



## OPINION

## Neonatal circumcision does not reduce HIV/AIDS infection rates

D Sidler, J Smith, H Rode

Non-therapeutic, non-religious circumcision is the surgical procedure most commonly published about,<sup>1</sup> but substantive indications are lacking. Since its introduction to the USA during the Victorian period, when it was thought that it prevented masturbation,<sup>2</sup> medical justifications for the procedure progressed to prevention of various infective conditions (sexually transmitted diseases, penile and cervical cancer) and controlling of the sexual drive. Recent Joint United Nations Programme on HIV/AIDS/World Health Organization (UNAIDS/WHO) policy proposes male circumcision for the prevention of HIV/AIDS.<sup>3,4</sup>

HIV/AIDS in Africa is mainly spread by multiple concurrent heterosexual relationships,<sup>5</sup> compounded by female subjugation<sup>6,7</sup> and poverty.<sup>8,9</sup> Condoms, although highly protective, are infrequently used, particularly among circumcised males.<sup>10,11</sup>

The HIV/AIDS crisis demands extraordinary curtailment measures. It is, however, questionable how circumcision, and particularly neonatal circumcision, could achieve such a goal. A rational and critical analysis of the scientific evidence<sup>12-14</sup> ought to conclude that non-therapeutic infant circumcision is merely the medicalisation of an old ritual that should not, in the 21st century, be advocated as prevention strategy for HIV/AIDS.

Repeated publications of matching opinions do not necessarily lead to solid scientific evidence and policies.

*Daniel Sidler (MD, MPhil (Applied Ethics), FCS) is a paediatric surgeon at Tygerberg Children's Hospital, Tygerberg, W Cape, with a special interest in neonatal and laparoscopic paediatric surgery and medical ethics.*

*Johan Smith (MB ChB, MMed (Paed), PhD, Cert Neonatology) is a neonatologist at Tygerberg Children's Hospital, and his special interests include neonatal lung function and surfactant replacement therapy. He is the vice-president of USANA (United South African Neonatal Association).*

*Heinz Rode, MMed (Surg), FCS (SA), FRCS (Edin), is Emeritus Professor of Paediatric Surgery, Red Cross War Memorial Children's Hospital, Cape Town.*

Corresponding author: D Sidler (ds2@sun.ac.za)

They rather suggest that the peer review process of journal publication may be unreliable.<sup>15</sup> Information overload can cause limitations, for example influencing expert and public opinion with ideological and pseudoscientific content.<sup>16-18</sup> This context and such therapeutic misconceptions contribute to circumcision still being practised as a non-therapeutic infant procedure. This mainly applies to English-speaking countries, where circumcision appears to have become a medicalised ritual. In contrast, in Europe non-therapeutic circumcision is not the norm.

Many reviews<sup>19-21</sup> question the necessity of non-therapeutic infant circumcision, showing it to have neither short- nor long-term medical benefits. It has been suggested that parents should be granted responsibility and final decision-making authority after having thoroughly considered all the relevant facts.<sup>19</sup> The reported increase in demand for preventive circumcision, long before publication of results of the three randomised controlled trials (RCTs) in South Africa,<sup>22</sup> Kenya<sup>23</sup> and Uganda<sup>24</sup> that have shown that circumcision is partially protective against HIV, suggests that informed proxy consent, within the context of the HIV/AIDS epidemic and the prevalence of poverty and ignorance, has to be seriously questioned.<sup>25</sup> The desperate hope and need for action of people ravaged by HIV/AIDS, rather than solid scientific evidence, may be driving the increased demand for preventive circumcision.

