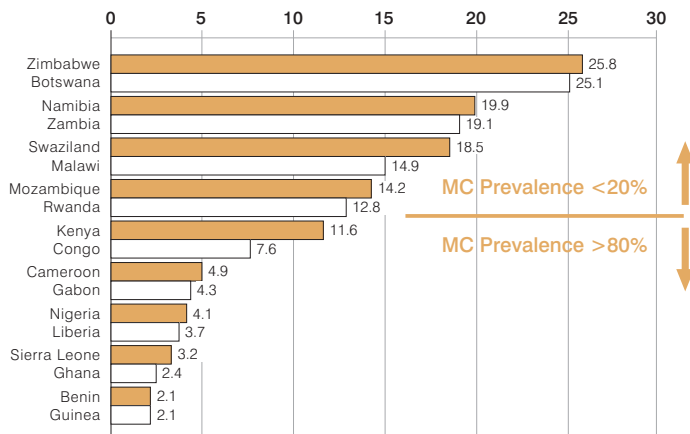


### Male Circumcision as an HIV Prevention Method

Numerous observational studies indicate that circumcised men have lower levels of HIV infection than uncircumcised men. Throughout the world, HIV prevalence is generally lower in populations that traditionally practice male circumcision than in populations where most men are not circumcised<sup>i</sup>. Until the three randomized controlled trials in South Africa<sup>ii</sup>, Kenya<sup>iii</sup> and Uganda<sup>iv</sup> were completed, it was unclear to what extent this was the result of a biological effect of male circumcision, or the result of cultural or social factors that can accompany high rates of male circumcision.

A systematic review and meta-analysis of 28 published studies found that circumcised men are two- to three-fold less likely to be infected by HIV than uncircumcised men, with differences most pronounced in men highly exposed to HIV infection<sup>v</sup>. A sub-analysis of 10 African studies found a 3.4-fold lower incidence of HIV infection among men considered to be at high risk of becoming infected.

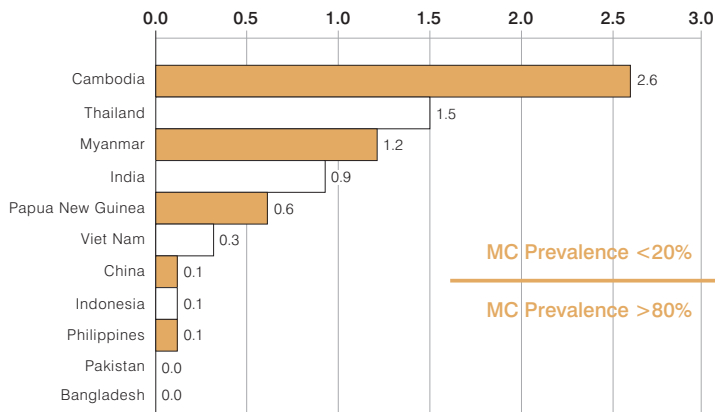
**Figure 1 – African Countries HIV and Male Circumcision Prevalence**



The geographic regions in sub-Saharan Africa where men are more commonly circumcised overlap with areas of lower HIV prevalence. Low prevalence of male circumcision and high prevalence of genital herpes, which is more common in uncircumcised men, emerged as the principal determinant for the differences in HIV rates found in sub-Saharan Africa. The bar chart figure 1 shows that countries in sub-Saharan Africa with relatively low rates of male circumcision (<20%) have a higher HIV prevalence when compared to countries

with high (>80%) rates of male circumcision. Countries in West Africa where male circumcision is common have HIV prevalence levels well below those of countries in eastern and southern Africa, despite other risk factors for high rates of heterosexual HIV transmission, such as multiple concurrent sexual partners, inconsistent condom use, and high prevalence of other STIs.

**Figure 2 – Asian Countries HIV and Male Circumcision Prevalence**



HIV prevalence in the south and southeast Asian countries where nearly all men are circumcised (Bangladesh, Indonesia, Pakistan and Philippines) remains extremely low, despite similar patterns of risk factors for HIV and other STIs found elsewhere in the region (figure 2).

