Male circumcision and HIV: Non-blindedness and biases in RCTs; female preferences; penile sensitivity, satisfaction and ambient stimulation; risk compensation; acceptance of insufficient condom use and personal hygiene and related externalities

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ABSTRACT

Literature was reviewed in order to examine what the likely efficacy of male circumcision in combatting HIV-AIDS might be. There is no reasonable doubt that male circumcision in the absence of other measures does reduce the transmission of HIV. Due to very substantial non-blindedness in RCTs and elsewhere, there is substantial uncertainty regarding the extent to which male circumcision in the absence of other measures could ultimately reduce HIV transmission into the future, such that the Odds Ratios usually given of about 0.4 for incident HIV infection of males with medical circumcision cannot be taken to be as applicable in contexts other than RCTs. The potential of non-blindedness in studies and in societies, to effect things like reporting bias and subjective and actual sexual and behavioural outcomes is very generally very poorly understood and insufficiently included in analysis and projection of outcomes. Risk-adjustment / disinhibition, such that circumcised men react to the partial protection of circumcision against HIV infection by engaging in riskier sexual behavior than they would have otherwise is almost certain to occur to substantial extent in most contexts. It seems very likely that circumcision does result in keratinization/ cornification of the glans, and also removes sexually-sensitive skin, both of which result in reduced intensity of coital pleasure, notwithstanding the various benefits of this in prolonging the coition. Already even uncircumcised men prefer coition without a condom due to the greater intensity of sexual sensation, and it is logical that this preference for coition without a condom would be greater in circumcised men. Already there is great under-use of condoms by African men. There is therefore a very real question of the extent to which male circumcision will result in substantial failure to achieve sufficient use of condoms in combatting HIV infection. This is offset by the possibility that it may be realistic to accept that sufficient use of condoms is not achievable in any case, because substantial non-compliance is inherent. Also there is the very under-examined question of how thorough sexual personal hygiene (if at all achievable) would modify the efficacies of both circumcision and condom use, and what the externalities of such thorough sexual hygiene might be when generalized to other infectious contexts improvable by better hygiene.

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INTRODUCTION

Human Immunodeficiency Virus (HIV) developed in African human populations roughly a hundred years ago, originating as Simian Immunodificiency Virus (SIV) in African monkeys and apes[1-4] and has since spread to have become one of the world's most serious human health problems by way of the resultant Acquired Immune Deficiency Syndrome (AIDS) and the requirement for Antiretroviral Therapy (ART) to prevent or combat the evolution of

this in infected persons. Although there has been much discussion of what combination of preventive personal measures, such as condoms, circumcision, topical antimicrobials, reduction of multiplicity of sexual partners, and genital washing, and timely identification and treatment ('test and treat') of those becoming infected, might be, there is presently far from a general consensus or rigorous definitive answer as to what is even feasible, let alone optimal, in this regard.

This review and analysis attempts to provide an overview of the situation and detail some substantial deficiencies in the data, information, analyses, opinions, initiatives, strategies, actions and forward planning as it presently stands, in order to contribute to a clearer understanding of the situation and its optimal solution.

METHODS

Pubmed database was searched using the terms HIV and circumcision to start with, as this is arguably the aspect that there is most disagreement about, and as there are underway major drives towards achieving high rates of circumcision in African men. Some initial recent reviews were acquired, attempting to include all opposing viewpoints or inclinations to viewpoints or representations of viewpoints. Literature referenced in these reviews was acquired attempting to sufficiently include all opposing viewpoints and their substantive bases. And so on with literature referenced in that latter literature. And so on until there seemed to have been acquired a sufficiently comprehensive collection of information to enable insofar the study to be properly concluded.

Male Circumcision and HIV
Preliminary Global Epidemiology
Around 1990 it was definitively enough established that male circumcision in Africa was associated with lower levels of HIV infection (prevalence, here), sufficiently enough through two studies that examined geographical variation for large numbers of population groups. Moses et al examined 140 locations in 41 different countries and the circumcision practices of 700 societies contributing to the populations of these,[5] and Bongaarts et al. examined the capital cities of 37 countries and the

circumcision practices of 409 ethnic groups contributing to the populations of these.[6] The actual statistical correlations were very high, as were the statistical significances (e.g. R = 0.9, p < .001).

Basic Biology of the Foreskin and HIV Infection
Uncircumcised men are at higher risk of HIV infection because: The inner foreskin is a mucosal epithelium low in protective keratin / cornification (hardening of the skin) (because it is not subjected to friction and drying as is the outer foreskin and other outer skin of the human body), and rich in HIV target cells. Soon after contact with infected mucosal secretions of a HIV-positive sexual partner, infected T-cells from the partner form viral synapses with keratinocytes and transfer HIV to Langerhans cells via dendrites extending to a little under the surface of the inner foreskin. Then Langerhans cells with that acquired HIV migrate to the basal epidermis and then pass HIV on to T-cells (e.g. CD4 T-cells) which the virus spreads amongst leading to a systemic infection that disables the T-cells from carrying out their role in dealing with other infections that then become much more problematic (e.g. fatal) than they would otherwise be. Infection with acquired HIV is exacerbated by inflammation of the foreskin or glans (head of the penis), the presence of smegma (the cheesy deposit accumulating in the folds of both male and female genitals, particularly in the absence of removal by washing), ulceration (e.g. that caused by infection with other sexually transmitted infections (STIs)), and tearing of the foreskin or associated frenulum during sexual intercourse.[7]

The Three Major Randomized Controlled Trials (RCTs) of Circumcision for Prevention of HIV Infection in Africa; Critiques of them, and Rebuttals of these
By 2007 three major (and very often referenced together as the definitive group of such) randomized trials, taken together, gave conclusive enough evidence that medical male circumcision had a substantial protective effect against HIV infection of the men in those (very similar) contexts.[8-10] This is not the same thing as saying that they gave conclusive enough evidence that the Risk Ratio (RR) of about 0.4 for acquisition of HIV for circumcised versus uncircumcised men is validly able to be extrapolated to other contexts. Nor is it the same thing as saying

that this or any other (i.e. lesser) reduction of risk of HIV acquisition from circumcision is purely additive (in particular, would not displace or otherwise reduce) to other measures that plausibly would, likewise *in and of and by themselves,* have some substantial effect in reducing transmission of HIV, such as: use of condoms, monogamy or reduction of the number of sexual partners, (potentially) vaccination, chemical creams, lotions or washes, and timely genital washing. These cautionary aspects will be dealt with later below.

The three major RCTs were:
Auvert et al (2005) randomized 3,274 uncircumcised men aged 18-24 years of Orange Farm and surrounding areas close to Johanessburg in South Africa who were HIV negative and wishing to be circumcised, to immediate circumcision or circumcision to be done 2 years later.[10]

Bailey et al (2007) randomized 2,784 uncircumcised men aged 18-24 years of Kisumu in Kenya who were HIV negative and wishing to be circumcised, to immediate circumcision or circumcision to be done 2 years later.[8]

Gray et al (2007) randomized 4,996 uncircumcised men aged 15-49 years of Rakai in Uganda who were HIV negative and willing to be circumcised, to immediate circumcision or circumcision to be done 2 years later.[9]

All three trials were much in agreement in reporting Risk Ratios of about 0.4 for acquisition of HIV for circumcised versus uncircumcised men, or put another way, a 60% efficacy.

Note that these figures refer to the 2 year period of the studies, and would potentially need modification in the case of all male members within a geographical area of sexual interaction being circumcised instead of just some (who wanted/ were willing to be circumcised) of them, and, possibly in the opposite direction, the case of further time going by.

There were later follow-ups of these study groups, including in Kisumu by Mehta et al. (2013),[11] and in Rakai by Gray et al. (2012),[12] and their findings remained much in agreement with those of the original studies, as were the findings of Auvert et al. (2013)[13] following up a similar group to their (2005) study in Orange Farm.

A more extreme earlier result was reported from a 1994-1998 study in Rakai of Uganda (by a similar group of authors to the Rakai major RCT[9] noted above) of 228 couples with a HIV-infected male and a HIV-uninfected female partner and 187 couples with a HIV-infected female and a HIV-uninfected male partner, where the rate of male-to-female transmission of HIV was very similar to the rate of female-to-male transmission of HIV (12.0 and 11.6 per 100 person-years), but there were 16.7 per 100 person-years transmissions of HIV involving uncircumcised men and none at all in circumcised men (p < .001).[14] The extremeness of the result here in the light of the later three major RCTs'[8-10] result begs the questioning of the scientific sufficiency of methodological design and/or rigour of execution of the study, and this study is included here mainly as an example of the sort of such limitations that are generally prevalent in research in this context, limitations that will be addressed further below.

Now, there were some published critiques disagreeing with the claims for efficacy of those three major RCTs and of many subsequent published papers, that objected to manifold putative defects and weaknesses of those studies, concluding that in fact male circumcision would be useless or worse than useless in combatting HIV in Africa.[15-17]

For the purposes of this work here, it is sufficient to say that most of the objections of those disagreeing critiques were plausibly enough rebutted by responses that addressed them in point-by-point detail,[18-20] such that more recent persistence with the contrary stance by van Howe[21-23] is not such as to nullify those rebuttals.

However, flaws or limitations in those rebutting articles[18-20] themselves (all by the same general group of authors including the Auvert, Bailey and Gray of the three major RCTs[8-10]) include (but are not limited to) that: albeit it was often due to the limitations on space in a journal article, the rebuttals generally

lacked in presentation of actual evidence facts, being mostly only opinion, plausible though that opinion seems notwithstanding; and, that they did not address at all the very real possibility that circumcision might displace condom use or prevent its complete or sufficient implementation, or displace hygienic genital washing or prevent its complete or sufficient implementation and the external benefits possibly accruing through generalization of better hygienic washing practices. Likewise, the use of protective sexual lubricants. These in the face of the massive absolute numbers of HIV cases expected to be accruing in incidence even if the Risk/Hazard Ratios of 0.4 were applicable to the context of entire national or African continental population(s).