A recent Centers for Disease Control (CDC) and WHO report<sup>26</sup> confirms previous reports that circumcision does not prevent sexually transmitted diseases (STDs).<sup>27</sup> Teens 15 years and older in the USA have the highest rate of STDs in any industrialised country and half will contract a sexually transmitted disease by age 25, despite two-thirds of young males having been circumcised. Such reports suggest that the social experiment of circumcision to prevent STDs, including HIV, has already failed in the USA, which has the highest rate of non-therapeutic infant circumcision in industrialised countries and the highest rate of HIV in the developed world.<sup>26</sup>

Before the three controversial RCTs<sup>22-24</sup> were published, a Cochrane Systematic Review<sup>28</sup> concluded that there was insufficient evidence to suggest use of mass circumcision to prevent HIV/AIDS. Irrespective of this review, advocates of mass roll-out of prophylactic circumcision repeatedly published the benefits of infant non-therapeutic circumcision and either omitted to mention the Cochrane Systematic Review



or misrepresented it.<sup>29-31</sup> Since the Cochrane Collaboration's Review, infant non-therapeutic circumcision in South Africa has become illegal,<sup>32</sup> making the discussion of forced infant circumcision moot, at least in this country.

Research ethics committees appear to have accepted research proposals such as that of Auvert *et al.*<sup>22</sup> without considering the historical context within which non-therapeutic circumcision became so prevalent in English-speaking countries. Omitting the Cochrane Systematic Review in the research protocol and final publication raises serious concern. Similarly, peer-reviewed journals have repeatedly accepted papers that omit contradictory evidence. A journal reviewer for the *New England Journal of Medicine*, *JAMA*, *Archives of Disease in Childhood* and *Pediatrics* stated under oath that he had never accepted any paper attempting to demonstrate the inefficacy of infant circumcision as a prevention tool.<sup>33</sup> It therefore becomes increasingly important to question the many and similar scientific and media publications promoting the benefit of mass roll-out of circumcision as a strategy for prevention of HIV/AIDS.

The use of mass circumcision to curb HIV in Africa is ill-advised, and may worsen the crisis while expending scarce resources that could be applied better for more effective preventive measures. Neonatal non-therapeutic circumcision to combat the HIV crisis in Africa is neither medically nor ethically justifiable on the basis of current medical evidence or universally recognised ethical and human rights principles. The call for neonatal non-therapeutic circumcision for prevention of HIV by some members of the Catholic Church<sup>31</sup> suggests misunderstanding of the local context, and supporting genital surgery on newborn boys but discouraging the more effective preventive measure of condom use lacks logic.

Neither an explanation for the outcome of the three RCTs nor evidence that they are applicable and repeatable in real-world situations exists.<sup>7</sup> No field test has been performed to test the theory or to analyse its effectiveness, cost and complications. To roll out a new programme based on limited evidence, implying to the African public that circumcision could reduce the male likelihood of contracting HIV by 50 - 60%, is inconclusive and misleading.<sup>34,35</sup> Coercing adults and forcing infants to be circumcised is unethical. Safe-sex campaigns could accomplish much greater reductions in infection frequency, as was successfully achieved in Brazil, Thailand and Uganda, where three mainly non-circumcising countries reduced the HIV epidemic through the ABC approach (abstinence, be faithful, condomise) alone.

The Australian Federation of AIDS Organizations (AFAO) concurs that male circumcision has no role in the Australian HIV epidemic.<sup>36</sup> There is no demonstrated benefit of circumcision in men who have sex with men. Consistent condom use, not circumcision, is the most effective means of reducing female-to-male transmission, and vice versa; and

African data on circumcision are context-specific and cannot be extrapolated to the Australian epidemic. Comparing Australia to America, they conclude: 'The USA has a growing heterosexual epidemic and very high rates of circumcision. Circumcision does not prevent HIV – in high prevalence areas, it *reduced the risk* of female-to-male transmission. HIV acquisition rates were nevertheless high in both the circumcised and the non-circumcised groups involved in the trials.'

