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Male circumcision and HIV: A controversy study on *facts* and *values*

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We present a controversy study on the association between male circumcision (MC) and HIV. Our general goal is to shed light on the issue, unravelling and comparing different conceptions of scientific evidence and their respective world views. We seek to reconstruct, based on an analysis of the literature on the topic, key moments in the history of the controversy about the association between MC and HIV prevention, analysing more closely three recent randomised studies, given their relevance to the argumentative strategy employed by those who defend circumcision as a prevention method. Following this, we present a synthesis of the main arguments against the three referred studies. In conclusion, it seems that reasonable arguments for a more cautious approach are not being adequately considered.

Keywords: male circumcision; scientific facts; scientific values; HIV/AIDS; controversy studies

Introduction

A constant in the history of HIV/AIDS has been the search for an elusive definitive cure and/or prevention. More recently, among other proposals, male circumcision (MC) has begun to gain relevance as a preventive measure, through studies conducted basically in southern Africa. Some of these studies recommend implementing circumcision as a public policy, since it would be capable of, in their description, to reduce by up to 60% (the percentage varies according to study, but this is usually the maximum value) the possibility of HIV contamination through sexual transmission for men. Others reject the legitimacy of such a policy because there would not be enough supporting scientific data or the 'extra-scientific' (*values*) aspects of the issue would not have been sufficiently taken into consideration. It is worth noting that neither side of the dispute is homogeneous; on the contrary, they both display disparate positions, which leads us to conclude that multiple contradictions are present. Still, we believe that a study seeking to accentuate the points of divergence, as well as to put in evidence the common traits, may contribute to the advance of the discussion – even though this is a literature review, in the broad sense, with which we may give *equal* value to dissonant voices, including those that do not have great repercussion.

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More specifically, in this article we seek to carry out a *controversy study* (Collins, 1983) on the positions concerning the issue of MC and HIV prevention – centred on the period starting in 1986 and continuing until present day. We base our work on the science studies' methodological assumption that it is necessary, when describing the theses defended by opponents in a given scientific dispute, to make use of the same kind of explanation for either side of the argument. That is, one must avoid attributing, as classic epistemology often did, a differentiated *causality* to conflicting scientific theories, based on the judgement that, for example, the 'victorious' would have acted rationally – which meant, generally, employing what was considered to be *logical-empirical* criteria – while the 'losers' would have allowed themselves to get carried away by external, 'irrational' forces, such as political ideologies, economic interests and religious beliefs (Barnes, 1974; Bloor, 1991 [1976]; Knorr-Cetina, 1981; Collins, 1985; Fuller, 2002; Galison, 1987; Hacking, 1983; Latour & Woolgar, 1979; Pickering, 1984; Rouse, 1987; Shapin & Schaffer, 1985). Our goal, therefore, is to focus on a specific subject – MC and HIV transmission/prevention – delimited historically by a period of approximately 30 years and geographically by a space restricted to South African countries, attempting to maintain a position as impartial as possible with regards to diverging conceptions of that subject, although 'impartiality' must be relativised in any approach that acknowledges the situational and contextual character of knowledge (Nickles, 1995; Tosh, 2006).

Our guiding assumption, also inspired by the science studies, is that each side involved in the dispute possesses, though not always explicitly, both *epistemological* and *axiological* conceptions which, though not *identical*, may both be endowed with coherent and consistent arguments in each case (see Lacey, 2008, 2010; despite his critique of what he deems to be an exaggeratedly postmodern position of the science studies). Our general goal, then, is to shed light on the relevant debate concerning MC and HIV transmission (or prevention), unravelling and comparing different conceptions of *scientific evidence* and their respective *world views*.

The historical-social discovery of a scientific-natural construction

The initial set of references was produced by a search on Medline on 21 March 2011, using the search words 'HIV' and 'circumcision', which yielded 730 references. We did not previously define the central categories of analysis so that we could glean those valued by the authors themselves.

