



World Bank Global
HIV/AIDS Program

HIV/AIDS M&E - *Getting Results*

These reports describe activities, challenges and lessons learned during the Global AIDS Monitoring and Evaluation Team's (GAMET) work with countries and other partners.

Male Circumcision: Evidence and Implications

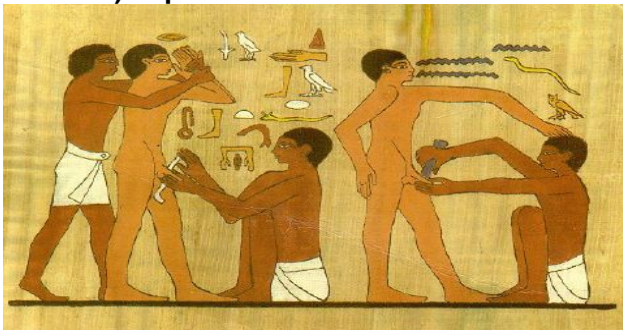
David Wilson and Joy de Beyer

This report summarizes the evidence linking male circumcision and HIV infection, and assesses the implications for HIV prevention programs. The practical implications are especially pertinent in countries with very high HIV prevalence and low circumcision rates – including South Africa, Botswana, Lesotho, Swaziland and Namibia.¹

New evidence on an old procedure

Could the oldest and most common surgical procedure – male circumcision – help turn the tide of HIV infection in high-prevalence countries?

Figure 1: Tomb art from Egypt's 6th Dynasty (2345-2181 BC) depicts circumcision



Source: Badawy 1978

An association between HIV and the absence of male circumcision has been noted since the late 1980s, but skeptics argued that it was entangled with behavior, religion, culture and geography. Now three randomized prospective intervention trials are underway and one has already generated additional strong evidence on whether circumcision protects men from HIV infection. One trial is also investigating whether circumcised HIV-positive men are less likely to infect their female sexual partners. This paper reviews the emerging results of these trials, and other evidence, and considers the implications.

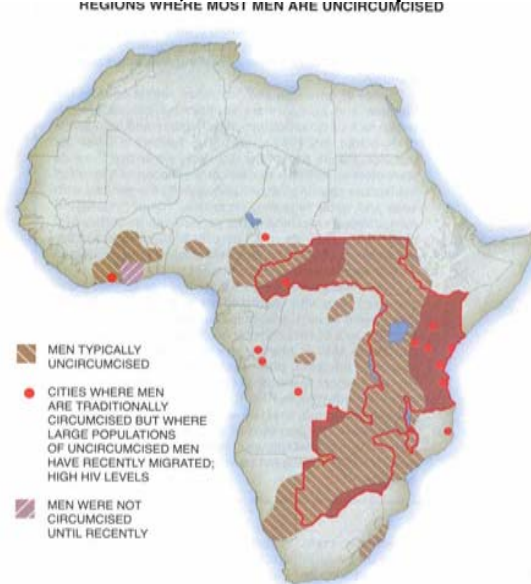
¹ This paper is based on a talk given by David Wilson on February 8, 2006 at the World Bank, Washington DC. We are grateful to Catherine Hankins, Charles Wiysonge and Timothy Farley for their review comments.

Overview of the evidence

Ecological evidence – the geography of circumcision and HIV

Four ecological studies show the clear geographical correlation of high HIV prevalence and areas where male circumcision is rare. A multi-site study found that male circumcision was a strong predictor of variations in Africa's HIV epidemic (Auvert et al 2001). The pattern is illustrated in the 1996 map in Figure 2, where the "AIDS belt" of areas with very high HIV prevalence rates within the red border coincided closely with areas where circumcision is rare. (Additional data, which include South Africa, confirm and strengthen the pattern.) Recent data from antenatal clinics (Table 1) and population-based data confirm this pattern for Africa (Figure 3) and Asia (Figure 4), with the data from population-based surveys that include men showing the relationship especially clearly. No Asian country with widespread male circumcision has a significant sexual HIV epidemic.

Figure 2: Africa: regions where most men are uncircumcised, and where HIV prevalence is high



Source: Scientific American, 1996

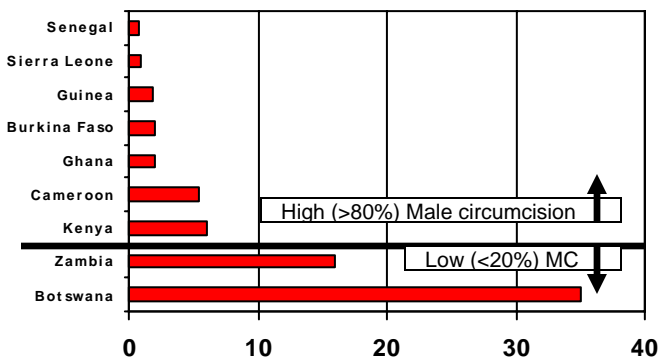
Source: Caldwell & Caldwell 1996

Table 1: High and low male circumcision (MC) and antenatal HIV prevalence in Africa