The Royal Australasian College of Physicians policy statement on circumcision could not recommend circumcision to help stop the epidemic: 'How much circumcision could contribute to ameliorate the current epidemic of HIV is uncertain.'<sup>37</sup>

The French Conseil National du SIDA issued a report<sup>38</sup> to clarify the issues following the mass media reporting and misreporting of the three African RCTs. 'The studies are generating debate among the scientific community and are also raising a number of questions with regard to its implementation and role in terms of public health strategy. Implementation of male circumcision as part of a draft of preventative measures could destabilize health care delivery and at the same time confuse existing prevention messages. The addition of a new tool could actually cause a result opposite to that which was originally intended.'<sup>37</sup>

## Circumcision could increase the risk of HIV

Promoting circumcision might worsen the problem by creating a false sense of security and protection and therefore undermining safe sex practices and condom usage among men and their partners.<sup>39,40</sup> If the 50 - 60% protective effect the RCTs claim is true, and if all African males were to be circumcised over the next 15 years, the number of infections would only be reduced by 8% and related deaths by 1%.<sup>40,41</sup> Men who have sex with men are not protected from HIV, even if they are circumcised.<sup>42-44</sup> Furthermore, the role of commercial sex workers and sexual networks has not been adequately addressed in plans to stop the epidemic.<sup>45,46</sup>

Another serious concern is the breakdown of sexual socialisation of the youth, coupled with the continuous erosion of the role that circumcision initiation schools once played. A norm appears to be emerging where circumcision is increasingly regarded as a gateway and right to unprotected sex<sup>47,48</sup> rather than a marker for assuming responsibility in sexual behaviour. This should give pause for thought concerning the practical efficacy of research, which shows some medical benefit to circumcised males in the form of protecting them against HIV while discarding the attendant socialisation within the customary context.

Further cause for concern is the confirmation of a preliminary report stating that women have an up to 60%



increased cumulative risk of contracting HIV over the period of 24 months if their male partner is HIV positive and has been circumcised.<sup>49,50</sup> Female opinion has generally been disregarded in the debate on male circumcision as a method for HIV prevention. Informal discussions with women reveal a range of concerns, preferences and views that researchers and governments would do well to consider before drawing up plans for rolling out a national mass circumcision programme. African women are concerned that such a programme will give their male partners another excuse not to use condoms.<sup>11,51</sup>

## Potential complications and harms from circumcision<sup>52</sup>

Risks and harms of circumcision have to be considered before any mass circumcision programme could be adopted. A neonatal circumcision complication rate of 20.2% was found in Nigeria;<sup>53</sup> risks of methicillin-resistant *Staphylococcus aureus* and other infections in newborns increase;<sup>54-57</sup> and even deaths and severe complications resulting in lifelong disability have occurred.<sup>58</sup> Meatal stenosis affects 5 - 10% of circumcised infant males. Sexual side-effects and sensitivity loss,<sup>59,60</sup> as well as psychological consequences including an infant analogue of post-traumatic stress syndrome<sup>61,62</sup> and addictive behaviours,<sup>63</sup> are some more controversial claims. Whether controversial or not these claims need to be carefully considered, particularly in the context where neonatal circumcision is performed without analgesia or anaesthesia.<sup>64</sup>

## A 'social vaccine'

Education, female economic independence, safe sex practices and consistent condom use are proven effective measures against HIV transmission. Such a strategy dropped the HIV adult prevalence rate in Uganda from over 30% in 1992 to 14% in 1995 to below 8% in 2000.<sup>65</sup> Consistent condom use reduces lifetime risk of contracting HIV by 20%,<sup>66</sup> as opposed to 8% for circumcision.<sup>40,41</sup>

It is the responsibility of those who insist on circumcision as a globalised roll-out for HIV prevention to prove that circumcision will not cause any short- or long-term harm. Such responsibility would imply registration of all circumcisions for HIV prevention and the collection of data, particularly of complications, including the rate of HIV acquisition of male and their female partners. Such responsibility would mean lifelong follow-up.

