

## REVIEW

# WHY THAILAND SHOULD CONSIDER PROMOTING NEONATAL CIRCUMCISION?

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**Abstract.** Male circumcision (MC) has been proven to reduce the risk of HIV transmission. The WHO and UNAIDS jointly recommend the international community consider MC as an HIV prevention measure. MC reduces the risk of acquiring other sexually transmitted infections (STIs) among men, urinary tract infections among children and penile cancer. Lowering the prevalence of STIs in men may reduce the incidence of STIs among women. High levels of adult MC are difficult to achieve in cultures where it has not been customary. Adult MC is associated with a high prevalence of post-operative complications. Neonatal male circumcision (NC) is simpler, safer, and cheaper. Higher coverage with MC can be achieved through NC. Thailand is a good country to promoting NC for the following reasons: most HIV infections are contracted through heterosexual transmission, there is a low MC rate, most newborn deliveries occur in hospitals, there is a relatively strong health care infrastructure and Thailand has well developed HIV care services. Issues of concern regarding promoting NC include length of time before seeing benefits, cost effectiveness of the intervention, the burden to the health care delivery system and concerns about children's rights. NC is an efficacious HIV prevention strategy that should be considered by those involved in HIV/AIDS prevention planning in Thailand. Further studies are needed to determine whether NC should be promoted in Thailand.

**Keywords:** circumcision, neonatal circumcision, infant circumcision, HIV prevention, STIs prevention, Thailand

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## MALE CIRCUMCISION AND DISEASE PREVENTION

There is strong evidence that male circumcision (MC) can lower female to male transmission of HIV (Siegfried *et al*, 2009). Observational studies (Gray *et al*,

2000; Baeten *et al*, 2005) comparing HIV infection rates between populations that did and did not practice MC found lower HIV infection rates among those who practiced MC. One review of observational studies investigated the relationship between MC and risk for HIV infection and found circumcised men were less likely to contract HIV infection than uncircumcised men (Siegfried *et al*, 2003). In a review of circumcision practices and infectious disease prevalence in 118 developing countries, Drain *et al* (2006) found MC was associated with lower HIV prevalence. Three randomized controlled trials conducted in South Africa (Auvert *et al*, 2005), Kenya (Bailey *et al*, 2007), and Uganda (Gray *et al*, 2007) found a reduction in the incidence of female to male HIV transmission by 51-60% among circumcised men compared to non-circumcised men. Williams *et al* (2006) found one case of HIV infection could be averted for every 5-15 MCs performed, based on the prevalence of HIV in the population. As a result, the WHO and UNAIDS jointly recommended the international community consider MC as a potential HIV prevention measure (UNAIDS, 2007).

There are four plausible biological explanations for how MC helps protect individuals from acquisition of HIV. First, the inner mucosal foreskin of an uncircumcised penis is thinner and less keratinized, and may be subject to micro-tearing during sexual intercourse (McCoomb and Short, 2006). This provides an entry point for HIV. Second, there are more CD4+ cells, macrophages and Langerhans cells, which are the target cells for HIV, in the inner foreskin than any other parts of the penis (Patterson *et al*, 2002). Third, HIV may remain viable longer in the preputial cavity between the non-retracted

foreskin and the glans penis since the micro-environment is suitable for survival (Alanis and Lucidi, 2004). Fourth, lower rates of other sexually transmitted infections (STIs) among circumcised men have an indirect protective effect against HIV infection (Boily *et al*, 2008).

MC has been found to reduce the risk of acquiring other STIs in men, including genital ulcer disease (Gray *et al*, 2009; Brankin *et al*, 2009), HSV-2 and human papilloma virus (HPV) (Tobian *et al*, 2009). A study in Uganda (Gray *et al*, 2009) found a reduction in symptomatic genital ulcer disease and herpes simplex virus type 2 (HSV-2) infections due to circumcision accounted for an 11.2% and 8.6% reduction in the contraction of HIV infection, respectively. HSV-2 is incurable and may cause recurrent genital ulcers (Schiffer and Corey, 2009). HPV infection can cause genital warts; some HPV genotypes are associated with cervical cancer, penile cancer, and anal cancer. The HPV vaccine is effective, but expensive; not affordable for many people living in low and middle income countries. This makes MC a desirable means for lowering the risk of HPV infection in these countries.