The articles by Alcena (1986) and Fink (1986) are often pointed to as the initial references of the supposed causal association between MC and HIV prevention. Since then, several studies were carried out that sought to either confirm or deny that circumcised men are less likely to contract HIV. Currently it seems that this idea has been mainstreamed in the HIV/AIDS research community, evidenced by the endorsement by international organisations of circumcision as a public health policy. The publication of several articles in one edition of Reproductive Health Matters (vol. 15, no. 19, 2007) is emblematic. Every one of those articles had the 'WHO/UNAIDS Technical Consultation' that took place from 6 March until 8 March 2007 as their key topic (WHO/UNAIDS, 2012), even if some were critical of the meetings' recommendations. Even more so, in recent years, three large, randomised studies were carried out in different regions in southern Africa aiming to 'prove' that previous observational studies were correct in pointing a correlation

between circumcision and HIV prevention. However, there are still opposing researchers who question the validity of these results, suggesting the need to carry out new studies that take into account other issues beyond the 'supposed scientific fact' that circumcision reduces the risk of HIV infection. Let us follow, though in very broad strokes, the main historical milestones of this controversy, or *controversies*, in plural. Unlike most controversy studies in which the scientific dispute is polarised between two scientists, the controversies here are more properly described as being carried out in trans-epistemic arenas (Knorr-Cetina, 1982). In that sense, these controversies also involve actors and venues outside the strict domain of science, and in particular international organisations and political groups, such as UNAIDS, the World Bank and AIDS NGOs.

The association between circumcision and HIV prevention was suggested in 1986, but only in the 1990s did researchers begin to systematically carry out observational studies in sub-Saharan Africa. In fact, some ecological studies were carried out that suggested – in regions where HIV transmission is largely based on heterosexual contacts – that AIDS incidence and MC were inversely proportional (e.g. Bongaarts, Reining, Way, & Conant, 1989). Cross-sectional studies, the majority among observational studies, reportedly found a higher rate of prevalence of HIV among non-circumcised men, as well. Moses et al. (1990), for instance, mapped 700 distinct African societies and ethnic groups and arrived at the conclusion that there would be a considerable geographical connection between low HIV incidence and regions were circumcision is routinely practiced. Seeking to look more closely into the so-called confounding factors and the several variables at stake, prospective studies were carried out which followed participants through visits. Among these, two studies are emblematic: Lavreys et al. (1999), which involved 746 employees (HIV-negative men) of transporter companies in the coastal city of Mombasa, Kenya, and Quinn et al. (2000), carried out in the rural district of Rakai, Uganda, involving no less than 15,127 participants. It is important to note that all these observational studies cover more highly complex epidemiological aspects, from the large quantity of people involved to the choice of statistical methods that are considered more sophisticated, through the selection of diverse criteria for data gathering and analysis.

Currently, there are tens of observational studies, most of which are still being endorsed despite the persistent criticism that they largely fail to look into 'confounding factors' (e.g. socio-economic status, educational level, ethnicity, religion, age). In the two meta-analysis articles we identified, there is an explicit controversy on the matter. Weiss, Quigley, and Hayes (2000, p. 2367) defend the idea that their study 'provides compelling evidence that MC is associated with a reduced risk of HIV infection in sub-Saharan Africa', although they acknowledge that the cited factors are the main limitation of observational studies and, therefore, of their own work; while Van Howe (1999a, p. 13) asserts that '[t]he quantification of a potential benefit, if any, that could be expected from MC as protection from HIV transmission is highly problematic. Inconsistent study results coupled with the results of the meta-analysis emphasise this'. Opting to limit themselves to a systematic review to evaluate the quality of studies, since a meta-analysis would run the risk of relying upon studies with a high probability of biases and substantial heterogeneity, Siegfried et al. (2005, p. 172) arrived at the conclusion that 'the current quality of evidence is insufficient to consider implementation of circumcision as a public health

intervention'. Despite the seemingly cautious perspective, they also point towards the need to carry out randomised controlled trials in order to reach a definitive position about the discussion. We will discuss these studies shortly, but first it is necessary to go back to the biological studies, since they serve as basis for all the others, given the relevance of biologically founded arguments in medicine, in general (see, for instance, Camargo, 2003).

