Findings from three randomised controlled trials in South Africa, Kenya and Uganda have shown the efficacy of medical male circumcision in reducing HIV transmission risk among men when engaging in vaginal sex. These results led to a recommendation from the World Health Organization calling for immediate scale-up of Voluntary Medical Male Circumcision (VMMC) in high HIV-prevalence settings to 80% coverage among men aged 15-49. South Africa, with an astounding 6.4 million people infected with HIV and medical circumcision coverage of only 18.6%, has been identified as one of 14 priority countries in east and southern Africa targeted for scale-up. This chapter reviews the current situation regarding VMMC in South Africa, including progress in achieving scale-up, the complexities of rolling out such an intervention, demand creation, and supply-side issues such as costs and resource availability to achieve coverage. The chapter also examines issues related to integrating safe medical circumcision into traditional practices. Finally, we look at the implementation of the intervention going forward, including new technologies for non-surgical circumcision, possible targeting strategies for maximum cost-effectiveness, and the integration of VMMC in a wider range of HIV prevention and treatment services being rolled out in the country.
Introduction

Voluntary Medical Male Circumcision (VMMC) was first proposed as an HIV prevention intervention for men over a decade ago based on observational data. These initial observational studies showed a link between circumcision and low HIV prevalence. Three randomised controlled trials (RCTs) have confirmed the effectiveness of VMMC as a biomedical prevention intervention for the reduction in HIV risk acquisition in men. The first RCT to test for efficacy of VMMC was conducted from 2002 to 2004 in Orange Farm, a high HIV prevalence site near Johannesburg, South Africa. This trial, along with the two subsequent RCTs in Kenya and Uganda, demonstrated that VMMC reduces the risk of HIV infection for men by up to 60% and additional studies have found that VMMC offers durable protection, with prevention benefits documented five years after VMMC. Observational data have revealed plausible biological reasons as to why the removal of the foreskin would reduce the risk of HIV acquisition in men. The foreskin has the tendency to develop epithelial disruptions, or tears, during intercourse, which may allow HIV a portal of entry and compared with the tissue of the outer foreskin, the foreskin’s HIV target cells (Langerhans cells with CD4 receptors) are closer to the epithelial surface.

In response to these findings, in 2007 the Joint United Nations programme on HIV/AIDS (UNAIDS) and the World Health Organization (WHO) published recommendations supporting Voluntary Medical Male Circumcision (VMMC) as an HIV prevention strategy among young boys, adolescents and adult men in countries with generalised heterosexual epidemics, high prevalence of HIV and low levels of circumcision. Recommendations from modellling studies showed that scaling up VMMC to 80% in men aged 15–49 within five years would avert over a million HIV infections in South Africa alone. VMMC is also seen as a highly cost-effective HIV biomedical intervention strategy. More recently, the UNAIDS investment framework, a strategy for investing resources in key programmatic activities to achieve an impact on new HIV infections (2011–2020), sees VMMC as a core value-for-money activity in programmatic activities to achieve an impact on new HIV infections and low levels of circumcision. Recommendations from modelling studies showed that scaling up VMMC to 80% in men aged 15–49 within five years would avert over a million HIV infections in South Africa alone. VMMC is also seen as a highly cost-effective HIV biomedical intervention strategy. More recently, the UNAIDS investment framework, a strategy for investing resources in key programmatic activities to achieve an impact on new HIV infections (2011–2020), sees VMMC as a core value-for-money activity in the context of declining international development assistance. As an additional indicator of effectiveness, a series of costing studies in the southern African region have shown that VMMC is not only highly cost-effective, but after 15 years will save over US$16 billion if scaled up to 80% within four years and maintained into the future.

Although findings from the three RCTs showing a protective effect for men against HIV infection have been widely accepted, a number of concerns have been raised regarding the scale-up of VMMC programmes in the “real” world. These include the effectiveness of VMMC for reducing HIV transmission outside of controlled clinical trial settings, the impact of widespread VMMC on women, as well as the negative impact of risk compensation following VMMC. These concerns need not negate the advocacy for VMMC as a prevention tool for inclusion in the HIV response, but do highlight the importance of careful consideration of the manner in which the intervention is scaled up, as well as much-needed evidence for assessing context-specific effectiveness.