Parents should not be misled into thinking that the results of studies performed on adult African males could be extrapolated to health policy for newborns. It is unprecedented and unethical for a prophylactic surgery to be offered as a 'health benefit' to parents of newborns to reduce the risk of a disease acquired in adulthood for which there are safer, less invasive, less expensive, and proven prevention methods available.<sup>10</sup> Newborns are not sexually active and not at risk of

sexually contracted diseases. Furthermore, by the time today's newborns are sexually active, a vaccine or other methods of treating the disease may be available. They may prefer to retain their foreskin and as adults choose vaccination and safe sex practices, including using condoms.

Infant circumcision is not a common African tradition. To our knowledge the Coptic Christians and black Jews in Ethiopia and Eritrea are the only African peoples who practise neonatal circumcision. Each circumcising African tribe has a specific and very different technique and ritual of circumcision. The introduction of an Americanised neonatal circumcision could be considered cultural and religious interference, and even be construed as medical colonisation.

## Conclusion

Male non-therapeutic infant circumcision is neither medically nor ethically justified as an HIV prevention tool. Circumcision is not equivalent to successful immunisation, is being practised with decreasing frequency in English-speaking countries, and is becoming illegal in South Africa under the new Children's Act.<sup>32</sup> There are far more effective prevention tools costing considerably less and offering better HIV reduction outcomes than circumcision.

Finally, the WHO and UNAIDS appear to be basing these multi-million-dollar prevention programmes on limited and in some instances biased information. In order to prevent confusion and parents making misguided decisions on behalf of their infants, and to offer effective help in alleviating the suffering that is being created by HIV/AIDS, a much broader review process would be called for. Such a process would involve more objective scientific opinion, and the involvement of a representative panel of African experts, such as paediatric surgeons and neonatologists.

1. Heyns CF, Krieger JN. Circumcision. In: Schill W-B, Comhaire FR, Hargreave TB, eds. *Andrology for the Clinician*. Berlin: Springer-Verlag, 2006: 203-212.
2. Darby R. *A Surgical Temptation: The Demonization of the Foreskin and the Rise of Circumcision in Britain*. Chicago: University of Chicago Press, 2005.
3. WHO/UNAIDS Technical Consultation Male Circumcision and HIV Prevention: Research Implications for Policy and Programming. Montreux, 6 - 8 March 2007. Conclusions and Recommendations. [http://data.unaids.org/pub/Report/2007/mc\\_recommendations\\_en.pdf](http://data.unaids.org/pub/Report/2007/mc_recommendations_en.pdf) (accessed 15 July 2008).
4. Male Circumcision: An Intervention for HIV Prevention in the WHO African Region. An Information Note from the WHO Regional Office for Africa. [http://www.afro.who.int/aids/publications/male\\_circumcision\\_en.pdf](http://www.afro.who.int/aids/publications/male_circumcision_en.pdf) (accessed 15 July 2008).
5. Halperin DT, Epstein H. Why is HIV prevalence so severe in southern Africa. *Southern African Journal of HIV Medicine* 2007; 3: 19-25.
6. Health Canada. HIV and Sexual Violence against Women. [http://www.hc-sc.gc.ca/hppb/hiv\\_aids/you/sex\\_violence](http://www.hc-sc.gc.ca/hppb/hiv_aids/you/sex_violence) (accessed 17 December 2007).
7. Fourie P, Schönsteich M. Die, the beloved countries: Human security and HIV/AIDS in Africa. [http://www.sarpn.org.za/documents/d0000177/P170\\_Security\\_HIVAIDS.pdf](http://www.sarpn.org.za/documents/d0000177/P170_Security_HIVAIDS.pdf) (accessed 17 December 2007).
8. Banett T, Whitside A. The Jaipur Paradigm: a conceptual framework for understanding social susceptibility and vulnerability to HIV. *S Afr Med J* 2000; 1098-1101.
9. Laszlo E. *The Chaos Point. The World at the Crossroads*. Charlottesville, VA: Hampton Roads Publishing Company, 2006: 16.
10. Issue Brief: The Effectiveness of Condoms in Preventing HIV Transmission. <http://www.amfar.org/cgi-bin/iowa/programs/publicp/record.html?record=21&gclid=CLez1fXsZACFR9WMAod1E8IGw> (accessed 17 December 2007).
11. Circumcision gives men an excuse not to use condoms. 31 July 2008. <http://www.irinnews.org/Report.aspx?ReportID=79557> (accessed 14 August 2008).
12. Svoboda JS. Circumcision - a Victorian relic lacking ethical, medical, or legal justification. *Am J Bioeth* 2003; 3(2, Spring): 52-54.



