidence and prevalence in circumcised men
- Potentially lower risk of HIV acquisition from an HIV-positive partner who is already circumcised
  - Lower HIV incidence in women in two serodiscordant (F -ve, M +ve) couple studies conducted before availability of ART – pooled incidence ratio 0.59 (0.35-0.99), or 41% reduction in risk
- But:
  - In RCT of circumcision in serodiscordant couples in which male partner already HIV-positive, higher risk of HIV transmission observed, particularly if couple resumed sex before certified wound healing
  - Study was conducted before immediate ART recommended for all people with HIV infection.
  - Circumcision when virally suppressed likely carries no excess HIV risk
  - Underlines importance of HIV testing prior to circumcision and delaying circumcision until ART has lowered viral load

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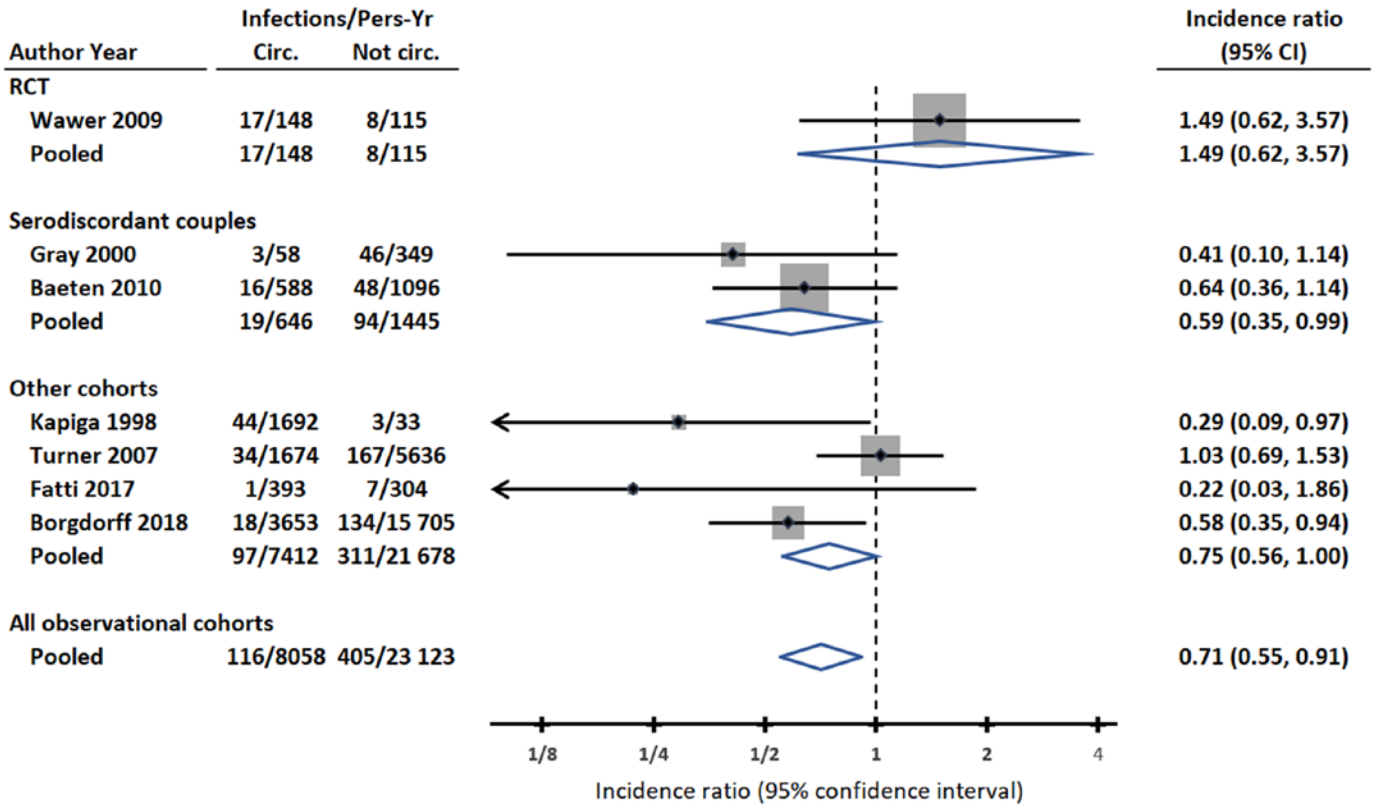
Impact of circumcision on HIV incidence in women



GRADE Evidence Profile

PICO

Does male circumcision reduce the risk of infection in women exposed to HIV through heterosexual intercourse?