Until the period that predates recent randomised trials, the referred observational studies sought to base themselves, in part, on biological studies. The research on the relationship between circumcision and sexually transmitted infections (STI) dates back to the nineteenth century (Van Howe, 1999b). Fink's (1986) article is the first to connect MC and low HIV transmission risk, hypothesising that the intact foreskin contributes to the possibility of contamination by HIV due to a large contact surface vulnerable to small abrasions. This work was later corroborated by biological, case-control studies, though with different explanations (see for instance O'Farrell et al., 2006; Patterson et al., 2002). On the other hand, the legitimacy of these studies did not go unquestioned; known examples of this criticism are articles signed by Van Howe, Cold, and Storms (2000) and Cruz (2000), among others, published in the letters to the editor section of the BMJ. Despite their differences, both draw attention to the 'non-scientific character' and disregard of ethical and juridical principles of the referred studies.

Despite the opposing researchers, observational studies reinforcing the link between MC and HIV prevention, as well as biological studies, increasingly gained acquiescence from researchers in several areas, leading to the ambitious enterprise of 'proving', through a randomised clinical trial, the assumption that circumcision could work as a form of HIV prevention, or, more precisely, as an additional strategy to control the HIV epidemic in Africa. After all, it is commonly thought that experiments are more decisive than mere observations in the realm of scientific controversies. In that sense, the authors seem to be aligned, even if not aware, with the so-called experiment epistemology, a successor to the philosophical tradition that emphasised the merely observational aspect of science.

'Crucial experiments': the costly process of producing truth

Randomised clinical trials are considered a requirement for 'greater scientific rigor' in the biomedical arena. Due to lack of space, we cannot reconstruct the discussion on randomised controlled trials in its entirety, but we would like to point out that despite the several methodological and political criticisms they have received, since the 1950s these trials, when properly designed and conducted, have become the standard of reference for evaluation of medical-sanitary interventions (for a critical appraisal, see Brown, 2010; Timmerman & Berg, 2003). Unsurprisingly, this was also the case when an assessment of the effective link between circumcision and HIV was demanded. Besides the attempt to include several potentially related variables in order to meet the requirement that confounding factors should be taken into account, the marked novelty of randomised clinical trials with regards to other studies resides ultimately in their potential for intervention and control: the fact that professionals carrying out the trial offer performing a circumcision to participants and follow them, clinically, for a period of time. Auvert et al. (2005) report the experience with 3274 men in Orange Farm, South Africa, between 18 and 24 years of

age, from which were formed an intervention group (circumcised) and a control group (circumcised at the end of the trial) who were supervised in visits of 3, 12 and 21 months; Gray et al. (2007) report a trial with 4996 men from Rakai, Uganda, between 15 and 49 years of age, of which 2474 were immediately circumcised and 2522 were only circumcised 24 months later; and Bailey et al. (2007) report the results of a randomised trial carried out in Kisumu, Kenya with 2784 men, between 18 and 24 years of age, in which there was an intervention group (immediate circumcision: 1391) and a control group (later circumcision: 1393), whose follow-up visits took place after 1, 3, 6, 12, 18 and 24 months. It is not our goal to discuss these studies in detail, but merely to point out that they are large-scale studies involving a considerable number of people, a reasonable period of implementation and, most importantly, repercussions in several domains – from the economic to the ethical. That is, there is a marked contrast to what the science philosopher Lakatos (1970) criticised as *instant reconstructions of scientific rationality*, as if the *truth* in science were discovered in a trivial, quick and definitive way – as long as one used the adequate method without any *subjective* interference – or as if a scientific quarrel were resolved with the simple recourse to so-called *crucial experiences* ('neutral judges').

Obviously, the (complex) methodologies of the epidemiological field and the *discoveries found* are slightly different, though the background and interpretation of results are practically identical in all three cases: based on the 'hypotheses' proposed by previous observational studies, the three experimental trials arrive at the conclusion that MC reduces by up to 50–60% the risk of HIV contamination in heterosexual relations. In Auvert et al. (2005), for instance, that meant the incidence of HIV seropositivity in the circumcised group was 0.85 per 100 person-years, and 2.1 per 100 person-years in the control group, a difference of 1.25 new cases per 100 person-years. It should be noted, however, that 'person' here refers to *men* only, since all the studies only looked at the men that were enrolled.

But we are interested, above all, in drawing attention to the points discussed and the rhetorics employed by the authors. Let us look at each study *per se*.