A meta-analysis revealed urinary tract infections (UTI) account for 7.0% of infants presenting with fever (Shaikh *et al*, 2008). A cohort study found uncircumcised infants had a 9.1 times higher risk of developing a UTI than circumcised infants (Schoen *et al*, 2000). Although penile cancer is uncommon in Thailand (Sriplung *et al*, 2005) and worldwide, its prognosis is poor (Novara *et al*, 2007). MC reduces the risk of developing penile cancer by preventing phimosis, the most important risk factor for penile cancer (Tsen *et al*, 2001) and reduces the risk of acquiring HPV, another risk factor for penile cancer.

## MALE CIRCUMCISION AS HIV PREVENTION

Effective HIV prevention measures have been sought since the beginning of the epidemic. Behavioral intervention to reduce HIV risk behavior is difficult to implement and maintain (Coates *et al*, 2008). A systematic review of studies of school-based behavioral interventions showed no significant reduction in risk behavior for STI among adolescents (Paul-Ebhohimhen *et al*, 2008).

A biomedical intervention with high coverage, predictable results, a long term effect, that does not rely on consistent behavior is preferable. An efficacious HIV vaccine would be the best biomedical HIV prevention strategy, but no vaccine currently exists with a high level of efficacy. The ALVAC-AIDSVAX prime-boost HIV vaccine (RV 144), tested in Thailand, is the sole HIV vaccine proving to have a moderate protective effect but cannot be used as a public health measure (Rerks-Ngarm *et al*, 2009) due to inadequate efficacy.

MC is a biomedical HIV preventive measure that has the previously mentioned favorable characteristics. The protective effect of MC should be life-long and may increase through time due to progressive keratinization of the glans (Kelly *et al*, 1999).

## PROMOTING MALE CIRCUMCISION

A high MC rate could result in lower rates of HIV transmission, not only among men, but among women as well. It could also result in a reduction in STI and cervical cancer (Drain *et al*, 2006).

Implementing a program to circumcise 80% of men, the level suggested by Williams *et al* (2006), as needed to have a major impact on the HIV epidemic, would

be difficult. Countries with high levels of MC have accomplished this by one or more of three means. In some countries, it is customary to circumcise newborns as a religious practice. As a result, most Muslim countries and Israel have high MC rates. In some countries, MC is performed among boys in early adolescence as a rite of passage (Dunsmuir and Gordon, 1999). South Korea (Ryu *et al*, 2003) and the Philippines (Lee, 2005) are examples in Asia where MC is performed among older boys. A community survey (Ku *et al*, 2003) from South Korea found 78% of men had received MC while a study among Filipino men found 91% were circumcised (Castellsagué *et al*, 2002).

Implementing MC as a religious practice in Thailand would mean introducing a new religious practice in a primarily Buddhist culture. This would require convincing monks throughout Thailand to support MC as a new religious rite. Using a rite of passage approach to MC would require educating and convincing fathers, mothers and adolescents to adopt this practice. This would be difficult to accomplish – particularly among adolescents who may be reluctant to accept ideas promoted by their elders. There is a high rate of complications after MC among early adolescents. In a study carried out in the Philippines, 59.6% of subjects reported post-circumcision penile complications including inflammation and swelling (Lee, 2005). While this may be acceptable in a culture where MC has long been in use, it could be difficult to adopt this practice without this cultural history.