Quality of Evidence

RCT	VERY LOW
Serodiscordant couples	LOW
Other cohorts	LOW

Farley *et al*. Male circumcision and HIV infection in women - Systematic review of evidence (FRPEC216). *20th International Conference on AIDS and STIs in Africa*; 2019; Kigali, Rwanda.

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Impact of circumcision on HIV incidence in the community (important outcome)

- Only one study with relevant data
- Rakai, Uganda community-based cohort conducted in 45 separate communities over the period 1999-2013
- Over the study period:
  - Circumcision in men increased from median 19% to 39%
  - ART use in women Increased from median 0% to 26%

- For each 10% increase in:
  - Circumcision in men 13% lower HIV incidence in men
  - ART use in women 5% lower HIV incidence in men

- Analysis of additional cohorts are awaited

Kong *et al.* Association of medical male circumcision and antiretroviral therapy scale-up with community HIV incidence in Rakai, Uganda. *JAMA*. 2016;316(2):182-90. doi: 10.1001/jama.2016.7292.

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Key points on evidence

- Combined results of three randomized controlled trials showed an estimated 59% lower incidence of heterosexually acquired HIV infection in circumcised men.
  - This led to the 2007 WHO recommendation on VMMC as an additional HIV prevention intervention.
  - This remains the best estimate of the efficacy of VMMC in reducing HIV risk

- Seventeen prospective observational studies between 1986 and 2017 showed an overall 50% lower risk of HIV infection in circumcised men, including when VMMC is implemented alongside combination prevention including ART.
  - This result is subject to biases which may have diluted the estimated effect, in particular some uncircumcised men self-reporting that they were circumcised.
    - The two studies conducted during scale up which assessed circumcision status by clinical examination showed a 61% reduction in risk

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Questions or comments?


Away from the screen break

Agenda

Part 2: Moderator Frank Lule		
Time	**Topic and presenter**	**Additional recordings**
15.25 – 15.35 (10 minutes) 15.35 – 15.45 (10 minutes)	Other benefits and harms • STI prevention benefits for women and men and other services delivered with surgical intervention - **Stephanie Davis** • Evidence on safety – **Moses Galukande**	
15.45 – 15.55 (10 minutes)	• Other factors to decision making Acceptability, Costs, Ethics and Human rights, Equity and Feasibility - **Sinokuthemba Xaba**	
15.55 – 16.05 (10 minutes)	Programme considerations - **Fabian Ndenzako**	
16.05 – 16.20 (15 minutes)	Questions and Answers	
16.20 – 16.30 (10 minutes)	**Wrap up - Moderator**	
End of Session 1		

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Other benefits and harms:

- STI prevention benefits
- Other services delivered with VMMC surgical intervention
- Safety by different health care cadres

Stephanie Davis MD, MPH

Medical epidemiologist

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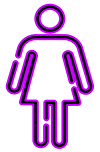
Additional benefits to women



- Reduced risk of STIs: trichomonas, bacterial vaginosis, high risk HPV types

Randomized controlled trial findings of protection from STIs for women with circumcised male partners
Source: **Adapted from Morris et al., 2019 *(56)*.**

STI	Circumcised partner versus uncircumcised partner
High-risk HPV	Incidence ratio: 0.72 (95% CI: 0.60–0.86; P=0.001)
Genital ulcer disease	Adjusted prevalence ratio: 0.78 (95% CI: 0.63–0.97)
Trichomonas vaginalis	Adjusted prevalence ratio: 0.52 (95% CI: 0.05–0.98)
Bacterial vaginosis	Adjusted prevalence ratio: 0.60 (95% CI: 0.38–0.94)