In the trial carried out by Auvert et al. (2005), though acknowledging the study's limitations (for instance, difficulty of generalisation, impact of lost participants on final results and full follow-up only of those participants recruited at the beginning of the study), the authors emphasise that the trial is the 'first experimental evidence' concerning the efficacy of MC as protection against HIV infection. The authors identify direct (keratinisation of the glans, quick drying after sex, reduction of total penile skin and reduction of target cells) and indirect factors (reduction of contraction of other STIs) as *causes* of this effect, both of a biological order, but stress that actual mechanisms are unknown, pointing out to the speculative nature of raising such factors. They conclude enumerating the purported advantages of MC: (1) a reduction of the risk of contamination among men; (2) usefulness and viability even among sexually active men living in areas with high HIV prevalence; (3) possibility of the protective effect on men contributing indirectly to the protection of women and, consequently, children; (4) possibility of protection against man to woman HIV transmission (here, authors acknowledge the need for additional investigation), a point that leads them to call on women to help in promoting MC.

From this, the authors recommend that MC be viewed as an important public health intervention, no less because it would be a cheaper measure to implement.

Immediately after this recommendation, they point out the 'potential risks' of MC: impossibility of full protection and danger of confusion between male and female circumcision. None of it prevents the authors from asserting the need for continuing studies on the acceptability of MC, nor does it keep them from concluding that their 'experimental demonstration' emphasises the role of MC in explaining the heterogeneity of HIV prevalence in Africa.

In the study carried out in Kisumu, Bailey et al. (2007) highlight the *consistency* between clinical (provided by the three experimental trials), observational and biological data in favour of the causal effect of MC as an argument for its plausibility, the underlying assumption being that the alleged agreement between theory and fact – and, we should point out, the consistency between theories themselves – is a relevant epistemic criterion. In addition, practically taking for granted the large-scale implementation of MC, they adopt as a model for the future practice the precautions taken in their own test: extensive training for the professionals involved, appropriate instruments, clear post-op instructions (believed by the authors as contributing themselves to the reduction of risky behaviours) and maintaining a continuous quality control.

Authors of scientific articles usually resort to a rhetorical tactic of anticipating criticisms (Latour & Woolgar, 1979), and epidemiology follows that rule. As expected, the authors of those studies acknowledge the trial's limits or deficiencies, though these are almost always followed by reservations meant to lessen these deficiencies: (1) the doctors involved could not be 'blind' to the treatment, though the remaining health workers were; (2) measures of the compensation of behavioural risk relied on self-reporting, thought there was no previous expectation that it would be higher or lower; (3) the results of HIV tests were incomplete for 9% of participants, but there were no significant differences between those with and those without full follow-up for HIV status; (4) the circumcision technique may be a source of variation in the protective effect; (5) several factors could restrict the trial's generalisation; however, once again, the authors resort to the argument of consistency with other studies to claim that the restriction seems unlikely, since 'there is no reason to suspect that Luo men act differently from others in response to circumcision' (Bailey et al. 2007, p. 655). With the likely broad dissemination of the three empirical trials, the authors fear that beliefs and attitudes towards circumcision may change, in the sense of a growing demand due to the positive results; this concern leads them to point to the following challenges: explaining that circumcision does not offer full protection against HIV contamination; being alert to the possible increase in the numbers of unqualified and poorly equipped practitioners; and showing that circumcision would be one more, and not the only, prevention procedure.

The trial carried out by Gray et al. (2007) presents an argumentative strategy similar to that of the other studies. In it, authors assert that their study demonstrates that circumcision is a 'proved intervention', also making use of the argument of consistency with other studies in order to defend it as a 'convincing case'. Unlike the other two trials, however, they defend the plausibility, without many reservations, that it would be possible to generalise the study at least to the Rakai population as a whole, among other reasons because there would have been a high acceptability among participants. The authors claimed they found no evidence that men in the intervention group adopted a higher risk behaviour that the men in the control group, which is credited by the authors to the intensive health education carried out

in the process. They also drew attention to the need for future circumcision programmess to emphasise that it is extremely necessary to practice safe sex after circumcision. Furthermore, Gray and his colleagues revealed that circumcision reduced symptoms of diseases such as genital ulcer, though they were not certain with regards to other ulcerative infections.