# INFORMATION PACKAGE ON MALE CIRCUMCISION AND HIV PREVENTION

## INSERT 4

The South Africa Orange Farm trial, which enrolled 3274 uncircumcised men aged 18 to 24 years showed a 61% protection against HIV acquisition. The trial in Kisumu, Kenya, of 2784 HIV-negative men aged 18 to 24 years showed a 53% reduction of HIV acquisition in circumcised men relative to uncircumcised men. The trial of 4996 HIV-negative men aged 15 to 49 years in Rakai, Uganda, showed that HIV acquisition was reduced by 51% in circumcised men. The trials involved adult, HIV-negative heterosexual male volunteers assigned at random to either undergo circumcision performed by trained medical professionals in a clinic setting or wait until after the end of the trial to be circumcised. All participants were extensively counselled in HIV prevention and risk reduction techniques and were provided with condoms.

An observational study in Uganda suggests that male circumcision may also protect against male-to-female transmission of HIV. Among 47 couples in which the circumcised male partner was infected with HIV, none of the female partners became infected in two years. By contrast, 26 of the 147 women who were partners of uncircumcised men with HIV infection became infected with the virus<sup>vi</sup>. A further randomized trial to assess the impact of male circumcision on the risk of HIV transmission to female partners is currently underway in Uganda with results expected in 2008.

There are several biological explanations why male circumcision may reduce the risk of HIV infection for men:

- By removing foreskin, circumcision reduces the ability of HIV to penetrate the skin of the penis due to keratinization or toughening of the inner aspect of the remaining foreskin<sup>vii</sup>.
- The inner part of the foreskin contains many special immunological cells, such as Langerhans cells, that are prime targets for HIV<sup>viii,ix</sup>. Some of these are removed with the foreskin, while the remaining cells become less accessible to the HIV virus due to the keratinization described above.
- Ulcers, which are characteristic of some sexually transmitted infections and which can facilitate HIV transmission, often occur on the foreskin. By removing the foreskin, the likelihood of acquiring these infections is reduced.
- The foreskin may suffer abrasions or inflammation during sex that could facilitate the passage of HIV.

Male circumcision reduces the risk of HIV infection, but it only provides partial protection. Circumcised men are not immune to the virus. Male circumcision must not be promoted alone, but alongside other methods to reduce the risk of HIV – including avoidance of unsafe sexual practices, reduction in the number of sexual partners, and correct and consistent condom use.

- i Auvert B, Buve A, Ferry B, et al. Ecological and individual level analysis of risk factors for HIV infection in four urban populations in sub-Saharan Africa with different levels of HIV infection. *AIDS* 2001;15:S15-30.
- ii Auvert B, Taljaard D, Lagarde E, et al. Randomized, controlled intervention trial of male circumcision for reduction of HIV infection risk: the ANRS 1265 Trial. *PLoS Med* 2005;2(11):e298.
- iii Bailey C, Moses S, Parker CB, et al. Male circumcision for HIV prevention in young men in Kisumu, Kenya: a randomized controlled trial. *Lancet* 2007;369: 643-56.
- iv Gray H, Kigozi G, Serwadda D, et al. Male circumcision for HIV prevention in young men in Rakai, Uganda: a randomized trial. *Lancet* 2007;369:657-66.
- v Weiss HA, Quigley M, Hayes R. Male circumcision and risk of HIV infection in sub-Saharan Africa: a systematic review and meta-analysis. *AIDS* 2000;14:2361-70.
- vi Gray RH, Kiwanuka N, Quinn TC, et al. Male circumcision and HIV acquisition and transmission: cohort studies in Rakai, Uganda. *Rakai Project Team. AIDS* 2000;14:2371-81.
- vii Patterson BK, Landay A, Siegel JN, et al. Susceptibility to human immunodeficiency virus-1 infection of human foreskin and cervical tissue grown in explant culture. *Am J Pathol* 2002;161: 876-873.
- viii Soilleux EJ, Coleman N. Expression of DC-SIGN in human foreskin may facilitate sexual transmission of HIV. *J Clin Pathol* 2004;57:77-78.
- ix Hussain LA, Lehner T. Comparative investigation of Langerhans cells and potential receptors for HIV in oral, genitourinary and rectal epithelia. *Immunology* 1995;85:475-484.