13. Mills E, Siegfried N. Cautious optimism for new HIV/AIDS prevention strategies. *Lancet* 2006; 368: 9543.
14. Dowsett GW, Couch M. Male circumcision and HIV prevention: Is there really enough of the right kind of evidence? *Reprod Health Matters* 2007; 15(29): 33-44.
15. Bacchetti P. Peer review of statistics in medical research: the other problem. *BMJ* 2002; 324: 1271-1273.
16. Heylighen F. Complexity and Information Overload in Society: why increasing efficiency leads to decreasing control. Draft paper, version: April 12, 2002, to be submitted to The Information Society. <http://pcp.vub.ac.be/HEYL.html> (accessed 21 December 2007).
17. Valhoul C. Cutting down the dissonance: the psychology of gullibility. [http://www.informationoverload.com/psychology\\_of\\_gullibility.htm](http://www.informationoverload.com/psychology_of_gullibility.htm) (accessed 21 December 2007).
18. Postman N. *Technopoly: The Surrender of Culture to Technology*. 1st ed. NY: Vintage Books, 1993: 69-70.
19. Benatar M, Benatar D. Between prophylaxis and child abuse: the ethics of neonatal male circumcision. *Am J Bioeth* 2003; 3(2): 35-48.
20. Fox M, Thomson M. Short changed? The law and ethics of male circumcision. *International Journal of Children's Rights* 2005; 13: 161-181.
21. Godbole P, Duffy P, Boddy SA, et al. Management of foreskin conditions. Statement from the British Association of Paediatric Urologists on behalf of the British Association of Paediatric Surgeons and The Association of Paediatric Anaesthetists 2007. [www.baps.org.uk/documents/circumcision2007.pdf](http://www.baps.org.uk/documents/circumcision2007.pdf) (accessed 22 July 2008).
22. Auvert B, Taljaard D, Lagarde E, Sobngwi-Tambekou J, Sitta R, Puren A. Randomized, controlled intervention trial of male circumcision for reduction of HIV infection risk: the ANRS 1265 trial. *PLoS Med* 2005; 2(11): e2.
23. Bailey RC, Moses S, Parker CB, et al. Male circumcision for HIV prevention in young men in Kisumu, Kenya: A randomised controlled trial. *Lancet* 2007; 369: 643-656.
24. Gray RH, Kigozi G, Serwadda D, et al. Male circumcision for HIV prevention in men in Rakai, Uganda: A randomised trial. *Lancet* 2007; 369: 657-666.
25. Scott BE, Weiss HA, Viljoen JI. The acceptability of male circumcision as an HIV intervention among a rural Zulu population, KwaZulu-Natal, South Africa. *AIDS Care* 2005; April; 17(3): 304.
26. United States Has Highest STD Rate. [http://www.mercola.com/2004/mar/10/std\\_rates.htm](http://www.mercola.com/2004/mar/10/std_rates.htm) (accessed 17 December 2007).
27. Dave SS, Fenton KA, Mercer CH, Erens B, Wellings K, Johnson AM. Male circumcision in Britain: findings from a national probability sample survey. *Sex Transm Infect* 2003; 79: 499-500.
28. Siegfried N, Muller M, Volmink J, et al. Male circumcision for prevention of heterosexual acquisition of HIV in men. In: *The Cochrane Library*, Issue 3, 2003.
29. Schoen EJ. Ignoring evidence of circumcision benefits. *Pediatrics* 2006; 118: 385-387.
30. Morris BJ, Bailis SA, Castellsague X, Wiswell TE, Halperin DT. RACP's policy statement on infant male circumcision is ill-conceived. *Aust N Z J Public Health* 2006; 30(1): 16-22.
