

## Missing safer sex strategies in HIV Prevention: A call for further research

Jason T. Kerwin\*

\*Department of Economics, (J T Kerwin MA; R L Thornton PhD) and  
Graduate School of Social Work (S M Foley LMSW)  
University of Michigan, Ann Arbor, MI, USA.

Sallie M. Foley†

† AIDS Research Institute, University of California – San Francisco,  
San Francisco, CA, USA.

Rebecca L. Thornton

Rebecca L Thornton, 611 Tappan St., University of Michigan,  
Ann Arbor, MI 48109, USA  
*rebeccal@umich.edu*

Paulin Basinga††

†† National University of Rwanda School of Public Health,  
Kigali, Rwanda.

Jobiba Chinkhumba‡

‡ Malaria Alert Centre, University of Malawi College of Medicine,  
Blantyre, Malawi.

### Abstract

*Despite the efforts of educators, public health officials, and HIV/AIDS prevention experts, condom promotion has failed to stop the HIV epidemic in most of sub-Saharan Africa and most researchers and policy makers have focused on risk reductions for interventions for penetrative sex. We consider another HIV prevention option: female-to-male oral sex (fellatio). Extensive medical evidence indicates that fellatio is roughly as protective against HIV transmission as vaginal sex with a condom, and much safer than unprotected sex, but it is rarely emphasized in HIV prevention curricula. Moreover, available data on the practice of oral sex in Africa suggests that the practice is very rare compared to the practice in the United States. This paper reviews some of the existing evidence on the efficacy and prevalence of oral sex, discusses the potential of this safer sex strategy for mitigating the spread of HIV in Africa, and stresses the need for further research.*

### Introduction

Worldwide, HIV/AIDS prevention programs have focused almost solely on the promotion of condoms as a safer-sex strategy. Despite the efforts of edu-

cators, public health officials, and HIV/AIDS prevention experts, this strategy has had limited success in most of sub-Saharan Africa. The famous “ABC” approach (Abstinence, Be Faithful, Using Condoms) approach offers only a

single prevention method – consistent condom use – for sexual activity outside a committed relationship. Given important cultural differences in sexual practices, such a one-size-fits-all prevention approach may be insufficient and unsustainable. Even when safer-sex strategies have moved beyond the ABC model, they generally have focused on risk-reducing interventions for penetrative sex, usually discounting how other sexual practices may facilitate intimacy between partners and provide an alternative HIV prevention strategy. We consider the potential of adding another option to the menu of choices offered by ABC: oral sex, in particular fellatio. We focus on fellatio alone (using the term interchangeably with “oral sex”) for two reasons. First, because cunnilingus is even less prevalent, and less studied, than fellatio. Second, because in the contexts of many sub-Saharan African cultures, sexual activity emphasizes and centers on male sexual pleasure. Fellatio has the potential to provide a potential risk-averting strategy for women that addresses this concern for providing male pleasure in a way that cunnilingus does not.

Extensive medical evidence indicates that female-to-male oral sex carries a much lower risk of HIV transmission than unprotected vaginal sex and is comparable in risk to condom-protected intercourse, but it is rarely emphasized in HIV prevention curricula. Moreover, while there is little evidence – either qualitative or quantitative – on the practice of oral sex in Africa, available data indicates that it is very rare compared with its prevalence in the United States. This paper reviews some of the existing evidence on the

efficacy and prevalence of oral sex from the literature. We discuss these results and the potential of this safer sex strategy for mitigating the spread of HIV in Africa, and stress the need for further research.

### **Limitations of condoms as a safer sex strategy**

Since being introduced by the Botswana government in the late 1990s the ABC strategy has played an important role in HIV prevention programs worldwide.<sup>1</sup> HIV advocacy groups and government agencies generally promote the underlying message: avoiding transmission is as easy as a choice between A (Abstinence), B (Being Faithful to an HIV-negative partner), or C (Condoms).<sup>2,3</sup> In recent years prevention campaigns have begun to emphasize alternatives to ABC, most prominently CNN (Condoms, Needles, and Negotiation).<sup>4</sup> While these alternatives differ from ABC in terms of target population and commonly tackle other risk factors, they have in common with ABC a focus on condom promotion as the predominant safer sex option.