Policy, targets, performance and demand for VMMC

South Africa has set an ambitious target of 4.3 million VMMCs by 2016 to achieve an impact on the HIV epidemic. This is due to the high HIV prevalence rate of 12.2% with a total of 469 000 new infections recorded in 2012. The South African VMMC programme is led by the National Department of Health (NDoH) and supported financially by a number of international donors (e.g. US President’s Fund for Emergency AIDS Relief – PEPFAR, the Global Fund to Fight AIDS, Tuberculosis and Malaria – GFATM; WHO and the World Bank). An implementation plan for the scale-up of the VMMC programme in South Africa (2011–16) has a number of objectives, including increasing access to VMMC services across the country, focusing on the establishment of high-volume sites and capacity-building; integrating safe medical circumcision into traditional practices; incorporating VMMC in an integrated package of health services, and increasing demand for circumcision through media and social mobilisation.

Table 1 shows the breakdown of provincial targets set out in the plan.

Table 1: VMMC targets per province 2011/12 – 2015/16

<table>
<thead>
<tr>
<th>Province</th>
<th>2011/12</th>
<th>2012/13</th>
<th>2013/14</th>
<th>2014/15</th>
<th>2015/16</th>
</tr>
</thead>
<tbody>
<tr>
<td>EC</td>
<td>27 585</td>
<td>33 102</td>
<td>33 102</td>
<td>55 171</td>
<td>181 248</td>
</tr>
<tr>
<td>FS</td>
<td>33 634</td>
<td>40 361</td>
<td>40 361</td>
<td>67 268</td>
<td>107 629</td>
</tr>
<tr>
<td>GP</td>
<td>115 701</td>
<td>138 841</td>
<td>138 841</td>
<td>231 401</td>
<td>370 242</td>
</tr>
<tr>
<td>KZN</td>
<td>145 688</td>
<td>174 826</td>
<td>174 826</td>
<td>291 377</td>
<td>466 203</td>
</tr>
<tr>
<td>LC</td>
<td>18 571</td>
<td>22 285</td>
<td>22 285</td>
<td>37 142</td>
<td>59 426</td>
</tr>
<tr>
<td>MP</td>
<td>41 719</td>
<td>50 063</td>
<td>50 063</td>
<td>83 439</td>
<td>133 502</td>
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<tr>
<td>NC</td>
<td>16 308</td>
<td>19 569</td>
<td>19 569</td>
<td>32 615</td>
<td>52 186</td>
</tr>
<tr>
<td>NW</td>
<td>42 279</td>
<td>50 735</td>
<td>50 735</td>
<td>84 557</td>
<td>135 291</td>
</tr>
<tr>
<td>WC</td>
<td>58 515</td>
<td>70 218</td>
<td>70 218</td>
<td>117 030</td>
<td>181 248</td>
</tr>
<tr>
<td>National</td>
<td>500 000</td>
<td>600 000</td>
<td>600 000</td>
<td>1 000 000</td>
<td>1 600 000</td>
</tr>
</tbody>
</table>

Achievement of the 80% target coverage hinges upon acceptability and demand creation. More specifically, demand creation activities to increase VMMC coverage aim to influence attitudes, perceptions and behaviours, to increase general social acceptability and individual uptake.22

While acceptability of male circumcision in southern Africa was found to be around 60% among uncircumcised men and women, this figure is likely to vary considerably depending on religion, culture and other attitudes and perceptions in different population subgroups.23, 24 In 2012, fewer than 40% of uncircumcised men in South Africa indicated that they would consider undergoing circumcision.17 Demand for VMMC, however, varies by age group. In the 15–24 age group, almost 60% indicated that they would consider VMMC, compared to 37.1% in the 25–49 age group and 11.7% of those over 50 years of age.17 Demand for circumcision has been increased through effective communication programmes. In 2012, The National Communication Survey estimated that about 47% (from 9% in 2009) of men and women had knowledge of the protective benefits of VMMC against HIV infection.25