High MC (>80%)		Low MC (<20%)	
Mauritania	0.6	Zambia	16.5
Senegal	0.8	Namibia	21.3
Gambia	1.2	Zimbabwe	24.6
Niger	1.2	Botswana	37.3
Madagascar	1.7	Swaziland	38.8
Benin	1.9		
Mali	1.9		
Eritrea	2.7	*Note:	
Djibouti	2.9	Cameroon's antenatal HIV prevalence data appeared to challenge the hypothesis, but the much lower HIV prevalence rate of 5.5% found in the population-based survey (which includes men and women) is consistent with the general pattern.	
Ghana	3.1		
Guinea	3.2		
Angola	3.9		
Togo	4.1		
Burkina Faso	4.2		
DR Congo	4.2		
Kenya	6.0		
Cameroon*	11.8%		

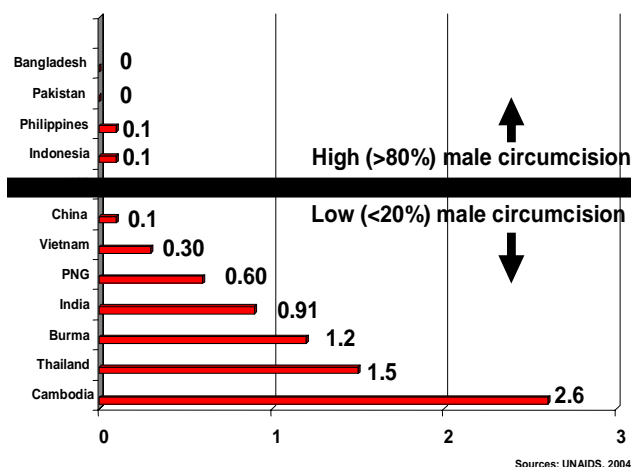
Sources: UNAIDS 2004, USAID/AIDSMARK 2003

Figure 3: Male circumcision and population-based HIV prevalence in Africa



Sources: ORC/MACRO, and USAID/AIDSMARK 2003

Figure 4: Male circumcision and population based HIV prevalence in Asia

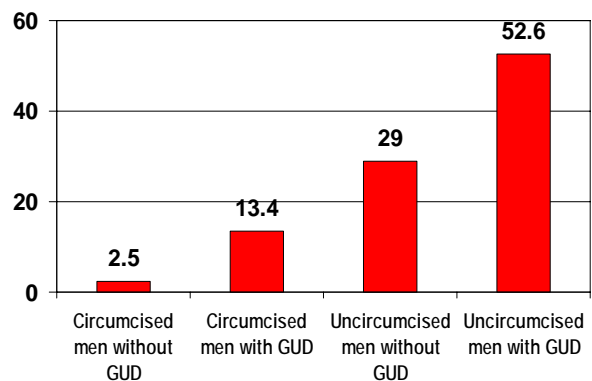


Source: UNAIDS 2004

Epidemiological evidence

Epidemiological data from three countries show a consistent, clear pattern (cross-sectional and prospective observational data). In India, HIV prevalence is seven-fold higher among uncircumcised men (Mehendale et al. 1996). In Uganda, among male partners of HIV-positive women in regular sexual relationships, 40 of 137 (29%) uncircumcised men and not one of 50 (0%) circumcised men sero-converted over a four year period (Gray et al. 2000). The same strong association between circumcision status and sero-conversion was found among Nairobi male STI clients after sex with sero-positive sex workers (Cameron et al. 1989). Figure 5 shows that 2.5% of circumcised men without genital ulcer disease (GUD, mostly chancroid and syphilis) became infected, compared to over 50% of uncircumcised men with GUD. The middle bars show that not being circumcised played a far larger role than GUD in potentiating infection.

Figure 5: Sero-conversion in Nairobi STI clients after sex with HIV+ sex worker



Sources: Cameron et al, 1988

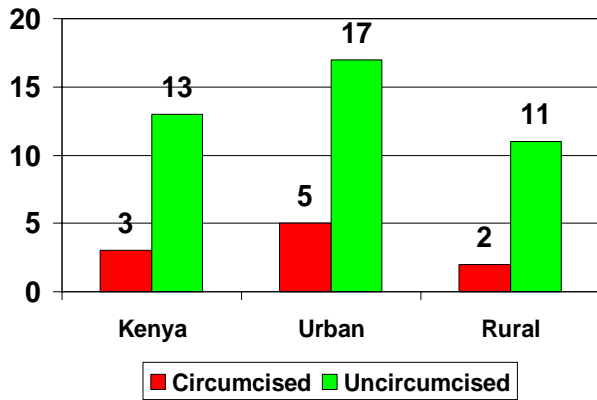
Note: GUD = genital ulcer disease (mostly chancroid and syphilis)

Source: Cameron et al. 1989

The 2004 population-based Kenya DHS+² survey found a 4-fold higher HIV prevalence rate among uncircumcised men than circumcised men (Figure 6). Adjusting for relevant differences in sexual behavior widens the gap even more – HIV prevalence is 11-fold higher among uncircumcised men. In Nyanza, the one province where most men are not circumcised, HIV rates were twice as high as elsewhere in Kenya, and within Nyanza, 21% of uncircumcised men and 2% of circumcised men are HIV-positive – ten fold higher.