The authors also explicitly mention the biological explanation as a reason for the alleged causal effect of circumcision. And, after estimating the procedure's effective large-scale efficacy – based on the assumption that the required number of surgeries will vary according to HIV incidence, level of acceptance and projected duration of protection – they urge policy-makers to consider the following question: would MC be an appropriate, cost-effective intervention in the specific regions? They conclude by alluding to neonatal circumcision or circumcision in young men as a simpler, safer and cheaper option in a long-term perspective. Whatever the case, the authors conclude their article defending the idea that it would be important to carry out a longer post-circumcision supervision in order to verify the effectiveness of circumcision, the durability of observed effects and the possible increase in high risk behaviour due to an exaggerated perception of its protective effect. They seem, therefore, to suggest that new tests be carried out with longer follow-up periods.

Did debate concerning the recommendation of adopting MC as public policy in southern African countries come to an end, due to its supposed efficacy? As we have shown, even the researchers who carried out the trials, though pointing in this direction, draw attention to the limits of extrapolating their results to regions with distinct characteristics. But would not carrying out several other such trials, with the purpose of gaining a 'more grounded position', already be a gradual implementation of public policy, given the considerable number of people involved? Furthermore, even if it is a 'scientific fact' that HIV prevention is aided by circumcision, should questions of value be left out? Until the end of the 1990s, discussions of this subject more frequently included factors normally held to be extrascientific, such as juridical, ethical, cultural and religious issues. Additionally, the biomedical angle seems to have gained a disciplinary predominance over the social sciences and humanities. Currently, articles with the greatest visibility (published in the most important journals) seem to deal exclusively with theoretical and empirical 'adjustments' to the already hegemonic paradigm defending the causal relation between MC and protection against contamination by HIV.

Solving the puzzle of a new paradigm

Although the authors of the three randomised controlled trials see as possible the implementation of MC as public policy, they seek to draw attention to the need to carry out new studies to solve persistent problems: it's as if it were necessary to solve the puzzle of a new paradigm, so as to broaden and deepen the knowledge of the *facts* conceived by the paradigm, better articulate the *facts* with the paradigm's theoretical schema and, lastly, continuously perfect the paradigm itself (Kuhn, 1962). Even the researchers who, after the publication of the three trials, became enthusiasts of MC as a HIV prevention strategy acknowledge the importance of developing research in several directions. Sawires, Dworkin, and Coates (2007), for example, listed 14 topics as future challenges and research opportunities. These topics are: (1) establishing the degree of acceptability (reviewed by Westercamp & Bailey, 2007); (2) adequately

communicating benefits; (3) defining risk, benefit and damage reduction; (4) unifying the various prevention strategies; (5) obtaining funds for social and behavioural research, as well as for fighting gender inequality; (6) defining the effect of MC on women (reviewed by Weiss, Hankins, & Dickson, 2009); (7) paying attention to religious and cultural practices; (8) defining the adequate age for circumcision; (9) distinguishing MC from female genital mutilation; (10) paying attention to potential medical complications (Kigozi et al., 2008 draw attention to the risk outside testing places, in the case of Uganda, for example); (11) broadening health systems' human and financial resources; (12) paying attention to the broader context of sexual and reproductive health programmes; (13) approaching unequal perceptions of power; (14) avoiding stigmatising men as perpetrators of the infection. In a more recent article, Weiss, Dickson, Agot, and Hankins (2010) listed other programmatic points, such as: HIV infection in men who have sex with men (Templeton, Millett, & Grulich, 2010 discuss the still small literature on the subject), the function and level of post-circumcision sexual satisfaction and the cost–benefit ratio (e.g. Gray et al., 2007). To carry on using the Kuhnian language, both articles were fortunate in synthesising the main *anomalies* that will occupy – many already do, as the references show – at least a generation of researchers in this emerging paradigm. Meanwhile, their adversaries would say, time is short and it should be spent searching for other alternatives.

Despite the above-mentioned anomalies, the fact remains that the new paradigm seems well established, to the point that even what is maybe the first qualitative research on the matter (an interesting ethnography carried out in Senegal and Guinea-Bissau, with *ontological pretensions*, about the diverse social representations of different ethnic groups that practice circumcision for sociocultural reasons) suggests a kind of cautious implementation of circumcision as public policy, in the sense of being aware of the peculiarities of local contexts and of taking into account other factors that may go beyond the merely biomedical aspect (Niang & Boiro, 2007).

