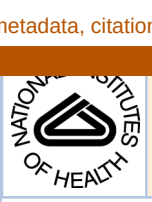



Published in final edited form as:

*AIDS Care*. 2012 ; 24(12): 1565–1575. doi:10.1080/09540121.2012.661836.

# A critical evaluation of arguments opposing male circumcision for HIV prevention in developed countries

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## Abstract

A potential impediment to evidence-based policy development on medical male circumcision (MC) for HIV prevention in all countries worldwide is the uncritical acceptance by some of arguments used by opponents of this procedure. Here we evaluate recent opinion-pieces of 13 individuals opposed to MC. We find that these statements misrepresent good studies, selectively cite references, some containing fallacious information, and draw erroneous conclusions. In marked contrast, the scientific evidence shows MC to be a simple, low-risk procedure with very little or no adverse long-term effect on sexual function, sensitivity, sensation during arousal or overall satisfaction. Unscientific arguments have been recently used to drive ballot measures aimed at banning MC of minors in the USA, eliminate insurance coverage for medical MC for low-income families, and threaten large fines and incarceration for health care providers. Medical MC is a preventative health measure akin to immunisation, given its protective effect against HIV infection, genital cancers and various other conditions. Protection afforded by neonatal MC against a diversity of common medical conditions starts in infancy with urinary tract infections and extends throughout life. Besides protection in adulthood against acquiring HIV, MC also reduces morbidity and mortality from multiple other sexually transmitted infections (STIs) and genital cancers in men and their female sexual partners. It is estimated that over their lifetime one-



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third of uncircumcised males will suffer at least one foreskin-related medical condition. The scientific evidence indicates that medical MC is safe and effective. Its favourable risk/benefit ratio and cost/benefit support the advantages of medical MC.

### Keywords

circumcision; HIV; evidence-based evaluation; public health policy; preventative medicine

## Introduction

The rise in heterosexually acquired HIV in developed countries (Centers for Disease Control and Prevention [CDC], 2011a; National Centre for HIV Epidemiology and Clinical Research [NCHECR], 2011; UNAIDS, 2010) and proof that male circumcision (MC) protects against HIV (Auvert et al., 2005; Bailey et al., 2007; Gray et al., 2007, 2012) have led to calls for increased infant MC (Cooper, Wodak, & Morris, 2010; Tobian & Gray, 2011; Tobian, Gray, & Quinn, 2010; Zetola & Klausner, 2012). Here we critique opinions of MC opponents (Boyle & Hill, 2011; Chin, 2011; Conroy, 2011; Darby, 2011; Darby & Van Howe, 2011; Forbes, 2011; Paix, 2011; Travis et al., 2011). These misrepresent credible research, and cite questionable websites, superseded publications, outlier studies, non-peer-reviewed book chapters and discredited paediatric policy statements (Schoen, Oehrli, Colby, & Machin, 2000; Morris, Bailis, Castellsague, Wiswell, & Halperin, 2006; Morris et al., 2012b). Opposition to infant medical MC in the USA (Green, McAllister, Peterson, & Travis, 2009) has seen Medicaid coverage decline, posing a danger to public health (Leibowitz, Desmond, & Belin, 2009; Morris, Bailis, Waskett, Wiswell, & Halperin, 2009).

Boyle and Hill (2011) and Darby and Van Howe (2011) repeat claims opposing medical MC for HIV prevention in sub-Saharan Africa (Gisselquist et al., 2009; Green, McAllister, Peterson, & Travis, 2008; Green et al., 2010; Van Howe, 1999; Van Howe & Storms, 2011) shown previously to be seriously flawed (Banerjee et al., 2011; Morris et al., 2011b; Moses, Nagelkerke, & Blanchard, 1999; O'Farrell & Egger, 2000; Wamai et al., 2008, 2011; Wamai & Morris, 2011; Wawer et al., 2011). A dated opinion piece by Fleiss, Hodges, and Van Howe (1998) cited by Paix (2011) contradicts research. Van Howe's other anti-MC claims have been refuted (Bailis, 1998; Castellsague, Albero, Cleries, & Bosch, 2007; Schoen, 1997, 2007; Waskett & Morris, 2007, 2008; Waskett, Morris, & Weiss, 2009). Contrary to Darby and Van Howe (2011)'s claim that "it will be many years before we learn whether the current African circumcision programs have succeeded", a large-scale MC roll-out has demonstrated 76% HIV protection (Auvert et al., 2011).

