Conclusion and Recommendations

Summary

The World Health Organisation recommends male circumcision for HIV prevention in priority African countries on the basis of clinical trials finding 50–60% reduced female-to-male transmission [1-3]—with considerable controversy (see Background). Since the WHO recommendation in 2007, a range of research and policy developments have occurred which challenged the basis for the intervention on scientific [4-6], clinical [7,8], epidemiological [9,10], and ethical and human rights grounds (Section I). With respect to nontherapeutic circumcisions performed on children, a range of medico-legal developments have occurred between 2010 and present that have made the intervention increasingly controversial on the global stage. Local opposition to genital cutting practices in Africa, too, is longstanding. Contrary research and on-the-ground observations regarding circumcision for HIV prevention, compounding for more than a decade, have yet to reach the fore.

In light of the polarising nature of the intervention, the wide variety of expert opinions, and the range of stakeholders involved, the global health community is unlikely to reach a consensus on male circumcision for HIV prevention. However, the well-documented health and human rights complications on the ground—and a burgeoning African resistance movement—can no longer be ignored.

This Report presented the mass circumcision controversy from an African point of view, providing a rare view into VMMC experiences as presented to Ugandan and Kenyan researchers without Western interference. Its findings were grouped into three categories: involuntary circumcision (Section I), sexual impact (Section II), and behavioural and HIV impact (Section III) within VMMC-affected communities. Each category is summarised below, with proposed solutions.

I. Involuntary circumcisions

In targeting traditionally non-circumcising communities, the VMMC campaign has relied on coercive demand creation and recruitment strategies including government and media pressure and the deliberate targeting of boys below the legal age of consent. Quota-based incentives are reported to encourage unethical recruitment practices. Mass circumcision programmes performed on unwilling schoolchildren, and unlawfully without parental consent, are documented, with associated human rights concerns. African cultural opposition, including conceptions of medical male circumcision as an American practice in conflict with African tribal belonging and heritage, is also documented, with associated human rights objections. Involuntary VMMC recruitment practices present significant ethical challenges that remain unaddressed.

Proposed solutions:

• Eliminating quota-based incentives for mass circumcision.
• Restricting VMMCs to consenting adults.
• Establishing consequences for circumcisions performed without lawful consent.
• The provision of an auditing council for circumcision programmes targeting vulnerable groups.
• The provision of a monitoring system for consent forms.
• The addition of a “right to refuse” clause to the informed consent process.
• Built-in resources for victims of unlawfully performed circumcisions.
• A policy of cultural sensitivity for members of traditionally non-circumcising minority groups, with alternative HIV-preventive solutions provided to these communities.

II. Sexual impact

Although there is no singular African viewpoint on medical male circumcision, the VMMC Experience Project has uncovered a significant subset of men who report sexual complications—sensitivity loss, scarring, and erectile pain—and regret following participation in the campaign, and surrounding allegations of a lack of informed consent.

Proposed solutions:

• Amending the informed consent process to include possible adverse effects:
  o Adding the functions of the foreskin (Section II).
  o Adding information on reported sexual changes from male circumcision as possible complications.
Both positive and negative sexual consequences should be included for participants to make an informed choice.\(^1\)

- Restricting VMMCs to consenting adults.
- Prioritising educational models for HIV reduction.

### III. Behavioural and HIV impact

Post-circumcision risk compensation—with subsequent increased HIV incidence—has reached major news headlines in most VMMC target countries (Appendix D), is increasingly affirmed by Ugandan politicians, and is well documented in the VMMC Experience Project’s investigation. Reported risk compensation factors following circumcision for HIV prevention included decreased condom use, increased number of sexual partners, and increased sexual violence against women resulting from a false sense of HIV protection.

**Proposed solutions:**

- A thorough VMMC/EIMC policy review and revision.\(^2\)
- Further research into condom durability in SSA (see preliminary evidence from Kenya, Section III: Box C).
- Differentiating between HIV prevention and risk reduction via the Three Tier System.
- Reserving VMMC services for men who choose to be circumcised, and rechanneling remaining funds into Tier 1 and 2 interventions (prevention and prophylaxis).
- A gradual phasing out of VMMC/EIMC as a primary intervention strategy, beginning with the elimination of child circumcisions and “demand creation” sensitisation.
- A re-emphasis on HIV transmission education, particularly in rural communities.

**Three Tier System**

Numerous biomedical developments have occurred in the decade following VMMC roll-out, creating a need to rank and organise the solutions into actionable items on the global AIDS agenda. A Three Tier System (TTS) is proposed for the following purposes:

- To categorise the growing list of HIV-preventive solutions.
- To establish a hierarchy of primary, secondary, and tertiary (supplementary) interventions.
- To clarify the uses and limitations of preventive measures.
- To mitigate semantic confusion surrounding “partial protection” and “reduced chances” that puts African health and lives at risk (Section III).
- To differentiate between prevention and risk reduction for at-risk communities.
- To make interventions understandable to donors and stakeholders.