There is now a strong push for adult males to become circumcised in Africa in order to prevent HIV transmission. This has met with some success. However, adult MC has a high rate of complications; in a study of over 1,000 Kenyan

men who underwent MC, more than 25% of them experienced problems. Many of the complications occurred in those circumcised by a traditional healer, but the complication rate at a MC clinic was 18%; bleeding and infection were the most common complications, with excessive pain, lacerations, torsion and erectile dysfunction also being observed (Bailey *et al*, 2008). It is recommended adults who have MC refrain from having sex for six weeks. Failure to observe this advice can result in complications and a higher probability of contracting HIV because the surgical wounds are not completely healed. This advice is often not heeded (Avert, 2011).

The best way of achieving high MC rates is by having the procedure done during the neonatal period. This can be accomplished in countries, such as Thailand, where a majority of births occur in the hospital (Kongsri *et al*, 2011), where the procedure can be conducted in aseptic circumstances by trained practitioners. NC is usually performed a few days after birth and circumcised newborns can be discharged from the hospital with their mother. Once NC is accepted and becomes widespread, encouragement of NC must be maintained. In the United States in 1958, an estimated 90% of newborn males were circumcised ([historyofcircumcision.net](http://historyofcircumcision.net), 2011). This dropped to 48% by 1988-1991 during a period when many experts said that there was no medical benefit to circumcision. However, after the HIV epidemic began, when it was learned MC might prevent transmission of HIV, this rate rose to 63% in 1999 then declined to 56% in 2008. Two factors seemed to drive these fluctuations: one was that mothers considered the medical value of circumcision before giving permission for having their sons circumcised; the other factor driving the trend was the change

in reimbursing physicians for performing a NC (Zhang *et al*, 2011). One study showed circumcisions were 24% more likely to occur in states where physicians received payment for performing a NC (Leibowitz *et al*, 2009). This has important implications for countries that are considering widespread implementation of NC. Mothers are the decision makers and need to be educated about the medical benefits of NC and there needs to be incentive for physicians to perform the procedure.

### THE BENEFITS OF NEONATAL CIRCUMCISION

NC is simpler, safer and cheaper than circumcision among older boys and adults. It can be done under local anesthesia, either injection or topical. With surgical devices, such as the Gomco clamp and Plastibel, suturing is not needed (WHO, 2010). A new disposable device has become available and claims to be easier to use and provides a better cosmetic result compared to using conventional methods (Mustafa *et al*, 2008).

Bleeding and infection are the two main serious side effects of MC and occur more frequently in circumcisions among older age groups. When performed by trained health personnel, NC is safe and has a low rate of complications (Christakis *et al*, 2000). This has been shown to the case even in developing countries. NC complication rates were 2.4% in Jamaica (Duncan *et al*, 2004), 2% in the United Republic of Tanzania (Manji, 2000) and 0.3% in Nigeria (Ahmed, 1999). The wound healing period for NC is only 7 days (WHO, 2010), but may be a few weeks among adults (Kigozi *et al*, 2008; Avert, 2011). One prospective study recommended performing circumcision within 1 week of birth since the pain score increased with older ages



(Banieghbal, 2009). Another benefit of NC is that MC among adults may increase the risk of contracting HIV during the immediate post-op period. Sexually active males who were circumcised as an adult may increase their sexually risk behavior due to a perception they have less HIV risk following MC; this phenomenon is called "risk compensation" (Pinkerton, 2001) and is not an issue with NC.

To have an impact at the population level, an HIV prevention strategy needs to be implemented on a large enough scale. Women still need protection even if men are circumcised to a high enough level to achieve community herd immunity (Hallet *et al*, 2011). Higher MC coverage can be achieved through NC. Mothers who give birth to a boy can be educated about NC prior to going home from the hospital after delivery. There is no need to do HIV counseling and testing for newborns, since they are considered HIV negative, except those born to HIV-infected mothers.

Since MC provides lifelong reduced risk after the surgery. NC will provide the maximum HIV disease prevention, as well as infantile urinary tract infection. NC will provide baseline HIV risk reduction similar to HIV vaccination. Other HIV prevention interventions may be added later.