Our next step, however, consists of trying to identify some criticisms of the alternative paradigm, given way to some still dissonant voices. First, it is worth noting – as the mentioned long list of puzzles to be solved shows – the acknowledgement of the multiple faces of the argumentative line employed by defenders of MC as a preventive measure against HIV infection. Indeed, beyond the *properly scientific* bias in the search for *evidences*, the prevailing approach admits the need to encompass sociocultural, anthropological, economic, political, ethical and juridical aspects. We would also invoke Polanyi and Warner's (1998) view that our scientific convictions are a product of our *decisions*, not of *evidences*. Regardless, the fact remains that the emphasis on the *scientific fact* has been preponderant in the rhetoric adopted by defenders of the new paradigm. As if there were a split between the two spheres, one could argue that the *natural side* is defeating the *social side,* even thought certain opponents – such as Garenne and Green – do competently criticise the studies on technical, epidemiological and statistical grounds.

Contrarian research or well-based criticism? Only time will tell?

Our search strategy yielded a comparatively smaller bibliographical material from the adversaries of the predominant paradigm. This disproportion perhaps in part compromises – against our wishes – the symmetric approach we seek. It would be important to understand why there are less articles from this side of the controversy,

but exploring this issue would require a whole other study. Whatever the case, we seek to lessen this impediment with a more detailed reconstruction of the articles presented in some of the articles we found, since they seem to be representative of the tenor of the remaining critics.

In an article suggestively and ironically titled 'Just a snip?: A social history of male circumcision', Peter Aggleton (2007) seeks to oppose, through cultural and political questions, the alleged value neutrality of epidemiological studies that defend the causal relationship between MC and HIV prevention, since circumcision (female/male) 'is nearly always a strongly political act, enacted upon others by those with power, in the broader interests of a public good but with profound individual and social consequences' (p. 15). Resorting to the historiography on circumcision, Aggleton reproduces a narrative of 'a most violent of histories', from its alleged apocryphal origin among Egyptians until the attempt to ban it through the *Federal Prohibition of Genital Mutilation Act of 2007*.

After his brief account, Aggleton warns of the complex and delicate relationship between public health and social control, asserts his thesis concerning the need to take into account other factors besides the biological, laments the silencing and marginalisation of researchers opposed to circumcision as public policy and, finally, raises suspicions on the 'curious alliances' formed by clinicians, lawyers, religious leaders and 'moral entrepreneurs'. Likewise, Aggleton draws attention to the probable risk of creating new physical and social differences through the implementation of the practice. His central thesis, is that MC is linked to beliefs about social order and the expression of power, that it has 'profound social connotations and long-lasting physical and psychological consequences' (p. 18).

Another critical article, written by Dowsett and Couch (2007), bears a subtitle that suggests a far less incisive tone than Aggleton's: 'Is there really enough of the right kind of evidence?' The authors' answer is 'no' as long as the notion of evidence is not broadened to include social and cultural mechanisms and contextual conditions, no less because the controversial issues remain up for discussion. After mentioning uncertain items in the biological studies, Dowsett and Couch signal failures in the observational studies. According to the authors, there would be an absence of a comparison between the allegedly confirming cases carried out in sub-Saharan Africa with contrary evidences found in other geographical regions, such as South America, Australia and New Zealand, where a relatively low rate of HIV predominance coincides with areas with a relatively small use of circumcision. As for the alleged evidence of the three randomised clinical trials, besides pointing out several specific deficiencies, the authors draw attention to a difference between the efficacy of controlled trials and real-world effectiveness, highlighting the limits of a deliberate decontextualisation that seems not to notice the distinction between test tube experiments and experiments carried out in clinical trials involving people. They also list a series of remaining topics that are very similar to those already identified as anomalies to be remedied by the new paradigm, which somewhat relativises their critical stance. The authors' proposal consists of trying to insert MC within as broad as possible a HIV/AIDS programme. Strictly speaking, it is an allegedly prudent position, as the conclusion of the article suggests:

> At the moment, the enthusiasm for male circumcision is proffered to displace the disappointment of previous 'silver' or 'magic' bullets that have not worked as well as we

> had hoped. It is a dreadful pandemic, to be sure; but that does not mean we should lose sight of the fact that care, judgment, experience and knowledge are required before action. Evidence is but one form of this, and the determination not to harm others through haste or expedience must prevail. (p. 43)