There are numerous individual and community-level factors that can affect demand for VMMC. Some of the individual barriers to the demand for male circumcision (MC) include: fear of pain during and after the surgery; concern about the long healing period; financial and opportunity costs; fear of adverse events and complications relating to the procedure; perceptions about the benefits to the individual; perceptions about HIV and STI risk because of age and sexual activity; and personal preferences. Other factors also contribute to difficulties in creating demand for VMMC.26-29 Community-level factors include a lack of cultural acceptability and poor integration of traditional and medical circumcision practices.30 The main stimuli for VMMC demand seem to be health reasons,8 peer pressure and the influence of female intimate partners.29

Strategies to increase MC uptake

There are many challenges in implementing HIV prevention interventions on a large scale, especially considering the inherent complexities of the epidemic, as well as the social and economic contexts in which these interventions are rolled out. More particularly, in considering VMMC scale-up, the following important issues need to be considered in closing the gap between evidence and practice:

➢ VMMC communication strategies to create awareness and increase acceptability in uncircumcised men and minimise risk compensation in circumcised men;
➢ the role of traditional male circumcision;
➢ the supply of healthcare resources
➢ non-surgical circumcision; and
➢ neonatal and infant circumcision.

VMMC communication strategies, and minimising risk compensation

Current VMMC communication strategies have included mass media campaigns, billboard messages, print material, interpersonal recruitment, and edutainment.28,30,31 Despite a high level of exposure to VMMC messaging, Peltzer and Mlambo note that this does not necessarily translate into acceptability or uptake of VMMC.32 Two common problems inherent in these campaigns are inadequate messaging tailored to specific contexts28 and a lack of systematic integration of VMMC into HIV prevention messages.32 Moreover, identified barriers to VMMC include fear of HIV testing that precedes circumcision, concerns about adverse effects (e.g. lack of sexual pleasure),26, 27 transport costs,28 time off from work,28, 33 temporary sexual abstinence and unsupportive cultural norms.34 These barriers need to be adequately addressed in any communication strategy.

Evidence suggests that interpersonal communication, such as support from peers and intimate partners, is often central to a man’s decision to undergo VMMC.35 Demand creation activities need to be designed with the specific contexts and demographic characteristics of the targeted population in mind.22

In addition to targeted approaches, social mobilisation may be central to increasing demand and acceptability of VMMC. Organisations in South Africa, such as Brothers for Life and Soul City, are devoting considerable time and resources to researching the best communication strategies for this purpose, and these campaigns are continually developing to reach and influence as many people as possible with accurate information and effective messaging.30,31

VMMC efforts have often neglected the gender dimension and focused on men only. In a multi-country (Kenya, Namibia, Swaziland, South Africa and Uganda) study by AIDS Legal Network (ALN), 87% of the women said that they would support the introduction of VMMC in their communities, 74% would want to be involved in VMMC decision-making with their partners, and 72% were aware of the partial protection that VMMC offers.36 This study also showed that women’s involvement in VMMC programmes and policy development is low in the five countries. The majority of women surveyed did not talk to their partners about circumcision and felt it was ultimately a man’s decision to undergo circumcision.36 The findings indicate that women’s involvement in VMMC is shaped by the existing socio-cultural prescriptions on sexuality and health. As regards the South African data, findings were mixed.36 In a VMMC programme running in Gauteng Province, women felt that even though they were engaged with their male partners, the extent to which they affected the actual decision for men to be circumcised remains questionable.28

Risk compensation is a major concern relating to male circumcision. Risk compensation or sexual disinhibition is “the phenomenon whereby those who have taken protective steps offset the benefit with risk-related behavioural changes”.37 In the case of VMMC, the protective effect of the circumcision may be negated by engaging in risky sexual practices, for example: decreased condom use, increased number of [concurrent] partners, etc. This issue of sexual disinhibition may be especially relevant for young and sexually active populations in high HIV-prevalence areas. Data from the three RCTs suggest that in Uganda, participants did not report risk compensation.38 The South African RCT found an increase in the number of sexual encounters, but importantly, not an increase in the number of partners, and the Kenyan trial found a reduction in the number of sexual partners and increased condom use among both circumcised and uncircumcised men.38 While risk compensation may not have been a major issue under trial conditions because of high-quality motivational counselling, one cannot assume the same outcomes in the context of “real-world” VMMC scale-up. With VMMC services being increasingly promoted and offered, it is important to monitor for risk compensation.39 A study on male
circumcision among men in South African townships showed no real-world risk compensation. However, women’s anxiety about circumcised men’s sexual behaviour was evidenced in a study in KwaZulu-Natal among women attending tertiary institutions. While women were aware of the partial protective benefits of VMMC, some were concerned that VMMC could actually increase their risk of acquiring HIV because of behavioural disinhibition amongst circumcised men. In this study, VMMC was perceived as a threat rather than a protective factor against women being infected with HIV. According to Bailey et al., risk compensation may be addressed and minimised with appropriate education and condom promotion. Communication strategies are therefore important, to ensure that men who have been circumcised are aware of the limited protective effect of VMMC and that they should continue to be sexually responsible. VMMC promotion and advertising should not only focus on the benefits of circumcision, but importantly, on the fact that circumcision does not offer full protection from HIV infection.