Furthermore, objections of those disagreeing critiques that remained standing as not successfully rebutted included that psychological social desirability bias / 'demand effects' were likely to have been in effect in the three major RCTs,[8-10] although these objections were not well laid out in the disagreeing critiques.

Male Circumcision and Infection of Female Partners
The very important issue of what effect male circumcision might have on the transmission of HIV from HIV-infected men to HIV-uninfected women seems much less sure than the isolated extreme report noted just above would have it, and it is unlikely that the inner surface of the foreskin is just as good at delivering HIV infection to the female genitals as it is in receiving it from them, in the context of semen infectiousness. Studies of the HIV infectiveness of HIV positive males for HIV negative female partners have added some lesser weight to the case for medical male circumcision: A 2003-2007 side-study of the Rakai, Uganda RCT[9] study had 922 uncircumcised HIV-infected asymptomatic men randomized to immediate circumcision or circumcision to take place 2 years later and was stopped early when 18% of the HIV-uninfected female partners of the uncircumcised men and 12% of those of the circumcised men became infected (Hazard Ratio 1.5 but p = 0.37).[24] A 2013-2016 study in Durban in South Africa of 1,356 pregnant HIV-uninfected women in an area stated to have an antenatal HIV prevalence of 41% reported a Hazard

Ratio of 0.22 for transmission of HIV to the female partner for circumcised versus uncircumcised men (p = .011).[25] Unfortunately the interaction HIV-infected x (un)circumcised was not examined, the assumption being that any infection of a female with HIV must be from her steady partner. Unfortunately this type of failure to examine the most meaningful, indeed often enough the essentially-meaningful interactions amongst variables constituting the data collected in a study, is/was common in studies of the African HIV situation. Likewise, although p = .011 above, the journal article abstract gave a 95% CI very inclusive of 1.

It is noteworthy that given the study area has an antenatal HIV prevalence of 40% there was such a dramatic difference in HIV transmission from the 9 known HIV-infected partners (80%) to the HIV transmission from the 717 HIV-uninfected + 630 HIV-unknown partners (0.8%) to the initially-HIV-uninfected females, such that HIV-uninfection in the females is a very reliable marker for HIV-uninfection in the male partners. So, transmission of HIV from males to females must occur generally quite readily, not being much delayed, for example in comparison to transmission from females to males. And a reasonable speculation might be that the inner surface of a foreskin gives via shedding of cells and contact, with or without the foreskin in its entirety adding to via friction or enhancement of surface contact, roughly at least as much infectiveness during coition as there is shed in semen, which seems plausible given the affinity of inner foreskin surface cells for the virus.

Non-Blindedness
Now, the gold standard for RCTs, as even now in 2018 is still (even in major teaching hospitals in the developed world) poorly understood if even mentioned, is not merely the RCT, it is the *double-blinded* RCT. This remains the case even if blinding is not possible, and if blinding is not possible, then the possible effects of such lack of blinding need to be fully considered if the work is not to be left liable to being of low or negligible quality as a contribution to the evidence base. It is very much an incontrovertible fact that there was a very high degree of non-blinding in the three major RCTs,[8-10] and in virtually all related

trials, because it is not possible (at least at the stage of being involved in a trial of such) for a man to be unaware of whether he has been circumcised or not, and because it is not possible (at least at the stage of being involved in a trial of circumcision) for the man to be unaware of what the circumcision is being trialed for, and that the expectation is very much that the circumcision will be protective against HIV (it being just the *degree* of efficacy of the protection that is in question). Furthermore, it hardly requires a reference to state that men are very generally very heavily psychologically invested in their penises as part of their sense of self, and that the permanent exposure of the sexual focus of the penis, its head, by removal of what would otherwise cover it, the foreskin, is hardly likely to be a psychologically neutral circumstance.

Furthermore there is the non-blindedness of the populations in which the trials are carried out, such that there has been in the overwhelmingly large majority of trials of circumcision, the knowledge of those containing populations that circumcision is assumed to be protective to some substantial degree of efficacy against HIV and indeed other STDs. Also, there is the issue of females generally preferring the aesthetic appearance of the circumcised penis over the uncircumcised penis, this being partly related to male circumcision having been traditionally viewed as a rite of passage into manhood in many African societies, or being a part of a religion as in Islam, and also very likely related to female reaction to the traditional imposition of female 'circumcision' (genital mutilation) on them in the context of other subjugation to male dominance.

Therefore it is very likely that psychological demand effects and social desirability biases have been extant in virtually all trials of male circumcision against HIV. When a study or review of studies of the use of male circumcision against HIV does not properly recognize and address these aspects of (non-)blindedness in its reporting of results, that is bad enough, but possibly even worse, it begs the question of whether these aspects were even considered in the design of the study, in the execution of the study, and in the analysis of the data from the study.

Similar to the flaws or limitations in the rebutting articles,[18-20] and representative of the general failure to address (non-)blindedness in studies of male circumcision against HIV despite the authors all being from the very religiously pro-circumcision country of Israel, is the virtually complete failure of Friedman et al. (2016)[26] in their "evidence-based overview" of the pros and cons of circumcision to have understood (they made no mention) even the presence, let alone the very likely substantial impact on study data, of very substantial non-blindedness, psychological demand effects, and therefore the difference between trial, post-trial and other population group contexts. Even though the Cochrane Library's (2009) systematic review "Male circumcision for the prevention of heterosexual acquisition of HIV in men",[27] did correctly report "Reporting of methodological quality was variable across the three trials, but overall, the potential for significant biases affecting the trial results was judged to be low to moderate given the large sample sizes of the trials, and the balance of possible confounding variables across randomized groups at baseline in all three trials", again there is the complete failure by the Cochrane reviewers here to have understood (they made no mention) even the presence, let alone the very likely substantial impact on study data, of very substantial non-blindedness, psychological demand effects, and therefore the difference between trial, post-trial and other population group contexts.

Now, if even without considering the non-blindedness aspects of the three major RCTs, there is a "low to moderate" "potential for significant biases affecting the trial results", then when considering also the potential for non-blindedness to have affected trial results, it must be considered likely that the real Hazard/ Risk Ratio for male circumcision versus uncircumcision for HIV infection of males is likely to be substantially above the 0.4 / 0.5 (95% CI's including 0.6) levels reported, leaving a very substantial portion of total HIV incidence and prevalence in Africa in the future almost certain to remain after circumcision of even all African males. Even the most recent meta-analyses[28] have the same failure to address (non-)blindedness, and gathering together whatever large number of works for combined analysis does not rectify this defect, and

indeed the Cochrane systematic review of 2005 on HIV and male circumcision by a group of authors that included all of the authors of the 2009 Cochrane review stated "Study quality was very variable and no studies measured the same set of potential confounding variables. Therefore conducting a meta-analysis was inappropriate."[29] The nature of non-blindedness in this context will be further detailed in the section Circumcision and Sexual Behaviour below.

It should be borne in mind that traditional male circumcision is a different context, for reasons including that the amount of foreskin removed is more variable, hygienic practice may be less, and psycho/socio/cultural contexts are different.[30,31] Also, that the results addressed above relate to heterosexual transmission, and the protective effect of circumcision against HIV transmission in men who have sex with men is even less certain and seems to be less in any case.[32]

Circumcision and Other STDs
HIV is just one STD, here the STD of primary focus, but there are other STDs relevant and requiring consideration here also, one reason being that they are substantially involved in the transmission and or outcome of HIV infection, another reason being that male circumcision could potentially have additional benefits in reducing transmission of these other STDs also. As should already be evident at this point of this work here, the analysis of the combined meaning of the literature available as to the ultimate benefit of male circumcision in Africa is complex enough to require substantial work in deriving that meaning, and HIV is just one disease, with more information available on the relation of circumcision to it than there is analogous information regarding other STDs; therefore it is beyond the scope of this work here to address this aspect as fully as for HIV, and this will be limited to noting that in the opinion of this author (who has not been circumcised, and prefers to remain uncircumcised, using condoms and appropriate genital washing instead in the presently statistically very unlikely rare event of any sexual activity eventuating such as to raise any need for any such measures..., and who has already enough experience of surgery on himself, including with only local

anesthetic, to have virtually no precluding anxiety about the potential surgical aspects of undergoing circumcision himself, and therefore is unlikely to be biased *towards* thinking that uncircumcision is an inherently less hygienic state in and of itself), it is very plausible that in the context of fully scrupulous genital washing generally not being the case, the warm, moist, even if only lightly smegmatous environment under the intact foreskin must provide some substantial potential for harboring infectious transmissible STD organisms (as it does harbor other transmissible organisms[33]), and to think otherwise seems to some extent magical thinking; and, to accept as plausible enough for the present context the findings (inherently not substantially presenting of actual evidence, in the context of a review article) of Friedman et al. (2016),[26] that circumcision does have some substantial benefits in reducing the transmission of other STDs also, e.g. Human Papilloma Virus (HPV), mycoplasma, genital ulcers (caused or contributed to by various STD organisms), Herpes Simplex Virus (HSV) and syphilis, and probably others. A 2014 finding of a Hazard Ratio of 0.38 (p < .05) for male circumcision as protective against syphilis for the males and their female partners is noted here mostly as an example of high levels of non-blindedness in subjects, partners and the containing population being very likely to have had some substantial (even if potentially not all in the same direction) biasing effect.[34] The situation here is one of a lack of conclusive evidence of effect, not one of even suggestive evidence of a lack of effect.