## Sexual function, sensation and satisfaction

Claims that MC is "highly mutilating", "seriously impairs penile function" (Paix, 2011) and "amputates healthy, functional, protective, erogenous tissue" (Boyle & Hill, 2011) have led vulnerable men to falsely believe their sexual problems stem from their infant circumcision, leading them to "feel angry and mutilated, even to the point of psychological disturbance" (Darby & Van Howe, 2011), resorting to mutilating "foreskin restoration" (Walter & Streimer, 1990). In reality, sexual dysfunction, especially with age, is either more common (Laumann, Maal, & Zuckerman, 1997; Richters, Smith, de Visser, Grulich, & Rissel, 2006) or no different (Collins et al., 2002; Ferris et al., 2010; Masood et al., 2005) in uncircumcised versus circumcised men.

Empirical measurements show no difference in penile sensitivity (Bleustein, Fogarty, Eckholdt, Arezzo, & Melman, 2005; Collins et al., 2002; Masters & Johnson, 1966),

sensation during arousal (Payne, Thaler, Kukkonen, Carrier, & Binik, 2007), sexual satisfaction (Collins et al., 2002; Fink, Carson, & deVellis, 2002), premature ejaculation (Son, Song, Kim, & Paick, 2010) or intravaginal ejaculatory latency time (Waldinger et al., 2005; Waldinger, McIntosh, & Schweitzer, 2009). Sexual satisfaction may increase (Senol, Sen, Karademir, Sen, & Saraçoğlu, 2008), with randomized controlled trials (RCTs) confirming similar or enhanced sexual function, sensitivity and satisfaction in men and their wives (Breda, 2011; Kigozi et al., 2008; Krieger et al., 2008; Westercamp, Bailey, & Agot, 2011).

Travis et al. ignore these, instead citing Sorrells et al. (2007), a discredited study with erroneous statistics (Waskett & Morris, 2007). Similarly Forbes (2011) cites a Korean study (Kim & Pang, 2007) also discredited (Willcourt, 2007), as have others (Morris, Waskett, & Gray, 2012).

US men ranked the *ventral surface* of the penis highest for "sexual pleasure" and "orgasm intensity", followed by the upper surface and sides, the foreskin being less important (Schober, Meyer-Bahlburg, & Dolezal, 2009). Sexual sensation is mediated by genital corpuscles, but these are absent from the foreskin (Rhodin, 1974). Penile sensitivity decreases during arousal, as appropriate for penetration (Payne et al., 2007). In circumcised men arousal response is quicker.

## Deaths from infant MC

The claim by Travis et al. of "0.9 deaths per 10 000 circumcisions" is from Bollinger (2010), who assumed sex differences in infant mortality in the USA are entirely due to MC. But sex differences are also seen in countries with low neonatal MC (Table 1). The cause is multifactorial (Drevenstedt, Crimmins, Vasunilashorn, & Finch, 2008),

Deaths from medical MC are exceedingly rare, as Darby and Van Howe (2011) confirm. They are mostly from general anaesthesia, local anaesthesia being safer.

## HIV infection in men

Travis et al. (2011) and Darby and Van Howe (2011) falsely dismiss MC for HIV prevention in the USA, failing to acknowledge that most incident HIV infections are in men-who-have-sex-with-men (MSM), via receptive anal intercourse, a mode unaffected by MC. Boyle and Hill (2011) fail to recognise that HIV is nevertheless lower in "insertive only" MSM (Buchbinder et al., 2005; Fox, 2007; Kreiss & Hopkins, 1993; Millett, Flores, Marks, Reed, & Herbst, 2008; Templeton et al., 2009; Wiysonge et al., 2011). HIV risk and vulnerability are multifactorial, including levels of sex education and condom usage (Brick, 1999; David, Morgall, Osler, Rasmussen, & Jensen, 1990; Dodge, Sandfort, Yarber, & de Wit, 2005; Michael et al., 1998; Wallace & Vienonen, 1989; Weinberg, Lottes, & Aveline, 1998). Countries with superior health care have greater testing, diagnosis and treatment, longer survival and thus higher HIV statistics.