- Reduced subsequent HPV-causing cervical cancer cases and associated mortality

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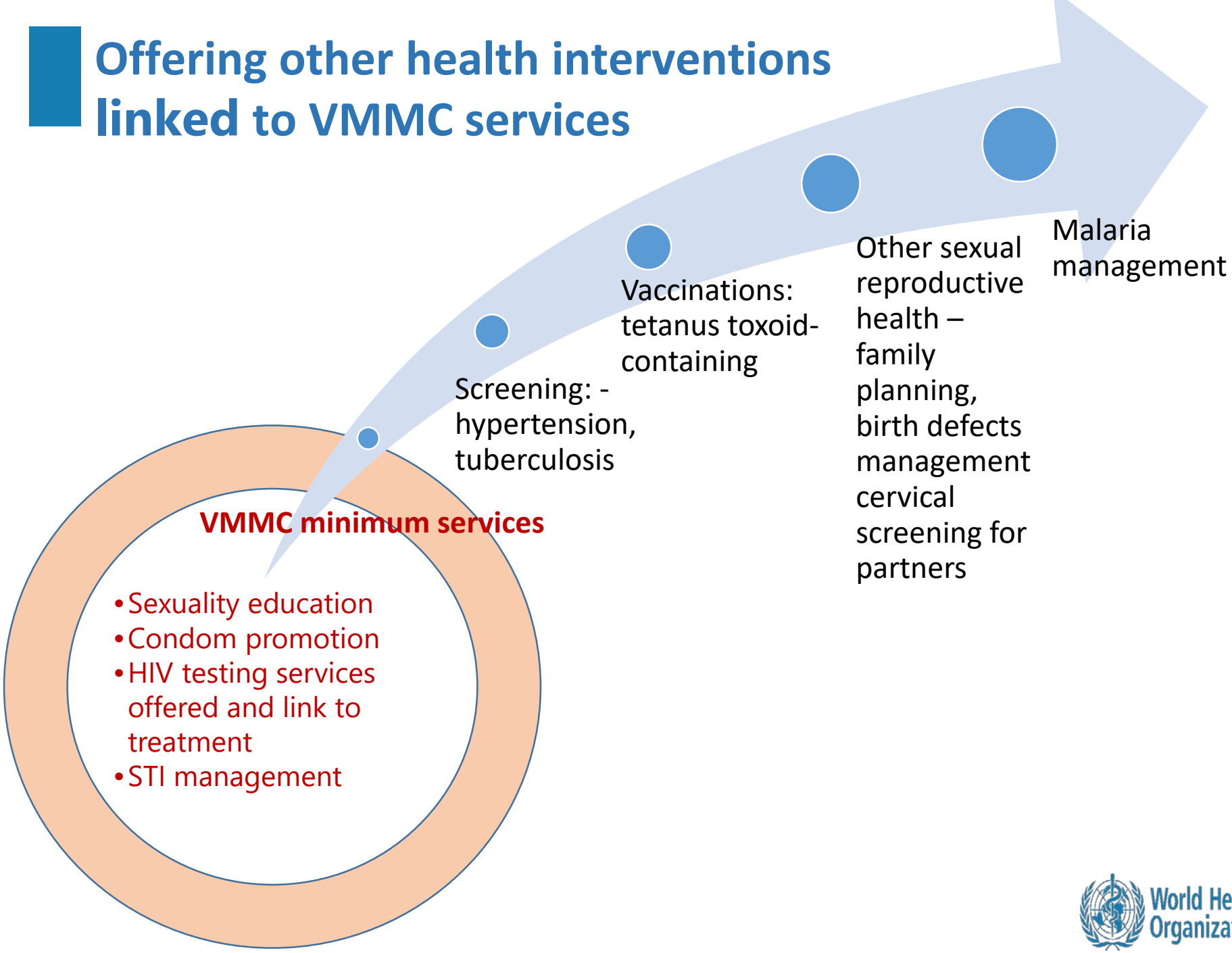
Offering other health interventions linked to VMMC services



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Safety by various cadres of health care workers

	Countries/ Settings	Study Designs	Total Client Participants	Cadres Compared or Included	Safety Findings (Physician : Non-physician)	Quality assessment: Newcastle-Ottawa score range
Comparison studies (N = 9)	Uganda, Kenya, South Africa / single and multisite, clinic and hospital, urban and rural	Prospective cohort; some research, some program data	15,759	Surgeons, physicians, medical officers, clinical officers, clinical associates, nurses	Six studies compared to physicians. None showed large gaps. Gaps favored both groups equally. Two had higher non-physician AE rates; one was statistically significant, but not among experienced workers.	5/9 – 9/9. (unspecified provider assignment method, no assessor blinding)
Non-comparison studies (N = 8)	Mozambique, Zambia, Uganda, Zimbabwe, Malawi, Rwanda, Kenya / same mix, plus rural camps	Prospective single-arm cohort; some research, some program data	4,259	Clinical officers, nurses, midwives, medical assistants, medical technicians, nurse aides	One study reported a moderate/severe AE rate >2% (standard acceptable threshold).	4/5-5/5