Risk compensatory behaviour will ultimately influence the level of risk to which women are exposed, as circumcision does not protect females from HIV infection. Hallett et al. indicate that risk compensation could lead to more women being infected with HIV, and project that a 90% decrease in condom use by men following circumcision will result in a 40% increase in HIV incidence in women. However, looking at the long-term effect of circumcision, over time, MC would probably protect more women than nearly any other HIV prevention strategy. The paucity of literature on motivations for men undergoing circumcision, as well as the dearth of studies documenting sexual practices of circumcised males, needs to be addressed in future research.

The role of traditional male circumcision

In South Africa, the majority of circumcisions are of a traditional nature. The national prevalence of circumcision was recorded as approximately 38.5% of men in 2002, with most of these circumcisions taking place in non-medical settings, often after sexual debut. In 2012, this figure had increased with an estimated 46.5% coverage of circumcision among men. However, only 18.4% of men were medically circumcised.

Figure 1 shows that, while traditional MC prevalence has been much higher than medical circumcision over the three survey periods (2002, 2008, 2012), traditional circumcision varies by ethnic group and province. Among the Xhosa, Pedi and Venda, traditional MC is practised widely, with the Sotho, Ndebele and Shangaan practising MC moderately and the Zulu, Tswana and Swazi rarely practising MC. As a result, traditional MC prevalence is considered to be high in the Eastern Cape (74%) and Limpopo Province (72.6%), and low in the Northern Cape (20.3%) and KwaZulu-Natal (23.2%).

In circumcising communities, MC is seen as a socio-cultural practice and rite of passage to manhood and the procedure is usually performed on young men in a non-clinical setting by a traditional provider. Some 10 000 Xhosa men are traditionally circumcised annually in the Eastern Cape. Amongst men who self-report as being circumcised, the foreskin is only partially removed. However, there is no evidence that incomplete removal of the foreskin reduces the risk of HIV infection.

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*MC prevalence estimates based on self-reporting may be misleading, as men may falsely report being circumcised.*

Figure 1: Trends in adult male self-reported circumcision by type of circumcision, South Africa 2002, 2008 and 2012

Clearly, the established practice of traditional MC has posed challenges within the context of scaling-up VMMC. Peltzer et al. noted that when VMMC is performed as part of the process of traditional initiation into manhood, a number of acceptability problems have been reported, notably those that relate to the visible physical differences between VMMC and traditional circumcision. For example, Xhosa initiates reported mixed attitudes towards combining medical circumcision with traditional circumcision. The majority of initiates suggested that there was stigma associated with being medically circumcised.

Compared to medical circumcision, traditional MC increased the risk of complications. Serious clinical complications and a considerable number of deaths have been reported from traditional circumcisions carried out on adolescents. Between 2001 and 2006, 2 262 hospital admissions, 115 deaths and 208 genital amputations were recorded as a result of traditional circumcision. The Eastern Cape has been associated with botched traditional circumcisions, with 853 boys having died since 1995. As a result of the high risk of complications, traditional practitioners are now required to be registered with the Provincial Department of Health.

In 2001, a law regulating traditional MC was passed in the Eastern Cape. The objectives of the Application of Health Standards in Traditional Circumcision Act (Eastern Cape) No. 6 of 2001 are to provide for the observation of health standards in traditional circumcision; the issuing of permission for the performance of a circumcision operation; and permission for the operation of initiation schools. Medical Officers appointed by the Provincial Department of Health issue permits to traditional circumcisers. Peltzer et al. noted significant reductions in the severity of adverse effects of traditional circumcision if the traditional provider was a registered practitioner.