² The Demographic and Health Survey is a standardized survey instrument, used in many countries. The “DHS+” surveys carry out HIV testing, in addition to interviewing men and women about their behaviors and beliefs. Details on the DHS are available at <http://www.measuredhs.com>

Figure 6: Male circumcision and HIV prevalence in Kenya



Source: Kenya Government and ORC/MACRO 2004

With improved measurement of HIV, particularly the use of population based data instead of antenatal data, the association has become clearer. Cameroon is a case in point – as the footnote to Table 1 above notes, and a comparison between Table 1 and Figure 3 shows, the HIV rate from antenatal data in Cameroon is more than double the HIV rate seen in the recent population based survey. So while Cameroon appears to be an outlier in Table 1, this is not the case in Figure 3, where Cameroon’s HIV rate is more similar to the other high circumcision countries than to the very high HIV prevalence countries with low rates of circumcision. A similar difference between antenatal and population based HIV data was seen in the Eastern Cape of South Africa, where circumcision is more common than other parts of the country, and women (whose sexual partners come from other regions as well) have similar HIV rates to the rest of the country, but men have amongst the lowest HIV rates in the country. HIV data from antenatal sites cover women only, so it is not surprising that they miss associations with male circumcision. It remains to be seen whether population-based HIV data will also show low HIV rates than in Ethiopia’s, where male circumcision is also widely practiced.

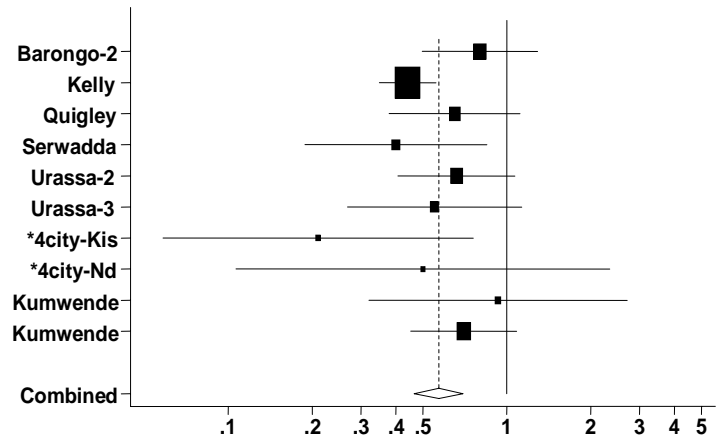
Two other data weaknesses complicate analysis of the effect of male circumcision on HIV infection: (1) where missing data make it impossible to disentangle the effect of factors such as ethnicity or religion that are correlated with circumcision; and (2) if self-reporting gives inaccurate measures of circumcision prevalence.

Meta-analytic evidence

Meta-analysis of 38 (mainly African) studies (including many of those cited above), found that circumcised men were less than half as likely to contract HIV (Weiss 2002). The protective effect appears to be even stronger for higher risk men: a sub-analysis of 16 studies of higher risk men found that circumcised men were 70% less likely to contract HIV (relative risk of 0.3). In Figure 7 and 8, the position of the squares indicates the actual value, the size

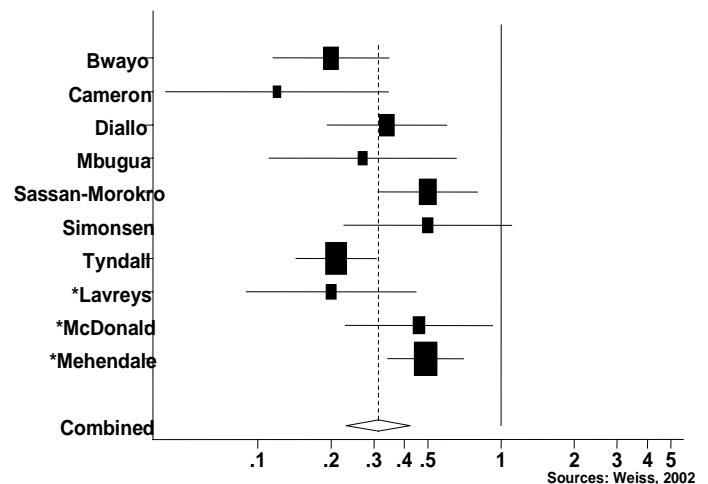
of the squares indicates sample size, and the horizontal lines show the confidence interval.)