#### THAILAND AND NEONATAL CIRCUMCISION

There are many reasons why Thailand is suitable for NC. Most HIV infections in Thailand occur through heterosexual transmission (The Thai Working Group on HIV/AIDS Projections, 2008) which is reduced by MC. Risk reduction of HIV is likely in Thailand where MC is rarely performed outside the Muslim com-

munity, which constitutes about 4% of the population (Wikipedia, 2011). Most deliveries in Thailand occur in hospitals (Kongsri *et al*, 2011). Health care providers may offer NC and educate mothers about the importance of having their children circumcised. Mothers may also be instructed in how to care for their child after NC. Thailand has a relatively strong health care infrastructure and HIV related services. This can be seen by the relatively low infant mortality rate (UNICEF, 2011) and the successful prevention of mother to child transmission of HIV (Plipat *et al*, 2007) and antiretroviral (Srikantiah *et al*, 2010) programs. The possibility of scaling up NC in Thailand is good and should be beneficial. Most Thais are Buddhists, and Buddhism does not have any prohibition about circumcisions.

#### CONCERNS

MC conducted among sexually active males yields a rapid HIV risk reduction. However, it may take 15 years to start seeing the benefits of NC. Policy makers may not be interested in this long of a time scale. However, we are now 30 years into a still expanding HIV epidemic and the disease will likely be with us for some time. Therefore, both long term and short term interventions are necessary. The only intervention that could have a more lasting effect on the epidemic besides MC is a preventive vaccine, but its development is years away. It is possible NC will be having an effect before a vaccine is available, affordable and widely utilized.

The impact of NC on HIV transmission will decrease if the incidence of HIV infection is declining due to other preventive activities. The impact of this intervention may also decrease if the HIV epidemic moves towards men who have

sex with men, since MC has not yet been proven to be protective in this population. Many men who have sex with men, also have sex with women, a phenomenon that has been reported as frequently occurring in Thailand (Griensven *et al*, 2006; Li *et al*, 2009). However, this potential for a declining benefit of NC for preventing HIV transmission does not devalue its effectiveness in reducing rates of other diseases that are linked to sexual transmission, such as cervical cancer and genital ulcer disease.

To achieve maximum HIV prevention at the population level, NC must be a routine procedure. Although the Thai health care system is strong, adding a new service will put a greater burden on the staff and budget. The introduction of NC may require a personal or institutional incentive, such as a change the rates paid to physicians performing NC. Program development, staff training, purchasing materials and equipment, program monitoring and evaluation are needed to guarantee quality service. If implemented, the delivery model should be appropriate for the local context.

In spite of the medical benefits, NC is controversial in the area of neonatal rights. Some people argue NC is neither necessary nor urgent, and the child should have the opportunity to decide on their own when they grow up (Van Howe and Svoboda, 2008), while others see NC as a violation of a child's rights and bodily integrity (Dekkers, 2009).

### CONCLUSION

NC is an efficacious HIV risk reduction strategy that should be considered by those involved in HIV/AIDS prevention planning for Thailand. The decision to

implement should be made after evaluation of the current infrastructure's ability to deliver quality NC services, health care provider attitudes about NC and parental, especially mothers, acceptability of NC. Assessment of nurses' attitudes and knowledge about the effectiveness and desirability of NC is crucial. Nurses who are mostly female are often mothers or plan to become mothers. They are often the most accessible health care members in the community and can be important advocates for NC. Their example with own children and their parents may have the greatest impact on NC rates. It is necessary to carry out research to develop a service delivery model. Once this is conducted there needs to be a budget analysis and development of a training program. Lastly, a cost effectiveness analysis of the program using different scenarios must be conducted to determine how to best implement this intervention.

These tasks require a significant effort and commitment by all levels of Thai society, but the potential reward is great.

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