There is some optimism that VMMC in South Africa could be integrated into traditional circumcision practices. There have been examples of success, notably in Limpopo Province where there is evidence of integration of VMMC into traditional circumcision resulting in general practitioners conducting circumcisions at...
initiation schools. However, in general, there is little evidence to show the level of involvement of traditional leaders in demand creation activities and whether these leaders are willing to advocate for VMMC instead of traditional circumcision practices.

Integrating VMMC and traditional circumcision practices in South Africa will be no small challenge, but support from leaders at all levels – especially traditional and religious leaders – will go a long way to improving the coverage of VMMC. For example, in KwaZulu-Natal at the end of 2009, the Zulu King Goodwill Zwelethini voiced his support for VMMC among Zulu men, who do not usually practise circumcision. This kind of support is necessary to help decrease stigma and objections to VMMC based on cultural, religious or ethnic identity. Internationally, VMMC experiences in Kenya have shown that early engagement of traditional leaders from non-circumcising communities can facilitate the uptake of VMMC.

The supply of healthcare resources

The success of the scale-up of VMMC in priority countries is directly attributed to the supply of healthcare resources. Supply-side issues include limited access to facilities that provide circumcision in high prevalence areas and limited human resources for health. In order to increase coverage, the NDoH plans to increase the number of VMMC sites from 460 to 508 during 2013/14.

One innovative intervention to increase both supply and demand currently being rolled out in South Africa is provision of VMMC at mobile clinics, which are fully equipped to adequately perform VMMC procedures. However, human resources for VMMC are a particular problem because of the inadequate production and poor retention of appropriately trained healthcare personnel, as well as the mismatch of needs and skills of the healthcare professionals, especially for HIV programmes. WHO recommendations for implementing Models for Optimising Volume and Efficiency (MOVE) suggest increased efficiency and effectiveness of services will be achieved through task-sharing, task-shifting, diathermy for haemostasis and prepackaged surgical instruments. MOVE was first developed and implemented in Orange Farm, South Africa, in the Bophelo Pele Male Circumcision Project which began in 2007. Since the release of the WHO guidelines in 2010, MOVE (or elements of this model) has been adopted by most of the priority countries in the east and southern African region. In South Africa, NGOs such as Anova Health, the Centre for HIV/AIDS Prevention Studies (CHAPS), and Maternal, Adolescent and Child Health (MatCH) have begun to implement MOVE in their circumcision programmes throughout the country. The South African government is also incorporating elements of MOVE into the national VMMC programme. Although there is no official policy on task-shifting, the NDoH has consulted with the South African Nursing Council and permission has been granted for professional nurses to conduct circumcisions. However, task-shifting has yet to be implemented.

Other countries have adopted innovative strategies which have resulted in increased uptake of VMMC. Kenya has implemented strategies including mobile and outreach services and Rapid Results Initiatives. Kenya has also adopted task-shifting strategies enabling nurses to perform circumcisions, which has increased the human resource capacity for VMMC in the country. In Tanzania, public sector clinicians were moved to high-volume sites during VMMC campaigns and this has resulted in increased delivery and scale-up.

While a focused approach to HIV prevention scale-up is often recommended, it may not be the most efficient approach, given that demand is rarely constant so it is difficult to dedicate space and staff for MC alone. There is also deliberate planning in some countries for VMMC programmes to be fully integrated within public health facilities, motivated by the possibility of broadly strengthening infrastructure within the health system. Again, the variable demand means that VMMC staff are available for other pressing needs within the health system. A customised approach may be a more plausible and effective strategy for VMMC scale-up.

Non-surgical circumcision

Given the human resource limitations for VMMC scale-up, there is a growing emphasis on the introduction and use of non-surgical circumcision devices in South Africa. Non-surgical devices currently include the Shang Ring, PrePex and the TaroKlamp – although the acceptability and usability of these devices varies because of the incidence of adverse events found with each device, price, and endorsement by the WHO. The use of these devices will strengthen South Africa’s ability to reach national circumcision targets for three important reasons. Firstly, these devices do not need to be administered by a doctor, nor do they require the use of a sterile facility, and the procedure takes only a fifth of the time for a surgical circumcision. This will dramatically reduce the burden on human resources and allow high-volume VMMC sites to undertake more circumcisions.