In line with the authors' cautious spirit, Marge Berer (2007) also criticises MC, from the standpoint of gender issues. Besides pointing out that MC is only beneficial and (partially) protective in the transmission from women to men and only through vaginal intercourse, Berer unveils an 'undeclared assumption' according to which the situation of unsafe, unprotected sex in sub-Saharan Africa cannot be changed:

> This is, of course, a false assumption, but it could become a self-fulfilling prophecy if MC services – or any other HIV prevention activities directed at men – are not set up in such a way that safer sex and condom use rates are not greatly improved. (p. 46)

Furthermore, in addition to defending the need to take into account other factors besides efficacy and the need for structural changes in patriarchal societies, Berer raises three general issues (two of which with successive questions) that are worth transcribing:

> (. . .) would a man who will not use condoms to protect himself and his partner(s) from HIV and who does not practice safer sex in some other way agree to be circumcised? If so, why? Does he really understand the nature of the partial protection circumcision will give him and the lack of protection it will give his partner(s), whether they be female or male? What about men who do use condoms? And what will happen when at least some of the men who seek circumcision are already found to be HIV-positive, a likely event in the high HIV prevalence settings where male circumcision is intended to be promoted? [First issue]
>
> if many women are still unable to negotiate condom use or other forms of safer sex with their male sexual partners, how can male circumcision programmes help them? [Second issue]
>
> to what extent is penile hygiene a factor in HIV and STI transmission risk? What about teaching penile hygiene as a population-level intervention? [Third issue]. (p. 46 and 47)

In a brief article, Green et al. (2010) are categorical as to the 'insufficient evidence and neglected external validity' of the studies that defend the causal relationship between MC and HIV prevention. More precisely, the authors point out five dimensions of external validity – in the sense of those aspects that extrapolate the merely biological explanation – that have not as of yet been properly considered. They are (1) the distinction between the efficacy of randomised clinical trials and real-world effectiveness (not to mention the impossibility of a longer, broader follow-up of the trials' participants); (2) the increased risk of contamination for women and gay men (see Turner et al., 2007 at stake would be questions concerning human behaviour, women's indirect role and the tendency to attribute undue power to a fixed technique, among others; (3) substantial complications of MC (unacceptable levels of adverse effects; see Okeke, Asinobi, & Ikuerowo, 2006); (4) cost-benefit considerations (use of condoms or anti-retroviral treatment [ART] being more cost-effective; see McAllister, Travis, Bollinger, Ruttser, & Sundar, 2008); (5) unresolved ethical questions (including some researchers' likely cultural bias, since this would be

a billion dollar business involving an ingrained part of the North American medical tradition). It should be noted that, although adversaries to the implementation of MC as public policy always mention ethical issues *en passant*, there are practically no specific articles on the subject; remarkable exceptions are *The American Journal of Bioethics* (vol. 3, no. 2, 2003) and the *BJU International* (supplement 1, 1999), which have published several articles on ethical, juridical, cultural and other aspects concerning circumcision itself. Green et al. conclude the article stating that:

> The global health community understands that the most important modifiable factor in sexually transmissible HIV is human behaviour. The policy questions to be considered are not whether a link exists between MC and reduced rates of HIV infection, but, rather, whether mass circumcision is (1) an ethical and safe public health choice, and (2) the most cost-effective use of limited resources. (p. 481)

Extending that critique one step further, Van Howe and Storms (2011), after pointing to relevant flaws in the design of the three main randomised controlled trials that became the 'gold standard' for the proponents of circumcision, suggest that the focus on this procedure will be a dangerous distraction that will end up increasing the spread of the virus. Similar criticisms were levelled by Boyle and Hill (2011), who also added more recent data that calls into question the 60% reduction in transmission, besides reporting that in at least one of the studies (done in Uganda) an actual increase in male-to-female transmission was observed in the follow-up, buttressing one of the main concerns of the critics.

Discussion

The first issue to be considered is whether there is a 'winning side' in this argument. With recent controversies this is very hard to establish, but we are considering that within the temporal framework we are working with the proponents of circumcision have the upper hand, basically because of the results of the Montreux conference. Although it could (and probably should) be asked whether there was effectively enough evidence to reach those results, at least in that conjuncture the proponents 'won', meaning that the proposition that MC offers enough protection against HIV transmission was accepted as true by major players in the arena, such as WHO, UNAIDS and the Gates Foundation (Perrey, Giami, Rochel de Camargo, & de Oliveira Mendonça, 2012).