Figure 7: Adjusted risk ratios in population studies



Sources: Weiss, 2002

Figure 8: Adjusted risk ratios in high risk groups



Source: Weiss 2002

Biological evidence

There are plausible biological explanations for a protective effect. Circumcision removes Langerhans cells from the underside of the foreskin, which are specific target cells for the virus. It causes keratinization (hardening) of the skin surface, and promotes more rapid drying which reduces the likelihood of bacterial sexual infections (like chancroid), which in turn reduces the risk of acquisition of HIV (Szabo and Short 2000). The soft mucosal surface of the inner foreskin is highly receptive to the virus; researchers at the University of Chicago found it difficult to infect specimens of outer foreskin tissue with HIV, whereas inner foreskin tissue absorbed HIV readily - up to 9 times more easily than cervical mucosal tissue (Patterson 2002).

Randomized trial evidence

Three randomized prospective trials in South Africa, Uganda and Kenya, in areas where circumcision is not widely practiced, set out to test whether and to what extent a circumcision intervention might have a protective effect. Enrollment is complete in all three, and collectively, they enrolled about ten thousand (mostly young) men (Table 2). The men, all of whom wanted to be circumcised, were randomly assigned either to a control group (and remained uncircumcised for the duration of the study), or to an intervention group and were circumcised by doctors trained for the study.

The first of the studies to complete enrollment (in South Africa) was stopped early when interim analysis showed

such a large protective effect that it was deemed unethical to continue the study.

The South Africa study results are remarkable. The men were followed for an average of 18 months, amounting to a total of 4,693 person-years of follow-up. Table 3 shows the dramatic differences in the number of new infections during each follow-up period, comparing the intervention group and control group. The unadjusted relative risk in the intervention group compared to the control group was 0.4, which means that 60% of potential new infections were prevented. Controlling for behavioral factors -- including condom use, health-seeking behavior, and risky sexual behavior -- marginally changes the protection effect from 60% to 61%.³

Table 2: Features of three male circumcision (MC) intervention trials

	South Africa (Orange Farm, Gauteng)	Uganda (Rakai)	Kenya (Kisumu)
Community Features			
Population	Semi-urban	Rural	Urban
Community MC rate	20%	16% (most Muslim)	10%
Annual HIV incidence	1.7%	1.8%	1.8%
Study Features			
Age	18-24	15-49	18-24
Final Number	3,274	About 5,000	2,784
Enrollment completed	February 2004	July 2005	Sept 2005
Study completion date	April 2005 (stopped early)	July 2007	Sept 2007

Source: Auvert et al. 2005, Krieger et al. 2005

Table 3: HIV incidence in intervention and control groups, South Africa

	M0–M3	M4–M12	M12–M21	Total
Intervention (<i>n</i> =1546/1446) ^a	2	7	11	20
Control (<i>n</i> =1582/1431) ^a	9	15	25	49
TOTAL	11	22	36	69

Notes: a/ Of the 3274 enrolled participants, 146 had tested HIV+ at enrollment and were excluded from the statistical analysis.

n= number at enrollment/number at end of study. The differences are the people lost to follow-up during the study; these losses were low for a population-based study.

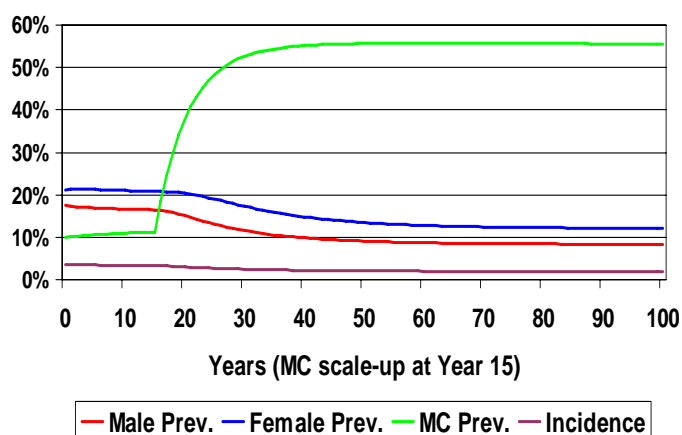
Source: Auvert et al. 2005

³ Unadjusted RR: 0.4 (95% CI: 0.24–0.68); *p*=0.00013, a protective effect of 60% (95% CI: 32%–76%), (Auvert et al. 2005), using “intent to treat” analysis that compares results between the two groups as randomized (regardless of compliance). The protective effect is 76% when the data are analyzed “per protocol”, based on observed circumcision status. The difference is at least partly explained by “crossovers” – men who were randomized to the control group but who chose to be circumcised independently of the trial; and men who were randomly assigned to the intervention group but were not circumcised as planned.