Heterosexual US men have lower HIV prevalence if circumcised (Kassler & Aral, 1995; Moses, Bailey, & Ronald, 1998; Smith et al., 2010; Sullivan et al., 2007; Telzak et al., 1993; Tobian et al., 2010; Warner et al., 2009). RCTs are not needed in developed countries, given supportive observational data (Lie & Miller, 2011). Since most US males are circumcised as infants, the claim that "there is no hard evidence that neonatal circumcision has any protective effect against acquiring HIV" (Darby, 2011; Darby & Van Howe, 2011) is specious. High US medical MC may have moderated HIV prevalence (Addanki, Pace, & Bagasra, 2008). Each year 1.2 million boys (55–56%) are circumcised before hospital discharge (CDC, 2011b; Merrill, Nagamine, & Steiner, 2008), then others post-discharge.

Regional differences of 75%–31% are from Hispanic births (Merrill et al., 2008). A reduction in reimbursement by public and private health insurance (Clark, Kilmarx, & Kretsinger, 2011; Leibowitz et al., 2009; Morris et al., 2009), and a decline in medical MC rate, could reverse the benefit experienced in the USA to date (Sullivan et al., 2007). In Australia, the decline in MC from high pre-1970s levels to only 27% in 16–19-year-olds currently (Ferris et al., 2010) should ring alarm bells (Cooper et al., 2010).

Rather than "the jury [being] still out" (Conroy, 2011) or medical MC being "irrelevant" (Darby, 2011) for HIV prevention amongst heterosexuals in developed countries, in the USA 9.6% of new HIV cases in 2009 were from heterosexual intercourse (CDC, 2011a), and in Australia all HIV-positive heterosexual male STI clinic attendees acquired HIV from heterosexual contact, not injecting drug use (Figure 33 of NCHECR (2011)). Darby and Van Howe (2011) seem unaware that unlike MSM, who get tested frequently, heterosexuals do not (NCHECR, 2011), so most presenting with a sero-conversion illness have not previously been tested. Rather than "23 men newly infected in 2009", Table 1.1.6 of the 2010 NCHECR report Darby & Van Howe cite states 155 were newly infected in 2009, with a steady rise from 88 in 2005. The NCHECR reports 23% (not "10%") of infections were from heterosexual contact in 2009. Of these, 47% were in heterosexuals neither from, nor having a partner from, a high prevalence country. Australian-born individuals accounted for 31% of the heterosexual total. Their statement that infant MC for HIV prevention "would be ruled out on cost-benefit considerations alone" is inconsistent with public health policies that include childhood vaccinations. A pertinent example is costly vaccination programs for school girls against HPV, also acquired sexually, to reduce later cervical cancer in a small minority (Maine, Hurlburt, & Greeson, 2010). HIV prevalence in sub-Saharan Africa in the early 1980s was similarly low. If MC programs had been implemented earlier millions of lives and dollars would have been saved (Potts et al. 2008; Potts, Prata, Walsh, & Grossman, 2006).

Using almost identical wording, Travis et al. (2011) and Darby and Van Howe (2011) say that "African Americans have the highest rates of both circumcision and heterosexually transmitted HIV infection". Although annual HIV diagnoses in African-Americans are seven times higher than whites, 25% from heterosexual contact (CDC, 2007), the MC figures they quote of 66.2% for Blacks and 60.0% for whites were San Francisco STD clinic data (Mor, Kent, Kohn, & Klausner, 2007), whereas representative national data show 89% of non-Hispanic white and 73% of Black men are circumcised (Xu, Markowitz, Sternberg, & Aral, 2007). Whites (15 per 100,000) have the lowest heterosexually acquired HIV (CDC, 2011a); Black men the highest (466 per 100,000).