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Evidence on safety

Moses Galukande,
Dept of Surgery, School of Medicine and
Education and Research Unit
Makere University

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Definitions of serious, severe, moderate adverse events

- Serious: as per the WHO Technical Advisory Group on Innovations in Male Circumcision, 2014:
  - "all deaths and hospital admissions to intensive care occurring within 30 days of a circumcision procedure,
  - all cases of tetanus within 30 days of circumcision, and
  - all serious glans, penile or urethral injuries"

- COSECSA / PSI AE Guide classification
  - Severe AEs: those AEs requiring extensive intervention with referral or specialist input.
  - Moderate AEs: " neither mild nor severe, require intervention, and are usually managed on site".

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Evidence from published literature

Type of study	Number of studies	Number of countries	Moderate and severe AEs per 100 procedures (95% CI)
Randomized controlled trials	3	3 African	3.33 (2.89–3.83)
Device-based research with comparison with conventional surgical method	11	7 African	4.70 (3.43–6.29)
Small pilot implementation, fewer than 1000 clients	5	4 African and Dominican Republic	6.65 (5.68–7.73)
Pilot implementation, surveillance or retrospective reviews in routine settings with 1000 to 10 000 clients	8	5 African	3.86 (3.63–4.11)
Larger programme, routine adverse event reporting with at least 10 000 clients	4	3 African	0.22 (0.22–0.23)
All studies	31		0.30 (0.29–0.31)

Source: Jindai K, Awori Q, et al. Safety of male circumcision for HIV prevention by conventional surgical methods and age, unpublished systematic review, June 2019.

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Evidence from country monitoring systems

- WHO reports from active request 2014-2017
  - Excessive bleeding, infections and rare cases of penile/glans injuries
- WHO passive reports submitted - 2012 through 2018.
  - 18 tetanus cases
    - Significant difference by circumcision method with highest incidence among users of elastic collar compression device method
- PEPFAR Notifiable Adverse Events surveillance system: 2015-2018
  - Most commonly reported severe AEs: bleeding (42), infection (69)
  - Rare reports:
    - glans injuries (24), urethral fistulae (20), tetanus (14)
    - long-term complications: keloids (4)

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Summary on adverse events

- Reported rates of severe and moderate AEs in VMMC programmes have been at a level similar to those observed in the randomized controlled trials (pooled prevalence of 3.3%)
- Underreporting is a challenge
- Many of the main severe AEs, including infection and bleeding, are resolvable events.
- The rates of AEs may decline as programmes, quality assurance approaches and the competence of health care workers mature.
- Tetanus risk could be reduced through adequate tetanus toxoid vaccination among adolescent boys, a vaccine booster dose is recommended by WHO for all adolescents – boys and girls.

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Other factors to decision making:

Values and preferences, acceptability, ethics and human rights, equity and feasibility

Sinokuthemba Xaba
Zimbabwe Ministry of Health and Child Care

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Other factors to decision making: values and preferences

The relative importance men, women and community place on the reduced risk of HIV infection and complications of the procedure

Evidence/information

- HIV prevention and risk reduction: **valued by programmes in high burden countries and donors** for contribution to preventing HIV and associated burden and potential to reach men for other health care interventions.
- **Limited information on values of preventing HIV** from the perspective of men and women; some information on **older men in ESA indicated that higher priority concerns are** livelihood, food, sex.
- One qualitative process evaluation of a sports-based intervention noted that **older men (over 30 years) reported a lack of motivation for circumcision** because HIV testing and VMMC would make little difference at their age**.**

Judgment

Due to **limited evidence**, it is **not possible to assess** if there are any important uncertainties and variabilities in the **importance of VMMC for HIV prevention**.

The Guideline Development Group **considered the health burden of HIV to be large**. It is **important to implement effective interventions that help people to avoid this burden**.