31. Clark PA, Eisenman J, Szapor S. Mandatory neonatal circumcision in Sub-Saharan Africa: Medical and ethical analysis. *Med Sci Monit* 2007; 13(12): RA205-213.
32. Children's Act No. 38 of 2005. *Government Gazette* 2006; 492 (No. 28944, 19 June). <http://www.info.gov.za/gazette/acts/2005/a38-05.pdf> (last accessed 15 July 2008).
33. Schoen E. *Dep. Schwan v. Ball Memorial Hospital* 2007; 25 June, 101: 11-102:3.
34. Mills E, Siegfried N. Cautious optimism for new HIV/AIDS prevention strategies. *Lancet* 2006; 368: 1236.
35. Garenne M. Male circumcision and HIV control in Africa. *PLoS Med* 2006; 3(1): e78.
36. Australian Federation of AIDS Organizations. *Male Circumcision Has No Role in the Australian HIV Epidemic*. Newtown, Australia: AFAO, 2007.
37. Beasley S, Darlow B, Craig J, Mucahy D, Smith G. Policy Statement on Circumcision. Royal Australasian College of Physicians, Paediatrics & Child Health Division, Sept 2004. <http://www.racp.edu.au/download.cfm?DownloadFile=A453CFA1-2A57-5487-DF36DF59A1BAF527> (accessed 15 July 2008).
38. Rozenbaum W, Bourdillon F, Dozon J-P, et al. *Report on Male Circumcision: An Arguable Method of Reducing the Risks of HIV Transmission*. Conseil National du SIDA, 2007: 1-10.
39. Kalichman S, Eaton L, Pinkerton S. Circumcision for HIV prevention: failure to fully account for behavioral risk compensation. *PLoS Med* 2007; 4(3): e138.
40. Myers A, Myers J. Male circumcision – the new hope? *S Afr Med J* 2007; 97(5): 338-341.
41. Williams BC, Lloyd-Smith JO, Gouws E, et al. The potential impact of male circumcision on HIV in sub-Saharan Africa. *PLoS Med* 2006; 3: e262.
42. Millett G, Ding H, Lauby J, et al. Circumcision status and HIV infection among black and Latino men who have sex with men in 3 US cities. *J Acquir Immune Defic Syndr* 2007; 46(5): 643-650.
43. Templeton DJ, Jin F, Prestage GP, et al. Circumcision status and risk of HIV seroconversion in the HIM cohort of homosexual men in Sydney. 4th Conference on the HIV Pathogenesis, Treatment and Prevention, 23-25 July 2007. Sydney, Australia: International AIDS Society (abstract). <http://www.ias2007.org/pag/Abstracts.aspx?AID=2465> and <http://www.ias2007.org/PAG/ppt/WEAC103.ppt> (last accessed 15 July 2008).
44. Mor Z, Kent CK, Kohn R, Klausner JD. Declining rates in male circumcision amidst increasing evidence of its public health benefit. *PLoS One* 2007; 2(9): e861.
45. Talbot JR. Size matters: The number of prostitutes and the global HIV/AIDS pandemic. *PLoS One* 2007; 2(6): e543.
46. Chin J. *The AIDS Pandemic: The Collision of Epidemiology with Political Correctness*. Oxford: Radcliffe Publishing, 2007. xix + 311.
47. Boys will be boys. Traditional Xhosa male circumcision, HIV and sexual socialisation in contemporary South Africa. *Culture, Health and Sexuality* 2008 (in press).
48. Gusongoirye D. Nothing can fight HIV/AIDS better than discipline. *The New Times* (Kigali), 12 February 2008. <http://allafrica.com/stories/200802120181.html> (last accessed 15 July 2008).