Circumcision and Penile Sensitivity, Ambient Stimulation, and Sexual Satisfaction
Basic Neurology and Sensitivity of the Penis
Cold and Taylor (1999) provide the following summary from authoritative works: "The male prepuce (foreskin) has somatosensory innervation by the dorsal nerve of the penis and branches of the perineal nerve (including the posterior scrotal nerves). Autonomic innervation of the prepuce arises from the pelvic plexus. The parasympathetic visceral efferent and afferent fibres arise from the sacral centre, and sympathetic preganglionic afferent and visceral efferent fibres from the thoracolumbar centre. ... The glans penis (head of the penis) is primarily innervated by free nerve endings and has

primarily protopathic sensitivity. Protopathic sensitivity refers to cruder, poorly localized feelings (including pain, some temperature sensations and certain perceptions of mechanical contact. In the glans penis encapsulated end-organs are sparse, and found mainly along the glans corona (the ridge or flange of the glans immediately before its connection (via the foreskin, externally) with the shaft) and the frenulum (where the foreskin gathers in to its connection with the middle of the underside of the glans). The only portion of the body with less fine-touch discrimination than the glans penis is the heel of the foot. In contrast, the male prepuce ridged band (the inner surface of the foreskin where it comes in and connects with the frenulum) at the mucocutaneous junction has a high concentration of encapsulated receptors. The innervation difference between the protopathic sensitivity of the glans penis and the corpuscular receptor-rich ridged band of the prepuce is part of the normal complement of penile erogenous tissue.... The mucosal epithelium (the inner surface) of the male prepuce is the same as the squamous mucosal epithelium that covers the glans penis."[35] However, it was reported that electrophysiological stimulation of the dorsal nerve of the penis and recording of action potentials at the glans demonstrated that the glans was filled with nerve endings supporting its function as a sensory structure.[36] Any intact male can readily verify with appropriate self-testing that the outer skin of the shaft of the penis and the foreskin is substantially less sensitive than the skin of the inner surface of the foreskin, leaving alone what might be the case for different parts of the glans in different phases of thrust and return strokes of coition, which has not been at all well defined. Furthermore, the glans penis is very closely the same sort of thing as the glans clitoris, and the central involvement of the clitoris (though it is not certain to what extent the clitoral prepuce is also involved) in female sexual pleasure is common knowledge.

Systematic Reviews and Meta-Analysis of Circumcision and Sexual Function, Sensitivity and Satisfaction
Two systematic reviews (both published in 2013) investigating the possible effects of circumcision on sexual function, sensitivity and satisfaction, both reported formal quantitative meta-analyses finding that circumcision had no sexual function including parameters such as penile sensitivity, sexual arousal, sexual sensation, erectile function, premature ejaculation, ejaculatory latency (coition time to ejaculation), orgasm difficulties, sexual pleasure, and pain during penetration.[37,38]

However, summarizing here again points made above, It is very much an incontrovertible fact that there was a very high degree of non-blinding in virtually all the studies examined, and that it hardly requires a reference to state that men are very generally very heavily psychologically invested in their penises as part of their sense of self, and that the permanent exposure of the sexual focus of the penis, its head, by removal of what would otherwise cover it, the foreskin, is hardly likely to be a psychologically neutral circumstance. Furthermore there is the non-blindedness of the populations in which the trials are carried out, and the issue of females generally preferring the aesthetic (visual, olfactory and gustatory) and hygienic aspects of the circumcised penis (particularly if it be an improperly-cleaned penis) over the uncircumcised penis, involving also very plausibly female reaction to the traditional imposition of male dominance. Also there is the issue of religious belief often associated with circumcision. Therefore it is very likely that very substantial psychological biases have been present in virtually all the studies considered by the two systematic reviews noted just above. Similar to the flaws or limitations in the rebutting articles[20-22] noted above, and representative of the general failure to address (non-)blindedness in studies of male circumcision against HIV, yet again here there is the virtually complete failure to have understood (they made no mention) even the presence, let alone the very likely substantial impact on study data, of very substantial non-blindedness as including placebo effects, psychological defense mechanisms like rationalization and denial, psycho-social programming and reinforcement, socialized preference biases, and psychological demand effects in the case of studies of experimental trials, because virtually all the data examined was derived from *subjective report, not from objective observation and*

measurement, although they did note the generally low quality of the evidence available.

Individual Studies of Circumcision and Reported Sexual Function, Sensitivity and Satisfaction, Grouped by Demographic Location
Africa
The four studies here, two published in 2008 [39,40] and two in 2015,[41,42] collecting subjective reports of sexual function, not objective observed measurements, suffered from much the same limitations due to high levels of non-blindedness, and the consequences of that, as generally noted above, as well as other more general methodological limitations (which applies also to studies of this type done in other demographic regions, as dealt with below) so here they will be dealt with collectively. The limitations included: subject acquisition methods not fully detailed; response rates not fully detailed; no characterization of respondents versus non-respondents; bias in sample acquisition substantially likely; expectation of subjects, their partners, and the rest of their communities being that male circumcision reduces HIV infection and infection with other STDs, and improves cleanliness; female sexual partners in these cultures being subject to male domination, including via female genital mutilation, which latter is common knowledge, and substantially preferring the aesthetic (visual, olfactory and gustatory) and hygienic aspects of the circumcised penis (particularly if it be an improperly-cleaned penis) and communicating this preference to males, often to the extent of refusing sex with uncircumcised males; the very substantial counselling sessions including reduction of the number of female partners and the reduction of domestic violence being very likely to be very favorably viewed and reacted to by female partners including in the provision of better sexual experiences to subjects; the counselling sessions very likely improving communication and understanding between partners, which would very likely have improved sexual relations between partners; circumcision being either a traditional rite of initiation into manhood, or known to be such elsewhere; the socio-cultural perceptions of male circumcision in the population being not properly noted; studies including multiple relatively intensive counselling sessions and multiple

follow-up points; provision of substantial free obvious treatment/care to subjects, more so to the circumcised; therefore, high probability of substantial psychological demand effects as subjects give responses to please experimenters; common expectation that circumcision allows a longer period of coition before ejaculation and therefore enhances female partner sexual pleasure; conflation of sensitivity experienced due to ambient rubbing of the exposed head of the penis on clothing with sensitivity in coition; the likely conflation of the enhanced sexual pleasure of the first sexual act after the relatively long period of abstinence during healing, due to that period of abstinence, with the average pleasure when sexual frequency has been reestablished; likely female provision of enhanced sexual experiences for males after their circumcision and their own period of abstinence; placebo effects involved in the immediately aforementioned aspects; and, conflation of increased pleasure (including psychological pleasure) from increased acquisition of coition with the intensity of sensation per physiological unit of coital contact.

Suffice it to conclude that the reported overall slightly favorable (reported) outcome of male circumcision on sexual function can hardly be taken at all seriously, regards the actual physiological effects of circumcision, in the light of these very substantial, overwhelming really, study limitations, and that much the same applies to other studies based on subjective self-reported outcomes in Africa, because much the same limitations are the case.

Korea
Much the same authors contributed three papers from 2001 to 2012 on the South Korean male circumcision situation, which is a fairly well isolated natural experiment in that circumcision rates were nearly nil up until 1950 and the separation of North and South Korea after the Korean War. Thereafter, very much due to the involvement of the USA, circumcision rates rocketed to more than 90%, mostly due to circumcision after the commencement of sexual activity, the age at circumcision in 2001 being about 12 years. In this timespan the general cultural belief was that circumcision was a part of progress, development and modernity. Also, it was

generally believed that circumcision improved sexual function by prolonging the time in coitus to ejaculation, thus improving female partner pleasure. Despite this belief, of more than 5,000 subjects (the acquisition methods and response rate being not at all described), those circumcised as adults had 80% reporting no noticeable difference in "sexuality" subsequent to circumcision, 13% reporting decreased sexuality and 7% reporting increased sexuality. Furthermore, the context here includes the general attendance of the population at public bathhouses as a cultural habit, and the peer pressure and sense of shame attendant to being visibly uncircumcised there. Note that given the psychological contexts here it would have been expected for subjects to have reported enhanced sexual functioning, not the slight decrease in sexual functioning that they did report. Also, as at around 2001, South Korean doctors had a quite poor understanding of circumcision and recommended it very much on the basis of the prevailing cultural beliefs rather than on scientific understanding of the evidence.[43] A prospective study in (2006) of 255 South Korean men (the acquisition methods and response rate again being not at all described), circumcised at greater than 20 years of age, more than 50% being sexually active beforehand, reported that of the subjects 48% reported decreased masturbatory pleasure after circumcision, versus 8% reporting increased masturbatory pleasure, and 20% reported decreased sexual pleasure, versus 6% reporting increased sexual pleasure. Considering the psychological context was as described just above, if subjects reasoned correctly starting from the assumption (their belief) that time to ejaculation was prolonged by circumcision, then the nocebo effect here would be towards the report for decreased masturbatory pleasure, but ambiguous regards sexual pleasure as it was not defined at all well enough to differentiate perceptions of purely their own physiological pleasure from their own psychological satisfaction due to prolongation of coition or due to increased pleasuring of the partner. Therefore it is not reasonable to derive anything more than a mild suggestion here that circumcision might have reduced the sexual sensitivity of the penis.[44] In 2012 it was reported that circumcision in 14-19 year olds had declined from about 90% in 2002 to about 65%, and that the decline was very much

associated with the uncircumcised having accessed contrary information on the internet, which was generally not accessed by the circumcised, and not accessed by anyone more than 10 years ago.[45] Note that South Koreans by 2012 were already far from averse to having their bodies surgically altered such as in other cosmetic surgery, although there was by then a developing backlash against excessive worship of western (e.g. USA) cultural mores, both of these aspects providing further psychological context requiring consideration in analyzing the meaning of literature here and elsewhere.