If Green and colleagues pertinently synthesise the main issues raised by adversaries to the adoption of MC as a public health measure, we may class these issues, respectively, as follows: epistemological topics, gender topics, biomedical topics, economic topics and ethical topics. If we include the factors presented in the three previous articles, we have the following additions: political topics, historical topics, sociocultural topics, anthropological topics and educational topics. These ten topics make up nearly half of the seventeen puzzles of the already hegemonic paradigm. The economics of scaling up such an intervention to the level of populations will also play a key role in the feasibility of that proposal.

Whatever the case, in terms of complexity, common sense suggests they are in equivalent conditions; not to mention the fact that several among them intersect, to a certain extent. Furthermore, both sides seem to be faced with a great deal of effort in order to convince people. If adversaries to the implementation of MC can revert the

game, or if its defenders can practically take victory for granted will depend on the final arbitration of *natural facts* or of *social values*, or, better said, of both at once.

Either way, the fact remains that, in order to approach a problem as complex as the one examined in this text, staying within disciplinary bounds is, perhaps, not enough. Effectively, if we seek to gain an understanding of the problem in its entire depth and breadth, we must turn to philosophy, sociology, history, anthropology, political theory, economy, among other areas of humanities and social sciences. Here, we have made use of the science studies precisely because theirs is, by definition, an interdisciplinary perspective, as well as due to the fact that this field is concerned with a symmetrical reconstruction that takes into account the imbrication of epistemological and axiological factors. Because of this, there is, apparently, no way of asserting beforehand which of the two sides is being driven by *facts* and which is allowing itself to get carried away by *values*. This assessment will only be made retrospectively in the narrative of whichever side comes out victorious. Thus, since *contingency* seems to prevail over scientific controversies, perhaps the only *certainty* is that neither perspective is inevitably the *right* one or the *wrong* one.

Finally, we wish to point out that, while the controversy study methodology presupposes a suspension of critical judgement about the issue at stake (or at least an agnostic epistemological attitude), this does not exempt us from expressing certain concerns regarding the subject, which would maybe draw us closer to the critics than the proponents of MC as a preventive measure against HIV/AIDS. The latter operate within the traditional biomedical framework, in which technical interventions carried out *on* individuals and societies (as opposed to *with* those affected, which would imply sharing knowledge and responsibilities) are considered more 'scientific' and reliable, since they do not depend on the collaboration of voluble humans. Evidence of that can be found, for instance, in the somewhat hyperbolic and possibly misleading claim that circumcision 'provides a degree of protection against acquiring HIV infection equivalent to what a vaccine of high efficacy would have achieved' (Auvert et al., 2005, p. 1120), particularly when one considers that the study that prompted that remark had data exclusively of the effects of the intervention on men.

In the history of the struggle against the pandemic, there was an initial moment in which, in the absence of biomedical responses, a *dialogic logic* of prevention which was able to develop and prove itself to be efficacious (think, for instance, of the notion of 'safe sex' which, through eroticising the use of condoms during intercourse, contributed to an effective prevention of the spread of the virus; the original proponents of this strategy were organised gay groups from San Francisco, California). With the development of the antiretroviral therapy, this logic was once again relegated to the background, with a renewed predominance of a more strictly biomedical conception of the problem – and of its solutions. The proposal of circumcision follows the same direction; there is a non-explicit assumption that it is not possible to trust the self-management of sexuality as a basis for prevention; therefore, an intervention that operates independently of the subject's *will* is considered inherently superior. Considering, furthermore, that this intervention is not proposed by just any researchers for just any part of the world, but by European and North American researchers as a public policy recommendation for Africa, it seems to us inevitable to recognise echoes of a colonial past (Giami & Perrey, 2012).

With these considerations, it seems to us, once again, that caution is commendable, advising against the assumption that complex problems have simple solutions,

as is implicit in the examined proposal. The methods and theories of science studies can help to shed light on the inherent complexities of scientific statements and their incorporation in public health interventions, and thus hopefully contribute to a more reasoned discussion of public policy-making and implementation.

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