Secondly, there is optimism around the fact that these devices could allow for a smoother integration of medical and traditional circumcision practices where traditional leaders could be trained to administer safe circumcisions in non-clinical settings. This possibility is not one that has yet been accepted or tested, and there is some debate as to whether this concept would be implementable and practical in traditional circumcision settings. Although the acceptability of these devices is uncertain, careful negotiation and interaction with traditional leaders based on respect for traditional practices could see the inclusion of medical circumcision in the wider practices of the rites of passage to manhood.

Thirdly, non-surgical devices may present a demand creation opportunity. Devices such as PrePex that do not require surgery or the use of anaesthetic have already been shown in some settings to have a high level of acceptability and may present an option for circumcision that is preferred by some men. The PrePex device – endorsed by the WHO – was tested in South Africa in 2013/14 and, pending final recommendations from the WHO based on the results from three ongoing pilot studies, is planned to be rolled out as part of the national VMMC scale-up plan in 2014.

One of the key concerns for the roll-out of any circumcision devices is cost. Table 2 shows a comparison of the estimated costs of surgical circumcision and the use of the PrePex device in 2012. It should be noted that the data were collected from a pilot field study, so costs under scale-up conditions are likely to be different.
Table 2: Costs of Surgery vs. PrePex

<table>
<thead>
<tr>
<th></th>
<th>Surgery only</th>
<th>PrePex only</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost/ circumcision</td>
<td>$9.68</td>
<td>$3.82</td>
</tr>
<tr>
<td>% of unit cost</td>
<td>21%</td>
<td>7%</td>
</tr>
<tr>
<td>Cost/ circumcision</td>
<td>$11.53</td>
<td>$14.27</td>
</tr>
<tr>
<td>% of unit cost</td>
<td>25%</td>
<td>26%</td>
</tr>
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</table>

Table 3: Costs of combination surgery and PrePex

<table>
<thead>
<tr>
<th>Mixed</th>
<th># circ/yr</th>
<th>Unit cost $</th>
</tr>
</thead>
<tbody>
<tr>
<td>10% of max</td>
<td>2,640</td>
<td>83</td>
</tr>
<tr>
<td>20% of max</td>
<td>5,280</td>
<td>61</td>
</tr>
<tr>
<td>Average</td>
<td>15,400</td>
<td>47</td>
</tr>
<tr>
<td>80% of max</td>
<td>21,120</td>
<td>45</td>
</tr>
<tr>
<td>Max</td>
<td>26,400</td>
<td>44</td>
</tr>
</tbody>
</table>

Source: Njeuhmeli, 2013

While the cost per circumcision using the PrePex device (US$55.89) is estimated to be slightly higher than the cost per surgical circumcision (US$45.54), offering the option to be circumcised surgically or with a device may help to increase demand.

In 2013, the price of a device – excluding other incidental costs such as materials and implements needed to conduct the procedure – was not believed to be a sustainable solution for rapid scale-up purposes. The Global Fund to Fight HIV, Tuberculosis and Malaria has negotiated a price of US$12 per unit for 1.5 million PrePex devices to be distributed among 14 priority countries in the east and southern African region. If these prices can be maintained and continue to decrease, the widespread use of the device may become sustainable, representing a significant cost saving.

Although the new Chinese-manufactured Shang Ring device is likely to be cheaper than PrePex per device, this only comprises 20–30% of the cost per circumcision, such that VMMC using any device is not likely to provide a cheaper solution per procedure than surgical circumcision.

Creating demand for circumcision remains crucial in ensuring that the programme is cost-effective. If more men decide to undergo VMMC, clinics will operate closer to their full capacity, resulting in less waste and a declining average cost per procedure due to more efficient use of fixed resources. Table 3 shows estimates of the cost per circumcision at sites using a combination of surgical VMMC and PrePex depending on the utilisation capacity of the site. It is clear that low uptake will significantly increase the unit cost per circumcision.