European Low-Circumcision-Rate Countries
From Italy, a 2012 report that of 152 sufferers of premature ejaculation (PE), 82% responded to local anaesthetic treatment (LAT), but 83% of these experienced some adverse reactions, and 96% of these refused circumcision as proposed as a potentially definitive treatment for PE.[46] It seems that societal mores are very much in force here. However, a 2017 report by the same author reported on 27 patients out of a total of 207 with excessive prepuce (extending more than 1cm past the glans in the flaccid state) offered partial distal circumcision leaving the corona of the glans covered in the flaccid state, as a potential definitive treatment for their premature ejaculation who accepted, that, at 6 months after circumcision, there was an increase in the mean intravaginal ejaculatory latency time (IELT) from 40 seconds to 254 seconds ($p < 0.001$) and that the mean Premature Ejaculation Diagnostic Test (PEDT) score decreased from 17 to 7 ($p < 0.001$).[47] Furthermore, in the 20 patients with both an excessive prepuce and a short frenulum (all of whom received frenulectomy in addition to circumcision, there was an even higher increase in the mean IELT of 760% (from 32 to 277 s) and a more consistent reduction in the PEDT score of 66% (from 18 to 6), and that in the 7 patients presenting only with an excessive prepuce, the mean IELT increased from 64 to 187 s ($p < 0.001$) and the mean PEDT score decreased from 15 to 8 ($p < 0.001$), though there was no statistical testing reported for the difference between subjects with and without a short frenulum. The frenulum is reported as being one of the more sensitive parts of the penis, and all these circumcisions did remove the tip of the foreskin, said

also to be among the more sensitive parts of the penis, however, with only a roughly 15% response rate (no differences between respondents and non-respondents were reported), and the facts that half of the glans remained covered by remnant foreskin after the circumcisions, and that some of the exposed glans would be protected from ambient friction against clothes by the elevation of the adjacent end of the foreskin remnant, in the light of the collective meaning of other data including as presented here, it must be considered very likely that such an extreme result is very highly likely to have involved a very high placebo effect or other psychological subconscious or conscious (e.g. deliberate misreporting) effect, and this present author notes here this study as being probably a very good example of the possible great strength of such psychological effects due to non-blindedness very substantially distorting the data in the very large majority of studies on the aspect of male circumcision's possible effect on the sexual sensitivity of the penis.

A 2005 report of 150 UK men aged 18-60 y circumcised between 1999 and 2002 for benign disease, that penile sensation improved, penile appearance improved, and International Index of Erectile Function (IIEF-5) score remained similar,[48] contributes virtually no meaning to the present topic of discussion here because the men probably had a successful outcome for their benign disease, probably had some generalized placebo effect, some psychological demand effect and social desirability bias within their context, and having the benign disease to start with, were not representative of the population of men without such disease. Further from the UK is a 2005 report that although the local population and the clinic population was comprised of only 11-12% of Islamic or Asian backgrounds, 60% of patients presenting with a clinical diagnosis of PE by DSM-IV and UK national guidelines were of Islamic or Asian background.[49] Also from the UK is a 2006 report on an explorative qualitative study using semi-structured interviews with 10 male Islamic volunteers with a clinical diagnosis of premature ejaculation, reporting common themes as including: anxious first sexual experience (with subtheme: fear of being discovered and wanting to finish early); sex before marriage; sex outside of marriage; religion; "stress";

exposure to Western images; living in the United Kingdom; and subsequent feelings of freedom.[50] These latter studies suggest that psychosocial factors such as one's own religion and societal membership or integration have a strong effect on sexuality, and therefore need to be accounted for in studies of circumcision and sexual function. A 2013 report from Belgium on 1059 uncircumcised men and 310 circumcised (mostly in childhood) men aged 18 y or over, recruited opportunistically from distribution of an unknown number of leaflets at railway stations all over Belgium to an online survey, reported that the foreskin was said to be more erogenously sensitive than the glans, and that circumcision resulted in loss of sexual sensitivity of the glans and some discomfort.[51] Respondent bias could be considerable in this group(s). A 2011 study from Denmark of 5,552 participants (response rate about 50%) in a national health survey reported that circumcision (at an unreported age) was associated with less sexual satisfaction of various types.[52] Denmark has a very low circumcision rate.

Suffice it to say here that the reported overall unfavorable (reported) outcome of male circumcision on sexual function can properly only be regarded as mildly suggestive regards the actual physiological effects of circumcision, in the light of the very substantial study limitations as (and not exhaustively) noted.

Australia, previously a good majority being circumcised, declining to a good minority.

A 2001 report noted that circumcision was associated with reduced sexual sensation and long-lasting negative emotional outcomes.[53] As the study group of 35 female and 42 gay sexual partners, and 53 circumcised and 30 uncircumcised men was highly susceptible to sampling bias, the reported overall unfavorable (reported) outcome of male circumcision on sexual function can properly only be regarded as only very mildly suggestive regards the actual physiological effects of circumcision.

Turkey, an Islamic-majority, majority-circumcised country

A 2004 report studied 42 males aged 19-28 y circumcised only for religious (39) or cosmetic (3) reasons (uncircumcised adult males are anomalous rarities in Turkey); Brief Male Sexual Functional Inventory scores were not statistically significantly different for any of the five criteria, comparing before and after circumcision, but self-timed ejaculatory latency times were longer (p = .02) after circumcision.[54] In this context prolonged coition time to ejaculation is generally an expected beneficial outcome, therefore placebo effect, social desirability bias (the authors noted the possible action of these) and experimental demand effects are very likely to be substantially in force, and therefore the reported overall neutral (reported) outcome of male circumcision on general sexual function and implication of reduced sensitivity of the penis implied by longer ejaculatory latency can properly only be regarded as being too strongly affected by non-blindedness to contribute anything regards the question of the actual physiological effects of circumcision, notwithstanding the authors explicitly stating that they had had the ideal study group, and conclusively shown that circumcision has no detrimental effects on sexual function.

USA a substantially majority-neonatally-circumcised country

A 2002 report on 123 men circumcised as adults at mean age 42 y (64% for phimosis (tight foreskin), 17% for balanitis (inflammation of the glans), 17% for condyloma (warts), 9% for redundant foreskin and 7% for personal preference), comparing pre- and post-circumcision, had worsened (reported) erectile function (p = .01) and decreased (reported) penile sensitivity (p = .08), with 62% being satisfied with having been circumcised.[55] Given the substantial psychological content in the reasons for these circumcisions, and other non-blindedness including that in the USA circumcision is the norm, particularly at those age groups, and that increased coition time to ejaculation due to reduced sensitivity of the penis is the general expectation, these findings here can properly only be regarded as only very mildly suggestive regards the actual physiological effects of circumcision in general populations.

In 1999 was reported the results of a questionnaire formulated by the National Organization to Halt the Abuse and Routine Mutilation of Males, based on details of circumcision damage reported by men who had contacted circumcision-related organizations, that was mailed to 546 respondents of men who had requested information from those organizations and/or responded to announcements published in periodicals aimed at American men. 61% reported progressive sensory deficit in the glans and foreskin remnant, and 40% reported extraordinary stimulation being required for achieving orgasm. "All respondents described emotional suffering after realizing they had been dispossessed of an irreplaceable part of their body.", approximately half reported serious psychological distress, and 29% substance abuse or compensatory eating or sexual behavior.[56] In this study there is a very high likelihood that very substantial non-blindedness effects are at play, including, as well as the abovementioned, the initial self-selection, the name of the Organization involved, as well as that problems that possibly are really mostly due to other things are being attributed to circumcision. Therefore these findings here can properly only be regarded as only suggestive regards the possible actual physiological effects of circumcision in general populations.

In 1997 a national probability sample of 1410 men aged 18-59 y, English-literate and not living in dorms, barracks or prisons, with an oversampling of blacks and Hispanics, drawn from the National Health and social Life Survey, was analyzed of data to report that older (but not younger) uncircumcised men reported more sexual dysfunction; and that circumcised white men engaged in more masturbation and heterosexual fellatio and cunnilingus than uncircumcised white men, the differences being much less so in blacks and hispanics.[57] Firstly here there is a strong suggestion that culture substantially effects sexuality via psychosocial means. Other interpretation is not straightforward: the findings would be consistent with female partners finding the circumcised penis more esthetically pleasing and therefore being more positively involved in sexual interactions, and also with circumcision reducing the sexual sensitivity of the penis, thus resulting in lack of satisfaction and the further seeking of it other than in

coition. Again these are subject reports here, not objective measurements, and the psychological aspects of the non-blindedness as now amply detailed above would very probably be substantial, and so these findings here can properly only be regarded as only mildly suggestive regards the possible actual physiological effects of circumcision.

In concluding this section, the most important thing is the understanding that due to the high degree of non-blindedness and its obviously enough great effect on subjective reports of sexual function by individuals in virtually all contexts studied, the real effect of circumcision on the sexual sensitivity of the penis cannot be derived even close to conclusively from any collection of studies of self-reports, and one must turn to objectively physiologically measured studies, now addressed in the next section below.