An elaborated TTS is presented in **Table 1**.

#### Tier 1: Prevention

Tier 1 HIV solutions take the prevention of viral exposure as the top priority in the global AIDS response. Two subcategories are proposed: barrier methods, including a continuation of ABC behavioural strategies with improved condom durability; and viral load reduction in the form of antiretroviral therapy (ART). Tier 1 solutions are responsible for the encouraging downward trend in HIV incidence that was occurring throughout eastern and southern Africa before VMMC roll-out, and should be restored as primary intervention strategies until a vaccine becomes available.

#### Tier 2: Prophylaxis

Tier 2 solutions include those which prevent viral transmission during or following exposure to HIV. These solutions should be available as a backup strategy to Tier 1 priority interventions, with a carefully revised policy for informed consent surrounding the limitations and possible consequences, including risk compensation, that may result from their use. Tier 2 interventions include pre- and post-exposure prophylaxis (PrEP and PEP).

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\(^1\) Positive sexual outcomes attributed to medical male circumcision include improved hygiene, cosmetic benefits, and longer duration before ejaculation. Negative outcomes include sensitivity loss, motility loss, scarring, erectile pain, loss of lubrication, and increased vaginal abrasion. See **Section II**.

\(^2\) A VMMC/EIMC policy revision is proposed to include the locally documented adverse behavioural and HIV consequences of mass circumcision (Section III), newer research developments into foreskin langerin as a barrier to HIV-1 [4-6] (possible clinical implications at [7]), and the newer advent of pre- and post-exposure prophylaxis (PrEP and PEP) as more efficacious alternatives.
Table 1. Three Tier Solution for HIV reduction

<table>
<thead>
<tr>
<th>Tier 1: Prevention</th>
<th>Means</th>
<th>Priority</th>
<th>Comprehensive?</th>
<th>Methods</th>
<th>Efficacy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prevention of viral exposure</td>
<td>Primary intervention</td>
<td>Yes</td>
<td>Barrier</td>
<td>Durable condoms</td>
<td>75% [15]</td>
</tr>
<tr>
<td>Viral load reduction</td>
<td>Antiretroviral therapy (ART)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oral emtricitabine &amp; tenofovir</td>
<td>Oral tenofovir</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Post-exposure prophylaxis (PEP)</td>
<td>Combination ART</td>
<td>96% [17]</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tier 3: Risk reduction</td>
<td>Supplementary measures</td>
<td>Available by request</td>
<td>No</td>
<td>Microbicide</td>
<td>27–31% [18,19]*</td>
</tr>
<tr>
<td>Vaginal ring (dapivirine)</td>
<td>Surgical</td>
<td>Medical male circumcision</td>
<td>50–60% [1-3]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mucosal immunity</td>
<td>&gt;10 minute delayed washing for uncircumcised men</td>
<td>87% [7]**</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Third trial in progress.
**Results from a clinical study [7]; randomised trials indicated.

Tier 3: Risk reduction

Tier 3 HIV solutions, including vaginal microbicides, medical male circumcision, and “wait and wash” for uncircumcised men (see Future Research: Immune defences, p. 76), are classified as supplementary measures for HIV prevention. Funding should be allocated for men and women who choose these services; however, they should not be viewed as primary intervention strategies.

At-risk men and women must be continually reminded through empowering messaging that HIV infection can be avoided (Tier 1) and prevented (Tier 2) through active measures, with a subsequent de-emphasis on the rhetoric of “reduced chances.” To that end, Tier 3 solutions are proposed as a lower priority category, with services to remain available by request.

Education and outreach

The VMMC Experience Project’s investigation uncovered a wave of reports of inadequate or nonexistent youth education on HIV transmission and prevention in rural Uganda and Kenya. Intensive HIV education is needed to increase uptake of all TTS interventions. A comprehensive HIV education should target school-aged adolescents on a repeated basis, and should focus on infection as actively avoidable (Tier 1) and preventable (Tier 2), with additional supplementary measures available by request (Tier 3).

Transition

VMMC and EIMC funding and human resources should be rechanneled into priority Tier alternatives to minimise impact to stakeholders, particularly in low-income areas.
Future Research

The VMMC Experience Project proposes the following as areas for future research.

Condom durability

Reports of condom non-durability and leakage emerged incidentally in the Project’s investigation, particularly in rural Kenya. In his final statement with advice to donors, Samson Dambroka, age 29, implored: “The strong condoms should come.”