Neonatal and infant circumcision

One scale-up plan that has not received much attention thus far in South Africa is that of increasing the coverage of neonatal and infant circumcisions. Neonatal circumcision for HIV prevention has been the source of heated debate and presents many challenges. Issues of autonomy, human rights and consent complicate the issue of infant circumcision, especially in America where it is viewed as a form of non-consensual surgery. In this light, circumcising a male infant without his consent is seen as unjust. Those who are against infant circumcision propose that any parent should wait until the child is old enough to make an autonomous decision.

Recent PEPFAR-modelled data for South Africa illustrated in Figure 2 show that the most cost-effective strategy for VMMC scale-up in the short run is to target the age group with the highest incidence – ages 25–29. However, given that the HIV epidemic is unlikely to have disappeared in the next 15 to 20 years, promoting infant...
circumcision now for the health of the child may be as cost-effective as an HIV prevention intervention in the long term. The following graph shows the modelled reduction in incidence when VMMC targeting is used focusing on specific age groups.

From Figure 2 it is clear that the more time passes, the more effective targeting younger age groups will be. Looking 10 years into the future, targeting the 20–24 year age group for VMMC now will be most effective and after 20 years, targeting the 10–14 year age group will be most effective in reducing incidence. While it is clear that targeting younger age groups (especially infants) for circumcision will not be useful in stemming the tide of the epidemic immediately because they are not sexually active, it remains a relatively low-cost long-term intervention that must be considered. Neonatal circumcision is likely to be more cost-effective than adult circumcision in the long run because it can be integrated into existing maternal and infant health services.

Infant circumcision has a number of advantages: there are no days lost from school or work, and the cost is low as it can be integrated into existing reproductive clinical services and other postnatal programmes. When circumcision is done early in life, risk compensation is avoided. Furthermore, infant circumcision protects infants against urinary tract infections. Although there are some notable advantages in neonatal circumcision, it also has its drawbacks – specifically in the context of HIV prevention, the benefits will only be gained once these boys become sexually active. In other contexts, there can be socio-cultural pressure against neonatal circumcision, where circumcision is seen as a rite of passage into adulthood. Neonatal circumcision and MC in general have been viewed by certain sectors of society as genital mutilation. Potential factors that might affect uptake of infant circumcision relate to the safety, pain and discomfort that is associated with circumcision.

Acceptability studies on neonatal circumcision are scarce. If scale-up of infant MC is to be improved, there is a need to increase the acceptability of this practice among parents. In a study in Botswana, an estimated 90% of mothers were willing to have their infants circumcised if the surgery were done without charge and in a clinical setting. Their motivation to have their infants circumcised was driven by the future protective effect against HIV infection. Targeting circumcision before boys become sexually active should be considered for inclusion in VMMC scale-up plans, as this would offer maximum exposure to the benefits of this intervention, as well as result in optimal cost-effectiveness.

The rare short-term risks of neonatal circumcision need to be weighed against the potential benefits accrued in infancy and childhood (e.g. reduction of urinary tract infections), the longer-term benefits that may accrue in adolescence and adulthood (e.g. reduced risks of HIV, HSV2, and HPV), as well as possible benefits to female sexual partners of circumcised men (e.g. reduced bacterial vaginosis and trichomonas). As neonatal or infant circumcision is a simpler and safer procedure than adult circumcision, WHO/UNAIDS encourage countries to consider expanding services among infants as a longer-term HIV prevention strategy.

Neonatal circumcision is prohibited according to Section 12 of the South African Children’s Act (38 of 2005), except for cultural, religious or medical reasons. Based on the increasing evidence regarding the medical benefits of circumcision, KwaZulu-Natal MEC for health Dr Sibongiseni Dhlomo announced in a speech on 4 November 2010 that by January 2011, the Provincial Department of Health would be commencing neonatal male medical circumcision and referred to their awareness campaign for pregnant mothers to understand the importance of having their babies circumcised at birth. There exists a possible conflict between the international directives (WHO/UNAIDS, 2011 call for neonatal circumcision) and South African law on this issue, which would potentially present doctors in KwaZulu-Natal with an ethical dilemma between complying with the directive issued by the Provincial Department of Health and performing a procedure prohibited in terms of the South African law. This policy requires clarification, particularly in terms of whether HIV prevention can be accepted as a medical reason for infant MC.