Darby and Van Howe (2011) distort the biological evidence of risk posed by the foreskin, even falsely claiming "the inner foreskin secretes langerin, which is effective in killing numerous pathogens". Langerin is not secreted. Langerin's function and biological reasons for foreskin risk are detailed in a recent review (Morris & Wamai, 2012).

## Other sexually transmitted infections (STIs)

Forbes (2011) claims that "evidence of the protective effect of circumcision against other sexually transmitted infections in Australia is limited". Such obfuscation (because relevant data for Australia is lacking) misrepresents the strong evidence that MC protects against oncogenic types of human papillomavirus (HPVs) (Albero, Castellsagué, Giuliano, & Bosch, 2012; Larke, Thomas, Dos Santos Silva, & Weiss, 2011a; Morris et al., 2011a), herpes simplex virus type 2 (HSV-2) (Cherpes, Meyne, Krohn, & Hiller, 2003) and various other STIs in heterosexual men and their female partners in other developed, as well as developing, countries (Morris & Castellsague, 2011; Tobian et al., 2010; Tobian & Gray,

2011). History of STI amongst circumcised men was 3-fold lower in a longitudinal New Zealand study (Fergusson, Boden, & Horwood, 2006) and 2-fold lower amongst MSM in London gyms (Thornton, Lattimore, Delpech, Weiss, & Elford, 2010). In the USA syphilis was half as common in circumcised MSM (Jameson, Celum, Manhart, Menza, & Golden, 2010), and for insertive-only MSM was completely absent in Seattle (Jameson et al., 2010) and 10-fold lower in Sydney (Templeton, Millett, & Grulich, 2010). Circumcised Australian heterosexual men had 50% lower thrush (Ferris et al., 2010; Richters et al., 2006).

## HIV risk to women

Boyle and Hill (2011) and Forbes (2011) claim that MC increases transmission of HIV to women, selectively citing a study of HIV-positive men who resumed sex before complete wound healing (Wawer et al., 2009). Even then, the increase was not statistically significant. Resuming sex too soon does pose a potential risk. By performing circumcision in infancy (no risk of sexual HIV acquisition) the issue of healing in a sexually mature male does not arise.

Contrary to what Forbes and Boyle and Hill state, MC confers long-term indirect and potential direct positive impacts on women (Hankins, 2007). The indirect effects come from lowering of HIV prevalence in men (UNAIDS/WHO/SACEMA Expert Group on Modelling the Impact and Cost of Male Circumcision for HIV Prevention, 2009). A metaanalysis found 20% lower HIV in the female partners of HIV-positive circumcised men (Weiss, Hankins, & Dickson, 2009), being 38% lower subsequently (Baeten et al., 2010). In a general population setting, modelling predicted MC would lower male-to-female HIV transmission by 46% (Hallett et al., 2011).

## Condoms

Travis et al. (2011) argue that “condoms are 95 times more effective” than MC, but misquote their own article that actually states condoms are “95 times more cost effective” (McAllister, Travis, Bollinger, Rutiser, & Sundar, 2008). They also say “a circumcision program would be five times more costly than providing free condoms”. A systematic review of cost-effectiveness studies (Galárraga, Colchero, Wamai, & Bertozzi, 2009) offers no support for this claim, even for the African HIV epidemic. Moreover, medical MC is a one-time, permanent procedure that confers lifelong 75% protection against HIV, whereas condoms must be used correctly and consistently for an entire lifetime *each time* a person has sex with a partner not assured of being HIV negative.

The cost of neonatal MC in the USA averages $165, whereas cost later in childhood or adulthood is much greater (Schoen, Colby, & To, 2006). The annual cost for 1.2 M neonatal MCs in the USA is US$150–270 million (Schoen et al., 2006). Assuming 20 million sexually active, condom-using men, 50 acts of sexual intercourse per year and $1 per condom, unadjusted for inflation, annual national expenditure for condoms in the USA would be approximately $10 billion. This far exceeds the annual cost of neonatal MC.