Reports of inferior condoms were corroborated in a live demonstration of water leakage from condoms purchased in Nairobi by Kennedy Owino Odhiambo in Berlin (Section III: Box C).

Further research is urgently needed into condom manufacturing, storage temperatures, and subsequent effects on durability, as well as the scope and affected locations of the reported problem.

Immune defences

Future research should focus on immunotherapy to end HIV infection. In particular, the antiviral role of genital mucous membranes has tremendous implications for future policy as well as vaccine development.

Promising research developments into antiviral mechanisms utilising the immune system, including improved understandings of the mucosal immunity of foreskin and vaginal fluid against HIV infection, have already been reported [6]. At least two antiviral proteins produced in the foreskin—langerin [4,5] and lysozyme [11,12]—are known to be efficacious against HIV-1. The mechanism by which foreskin Langerhans cells utilise langerin to capture and eliminate HIV-1 in Birbeck granules is well described [4,5,13]. More recently, peripheral neurons at the genital mucous membranes, including the foreskin, were found to produce a compound which increases langerin expression and thereby HIV elimination through Langerhans cells [14]. Study authors described the effect as a “positive feedback mechanism” against HIV infection at the genital mucous membranes, with attendant implications for HIV immunotherapy in uncircumcised men and women.

Mucosal immune defences could translate to lower HIV incidence in uncircumcised men when post-sex bathing is delayed. In a large-cohort study into the role of hygiene on HIV transmission to uncircumcised men, participants who waited more than 10 minutes to bathe after sex had 87% lower HIV incidence relative to the majority who bathed immediately [7]. Study authors attributed the antiviral effect of delayed washing to the acidity of vaginal fluid left on the penis; however, the more plausible role of mucosal defences (in both foreskin and vaginal fluid) warrants further study.

An improved understanding of mucins and mucous in breastmilk as beneficial to infant immunology was instrumental in shaping the WHO’s policy in favor of breastfeeding. The VMMC Experience Project is hopeful that further research into the mucosal defences of the genital mucosa will similarly translate into an improved HIV-preventive policy, as well as enable vital research into immunotherapy and vaccine development.

Wait and wash

A large-cohort study (n=2,522) into the role of personal hygiene on HIV transmission among uncircumcised men found that those who waited more than 10 minutes to bathe after sex had 87% lower HIV incidence relative to the majority who bathed immediately [7].

The VMMC Experience Project calls for additional clinical studies to corroborate the efficacy of the “wait and wash” method for HIV reduction in uncircumcised men, with precise time intervals added to assess efficacy beyond the 10-minute mark.

The previously described clinical findings, coupled with new research developments into the mucosal defences of foreskin langerin against HIV [4-6], present compelling reasons for randomised controlled trials into the “wait and wash” method for risk reduction among uncircumcised men. However, expectations of protection from this method would be likely to introduce confounding risk compensation behaviours unless the trials can be adequately blinded (i.e. by concealing research motives). Moreover, because mucosal immune defences to HIV are only relevant to unprotected sex, it would be ethically unacceptable to conduct such trials. For these reasons, we propose further large-cohort studies into HIV incidence with respect to the hygiene habits that already exist in uncircumcised men, controlling for potentially confounding variables, in lieu of randomised trials. Should further results prove consistent, we propose “wait and wash” as the most effective Tier 3 supplementary intervention to pair with priority Tier interventions until a vaccine becomes available.
Immunisation

Vaccines are critical to provoking immune defences, and this is especially pertinent to HIV as a virus which targets the immune system. A final solution to HIV is likely to work with the immune system’s defences rather than remove them.

A high mucosal immunity score at the inner foreskin and vagina is associated with HIV protection. Further research into the mechanisms by which the immune system already provides limited protection against HIV infection at the mucous membranes could allow vaccine developers to boost and accelerate these mechanisms in order to provoke a robust immune response.

To that end, the VMMC Experience Project is concerned that mass male circumcision may ultimately prove an impediment to vaccine development and immunotherapy. In particular, circumcision for HIV prevention hinges on the removal of the foreskin’s immunological cells, including Langerhans cells, to prevent infection at the point of entry. The Project is concerned that should an immune response against HIV become available, those who are missing this portion of the immune system will be at a significant disadvantage. For this reason, we propose a gradual reduction in circumcisions in favor of research and development into an immune response to HIV.

At minimum, a long-term HIV-preventive strategy must preserve the capacity for an immune response at the site of infection.

African experiences

In light of the VMMC Experience Project’s work and mission, we call for support and funding into authentic locally organised research projects into VMMC experiences and complications without Western interference. Affected communities deserve attention and representation within the public health sphere.
References


Figure 1. Condom distribution by the VMMC Experience Project in Namayingo District, Uganda. 10 January 2019.