Studies of circumcision and *objectively measured* sexual function
A Review
Two of the authors, Krieger and Morris, having already delivered the review on subjectively reported sensitivity in 2013,[37] finding no effect of circumcision on that, which as detailed above was fatally flawed work, proceeded to present in 2015,[58] along with coauthor Cox, a review of "Histological correlates of penile sexual sensation" to further attempt to address the question, and perhaps further reinforce their previous very flawed stance from another angle, perhaps this latter possibility in great similarity to, as noted above, many other professionals in the area failing to see and react to properly the role of their own psychosocial programming in the continued holding and promulgation of opinions not at all properly based on the evidence. Their rebuttal of the significance of the 'ridged band', much on the basis of a lack of consensus on specifying whether or not it be at the junction of the inner and outer layers (the tip, when not retracted over the glans, more or less) of the foreskin, or whether it be the entire inner layer of the foreskin naturally wrinkled after retraction behind the glans, is much to set up a straw man and knock it down in avoidance of the real adversary. The real adversary being that the retracted foreskin, even when only retracted as far as to locate it passively behind the head of the penis, indeed presents that

inner surface of the foreskin for tactile stimulation, and that it is indeed far more sensitive in that position than the outer layer of the foreskin, as could be demonstrated very easily by/with any intact man or preferable of course group of men, suitably blinded in experimental design and execution as much as possible just to make it absolutely irrefutable to all but the most resolutely, unreasonably and unreasonedly biased pundit. Furthermore, that when, protruding beyond (into the diameter of penile measure) the rear of the head of the penis, the foreskin is dragged back towards being fully or partly presented along the shaft of the penis for stimulation by the walls of the vagina that are dragging it back, it is very obviously subjected to even further stimulation by the walls of the vagina, be it by friction, pressure or warmth (obviously enough, by all three of these, whichever might contribute most substantially to sexual pleasure and/or responses, via nerve endings of whatever degree of human scientific undifferentiation). Concluding somewhat correctly that "isolating any specific contribution of the prepuce is fraught with difficulties" with regard to the exact function of the different types of nerve endings present is far from a justification to moving to claim that there is no contribution of the prepuce to sexual sensation and pleasure. Their concluding on this basis in conjunction with very limited experimental evidence including mainly that involving subjects timing their own ejaculatory latency before circumcision (three times with only a minimum of only 24 hours between times is far from a good enough experimental specification, as is the failure to account for the partners anatomical differences or masturbatory technique whichever was the (unstated) case) and having the foreskins examined for density of free nerve endings, that "there is no biological basis for ascribing any sexual function to the prepuce" is not at all justified.

Regarding the question of possible differences in sexual sensitivity between the circumcised and uncircumcised head of the penis, the authors refer to physiological work mostly involving subjects measuring their own ejaculatory latency times, and although it is reasonable to assume the subjects could operate a stopwatch with accuracy sufficient to

the task in the face of any almost any bias if trying honestly, all of these subjects are in a very substantially non-blinded condition regarding their perceptions of the situations with themselves and their penises, and again, as detailed amply enough for very adequately similar contexts, therefore, their data can only reasonably be considered at the very most mildly suggestive. Furthermore, masturbation is not necessarily treated as a chore to be dealt with as soon as possible; with a pleasing fantasy incorporated (many prefer not to focus entirely on the reality of sexually pleasuring oneself solitarily), it will be preferred not to finish the job as soon as possible, but to prolong it at least a little (the fantasy may include the partner's pleasure), and accordingly, and even in the absence of a fantasy, the subject may adjust the masturbatory input such as to result in a satisfactory latency time – for example, if one had a tendency to premature ejaculation, would one want one's masturbatory experience including fantasy to be concluded as soon as possible or would one prefer it rather to incorporate a resemblance of a more satisfactory (in itself) duration? And the same sort of psychological aspects apply substantially also to coition and the same sort of adjustments be made (including subconsciously) to coital input (possibly by even both partners, the partners also being very substantially non-blinded).

Now, this author here suggests to the reader that it is common knowledge that if the soles of the feet are always protected by socks and shoes, from the friction involved in walking barefoot, that they will become very soft and sensitive to the point of discomfort to walking barefoot on bare ground, and that feet may cornify to a marked extent at points of contact with improperly fitting shoes, and that the palms of the hands and adjacent finger skin cornify very markedly in response to manual labour that involves subjecting them to friction – and that these facts require no reference to the scientific literature, as they are accepted as being obvious facts by all reasonable people. Now, most entire males, may easily, as this present author here has done in the past as an adolescent and even earlier, by way of investigating what it might feel like to be circumcised, retract the foreskin leaving the head of the penis exposed and proceed with activities of daily life, and if they do, they will doubtless likewise also perceive immediately that the head of the penis is being subjected to more friction from adjacent clothing than it is when covered by the foreskin. This will hardly be a surprise, particularly to any competent dermatologist, as the head of the entire penis has a surface of serous membrane protected from ambient friction by another serous surface, and accordingly has the bare minimum of keratinization. The perception by one of such increased friction at the now-exposed head of the penis in such a basic investigation as substantial is a reality, and it seems very much magical thinking to posit that that increased friction would not result in increased keratinization as it does in virtually every other body surface of relevance. And though it is possible that there could be physiological compensation to this increased keratinization by way of enhanced nervous sensitivity, it is most likely, that as elsewhere, the compensation would not be complete, and that there would be a reduction of sensitivity due to the increase in keratinization. And again, lack of evidence of something is not the same thing as evidence of a lack of something, the former, not the latter, being very much more the case in this context. Furthermore, clothing material and physical activity and circumcision and characteristics of sexual activity could easily vary in association with each other such as to confound.

Now, Cox, Krieger and Morris[37] referenced Szabo and Short[59] as the sole evidence for them stating that "Histological examination of cadaver penises from circumcised and uncircumcised men has, however, revealed there is no difference in keratinization (of the glans)". In fact, Szabo and Short made only the briefest note (9 single-column lines in their review article) of their work involving only 7 circumcised and 6 uncircumcised, with no description of methodology at all, and no statistical or otherwise criterion test at all being given, and with no other publication of the work being referenced, to state that they "found the epithelia to be equally keratinized", which is not at all even remotely a sufficient basis for making the statement of "no difference" as though it was an established fact, as Cox et al. did. The female partners of the 13 cadavers may have differed in genital anatomy and physiology (secretion of

lubrication is well known to vary widely among females), and sexual practices could easily have varied widely, as could the ambient friction incurred by the glans due to clothing and type of physical activity, in this very small study group. A lack of evidence, not evidence of a lack, here, obviously enough.

The authors in conclusion refer at some length to their own work, the fatally flawed review noted just above and initially further above,[37] and the other review,[38] both of whose manifold fatal defects have already been detailed further above, in support of their position that circumcision has no effect on penile sexual sensitivity/ function, reinforcing, if indeed any reinforcement was not redundant, the fatally flawed nature of their work here.

Studies with some physiological measure of penile sensitivity but involving the subjects report of detection of the stimulus

A 1996 report on 120 Chinese patients with primary premature ejaculation (PE) and 60 normal volunteers reported that vibratory thresholds of perception were less for the PE subjects ($p < .001$), and this without any dependency on age, whereas the normal volunteers had an increased threshold with increased age, though this was not statistically significant ($p > .05$).[60] A 2005 report on 125 adult patients, 62 uncircumcised and 63 neonatally circumcised, quantitatively tested on the dorsal midline of the exposed glans for vibration, pressure, spatial perception, warmth and cold sensitivity, reported no significant differences after age, hypertension and diabetes were controlled for.[61] A 2007 report on 20 uncircumcised men and 20 age-matched circumcised men reported that no differences in penile (including glans) sensitivity were found, but that the uncircumcised men were less sensitive to touch on the forearm.[62] This latter feature (usable as a within-subject statistical control) could well have been indicative of a baseline genetically lower sensitivity in the circumcised group, suggesting that if it had been controlled for in analysis there may well have been a statistically significant difference in penile sensitivity between the (small) groups. Furthermore, they reported that uncircumcised men had a lower penile temperature than circumcised men, which would be

consistent with more blood being routed to the penis as a whole in order to heat up the exposed glans if ambient temperatures were low enough. The physiological significance of this latter finding is not clear, other than that it is a difference, suggestive more of difference elsewhere than of similarity elsewhere. Certainly lowering the temperature of body parts usually prolongs the healing time for them, and circumcision being the removal of not only a physically protective but thermally insulating cover of the glans, further adds to the suggestion of difference.

A 2007 report of adult male volunteers (91 circumcised, 68 not) recruited via fliers at a San Francisco medical school, and solicitations in a medical radio program and in a local general newspaper, used Semmes-Weinstein monofilament touch test to map the fine-touch pressure thresholds of the penis, statistically controlling for age, type of underwear, time since last ejaculation, ethnicity, country of birth and level of education. They reported that the glans of the uncircumcised men had lower mean pressure thresholds than those of the circumcised men ($p = .04$). Also, that there were significant ($p < .001$) differences in pressure thresholds of different parts of the penis: five parts of the foreskin usually removed in circumcision having the most sensitivity, and the circumcision scar having more sensitivity than anywhere else on the circumcised penis.[63] A 2008 report of 96 patients with redundant prepuce before and after circumcision by quantitative measurement of sensitivity to vibration reported glans/finger sensitivity threshold ratios of 1.97 before circumcision, and 2.64 at 1 month post-circumcision, 3.09 at 2 months post-circumcision and 2.97 at 3 months post-circumcision.[64] Although the data here is very consistent with evolving keratinization of the glans following circumcision, as everywhere else in investigations of circumcision, it is crucial to bear in mind the potential for non-blindedness to have affected the results, the blindedness of the technicians administering the stimulation or otherwise interacting with the subjects was not given in the English abstract for this Chinese-language report, and the subjects were very likely to have not been blinded to the general expectation that keratinization would take place and would result

in some loss of sensitivity, and they would in any case have been less complacent about the whole fact of the circumcision closer in time to the circumcision and therefore potentially more focused on detecting anything involving the glans, and that although scientific instruments were used, again it is the subjective report of the subjects that is taken to be the endpoint for the threshold of the ability to detect the stimulus, not some more objective measure such as the measuring of the electrical signals resulting (or not) in the nervous system from the stimulation (evoked potentials) (see below).