Optimising VMMC impact: combination prevention

In the South African context, where HIV prevalence is high, widespread coverage of VMMC will be an effective tool in gaining control of the spread of the epidemic. However, due to the widely varying social, cultural and economic contexts of different people in the country, it is vital that South Africa continues to pursue a combined prevention and treatment approach. Circumcision is not equivalent to a vaccine and therefore being circumcised does not, for example, negate the use of condoms or any other prevention interventions and should not be presented as such. The newly discovered benefits of treatment as prevention have led to the WHO adjusting the CD4 count threshold recommendations for treatment to 500 cells/µL [up from 350 and 200 previously]. Recommendations also include scaling up provision of treatment to maximise the benefits of treatment as prevention. However, modelling studies from South Africa have shown that combination treatment and prevention strategies will be at least as effective and cost less. Table 4 shows the effectiveness and cost-effectiveness of a combination of these three interventions in averting new infections and AIDS deaths when scaled up to different levels. Different combination strategies were modelled in comparison to the base case scenario estimated for South Africa (ART 50%; VMMC 45% and TasP 0%). This provides a useful tool for understanding the effectiveness of different combination strategies for the HIV response.

Overall, the findings show that a combination of widespread VMMC and CD4 <350/µL as a threshold for treatment is as effective in reducing prevalence and incidence, as well as costing US$5 billion less in the next decade, as pursuing a treatment-as-prevention strategy alone. While scaling up all three interventions to 80% provides maximum effectiveness, the value for money significantly decreases, while total cost increases without a large impact on the number of infections and deaths averted.

h Circumcision of children under the age of 16 is prohibited, except when:

1. circumcision is performed for religious purposes in accordance with the practices of the religion concerned and in the manner prescribed ; or

2. circumcision is performed for medical reasons on the recommendation of a medical practitioner.
Table 4: Combination prevention

<table>
<thead>
<tr>
<th>Coverage, %</th>
<th>Cumulative discounted 2009–2020 (in millions)</th>
<th>ICER 2009–2020</th>
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<tbody>
<tr>
<td></td>
<td>ART TasP MMC Infections Deaths Costs S/IA S/DA</td>
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<tr>
<td>50</td>
<td>45 2.76 3.57 8 520 1 087 4 639</td>
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<tr>
<td>50</td>
<td>60 2.63 3.54 8 660 1 096 5 198</td>
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<td>60</td>
<td>45 2.47 3.23 10 341 6 366 5 353</td>
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Source: Barnighausen et al., 2012.87

Conclusion

Scaling up HIV prevention interventions is not simply about meeting targets. It requires a multifaceted response that promotes VMMC scale-up in order to achieve a long-term sustainable impact on the HIV epidemic. An appropriate strategy for scaling-up VMMC lies in customising the approach to meet the needs and align with the contexts of different populations. This requires tailored communication strategies to create demand for VMMC services and engagement with programme planners who have anticipated increasing demand and are designing VMMC interventions to respond by supplying safe, acceptable and accessible services. It will take continued innovation in medical device development and testing, along with other efficiency gains, to decrease procedure times and thereby increase access.11 Above all, successful scale-up requires strong central leadership, political commitment, efficient co-ordination and sufficient health care and material resources. It will also require a dynamic understanding of how VMMC programming presents opportunities to create synergies with other HIV prevention interventions to rapidly halt the increasing number of new HIV infections.

Human rights should be a central part of VMMC campaigns.19 MC needs to be voluntary, based on informed consent, non-coercive and carried out under safe conditions. The ethics, policies and practice of neonatal circumcision for HIV prevention requires more debate in order to foster points of consensus, given the ethical dilemmas that physicians currently face in performing neonatal circumcisions for HIV prevention.

Scaling up VMMC in South Africa should not be seen as a way of narrowing the HIV response, but rather as one that supports a widening approach, including a combination prevention strategy, a health systems strengthening approach, and the provision and promotion of a wide range of biomedical prevention and treatment interventions. Most importantly, VMMC is a partially protective procedure and should not be seen as the only solution in the context of complex drivers of the HIV epidemic. Circumcision will be most effective if it is not perceived as a stand-alone clinical procedure, but as one component of a full suite of HIV prevention and reproductive health services, including HIV testing and counselling, diagnosis and treatment of sexually transmitted infections, condom promotion, behavioural change counselling and promotion, and other methods that have proved to be effective.4
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