A Cochrane systematic review found condoms are 80% effective (Weller & Davis, 2001), i.e., are only slightly more effective than MC. But whereas MC is always in place, condoms must be applied each time. The need for consistent use, even during foreplay, means condoms are often unpopular, especially within long-term sexual partnerships. In the USA 16% of men and 24% of women reported never using condoms during heterosexual sex with a non-primary partner (Sanchez et al., 2006). In Australia, amongst young people at higher risk of HIV exposure, only 25% always and 25% never, used them (Kang et al., 2006). Senior high school students exhibited rising sexual partnerships, but no rise in condom use (Agius, Pitts, Smith, & Mitchell, 2010). Even Darby and Van Howe (2011) state that

"sexually active adult men who have regular intercourse with numerous female partners and do not always use condoms should consider circumcision for themselves".

While condom use should be encouraged, condoms are not a magic bullet. WHO/UNAIDS recommend both MC and condoms.

## Delaying circumcision

This suggestion (Chin, 2011) is unrealistic and impractical (Morris et al., 2012a; Tobian & Gray, 2011). By circumcising in infancy the male will be equipped with substantial protection against STIs when he reaches sexual maturity. Infant MC also provides immediate protection against urinary tract infections, kidney damage, balanitis, balanoposthitis, foreskin injuries, hygiene-related problems and phimosis. Foreskin retraction difficulties cause pain, problems with urine flow and difficulty with erections in the teen years and later. Infant MC may afford greater protection against penile cancer than MC later in life (Larke, Thomas, Dos Santos Silva, & Weiss, 2011b; Morris et al., 2011a). It is simpler, quicker, cheaper, more convenient, lower risk and provides a better cosmetic outcome than circumcision later (Morris & Eley, 2011; Sansom et al., 2010; Schoen, Wiswell, & Moses, 2000; Tobian et al., 2010; Weiss, Larke, Halperin, & Schenker, 2010; WHO and JHPIEGO, 2010). Wound healing is, moreover, quicker (Bermudez, Canning, & Liechty, 2011).

Parents must make many decisions on behalf of their children. The decision to circumcise (UNAIDS, 2007) is one of many that also includes vaccination.

## Cost and risk – versus benefit

Travis et al. (2011) say MC costs more than it saves. Forbes (2011) claims, without data, that the benefits and risks are evenly balanced. Darby and Van Howe (2011), by selective citation, inflate the risks associated with infant MC. MC is cost-effective in developing countries (Uthman, Popoola, Uthman, & Aremu, 2010), and in the USA a cost–benefit analysis by the CDC found infant MC would reduce lifetime HIV risk by 16%, making it cost-saving for HIV prevention (Sansom et al., 2010). Over their lifetime one in three uncircumcised males will be affected by at least one medical condition that MC protects against (Morris et al., 2006, 2007, 2012c). Benefits exceed risks by well over 100–1 (Morris et al., 2006, 2007, 2012c). Cost-benefit should be substantial, especially given the high cost of treating genital cancers and AIDS, each more prevalent when MC is not performed.

## Surgical vaccine

Darby and Van Howe (2011) criticise the term "surgical vaccine" which is used commonly when referring to MC, saying "Circumcision provides nothing like the kind or level of protection provided by a vaccine". The 75% protection afforded by MC against HIV is on a par with influenza vaccinations (Fiore et al., 2007; Kelly et al., 2009).

## Ethical and legal arguments

Arguments based on ethics, consent and other philosophical considerations, usually coupled with statements implying benefits and risks are evenly balanced (Forbes, 2011), or that MC is somehow harmful (Boyle & Hill, 2011; Darby & Van Howe, 2011; Paix, 2011), can be compared to the anti-vaccination lobby's dangerous misinformation that has outraged health authorities (Health Care Complaints Commission, 2010), reduced the uptake of childhood immunisation, and revitalised the spread of vaccine-preventable – and often fatal – diseases (Wallace, 2009; Wikipedia, 2011). Yet vaccination is accepted, despite higher risk of serious

complications for some (Wikipedia, 2011) than infant MC. Like vaccination, benefits of MC exceed risks by a large margin (Morris et al., 2006, 2007, 2012b).