In concluding this subsection, the evidence here is in support of circumcision resulting in keratinization of the head of the penis, resulting in some loss of sensitivity of the head of the penis. However, due to the non-blindedness of the subjects possibly having affected the results, this evidence might be false evidence.

Studies with physiological measure of penile sensitivity and using evoked potentials to detect sensitivity to the stimulus
A Pubmed search in 2018 using the term "circumcision evoked potentials" returned only 4 journal articles, only the following two being of any relevance to our questions here:

A 2008 report on 43 apparently Belgian healthy adult males willing (for reasons not noted) to undergo circumcision in this substantially-minority-circumcised(ing) country but with possibly growing rate of neonatal circumcision in the context of a growing Muslim portion of the population (very roughly 10%), had results of a difference in mean pudendal evoked potentials pre- and post-circumcision of 42.0 ms and 44.7 ms respectively (p < .001), consistent with the more subjective (reasons detailed above) ejaculatory latency time being increased post-circumcision (p < .001).[65] The authors concluded that circumcision may contribute to sexual satisfaction via these changes, illustrating again that this belief is part of the non-blindedness of the context here, which the subjects were probably non-blinded to and which could potentially have substantially affected their ejaculatory latency time

measuring, even though here it is indeed consistent with the evoked potential data.

A 2016 report on a study in China of circumcision in the treatment of premature ejaculation (PE) with redundant prepuce, of 81 PE patients who received circumcision, reported mean latencies (and amplitudes) of glans stimulation evoked potential of 38 ms before circumcision and 43 ms after circumcision (p < .001), whereas the mean latencies of dorsal nerve stimulation (not involving the glans) evoked potential were 40.5 ms both pre- and post-circumcision, consistent with the more subjective (reasons detailed above) intravaginal ejaculatory latency time being increased from 1.07 min pre- to 2.02 min post- and Chinese Index of PE increasing (p < .001).[66] Again there is the non-blindedness to the belief of circumcision potentially improving sexual experience via reduction of glans sensitivity and prolongation of coition time to ejaculation, which could potentially have substantially affected the ejaculatory latency time measuring, even though here again it is indeed consistent with the evoked potential data.

By at least this point the reader should have gained at least a fair understanding of the absolute necessity of studies using objective physiological measurements of the changes in the electrical signals of the nervous system in evoked potentials arising from objectively measured stimulation of the glans (and perhaps other parts of the penis as internal controls) in answering the question of whether male circumcision results in reduced sexual sensitivity of the glans, because the psychological effects of non-blindedness in subjects and/or experimenters are so plausibly so strong as to very likely result in too-substantially distorted data.

Also by this point it should be obvious enough that the evidence available fairly strongly supports the fairly common-sense proposition that exposing the head of the penis to increased ambient (non-sexual, from clothing), masturbatory and foreplay friction, as well as to increased dryness, by removing the foreskin in circumcision, results in increased keratinization of the head of the penis, and that this results in decreased sexual sensitivity of the head of the penis.

Sexual Behaviour and Risk Compensation/ Disinhibition in Risky Sexual Behaviour Associated with Circumcision and Anti-Retroviral Therapy ART

Aversion of Men to Condom use

That men find coition without wearing a condom substantially more intensely pleasurable than coition with the wearing of a condom is common knowledge even among the general population,[67] as is the problems this gives for female sex workers regards contracting STDs.[68] A 2000 report of a study in Rakai, Uganda, of informed, respondent couples who were tested for HIV and strongly encouraged to report the result of the test to their partner, and comprehensively intensively counselled regarding behavior for the prevention of HIV transmission including condom use, reported that in couples where the male was HIV-uninfected and their female partner was HIV-infected, an astonishing and dismaying 89% (364) of the men reported not having used condoms at all in the past year (of the study).[14]

Studies of Circumcision and Risk-Compensation / Disinhibition

Below follows a review of studies (nearly all African) attempting to address the question of whether circumcision does or is likely to lead to circumcised men, due to perceptions of their reduced vulnerability to infection by HIV, increasing the risk of acquiring HIV by increasing the riskiness of other sexual behavior, such as coition without a condom, and coition with a plurality of partners. The studies are grouped by demographic area, starting with larger areas, and weaknesses due to non-blinding in studies of smaller areas will be mostly detailed collectively at the end of the section, as they are similar throughout all of these studies:

Africa

A 2009 review of data from the three major RCTs on circumcision in South Africa, Kenya, and Uganda, noting inconsistent findings, is best included here as yet another example of almost total failure to have understood the very substantial likelihood that non-blindedness (possibly in interaction with cultural conceptions of the relationship of male circumcision and manhood) contributed to substantial distortion of the *self-reported* behavior data, for reasons as noted in sections above here and again below in concluding this section, dismaying in particular here, as, although lack of psychological competence is the usual case for researchers with a medical background, the corresponding author's listed address is a Department of Psychology. They did, however, correctly note the logically competing incentives for individuals considering circumcision and/or condom use.[69] A 2015 study of 11 Medical Male Circumcision-priority African countries, aside from the contradiction in data for total lifetime sexual partners in Tables 3 and 4, and lack of proper multivariate analyses, is best included here not for its finding of an association of circumcision with safe sexual behavior, but as an example of the great differences in the religious, socio-economic and sexual behavioural characteristics among the 11 countries, illustrating the absolute necessity for adjusting for these well in statistical analyses.[70] On the other hand, a 2006 study of male circumcision, religion, and infectious diseases in 118 developing countries,[71] aside from the inconsistent use of variables in statistical control in compared multivariate analyses, and that the purposes of the study did not include the study of sexual behavior, it is included here as an example of the potential for over-control to occur in multivariate analyses that are nonetheless attempting to be fully comprehensive in their control of confounding variables, and the reader is asked to consider how religion is a very good example of something that may be both a marker for some relevant aspect of a situation, and, at the same time, be involved in a true causal pathway at some step or other – there is no doubt that over-control is among the most difficult of things to fully understand as to where it might potentially occur in an analysis of a particular situation's data, and therefore its lack of comprehensive address is among the easiest of deficiencies to forgive, but avoiding the mention of the inherent possible deficiency/ limitation does not remove it, and fully rigorous work should at least mention the possibility when there seems a substantial enough possibility that it might occur such as to distort findings.

Uganda

A 2016 study of data drawn from two national surveys (2004 and 2011) in Uganda reported a generally relatively high rate of HIV and of non-

marital sex, and that circumcision was not associated with (reported) condom use in 2004, but in 2011 circumcision was associated with less (reported) condom use with the last non-marital partner.[72] A 2015 study of data drawn from a 2011 national survey in Uganda reported that men with riskier sexual behaviour, especially non-use of condoms with the last non-marital sexual partner, were more willing to be circumcised.[73] A 2014 study of data drawn from a 2011 national survey (the same survey as in the two studies referenced immediately above) in Uganda reported that the (adjusted) Odds Ratios (95% CI) for circumcision versus uncircumcision were: lifetime multiple sexual partners, 1.46 (1.27, 1.67); non-marital sex in the last 12 months, 1.26 (1.05, 1.52); condom use at last non-marital sex, 0.79 (0.63, 0.98).[74]

Rural Central and Eastern Uganda

A 2010 study of 267 adults aged > 24 y and 185 younger people aged 14-24 y living in three rural central and eastern Ugandan districts (Mpigi, Kayunga and Kaliro) reported that 87% of the older group and 76% of the younger group were aware of the protective effect of male circumcision in HIV transmission.[75]

Rakai, Uganda

The first two (very similar) of the studies noted here were on subjects that were part of the Rakai major RCT[9] of male circumcision for the prevention of HIV acquisition, and the third was in the same demographic area, all three being by similar groups of authors. A 2012 study of the control group, uncircumcised throughout the trial, and thereafter splitting into 81% self-selecting for circumcision and the other 19% remaining uncircumcised, found that, according to the subjects' reports, the circumcised men decreased condom use -9.2% with all partners and -7.0% with non-marital partners) and the uncircumcised men also decreased condom use – 12.4% with all partners and -13.5% with non-marital partners, but that the differences here were not statistically significant.[76] Another 2012 report seems to have been a preliminary mention of very much the same work, as part of a broader work covering also circumcision-HIV.[77] Here, there are two levels of self-selection involved, participation in the major circumcision-HIV RCT itself in the first place, and

then acceptance of the offered circumcision at RCT closure, the latter not being random in any relevant sense of the term. The non-blindedness here is very substantial, and what the full complement of distortions this probably had on the subject's reports is inherently difficult to surmise, let alone conclusively define (the authors did make a single-column two-line mere passing remark on the possibility), and one is left wondering at least the obvious: if declining circumcision at this point (given participation in the RCT in the first place incorporated willingness to be circumcised) was not a marker for some psychological characteristic or state predisposing to generally higher-sexual risk behavior (notwithstanding its lack of statistically significant difference from that reported by those accepting circumcision) at this point in the proceedings and the differential evolution of other aspects in their lives. Furthermore, that all of the control group had increased risky behavior after the end of the trial is far from a trivial matter, and this requires an addressing that did not occur, despite detailing of some ostensibly sophisticated statistical details that were offered perhaps in the stead of the appropriate dealing with these latter aspects.

A 2016 report of a study using data from three surveys (2006-8, 2008-9, 2010-11) of the Rakai Community Cohort Study, a period when free male circumcision was available to the general population following completion of the three major RCTs of circumcision-HIV[8-10], compared (before and after circumcision) 587 non-Muslim men who accepted circumcision with 4,907 non-Muslim men who remained uncircumcised, finding that the circumcised men reported before circumcision having less plurality of sexual partners (p = .05), less genital discharge (p = .03) after circumcision, and no statistically significant differences in condom use at last non-marital sex, nor in casual sex nor in new partner acquisition. After circumcision reports of risky sexual behavior did not statistically significantly differ between the two groups.[78] Here again, non-blinding is very substantial regarding its potential to have distorted the reports of the subjects, including many of the aspects discussed above, as well as almost doubtlessly the additional non-blinding to risk-compensation/ disinhibition.