The widespread adoption of strategies like ABC and CNN is for good reason: by offering people a menu of risk-reduction choices, it increases the possibility that each person will find an option that works for them. However, such approaches are not without their limitations. The only option they offer for people who have sex (outside of a committed relationship with an HIV-negative partner) is condom use, but there are many high HIV-prevalence areas where condoms are not commonly used. Researchers have pointed to many reasons for the low overall

rates of condom use ranging from lack of access to condoms and poverty to reduced pleasure from condoms and low female bargaining power.<sup>5</sup> But it is crucial to consider the context of local sexual practices as well: cultural variations in sexual practices often have a strong impact on the potential applicability of condoms. For example, Chimbiri (2007) finds that Malawians accept condoms for use with extramarital partners, but consider them inappropriate within a marriage; as a result, very few married couples use condoms.<sup>6</sup> Thege (2010) points out that condom use does not allow the 'flesh-to-flesh' experience of sexual activity that is considered to be an essential part of marital sexual intimacy.<sup>7</sup>

In many places in the world, sexual activity exists for two purposes – procreation and male sexual pleasure. Women may have little or no power in sexual relationships with their male partners. For example, for some couples in Malawi, a woman who generates vaginal lubrication during sex may be considered "loose" or immoral.<sup>8</sup> In certain cultures, women's satisfaction during sexual activity, rather than coming from physical pleasure, is derived from an awareness that she is satisfying her partner. This reassures her that her partner will not have reason to seek out other women. Whether or not she orgasms or feels any sexual response is not considered relevant to the sexual activity with her partner; her partner is her focus.<sup>7</sup>

Women's roles and expectations during sex may be also determined by their bargaining power in sexual relationships.<sup>9</sup> In many societies a patriarchal code of respect places the man

above the woman. Generations of custom and ritual reinforce the right of men to have authority over their wives and to expect the wife to be submissive, take care of the home, care for the children, provide sexually for her husband and stay in the marriage no matter what.<sup>10</sup> These norms are reinforced by women's economic opportunities: a lack of money as well as limitations on education, work, and freedom of movement can make many women entirely dependent on their male partners for economic security. Cultural interchange and shifts in the views of younger or more urban women are questioning these traditional customs, but change is slow. Change can also be dangerous: if a woman speaks up too much, it can threaten her partner and there can be a resulting backlash of tighter control and sometimes domestic violence.<sup>7</sup> In addition, cultural taboos in many sub-Saharan countries forbid open teaching and discussion of sexual issues among family members – for instance grandmothers and mothers with their children – considering it a breach of healthy boundaries around sexual behavior. Sexual concerns are discussed with children or young adults only at specified times, like initiation rituals, and by specific individuals within a tribe.<sup>11</sup> Many researchers believe that an important determinant of which countries are successful at reducing HIV infection rates is the extent to which women are empowered to use the prevention methods being promoted. Stein (1990) specifically calls for the development of methods that women can employ, pointing out that the most effective family planning programs have been focused on women.<sup>12</sup> In many

contexts women in sexual relationships are not empowered to ask for condom use or to demand that their partner remain faithful.

Another major limitation of the ABC strategy is its failure to consider the importance of pleasure as an aspect of sexual health. Physical pleasure is the main reason that most people have sex, and Philpott *et al.* (2006) point out that “promotion of pleasure in use of male and female condoms – alongside safer sex messages – can facilitate consistent use of condoms and boost their effectiveness to protect against STI and pregnancy.”<sup>13</sup> However, most HIV prevention programs, including those employing the ABC strategy, have not focused on making safe sex pleasurable.