Benefits, costs, complications and acceptability

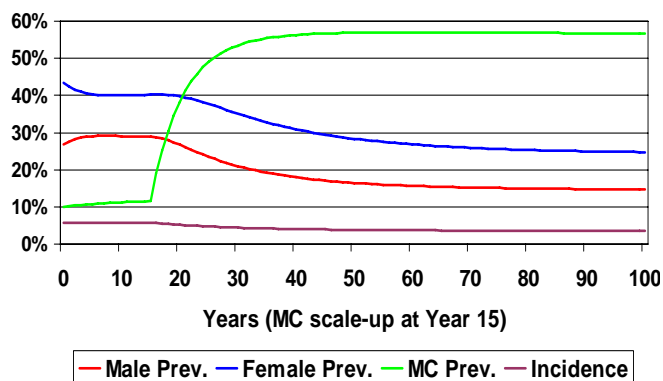
Strong as these results are, Koopman and Longini point out that randomized trials do not measure the population effect of the intervention. They estimate intervention efficacy in the study sample, that is, they examine transmission among the men in the trial, but do not study the effect on their sexual partners, or on the partners of those partners, and so on. Small differences in transmission risk can translate into much larger population effects, magnifying the effect on the epidemic. Modeling can estimate the size of this population effect, as in Figures 9 and 10 below. If just half of uncircumcised men in Kenya and Botswana were to be circumcised, and making a conservative assumption that this would make them one third as likely to become infected, overall prevalence could be halved over three decades.

Figure 9: Modeled implications in Nyanza, Kenya, assuming 50% MC uptake over 10 years, RR = 0.33



Source: Nagelkerke and Moses, 2005, personal communication

Figure 10: Modeled implications in Botswana assuming 50% MC uptake over 10 years, RR= 0.33



Source: Nagelkerke and Moses, 2005, personal communication

Other benefits of male circumcision

In addition to protecting against HIV, circumcision also reduces other sexually transmitted infections (STI), including chancroid (which causes painful ulcers), syphilis, balanitis (infected foreskin), phimosis (inability to retract the foreskin), penile cancer and cervical cancer in female partners. The evidence varies in strength; for example, a new meta-review finds strong evidence for a reduced risk of chancroid and syphilis, and less association for herpes (Weiss et al. 2006).

Complications of circumcision

The complications that can arise from circumcision – especially if performed under unhygienic conditions – are: excessive bleeding, infection, excessive pain, too much skin removed, anesthetic complications, penile damage or amputation, cosmetic complications, erectile dysfunction, psycho-behavioral complications, HIV infection from non-sterilized instruments, and possible death if appropriate treatment of complications is not provided. However, serious complications are very rare. Complications were reported by fewer than 4 percent of participants in the South Africa and Kenya trials, and none of the complications were life-threatening or serious, and most were not long-lasting (Table 4).

Table 4: Complications from circumcision in two studies

Type of Complication	Orange Farm, South Africa	Kisumu, Kenya
Pain	13 (0.82%)	
Swelling or hematoma	10 (0.63%)	
Excessive bleeding	9 (0.57%)	4 (0.8%)
Problems with appearance	9 (0.57%)	
Other	5 (0.32%)	
Damage to penis	4 (0.25%)	
Insufficient skin removed	4 (0.25%)	
Infection	3 (0.19%)	7 (1.3%)
Delayed wound healing	2 (0.13%)	4 (0.8%)
Anesthetic complications	1 (0.07%)	
Excessive swelling		1 (0.2%)
Erectile dysfunction		1 (0.2%)
TOTAL	60 (3.8%)	17 (3.5%)

Sources: Auvert et al, 2005 (South Africa); Krieger et al, 2005 (Kenya)

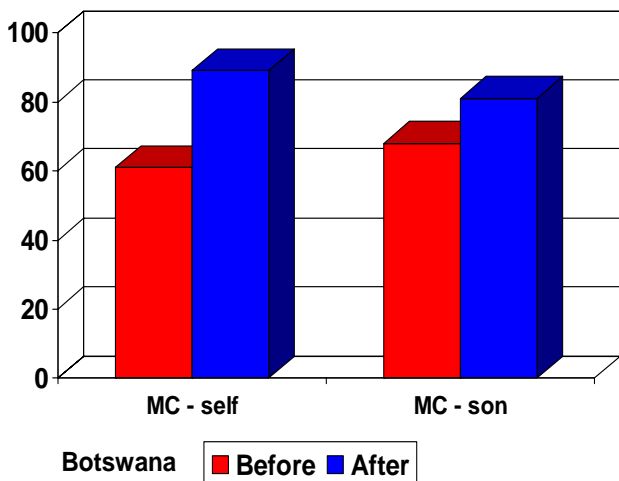
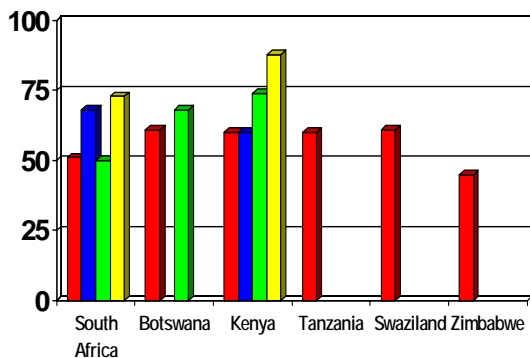
Cost