Wakiso, Uganda
A 2017 report on 25 in-depth interviews done in five public health facilities in 2015 with adult married/ stably-partnered 18-46 yo's, safe male circumcision clients reported that drivers for circumcision included that: women prefer circumcised males on the bases of appearance, hygiene and STDs, and improved male sexual performance; men want circumcision on these same bases also; men think, as told them by peers and health care staff, that circumcision hardens the skin of the glans and therefore desensitizes it, therefore allowing longer coition and less damage to the glans; and, that circumcision is in fashion. Furthermore the men acknowledged risk-compensation/ disinhibition as being a reality.[79] This study group may have been a very biased sample (no response rate was given) and the direction of the bias relative to the other segments of the population(s) of interest is inherently difficult to surmise. Another 2017 report from much the same group of authors, on subjects comprised by apparently the same 25 immediately aforementioned plus another 48 in-depth interviews of newly-circumcised men, reported that the latter reported maintaining or adopting safer sexual behavior, though even at this late date there was a prevalent belief that a newly-circumcised male should have the (ritual) first post-circumcision coitus unprotected by a condom and with a woman other than his own wife, as well as some other fairly peculiar and not at all science-based beliefs including the "sharpening" of the penis by the circumcising blades.[80] Other themes were consistent with the immediately aforementioned study. Regarding the reported maintenance or adoption of safer sexual behaviours, as well as the very selected nature of the study group (no response rate was given), the very high probability that their reports were substantially distorted by the very substantial degree of non-blinding and very likely resultant psychological demand-effect and social desirability bias should be obvious enough by this point here.

Mbale, Bugisu, Uganda
A 2015 report of a case-control study of 155 HIV-infected and 155 HIV-uninfected circumcised men aged 18-35y, 84% and 57% respectively being traditionally circumcised in a region which also has a significant Muslim religiously-circumcising population group, reported that men who had the religious circumcision were less likely (aOR = 0.4 CI 0.2 – 0.9) than men who had the traditional circumcision, similarly to the men who had the medical circumcision (aOR = 0.4 CI 0.1 – 1.1) versus the traditional, to have acquired HIV. 64% of cases and 36% of controls reported using condoms since circumcision either inconsistently or not at all.[81] Here the effect of religion/ culture is highlighted as being substantial, and very remarkable is the lack of condom use in Uganda at this time, by which time the topic of condom use and HIV had been very substantially in the public consciousness for years.

Mbarara of Rural Southwestern Uganda
A 2013 report on a study of 506 subjects on Anti-Retroviral Therapy enrolled between 2005-2011, had the men reporting increasing sexually risky behavior from the reported drop in it at commencement (to 4%) of ART back up to pre-ART levels (16%), although adjusting for the CD4 count removed much of the statistical significance of this. Females, in contrast, reported decreasing sexually risky behavior with time.[82] There is clear enough evidence here of disinhibition in the context of risk to someone else, here due not to circumcision but to ART. A question logically arising is that of to what extent complacency arising due to partial improvements (and the perceived or real sum or net of these) of the HIV situation from whatever angle(s) will result in substantial enough risk compensation/ disinhibition such as to prevent sufficient containment or reduction of HIV.

Botswana
A 2016 study of a representative sample of 313 sexually active men from the Botswana AIDS Impact Survey III, apart from tabled percentages that did not add up as they should, and failure to use interaction variables in statistical analyses (e.g. condom use x n sexual partners), and a fatally flawed (seemingly deliberately so) abstract, did yield the following data from extraction: circumcised men reported 66% having more than one sexual partner compared to 60% of uncircumcised men, 11% reported having sex when intoxicated compared to 9% of uncircumcised men, and 26% reported having inconsistent condom use compared to 20% of uncircumcised men.[83] They

did correctly report that marital status (never), lower education (another 2016 report on the natural experiment of increasing education in Botswana associated with reducing HIV confirms this,[84] location and higher alcohol consumption were associated with more sexually risky behavior in this context, notwithstanding that in other areas *higher* education may be.

Kisumu, Kenya
A 2010 report of 2008 data from in-depth qualitative interviews and focus groups with 30 sexually active circumcised men purposively sampled (response rate not given) reported that most respondents reported either no change in or less sexually risky behavior after circumcision (including not using condoms), though a minority of men reported more sexually risky behavior. The men described being able to perform more rounds of sex, and reported that women preferred circumcised men.[85] The context here incudes intensive counselling for condom use and against sexually risky behavior such as having multiple sex partners, as well as societal knowledge and beliefs, and so the degree of non-blinding (regardless of response rate) was very likely to give rise to substantial psychological effects such as placebo effects, demand effects and social desirability effects, such as to substantially distort the subject's reporting. Note that being able to ejaculate more times in a session of sex is very consistent with ejaculations being less intense due to reduced penile sensitivity from circumcision, notwithstanding that this aspect is likewise subject to the non-blinding.

Soweto, South Africa
A 2012 report of a survey collecting data on imagined subject reactions regarding sexually risky behaviors to a hypothetical HIV vaccine that would be 100% effective in only 30% of recipients is a quite stunning example of a most blatant contradiction by the abstract (increased sexually risky behavior) of the actual (hypothetical, reported) results (as in their Table 2), generally decreased sexually risky behavior.[86] This work here is included only as an example of bad science, and because the authors included, astonishingly and dismayingly, the corresponding author from the vaunted Yale University, Department of Epidemiology and Public

Health. A similar 2009 study in Los Angeles of high-risk adults considering hypothetical vaccines of various efficacies reported that 10% of the subjects would decrease condom use.[87]

Both rural and urban areas of Mwanza, Tanzania
A 2013 work reporting qualitative findings from group discussions involving 67 adult male and female Christian churchgoers, included noting that: half of sub-Saharan Africans are Christians; that circumcision can be perceived as related to promiscuity, including that in some tribal traditions it marks initiation into sexual life and activity; that circumcision can be perceived as a status symbol for being able to afford to have the procedure and the recovery time; that circumcision can be a crucial factor in the acceptability of a man to a woman; that Christian churches in SSA are highly influential on their members, other religions also being highly influential, though where religion does not address circumcision, people default to tribal customs for or against it.[88]

Summarizing risk-compensation/ disinhibition
The limitations in the studies here are very similar to those noted for studies dealt with in previous sections above (notwithstanding that particular limitations may differ in the severity of their effects in the risk-compensation context) and included: subject acquisition methods not fully detailed; response rates not fully detailed; no characterization of respondents versus non-respondents; bias in sample acquisition substantially likely; expectation of subjects, their partners, and the rest of their communities is that male circumcision reduces HIV infection and infection with other STDs, and improves cleanliness; female sexual partners in these cultures are subject to male domination, including via female genital mutilation, which latter is common knowledge, and substantially prefer the aesthetic (visual, olfactory and gustatory) and hygienic aspects of the circumcised penis (particularly if it be an improperly-cleaned penis) and communicate this preference to males, often to the extent of refusing sex with uncircumcised males; the very substantial counselling sessions including reduction of the number of female partners and the reduction of domestic violence being very likely to be very favorably viewed and reacted to by female

partners including in the provision of better sexual experiences to subjects; the counselling sessions very likely improving communication and understanding between partners, which would very likely have improved sexual relations between partners; that circumcision is either a traditional rite of initiation into manhood, or known to be such elsewhere; the socio-cultural perceptions of male circumcision in the population not being properly noted; studies including multiple relatively intensive counselling sessions and multiple follow-up points; provision of substantial free obvious treatment/care to subjects, more so to the circumcised; therefore, high probability of substantial psychological demand effects as subjects give responses to please experimenters; common expectation that circumcision allows a longer period of coition before ejaculation and therefore enhances female partner sexual pleasure; likely female provision of enhanced sexual experiences for males after their circumcision and their own period of abstinence.

Given the very high non-blindedness here, and the very likely psychological effect of it in causing the under-reporting of lack of condom use with non-marital partners, it is very likely that that the reduction of (appropriate) condom use was even greater than was reported by the study subjects. This sort of under-reporting due to psychological context distorting the subjects' responses has been found in analogous contexts, for example TB patients under-reporting smoking.[89]

HIV Remaining After Medical Male Circumcision, and Prevalence Versus Incidence

Optimistic estimations of the efficacy of medical male circumcision (MMC) are (were) roughly that if 80% coverage of MMC could be achieved by 2016 and be maintained at that level thereafter, 40% (e.g. 600,000 out of 1,500,000) of the new HIV infections otherwise projected for 2025 would be prevented.[90] The great absolute significance of the 900,000 new HIV cases therefore projected not to be prevented is incontrovertible in itself. The same authors correctly write "In the model, HIV incidence (the proportion of the susceptible population becoming infected each year) is the product of HIV prevalence in the population and the force of infection. ... Changes in

behavior are assumed to occur as the epidemic progresses because of two key influences. Individuals with the riskiest behavior are assumed to become infected first and die sooner than the rest of the population. Also, as AIDS deaths accumulate, a powerful effect on individual behavior is assumed, as those who know someone who has died from AIDS are motivated to adopt safer behaviors. Thus, the force of infection can drop over time as the cumulative number of AIDS deaths increases." It should also be noted that those with whatever genetic predisposition(s) to acquiring infection will become (on average) infected first, such that the remaining uninfected population will have some lesser genetic predisposition to acquiring HIV infection. So perhaps the most important point here in the context of HIV infection is that focus on achieving some decrease in incidence should not ever occur without reference to the prevalence.