Other factors to decision making: acceptability and feasibility

Acceptability	
Evidence/information: Men, women, community leaders, programmes, policy • To date over 23 million VMMCs have been performed, demonstrating acceptability. • Acceptability declines with age; evidence on adolescent or parental acceptability was limited. • Regional and cultural differences in acceptability. • Main drivers of acceptability were reduction of HIV/STIs risk and improved hygiene.	*Judgment*: VMMC considered acceptable in high HIV burden settings, with recognition of variation by age and culture.
Feasibility	
Scaling up to 23 million men circumcised -- 2008-2018 demonstrates feasibility in many settings. • Scale-up was a mostly vertical approach with donor support. However, integrated approaches showed positive outcomes towards sustaining services. • Scale-up challenges and barriers are specific to context and population. • Global efforts now underway to scale up adolescent services are essential and emergency surgical services present opportunities for synergies.	*Judgment:* VMMC a feasible intervention with recognition of the need for sufficient resource capacity.

Other factors to decision making: equity, ethics and human rights

Ethics and Human Rights	
Evidence/information: • **VMMC is subject to the same human rights, ethical and legal considerations of any elective procedure**, including high quality information for communities, women and men; informed voluntary consent; high quality, safe services that are monitored for adverse outcomes. • VMMC should not replace other interventions and **be provided as part of a combination prevention package**. • As a one-time intervention, **reduction in risk will continue over a lifetime.**	*Judgment*: **Ethics and human rights are essential;** overall ethical justification for VMMC as a public health initiative is dynamic and depends on different factors that can change over time, including the emergence of new HIV prevention modalities, epidemiological changes, new data on safety
Equity	
A few studies were identified that address equity. **Traditional community values, ethnic and social situation directly affect the acceptability of VMMC, indirectly affecting equity.** In one study (Tanzania) people residing in locations farther than 5-10 km from a VMMC facility were likely to be disadvantaged for post-MC follow-up.	*Judgment*: **Equity favours the one-time intervention to permanently reduce heterosexual HIV risk in men**.

Other factors to decision making: resource requirements

- VMMC is cost effective, and cost savings in many settings, within the next 5 – 10 years
- VMMC is most cost-effective in the age groups 15 - 29 years in the short and medium terms

Summary on evidence and other factors to decision making

Strongly in favor of the intervention

World Health Organization

Programme and implementation considerations

Fabian Ndenzako

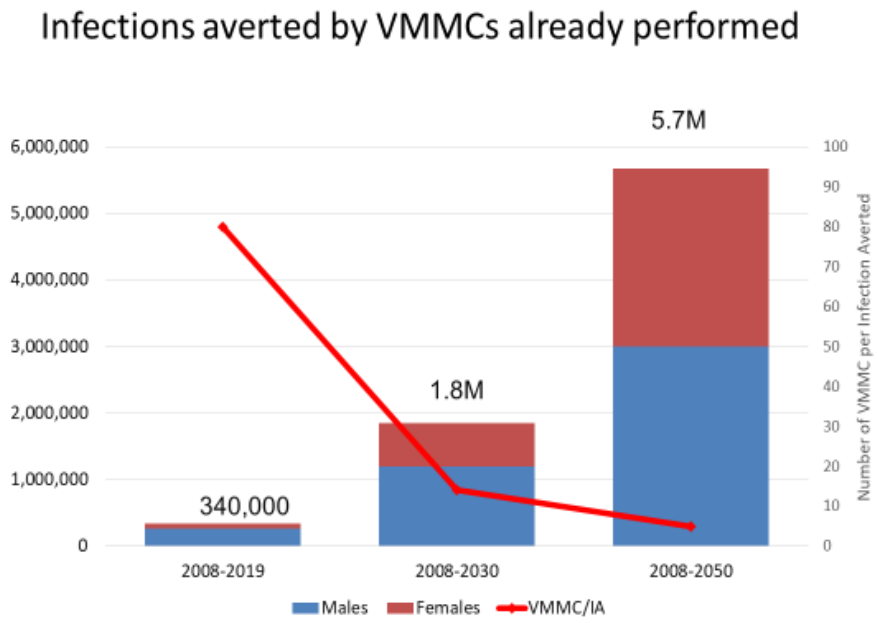
Medical Officer HIV prevention and treatment

WHO AFRO

World Health Organization

VMMC remains an important intervention for HIV prevention and epidemic control in East and Southern Africa