Obviously, costs would vary, but data from Nyanza, Kenya are indicative, and suggest that circumcision could be done in medical facilities, for about US\$25 per procedure (Bailey et al, 2006, personal communication). This cost estimate includes \$8 for medical expendables (sutures and needle, gauze, bandaging, analgesics), \$7 for surgical preparation (preparing the room, cleaning linens, sterilizing instruments), and \$10 in overheads (physician's fee, maintenance of room and equipment, utilities).

Acceptability

Twelve published studies and two unpublished manuscripts found reasonable acceptability of circumcision in Botswana, Kenya, Malawi, South Africa, Swaziland, Tanzania, Uganda, Zambia and Zimbabwe, ranging from 29-80% (mean 60%). Men were asked whether they would choose circumcision for themselves and their sons, and women were asked about acceptability for their husbands and sons. In Botswana, a one-hour information session increased acceptance rates from around 60% to around 80% (lower panel of Figure 11).

Figure 11: Percent who would accept male circumcision



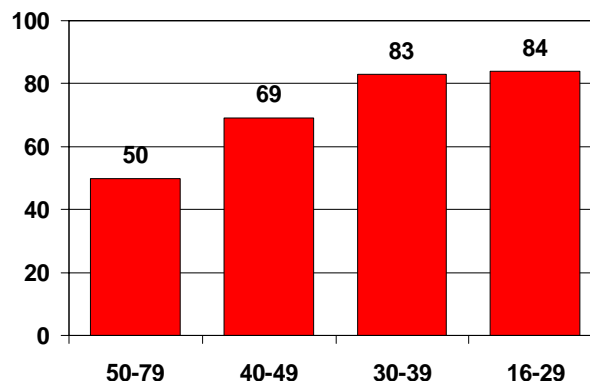
Sources: Bailey et al 2002, Halperin et al 2005, Kebaabetswe et al 2003, Nnko et al, 2001

Is cultural change possible?

Globally, about 25% of men are circumcised, but circumcision is rare in Europe, Latin America, East Asia, India, China and Southern Africa. Several of the most severely HIV-affected countries – Swaziland, Botswana, Lesotho, South Africa – practiced male circumcision widely in living memory, but the practice waned with

urbanization and westernization. Promoting it now would be returning to traditional culture, not introducing an unfamiliar practice. Some countries with no tradition of male circumcision have adopted it quickly and widely. For example, in South Korea, circumcision had been very rare, but became increasingly common from the 1950s, largely due to US medical influences, and reached over 70% relatively quickly. The rapid uptake is evident in the age-cohort data in Figure 12.

Figure 12: Male circumcision in South Korea, by age



Source: Kim, Lee and Pang, 1999

What are the practical implications of the data?

An indicator of the epidemic potential

Perhaps the least controversial implication of the data is that male circumcision is an important tool for understanding the epidemic, its potential, and the implications for HIV responses. Many of the social factors that originally were expected to predict infection have not proved reliable. But the evidence on circumcision has held up, and grown stronger. The data suggest that countries with high rates of male circumcision are unlikely to have generalized sexual epidemics. As Figure 4 showed, many highly circumcising Asian countries have limited sexual epidemics – including Central Asian Republics, Afghanistan, Pakistan, Bangladesh, Indonesia (outside Papua) and Philippines. However, injecting drug use may fuel HIV transmission, greatly amplifying epidemic potential. This makes effective IDU programs imperative to curtail the potential for sexual epidemics.

Information

We owe people accurate factual information and the best scientific evidence we have. So health communications should include information on the protective effects of circumcision. The results of the South Africa study have been widely publicized in the region and discussed by leaders, parliamentarians, health workers, the press and general public. Many prominent people have made strong statements

promoting circumcision, (see box) although there are also more cautious and contrary voices.

Recent Supportive Statements by Southern African Leaders and Health Professionals

"All male children should be circumcised. To show my seriousness, I have taken all my sons for circumcision." (MP Marwick Khumalo, Lobamba, Swaziland)

"I have seen people dying left and right, and leaving children. To take good care of my children, let me undergo the procedure." (Hospital Administrator Dr Dlamini, Swaziland)

Pharmacist, Lungile Maziya, Swaziland scheduled circumcisions for her husband and all four of her sons, aged 6 to 15. Only her 15-year-old balked. She said she told him, "My boy, when you're 18, you'll really thank me for this."

