Can male circumcision stem the AIDS epidemic in Africa?

As a preventive measure, voluntary male circumcision is gaining favor as a large-scale attack against HIV's spread.

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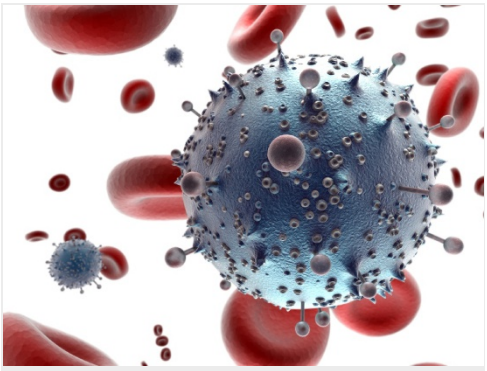
For the Xhosa in South Africa, a boy's coming of age is often marked by an elaborate and lengthy set of rituals. One of the ordeals is circumcision, which is traditionally performed by a healer and occasionally leads to an ineffective cut, infection or even death. The young men who emerge from the ceremony healthy, however, achieve not only new social status but are also much less likely to become infected with HIV.

Adult male circumcision, in which the foreskin of the penis is surgically removed, has emerged as one of the more powerful reducers of infection risk. Some studies are finding that it decreases the odds that a heterosexual man will contract HIV by 57 percent or more. With HIV vaccine research still limping along, condoms being underused and the large-scale vaginal gel trial Vaginal and Oral Interventions to Control the Epidemic (VOICE) just called off early last week after disappointing results, the operation has been gaining ground.

For the past three years 13 countries in southern and eastern Africa at the heart of the HIV/AIDS epidemic have been on a mission to circumcise 80 percent of their men by 2015 in an effort to cut in half the rate of sexual transmission of the disease from 2011 levels. And a new series of nine papers, published online Tuesday in *PLoS Medicine*, assesses whether the ambitious goals could work—and whether they are worth it.



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HIV transmission can be reduced by up to 57% by male circumcision.

The analyses "give a pretty optimistic assessment," says Atheendar Venkataramani, a resident physician and researcher at Massachusetts General Hospital, who was not involved in the new papers. But from his own research in the field, he says, he is inclined to share the optimism.

Cutting costs

Because HIV and AIDS are still incurable, infection means a lifetime of antiretroviral therapy. So with more people getting infected every day, the cost of treatment for the ever growing global HIV population is increasing. A surgical procedure, such as a circumcision, is not cheap either, but when compared with indefinite treatment, the one-time cut is poised to be a cost saver.

The estimated price tag for all of the 13 countries (Botswana, Kenya, Lesotho, Malawi, Mozambique, Namibia, Rwanda, South Africa, Swaziland, Tanzania, Uganda, Zambia and Zimbabwe) to reach the 80 percent male circumcision rate by 2015 would be somewhere on the order of $1.5 billion, the authors of one of the papers suggest. To keep that saturation constant for another 10 years would cost a further $500 million. These 20.3 million circumcisions, however, could prevent some 3.4 million new HIV infections in both men and women, according to the new findings. From 2016 to 2025, after accounting for the initial expenditures, the programs would save some $16.5 billion.

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Previous research had concluded that male circumcision programs would be cost-effective, but this is some of the first large-scale work to incorporate information specific to country—and in some cases, region—to assess costs and savings. The recent data can go straight to the countries' respective ministers of health and, perhaps even more important, to the countries' ministers of finance, points out Emmanuel Njeuhmeli of the U.S. Agency for International Development, who is a co-author of several of the papers. "Understanding the science is not enough—they need to have the resources," he says of the countries' health ministries. And that can be a lot to ask of a sub-Saharan African country such as Lesotho, which has a GDP of $2.1 billion and where much of the population lacks even basic medical care.

"It's not a difficult procedure to do well," Venkataramani says. "Once someone is trained, you can knock out hundreds of procedures a day." But finding medical personnel to train can be a challenge. "If you have limited health care, are you going to be drawing from the labor pool?" he asks. "And will that divert them from doing other things," such as giving vaccinations to children or helping to deliver babies?

New demand

The term for the procedure, voluntary male medical circumcision, might sound almost outlandish. Yet in the past few years some public-awareness campaigns have been so effective in educating men about the benefits of circumcision (which also extend to decreased risk of other sexually transmitted infections) that "creating the right balance of demand and service" has become the new challenge, says Caroline Ryan, director of technical leadership at the Office of the U.S. Global AIDS Coordinator.

For groups in which male circumcision is an integral part of the culture, the move to a more medicalized procedure can be dicey. "If you bring in something that gets at the core of people's beliefs, and it's perceived as being disrespectful, that might be your last chance to reach that population," Venkataramani says. He also found that males who had incomplete or delayed circumcisions were more likely to contract HIV than those who had early, medical procedures. "You can't count on the traditional circumcision on being the protective circumcision," he says.

Some groups and villages have adopted a medicalized approach, however. In Zimbabwe, for example, village boys would not always return from their rite of passage after a traditional circumcision went awry. Thus, some village chiefs have encouraged the use of medical circumcision, by having doctors and nurses attending at the ceremonial camps, by allowing boys to make a trip to a clinic or by training traditional healers in how to perform a safer operation.

"There has been a change in social norms, where the community has completely embraced medical male circumcision," Njeuhmeli says of some of these villages. Many local women also support the move. "You can see a mother so happy that the boys, all of them, will come back," alive and well.

Nevertheless, as one of the papers on research led by Zebedee Mwandi of the U.S. Centers for Disease Control and Prevention Global AIDS Program Kenya shows, so far only Kenya is in good shape to meet the 80 percent goal, with more than two thirds of its men already circumcised—which is more than twice the global average.

Risky prevention

Not everyone in the AIDS-prevention field is convinced that this approach will be as effective as promised. As the old economic logic goes, once people think they are protected against something, they will be more likely to take on more risks. So a circumcised man might be more inclined to have unprotected sex or sleep with more partners. As yet, however, research has yet to bear this out.

"It's also a very good way to get access to men," Ryan says of the increasingly common procedure. Women spend much more time in the health care systems in many of these countries because they often seek care during pregnancy. But with adult and adolescent males coming in for circumcision, doctors and nurses have the opportunity to give them information about condoms and other ways to reduce their risk of HIV, as well as to identify men who already have the retrovirus and get them started on treatment earlier in their illness.

With circumcision being an imperfect protector, why not put the money toward a more sure thing, such as condoms? Despite years of campaigns and distribution, neither male nor female condoms have become as widely used as previously hoped. As Ryan points out, many other groups are supporting condom programs, so she and others working with the U.S. President's Emergency Plan for AIDS Relief (PEPFAR) are looking for approaches that are not covered by other programs.

Unlike a condom, the operation is a one-time intervention, Ryan notes. And "now we have some very good data, so we can have an extremely strong impact." With fewer infected men, fewer women will also be at risk for HIV infection. But, as she points out, the impact is also proportional to the breadth and speed of the scale-up. If fewer men are circumcised or if the target year is met years later, the epidemic will continue spreading all that much more quickly. This momentum is also the reason for targeting sexually active men and adolescents rather than infants. Although protecting the next generation is a long-term goal, to curb the epidemic as quickly as possible—and lessen the likelihood that children born today will face as high a risk of contracting the illness when they are grown—the analyses suggest putting money toward the older boys and men.

"It doesn't obviate our need to think about other policies," Venkataramani says. But "from a harm-reduction standpoint," he notes, "it's as good as we've got right now."

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