- Evidence is high quality, consistent
- More details in guideline
- Estimates from modelling are available as a additional recorded presentation
  - shown here: estimates of HIV infections averted by VMMCs performed through 2019; impact will grow over time



Source: GAM; and modeling analysis by Avenir Health

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Populations and services for HIV prevention in East and Southern Africa

Reaching 2030 HIV incidence goals and then keeping HIV incidence at low levels requires the right combination of effective prevention interventions at high levels of coverage

- VMMC: an important strategic point of contact with health services for men.
- Reaching men at higher risk of HIV infection Higher risk men include:
  - men attending STI clinics
  - men in certain occupational groups with historically high HIV infection rates, such as migrant workers, uniformed services, fisherfolk and truck drivers.
  - serodiscordant couples
- For ongoing scale-up, governments must continue to lead in advocacy, strategic planning, coordinating across relevant ministries and sectors and other partners.

Populations and services for HIV prevention

- VMMC services should continue to include minimum service package
- VMMC service provision should be used as an opportunity to address the sexual health needs of men and to offer locally relevant noncommunicable disease interventions.
- Policy-makers and programme managers also could consider ways that VMMC programming can address gender norms that are harmful for men and women and gender-based violence.
- Safety monitoring should be improved, including promoting learning and response systems on adverse events at all levels

Training and communication on VMMC

Health care workers need sufficient training to clearly convey key messages such as these:

- VMMC does not provide full protection from HIV infection, but it does contribute, along with other protective measures, to reducing the risk of HIV infection.
- Men who resume sexual activity before wound healing may be at higher risk of HIV infection.
- Men who have HIV and are not virally suppressed on ART are at higher risk of infecting their sexual partners if they resume sex before the circumcision wound is fully healed.

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Preventing harm

- In settings where female genital mutilation takes place, the message that medical male circumcision is very different from female genital mutilation needs emphasis.
  - FGM has serious adverse effects on the health of women and on obstetric outcomes. Unlike male circumcision, female genital mutilation has no demonstrated medical benefits, and it harms girls and women in many ways

- Programme managers and policy-makers have an ethical obligation to monitor and minimize the potential for harms resulting from misunderstanding or misrepresentation of VMMC for HIV prevention.

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Research needs on HIV prevention with VMMC

To inform programming, service design and service delivery, research is needed to:

- measure the impact and contribution to HIV prevention of VMMC within combination prevention services, taking account of ART's secondary prevention effect;
- assess the effect of VMMC in reducing other STIs and cervical cancer;
- assess and understand more broadly men's values and preferences concerning HIV prevention, including its importance, relative to their life situations;
- better understand policy-makers', communities' and individual's perspectives on VMMC for HIV and STI prevention.
- assess feasibility, cost, and effectiveness of expanding other services for men provided along with VMMC services.

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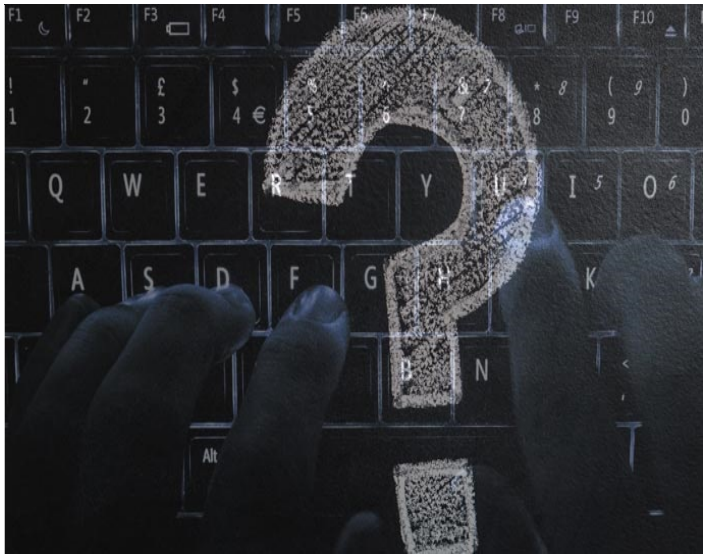
Questions or comments?

YOUR FEEDBACK REQUESTED

TYPE IN CHAT WINDOW NOW

1. **Would you like more information on any of the topics covered today? Please specify.**

2. **Would additional technical resources or tools assist you in implementing VMMC to reflect these updates? Please specify.**



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Wrap up
Frank Lule