"Everyone wants to have it done. Not one person has called to say it's 'un-Swazi.'" (Prominent physician and health show host Dr Themba Ntiwani, Swaziland)

Sources: Timberg 2005.

Responding to growing demand for services

There are already indications of increasing demand for male circumcision in traditionally non-circumcising societies in Southern Africa. At the University Teaching Hospital in Zambia, demand has grown from 1 to 15 per month, with a three month waiting list. Demand at one Swaziland hospital (the Mbabane Clinic) is reported to have risen from less than 1 per month to 40 per month (Harrison 2006). Growing demand creates an obligation on governments and the international community to support safe, affordable, surgical procedures, counseling and post-operative care. In response, on 27 January, 2006, Swaziland offered circumcision training to physicians and nurses and over 60 attended. Moreover (as an anecdotal indication of demand), there were so many volunteers to be demonstration and practice patients during the training session, that a hundred men had to be turned away.

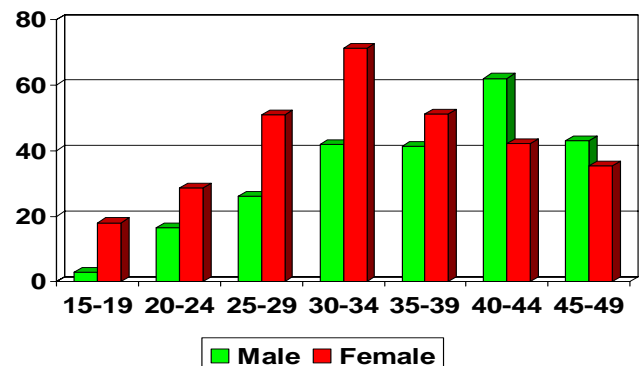
Should male circumcision be promoted for HIV prevention in the most affected countries?

This is the most urgent and complex question raised by the new data. Note that this question is posed for the most affected countries where transmission is mainly through heterosexual sex, and **not** for countries with low general population prevalence (especially where transmission is driven mainly by injecting drug use), where the costs and complications of circumcision might easily outweigh the benefits. UNAIDS's position (published in July 2005 and signed onto by WHO, UNICEF and UNFPA) is that safe circumcision should be provided where people want it, but that a policy decision on whether to promote it should wait until the results of the Kenya and Uganda trials are available. This is sensible, and while awaiting the results (which are

expected in 2007), a UN Work Plan on Male Circumcision is being implemented to help countries improve the safety of their circumcision practices, and to prepare for discussions and decisions about whether and how to include male circumcision in comprehensive HIV prevention programming. The Work Plan includes undertaking rapid assessments, acceptability and impact studies, cost analyses; training health care workers; assessing regulatory and licensing issues, etc. (Hankins, C, personal communication).

There is urgency to act on a potentially effective intervention in the most affected countries where the epidemic continues to rage, despite all efforts. For example, Figure 13 shows staggeringly high population prevalence rates in some groups from the most recent household survey in Botswana's second-largest city – above 70% among women in their early thirties, and more than half of all women aged 15-45 (BAIS, 2005).

Figure 13: Population-based HIV prevalence in Francistown, Botswana, 2005



Sources: BAIS, 2005

These rates are higher than were ever thought likely or possible. Whether or not the World Bank and broader international AIDS community decide to actively promote circumcision, we should be ready to respond quickly if countries ask for help in incorporating circumcision in their national response.

Infant circumcision

One option would be to promote routine circumcision of infants – perhaps as part of antenatal care and packaged with programs to prevent mother-to-child transmission (PMTCT) – in the most affected countries. Botswana in fact took a policy decision to offer male circumcision as a routine part of antenatal care at all health facilities some years ago, but this has not been implemented. One of the first questions would be to consider what training, facilities, staff and equipment would be needed. In Southern Africa, medical circumcision at infancy would have the additional advantage of reducing the complications – often including several deaths – that result from traditional

circumcision rites in adolescence. But the major benefits of infant circumcision in preventing HIV infections would take more than 20 years to begin to be realized.

Adult circumcision

A more controversial question is whether it is justified and feasible to promote and offer adult circumcision for HIV prevention in the most affected countries. In 2000, Malcolm Potts offered a rough (conservative) estimate that circumcision had prevented perhaps 8 million infections in Africa and Asia, which makes a compelling case. Whether his estimated numbers are accurate or not, the logic is sound. If the protective effect indicated in meta-analysis is valid, then every 15 to 60 circumcisions could prevent one case of HIV infection (Quinn, 2006).