49. Differding V. Woman may be at heightened risk of HIV infection immediately after male partner is circumcised. March 12, 2007. <http://www.aidsmap.com/en/news/3CBF12A3-A1AC-4A0E-A79C-54FC6EF93E28.asp> (accessed 15 July 2008).
50. Wawer M, Kigozi G, Serwadda D, et al. Trial of male circumcision in HIV+ men, Rakai, Uganda: Effects in HIV+ men and in women partners. 15th Conference on Retroviruses and Opportunistic Infections, Boston, MA, 3-6 February 2008. Abstract 33LB.
51. Mass male circumcision – what will it mean for women? *Science in Africa*, Africa's First On-Line Science Magazine, August 2007. <http://www.scienceinfrica.co.za/2007/august/circumcision.htm> (last accessed 15 July 2008).
52. Muula AS, Prozesky HW, Mataya RH, Ikechebelu JI. Prevalence of complications of male circumcision in Anglophone Africa: a systematic review. *BMC Urol* 2007; 7(4):1-6.
53. Okeke LI, Asinobi AA, Ikuero OS. Epidemiology of complications of male circumcision in Ibadan, Nigeria. *BMC Urol* 2006; 6: 21.
54. Van Howe RS, Robson WLM. Possible role of circumcision in newborn outbreaks of community associated methicillin-resistant *Staphylococcus aureus*. *Clin Pediatr* 2007; 46,X: 1-3.
55. Nguyen DM, Bancroft E, Mascola L, Guevara R, Yasuda L. Risk factors for neonatal methicillin-resistant *Staphylococcus aureus* infection in a well-infant nursery. *Infect Control Hosp Epidemiol* 2007; 28: 406-411.
56. Annunziato D, Goldblum LM. Staphylococcal scalded skin syndrome. A complication of circumcision. *Am J Dis Child* 1978; 132(12): 1187-1188.
57. Donovan B, Bassett I, Bodsorth NJ. Male circumcision and common sexually transmissible diseases in a developed nation setting. *Genitourin Med* 1994; 70: 317-320.
58. Bollinger D. Death and the new penis: Circumcision related death estimate for the United States. International Coalition for Genital Integrity, 2006. <http://www.icgi.org/articles/bollinger4.pdf> (accessed 17 December 2007).
59. Sorrells ML, Snyder ML, Reiss MD, et al. Fine-touch pressure thresholds in the adult penis. *BJU Int* 2007; 99: 864-869.
60. O'Hara K, O'Hara J. The effect of male circumcision on the sexual enjoyment of the female partner. *BJU Int* 1999; 83: suppl. 1, 79-84.
61. Taddio A, Katz J, Ilersich AL, Koren G. Effect of neonatal circumcision on pain response during subsequent routine vaccination. *Lancet* 1997; 349: 599-603.
62. Boyle GJ, Goldman R, Svoboda JS, Fernandez E. Male circumcision: Pain, trauma and psychosexual sequelae. *J Health Psychol* 2002; 7: 329-343.
63. <http://www.undp.org/hiv/docs/olpubs/uganda.pdf> (accessed 14 August 2008).
64. Low-Beer D, Stoneburner RL. *Behaviour and Communication Change in Reducing HIV: Is Uganda Unique?* Johannesburg: Centre For Aids Development, Research And Evaluation, 2004: 14. <http://www.poplne.org/docs/192015> (accessed 28 August 2008).
65. Laumann EO, Masi CM, Zuckerman EW. Circumcision in the United States: Prevalence, prophylactic effects, and sexual practice. *JAMA* 1997; 277: 1052-1057.
66. Routine infant circumcision. <http://video.google.com/videoplay?docid=5115119039576299090> (accessed 22 July 2008).