Modelling Studies and Flawed Assumptions

In modelling studies of the efficacies and costs and cost-benefits of medical male circumcision against HIV in Africa,[90-93] there are various assumptions made for important modelling parameters. Even quite recent (2015/ 2016) such studies have assumptions that are very substantial in their potential to lead to flawed results.[91-93] Alongside the dubious assumption that there will be no increase in risky sexual behavior (for example decreased use of condoms), which at least may be made explicit, there is generally no mention made of what beneficial externalities there might be to the promotion of optimal sexual personal hygiene (washing of the genitals (including, crucially, under the foreskin) at the optimal junctures, e.g. immediately before and after coition and perhaps other sex acts). The externality here would be that the better personal hygienic practices would carry over into and reinforce personal hygiene in non-sexual contexts such as those that are virtually universally accepted in public health to have a very substantial effect in other infectious diseases of major importance.

Retention in Care of HIV-Infected People

Another area of substantial doubt in modelling studies is that of the uptake and compliance by HIV-infected people of both the treatment and behavioral

practices necessary to reduce the spread of HIV. It was reported that even in the USA in 2011 only 59% of HIV-infected cases are retained in care, this in the context of only 34% of HIV-infected cases having viruses suppressed to < 400 copies/ml, and only 29% to < 75 copies/ml.[94] The following is verbatim from a 2011 review: "In summary, we conclude that ~ 75% of individuals with newly diagnosed HIV infection successfully link to HIV care within 6-12 months after diagnosis; 80%-90% link within 3-5 years. … Over longer periods, approximately one-third of HIV-infected individuals fail to access care for 3 consecutive years in some communities. Multiple cohort studies have found that 25%-44% of HIV-infected individuals are entirely lost to follow-up in many settings, although these individuals may eventually re-establish care. … In summary, ~ 50% of known HIV-infected individuals are not engaged in regular HIV care. … Those who receive antiretroviral therapy intermittently are at increased risk of viral resistance. … In addition, these individuals contribute to ongoing HIV transmission in the community. … Diagnosis of 90% of HIV infections, achievement of 90% engagement in care, treatment of 90% of engaged individuals, and suppression of viremia in 90% of treated individuals could lead to considerable improvement in the proportion of HIV-infected individuals in the United States with undetectable loads. However, even in this ideal scenario, ~ 34% of HIV-infected individuals will remain viremic, with the potential to spread HIV infection to others. … Patient navigation, intensive case management, cell-phone or text-messaging based systems, and integrated informatics to identify at-risk or out-of-care individuals hold promise for further development. Finally, information on the extent to which perceptions of stigma impede engagement in HIV care and interventions should be pursued. … financial barriers.[95]

A 2017 study investigating the underlying reasons for these disturbing figures reported, however, that a broad array of memory devices were used to no avail across non-adherence groups, and that individuals who were severely non-adherent were significantly more likely to attribute missing medications due to substance use and structural barriers, including running out of medications, inability to get to pharmacy, and inability to afford medications.[96] Different people have different viewpoints on the exact or complete nature of structural barriers contributing to the problem(s) here, but there can be little doubt that they are all of formidable, multi-level and complex.

The situation regarding retention in care is obviously generally even worse in the developing world, exemplified by a 2017 work from Ethiopia, were there was the convergence of HIV, TB, and resources, logistical, cultural and knowledge problems.[97]

Targeting Issues
A 2017 work has elaborated on the necessity of targeting different substantially psychologically-characterisable subgroups of the Zambian and Zimbabwean population of males for circumcision with a view to combatting HIV.[98] Such difficulties doubtlessly apply elsewhere both geographically and with regard to strategies other than circumcision (other strategies which will be necessary in any case) for the combatting of HIV. Another 2017 work on Zambia and Zimbabwe notes the conflict between infant and adult male circumcision, while failing to address the factor of religion and how it is related to sexual behavior, generally important in this regard.[99] Works from 2014 to 2017 elaborate on the difficulty of attempting to implement fairly conceptually-straightforward sexual health practices in contexts of low literacy, and even given literacy, low knowledge, and even with substantial effort to provide ostensibly sufficient infectious disease knowledge of HIV, culturally skewed perceptions and antipathy.[100-103] And even in Africa there is a substantial homosexual component to HIV epidemiology, notwithstanding it being a lesser fraction, for example in prison populations of men without access to sexual congress with women, and here the cultural refusal to accept homosexual behavior impacts implementation of condom use.[104]

Broader Societal Issues: ethics and rights of individuals being circumcised
There is a very real ethical problem of whether an individual should be circumcised before they become old enough to be able to make an informed decision to have themselves circumcised, as is certainly the

case in the circumcision of infants and even any age of pre-adolescent person. This is particularly true as prior to the commencement of sexual intercourse there is so little benefit (e.g. by way of reduction of urinary tract infections) that it cannot reasonably be thought to offset potential loss and derangement of penile sensitivity (even without consideration of potential psychological effects), and that the individual cannot make an informed choice until adolescence is well enough progressed that at a minimum there is enough experience with masturbation to enable the individual to give a full enough consideration of the possible benefits and costs to make a substantively informed decision.[105-108]

Complementary and Competing Strategies

There has been enough said here and elsewhere as referenced above, that workers and other decision-makers in the HIV field are well enough aware that actions that could potentially (if able to be implemented, e.g. and complied with) substantially contribute towards combatting HIV include: male circumcision; use of condoms; scrupulous use of sexual personal hygiene; monogamy or lowering of the numbers of sexual partners of an individual; and viricidal or antiviral lotions (lemon/ lime juice has also been suggested[109]). Likewise, the possible gain from combination of these actions has not now in 2018 been any longer a novel topic of discussion for some time. However, what has not been at all sufficiently well considered is the extent to which these although plausibly complementary actions are inherently also to some extent competing and adversarial. In particular, if circumcision does substantially reduce penile sexual sensation and pleasure insofar (which is almost certain), will it then result in reduced use of condoms, particularly in the context of risk-compensation/ disinhibition? Will circumcision prevent sufficient reduction of multiple sexual partnerships? Will circumcision result in decreased use or uptake of sexual personal hygiene, and also by generalization, of other, important, non-sexual personal hygienic practices? Will circumcision, by its one-off nature, result in some decrease in engagement by both providers and recipients in health education and promotion and in primary health care? There are other similar questions that

could be asked, but I have chosen these as sufficiently illustrative, and as a particular focus.

SUMMARY AND CONCLUSION

There is no reasonable doubt that in the absence of all other preventive measures, male circumcision has, does, and would in the future as planned of large scale implementations, even given the overall complement of inherently-resultant modifications to sexual behavior being possibly such as to reduce the efficacy, bring about a very substantial reduction in HIV incidence and prevalence. However, there would be a very substantial residual prevalence and incidence of HIV causing a very substantial burden of disease, with a substantial probability of the eventual evolution of ART-resistant viruses. Furthermore, it seems virtually doubtless that a combination of the anti-HIV measures noted above (male circumcision; use of condoms; scrupulous use of sexual personal hygiene; monogamy or lowering of the numbers of sexual partners of an individual; and viricidal or antiviral lotions) will be used, resulting in interaction effects (including the psycho-social) that may be adversarial rather than complementary in nature. The most meaningful question to be asked then, is which preventive measure or complement of preventive measures is likely to result in the most desired overall health benefit as assessed including with regards to the inherent trade-offs between what might plausibly be achieved at/through different points/periods of future time.

The situation here is inherently complex, and the complexity here is inherently difficult to deal with in this context, but reluctance to face these doubtlessly factual aspects will not render them less factual, nor less substantial. There are a plurality of questions that it would be sensible to ask about various possible interactions, and even listing them fairly comprehensively would be difficult, let alone elaborating them all well and ordering them by potential benefit at/through different points/periods of time. For this work here the questions chosen to be presented are those that this present author has come to perceive as being probably among the most important:

1) Given that condoms reduce the intensity of purely physical sexual pleasure to an extent

that makes compliance with recommendations for their use far from completely or even acceptably attainable, and given that circumcision also reduces the intensity of purely physical sexual pleasure, to what extent will implementation of male circumcision perforce result in substantial continued insufficient use of condoms, such as to leave an unacceptable amount of HIV burden of disease?

2) To what extent will implementation of male circumcision result (through the phenomenon of generalization) in substantial continued insufficient use not only of sexual personal hygiene, but also of other hygienic measures, such as to leave an unacceptable amount of not only HIV but also other burden of disease?

3) Could provision of condoms with ribbing or studding for the enhancement of female sexual pleasure, and some promotion of this feature in the context of some efficacious and feasible comprehensive public health initiative, overcome male aversion to condom use such as to acceptably reduce either HIV burden of disease remaining either after male circumcision, or maybe better, without male circumcision?

4) How would the like promotion of scrupulous sexual personal hygiene, including also the successful dealing with the involved issue of inter-partner trust and the possibility of the giving of offense to sexual partners, delivered along with the clean water to enable it and other personal hygienic practices, interact with the measures noted above for ribbed or studded condoms, such as to acceptably reduce either HIV burden of disease remaining either after male circumcision, or maybe better, without male circumcision?

5) On the other hand, is there little enough chance of achieving sufficient enough uptake of either or both of condom use and personal sexual hygiene, with respect to future points and periods of time, to acceptably combat HIV, that mass male circumcision in (less likely) infancy or (more likely) early adulthood

should be an aim in the combatting of HIV in Africa?

It is very clear to this author, from extensive enough reviewing of the literature, that these are essential questions, and equally clear, that they have not been properly considered by those active in promoting and carrying out mass male circumcision in Africa.

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