If prophylactic infant MC were "legal battery" (Travis et al., 2011) then court decisions reflecting this should exist. But there are none. Thus the legal system upholds the rights of parents to make decisions in the best interests of their child. The County of San Francisco Superior Court struck down a 2011 ballot initiative that would have banned MC of minors, stating that the city does not have the authority to restrict legal, medical procedures that physicians can perform with the parents' consent. This judgement was then supported unanimously by the California Senate, and signed into law by the Governor as bill AB768. When one considers the issues of "beneficence", "non-maleficence", "proportionality", "justice" and "autonomy" (Darby & Van Howe, 2011), an impartial, evidence-based assessment leads to an affirmative conclusion favouring MC. Support for infant MC amongst informed parents is strong (Ahaghotu, Okafor, Igiehon, & Gray, 2009; Wang, Macklin, Tracy, Nadel, & Catlin, 2010). Any health professional who advises against infant MC risks consequences should foreskin-related medical problems, morbidity or death ensue (Russell, 2005).

## Distortions of evidence by MC opponents

Conroy (2011) misquotes the report from a CDC meeting in 2007 of all relevant stakeholders (Smith et al., 2010). Van Howe presented his anti-circumcision case but his arguments did not feature in the report.

In complete contradiction to the sources he cites (CDC, 2008; Morris, 2007) Conroy makes the untenable claim that the evidence favouring MC for HIV prevention in countries like the USA and Australia is based on "opinion or other inconclusive, low-quality evidence". MC's protective effect against STIs in developed and developing countries per act of sexual intercourse is similar (Kassler & Aral, 1995; Moses et al., 1998; Smith et al., 2010; Sullivan et al., 2007; Telzak et al., 1993; Tobian et al., 2010; Warner et al., 2009).

The Cochrane committee concluded that "inclusion of MC into current HIV prevention guidelines is warranted" and that "no further trials are required" (Siegfried, Muller, Deeks, & Volmink, 2009). It seems, however, that there would be never enough evidence to convince opponents of MC.

## Conclusion

A reasoned policy debate on MC must separate "values" discussions from factual discussions (Robert & Zeckhauser, 2011). Scientists are trained to properly evaluate information and make evidence-based conclusions. Misinformation, distortions and specious arguments by MC opponents could subvert evidence-based policies, leading to suffering and deaths. As the late US Senator Daniel Patrick Moynihan was fond of saying, "Everyone is entitled to their own opinions, but they are not entitled to their own facts".

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## Table 1

Infant mortality (IM) rates (deaths per 1,000 live births) for selected countries for which neonatal MC rate is known

| Country | Est. neonatal MC rate | IM (male) | IM (female) | IM (m:f ratio) |
|---|---|---|---|---|
| Israel | >90% | 4.1 | 3.9 | 1.05 |
| Nigeria | 80–90% | 97 | 85 | 1.14 |
| USA | 60–80% | 6.7 | 5.4 | 1.25 |
| Australia | B20% | 4.6 | 3.6 | 1.28 |
| UK | <5% | 5.1 | 4.2 | 1.22 |
| France | <5% | 3.6 | 3.0 | 1.22 |
| Denmark | <5% | 3.7 | 3.0 | 1.23 |
| Norway | <5% | 3.7 | 2.6 | 1.42 |
| Finland | <1% | 3.7 | 3.1 | 1.20 |

Notes: Figures used for calculations were from: CIA World Factbook, https://www.cia.gov/library/publications/the-world-factbook/fields/2091.html; United Nations Economic Commission for Europe, http://w3.unece.org/pxweb/dialog/varval.asp?ma=003_GEHEInfantDeath_r&path=../database/STAT/30-GE/06-Health/&lang=1&ti=Infant+mortality+rate+by+sex); Australian Bureau of Statistics, http://www.abs.gov.au/ausstats/abs@.nsf/Lookup/by%20Subject/1370.0~2010~Chapter~Infant%20mortality%20(4.1.3); UNICEF, http://www.childinfo.org/statistical_tables.html; Inter-agency Group for Child Mortality Estimation, http://www.childmortality.org/; Population Reference Bureau, https://www.prb.org/datafinder.aspx