

# Letters to the Editor

## Does sexual function survey in Denmark offer any support for male circumcision having an adverse effect?

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In the current issue of *International Journal of Epidemiology* Frisch *et al.* extend previous research that showed '11% of sexually active Danish men and women fulfilled rather stringent criteria for having at least one sexual dysfunction'.<sup>1</sup> Their new survey examined associations with male circumcision (MC).<sup>2</sup> Of 5395 men invited to participate, 48% accepted, and 1893 uncircumcised and 203 circumcised men were interviewed, as were 40% of the 5521 female partners invited. The survey involved 12 questions related to sexual activity and function. The findings for uncircumcised and circumcised participants were largely similar, there being no difference in age at first intercourse, perceived importance of a good sex life, sexual activity with partner in the past year, frequency of sex, sexual function overall, premature ejaculation, erectile difficulties or dyspareunia (painful intercourse).

The only differences found were (i) that circumcised men had a greater 'number of sex partners since age 15' and (ii) under 'orgasm difficulties' (where the options were 'no', 'occasional' or 'frequent'), 10 of the 95 circumcised men reported 'frequent'. The authors stated that most men, circumcised or otherwise, reported no or only occasional difficulties.

A note of caution is, however, needed in interpretation of these new findings. Before explaining our reservation, it may be worth noting that under 'Conflicts of interest' Frisch declares his active involvement in opposition to MC. The tone of the paper accords with such a stance.

The low participation rates are concerning as these can lead to self-selection bias. The statistics merit particular scrutiny. The large number of predictors in their statistical model versus the relatively small number of circumcised men with 'frequent orgasm difficulties' (10 circumcised) and women with 'dyspareunia' ( $n=8$ ) is problematic, and may indicate overfitting and, consequently, instability in the model. The study also did not correct for multiple testing.

Another concern is that their use of odds ratios (ORs) as a measure of association is inappropriate

if the outcome of interest is common ( $>10\%$ ). The prevalence risk ratio is the more appropriate measure.<sup>3,4</sup> As an example, the authors report an odds ratio of 3.26 [95% confidence interval (95% CI) 1.15–9.27] for 'frequent sexual function difficulties' in women with circumcised partners (31%) compared with uncircumcised partners (22%), whereas the prevalence risk ratio is 1.41. All of the odds ratios for frequent outcomes are similarly biased, and this exaggerates the apparent associations.

Without evidence, Frisch *et al.* argue for reduced penile sensitivity as being responsible for their findings. However, this explanation is questionable since medical MC in Denmark is only partial (CH Anderson, personal communication) and the foreskin is not removed as it is for MC in most other countries such as the USA. Thus, the men who self-reported that they were 'circumcised' may still have had residual foreskin tissue and its associated nerve endings. The only exception would have been the 4% who were Muslim and 2% Jewish who had religious circumcisions. In all, 89% of the circumcised men were Lutheran or not religious, i.e. were typical of a traditional Danish population. Moreover, the fact that 85% had their 'circumcision' after infancy is consistent with it having been performed for treatment of foreskin pathology such as phimosis (which affects ~10%—not 1%—of boys by their late teens<sup>5</sup>). Moreover, virtually all credible research,<sup>5</sup> including clinical measurements and large randomized controlled trials (RCTs),<sup>6,7</sup> that the authors disparage, show no difference in sensation or sensitivity during arousal as a result of MC. Their claim that 'reduced penile sensitivity [of the circumcised penis is] supported by recent neurophysiological studies' uses as support a flawed study funded NOCIRC in which a subsequent proper statistical analysis of the data revealed no difference.<sup>8</sup> One of the large RCTs, moreover, found that 'circumcised men reported increased penile sensitivity and enhanced ease of reaching orgasm'.<sup>6</sup>

If their 'frequent orgasm difficulties' finding were valid, a possible reason could be that the data emanate from a population in which very few men are circumcised (here 5%). Psychological factors can affect sexual function. In this regard, Frisch *et al.* admit that their study had limited statistical power to address 'whether the observed associations with sexual difficulties applied particularly to neonatal circumcisions or operations performed after infancy'. A study in Sydney of men who have sex with men (MSM) noted some associations between MC and sexual difficulties only among those men who had been circumcised after infancy.<sup>9</sup> Because of their foreskin problems and associated penile pain and/or difficulties, these men had already acquired behavioural aversions and sexual practices that meant they engaged in less penetrative sex than men who had never had penile problems. Since most of the Danish circumcised men were likely circumcised post-infancy for a medical reason, the majority of the 'circumcised' men in the Frisch study would likely have been previously uncircumcised men who had had a lingering medical problem that one might suspect of causing them distress. If true, as is likely, the findings argue in favour of circumcision in infancy as a prophylactic measure to prevent later medical, and associated sexual and thus psychological, problems that then require medical intervention. Research in China has, moreover, found that men with redundant prepuce or phimosis have poor mental health.<sup>10</sup> Psychological factors were also implicated in a Swedish study that reported slight shyness in the school changing-room in 9% of boys after circumcision for medical reasons.<sup>11</sup> Could it be that, being aware that their penis looks different from that of most other Danish men, some may suffer anxiety during sex with a fellow countrywoman unused to a circumcised penis?