“How many HIV infections have been prevented by male circumcision? HIV...in (circumcising) west Africa clusters between 1% and 5%. In comparison, the predominately non-circumcising east and southern African nations have rates approaching 25%. Let us assume...male circumcision accounts for about half the disparity in heterosexual HIV rates...It can be estimated that if male circumcision had not been a widespread practice, HIV frequency would have reached at least 10% in...west African countries. This estimate suggests that about 6 million additional adults would now be infected in the region. A similarly conservative estimate of the impact in the four south and southeast Asian countries with a high male circumcision rate would be that ... an additional 2 million adults would now be infected in these four Asian countries. Hence, it is possible that 8 million or more adult HIV infections have been prevented by male circumcision in 15 African and Asian countries.” (M.Potts, Lancet 2000; 355:926)

There are three caveats.

- First, the procedure must be done by well-trained personnel, under hygienic conditions, with adequate follow-up. There is much to be done to plan and prepare. In countries where serious complications and even deaths from circumcision done under poor conditions occur regularly, there would be strong benefits to involving health care professionals. (This would not preclude working with traditional circumcision practitioners and traditional healers.)
- Second, in the healing period, sexually active men are likely to be at a higher risk of HIV infection, and this risk should not be underestimated. Men need to be well-informed about the risks and the precautions they should take.
- Third, some disinhibition is likely, because of the perceived reduction of risk. Circumcision does not provide full protection and could reduce protection in men who, for example, decrease their condom use or engage in other riskier behavior. In the Orange

Farm trial in South Africa, the men in the intervention group did not differ from the men in the control group in their number of sexual partners or condom use, but they engaged in sex more frequently. While the protective effect of circumcision remained despite this risk compensation, an increase in risky behavior is a concern when considering promoting circumcision widely to prevent HIV infection (Auvert et al. 2005). But disinhibition also occurs with condom use, ARV therapy and post-exposure prophylaxis. It is a real factor, and must be taken into account, but it is not a reason to reject circumcision as an intervention.

Reaching youth

In addition to offering circumcision through health facilities, schools and youth centers could also be used as outreach points. This would enable young men to be reached before they become sexually active, and with the benefits realised quickly, without the long time lag if the focus were on infants only.

Gender

Circumcision has been compared to a vaccine that would be 60% effective, except that there is a gender bias, since it is an intervention that can be offered exclusively to men. This is not such a concern in universally circumcising countries, where, since it appears to suppress most sexual HIV transmission, male circumcision protects women almost equally. But in partially circumcising countries, women may be exposed to non-circumcised partners. Partial promotion of male circumcision may reduce overall HIV transmission, but widen disparities between male and female HIV rates. To the extent that male circumcision reduces the risk that an infected man will transmit the virus through sex, the gender disparity is reduced. Preliminary results reported on February 8th at the 2006 Conference on Retroviruses and Opportunistic Infections suggest that there is reduced transmission risk: in the Rakai study, circumcision in HIV+ men reduced the risk that they would infect their female partners by about 30 percent (RR 0.67) and to zero in discordant couples where the man had a viral load below 50,000 cps/mL (Reynolds 2006).

Conclusion

Whether one agrees or disagrees with the evidence and its implications, there certainly has been insufficient fine-grained analysis and debate, particularly on the implications for HIV prevention programs. Bertran Auvert writes that “*MC provides a degree of protection against acquiring HIV infection equivalence to ... a vaccine of high efficacy... (and) should be regarded as an important public health intervention for preventing the spread of HIV. MC could be incorporated rapidly into the*

national plans of countries where most males are not circumcised and where the spread of HIV is mainly heterosexual.” But he thinks that the international community is “waiting for a vaccine. They’re not interested in a cut from some scissors.” Is he right? Is this why there has been muted reaction to the extraordinary results of the South Africa trial? Some people see circumcision as too controversial, but it is not more controversial than many other HIV and AIDS related issues.

In discussing this review of the evidence, there was consensus among a group of World Bank staff on the implications for the Bank’s HIV/AIDS work: subject to the results of the two remaining trials, the Bank must be ready to respond if countries ask for help in being able to offer male circumcision. Like other controversial interventions, the Bank can move boldly whereas some of the major donors may be constrained or cautious. At the modest cost of around \$25 per procedure, and if every 15-60 procedures were to prevent one new infection (Quinn, 2006) circumcision would be extremely cost effective -- in the range of \$375 to \$1500 per infection averted, far below the cost of providing lifetime antiretroviral treatment. There is a strong argument for being ready to support voluntary male circumcision programs in South Africa, Swaziland,⁴ Lesotho, Botswana and Namibia, where the epidemic is largely sexually transmitted, prevalence rates are high and male circumcision is low, the numbers of people are manageable and health services likely to be able to handle the demand. Beginning in a few, mostly small countries would allow the initial programs to be done well, with careful evaluation.

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⁴ The UNICEF office in Swaziland is supporting efforts there already.

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