The findings for women are at odds with a survey in Mexico of women who had experienced sexual intercourse with the same partner before and 2 months after his circumcision.<sup>12</sup> That study found no difference in general sexual satisfaction, pain during vaginal penetration, desire and vaginal orgasm.

The findings are also at odds with data from a large RCT of MC for HIV prevention in healthy men.<sup>13</sup> Like the men, their wives had experienced intercourse both before and after the procedure, meaning they could compare what it was like with the same man over time. The women reported either no change (57%) or improved (40%) sexual satisfaction after their male partners had been circumcised. One reason was improved genital hygiene of their male partners. The authors of the RCT concluded that MC has no deleterious effect on female sexual satisfaction, and that it might, moreover, have social benefits in addition to the established health benefits.

Frisch *et al.* fail to point out that 'dyspareunia' can be due to psychological causes. This is likely to be an

important factor in the context of a society in which 95% of the men are uncircumcised. So could a type of penis that the women are unused to explain in part the report of dyspareunia by 8 of the 68 (11.8%) female participants when having sexual intercourse with 'circumcised' men?

In contrast to statements to the contrary by Frisch *et al.* in their paper, rather than 'a widespread belief', there is now strong evidence from a large meta-analysis and RCTs, as well as biological support, that indeed 'circumcision provides superior penile hygiene and protects against urinary tract infections, phimosis, paraphimosis, balanoposthitis, venereal [*sic*] diseases and [genital] cancer'.<sup>5</sup> Their claim that 'reduced risks of balanoposthitis, sexually transmitted infections and penile cancer, can be achieved without tissue loss through the maintenance of good penile hygiene combined with proper use of condoms' has limited or no research support. For example, phimosis, the biggest risk factor for penile cancer (OR = 12),<sup>14</sup> is only eliminated by MC, hygiene does not reduce penile cancer risk<sup>15</sup> and condoms offer only partial protection against oncogenic human papillomavirus,<sup>14</sup> whereas RCT data show MC reduces HPV-related flat penile lesions by 98%.<sup>16</sup> 'HIV transmission in industrialized parts of the world' is mostly from receptive anal intercourse among MSM and contaminated needles, although for heterosexual men MC offers similar protection during intercourse with an infected woman in the USA as in sub-Saharan Africa.<sup>5</sup> Moreover, in contrast to the selectively cited outlier studies, data from multiple large populations and a meta-analysis<sup>17</sup> suggest female partners of circumcised men may be at lower risk of HIV.

The paper ends with a plea to the WHO to consider the 'possible sexual consequences of circumcision'. The Danish study, however, provides no convincing evidence of sexual dysfunction in circumcised men given the potential self-selection bias due to low participation rates, the potential confounding by indication among the majority of men who were circumcised at older ages, and the inappropriate statistical analyses. We therefore consider that the WHO and other bodies such as the Centers for Disease Control and Prevention should have no qualms in supporting MC as a safe, effective procedure whose benefits far outweigh any immediate risks,<sup>5</sup> and where considerable research has failed to provide convincing evidence for any adverse long-term effects on sexual function.

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doi:10.1093/ije/dyr180

Advance Access publication 28 November 2011

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## Author's Response to: Does sexual function survey in Denmark offer any support for male circumcision having an adverse effect?

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Novel findings in our population-based survey, which had participation rates of 48% in men and 54% (not 40%, as wrongly mentioned by Morris *et al.*) in women, suggest, but by no means prove, the existence of non-trivial associations of male circumcision with frequent orgasm difficulties in men and with a range of frequent sexual difficulties in women, including orgasm difficulties, dyspareunia and a sense of incomplete sexual needs fulfilment. Morris *et al.* should not be blamed for feeling unconvinced by our findings. However, as these critics repeatedly refer to Morris' pro-circumcision manifesto<sup>1</sup> as their source of knowledge, their objectivity must be questioned.

Morris *et al.* express concern over possible overfitting in our logistic regression models because we included a number of potentially confounding variables that differed between circumcised and uncircumcised men and between women with circumcised and uncircumcised spouses. However, as seen in Tables 3–6

of our paper, models with adjustment only for age provided odds ratios (ORs) similar to those obtained in the fully adjusted model, suggesting that this is mostly a theoretical concern. Next, Morris *et al.* suggest that we should have corrected for multiple testing even though such statistical manoeuvres are, at best, unnecessary and, at worst, deleterious to sound statistical inference in most epidemiological studies.<sup>2</sup> Morris *et al.* also claim that prevalence ratios would have been more appropriate measures of association than ORs. However, despite Morris *et al.*'s firm statement to the contrary, there is nothing inherently inappropriate about using ORs in cross-sectional studies, even in situations with common outcomes. In such situations, however, ORs should not be misinterpreted as prevalence ratios. We would have been wrong to claim that our OR of 3.26 implied that frequent sexual difficulties were 3.26 times more common in women with