### Local sexual practices and HIV prevention

Existing cultural norms of sexual practices can have a large impact on both the transmission of HIV and the effectiveness of condoms. This can take many forms, but in sub-Saharan Africa one of the most important factors is the role of vaginal moisture and lubrication because of the high prevalence of, and preference for, “dry” sex in some countries. Vaginal wetness is important for a number of reasons. First, increased lubrication can make the vagina less susceptible to scratching and tearing, and decreases the risk of condom failure. Second, the natural engorgement of the vagina during sex leads to more lubrication and directly reduces the risk of trauma. Third, even when no trauma occurs, vaginal mucus helps prevent HIV transmission.<sup>14</sup>

The prevalence and practice of dry sex varies greatly by cultural context, so

it is impossible to generalize conclusions to Africa as a whole. To illustrate the differences in perceptions of vaginal moisture and sexual gender roles, we consider two contrasting case studies: Malawi, where many people favor a dry and tight vagina during sex, and Rwanda, where wetness is emphasized. Previous research by Woodsong and Alleman (2008) indicates that Malawians often practise a form of “dry” intercourse, in which the woman uses herbs or chemicals to dry and tighten her vagina.<sup>8</sup> They also found that Malawian men express a preference for dry, tight vaginas and both men and women emphasize quick ejaculation as a main goal of sex. Moreover, the authors reported that women may experience pain during intercourse and derive pleasure from the man’s pleasure in sex.

Vaginal moisture has a very different role in Rwanda. During sex, Rwandese men use a technique known as *kunyaza* (“to provoke vaginal secretions”) which involves tapping the labia minora and clitoris with the erect penis.<sup>12</sup> To ensure good results from *kunyaza*, Rwandese women practice *guca imyeyo*, a technique which promotes the enlargement of the labia minora. In a study by Veldhuijzen *et al.* (2006), both men and women agreed that good sex required a sufficiently moist vagina, and that the proper way to ensure this was to focus on arousing and stimulating the woman.<sup>13</sup>

### HIV transmission and oral sex

What is the risk benefit of oral sex relative to other sexual behaviors? While accurately measuring HIV transmission rates via oral sex is difficult, quantitative

medical and epidemiological studies have suggested that fellatio (female-to-male oral sex) carries a very low risk of HIV transmission. The most-cited study, Vittinghoff *et al.* (1999), estimates the rate of transmission to be four in 10,000 acts of oral sex between men who have sex with men (MSM) in the United States.<sup>15</sup> As a point of reference, studies of American couples estimate rates of transmission of nine in 10,000 acts of unprotected vaginal intercourse.<sup>16</sup> However, the Vittinghoff *et al.* figure may be an overestimate. Their study does not directly measure oral transmissions, but rather estimate the risk of transmission from oral sex by fitting a statistical model to individuals with multiple risk factors over the course of a calendar year. As Baggaley *et al.* (2008) note in their systematic review of the literature on HIV transmission and oral sex, “None of the MSM who exclusively reported OI [oral intercourse] as a risk factor seroconverted in Vittinghoff *et al.*”<sup>17</sup>

Studies that isolate exposures via oral sex alone find HIV transmission risks that are vanishingly small. One Spanish study followed 135 HIV-negative individuals in monogamous relationships with an HIV-positive partner; all 135 reported that their only risk factor was unprotected oral sex for several years. After over 19,000 reported incidents of oral sex between an HIV-positive and HIV-negative partner, not one HIV-negative individual seroconverted.<sup>18</sup> The Baggaley *et al.* review finds that out of ten total studies of HIV transmission through oral sex, six estimate that it carries no risk.<sup>17</sup>

Some studies that estimate higher risks are based on retrospective data

collection, in which people who already know their serostatus are asked to recall their past behaviors. For example, Giesecke (1992) uses a retrospective methodology to find that oral sex carries a per-partner risk (across all acts) of 20%, which is very high relative to other estimates; to be consistent with even the relatively high Vittinghoff estimate of per-act risks would imply that seroconverters average ~560 unprotected oral encounters per partnership with no other unprotected sex.<sup>19</sup> These retrospective estimates have been critiqued as more susceptible to recall and social acceptability bias. Dillon *et al.* (2000) specifically investigate 20 reported cases of seroconversion through oral sex alone and find that 12 of the cases have other unreported risk factors such as condom breaks, unprotected anal intercourse, and substance-related blackouts.

Because HIV transmission rates vary by location, viral load, coincident sexual infection, and length of partnership, studies in developed countries are not useful in estimating levels of risk in an African country. However, we can still use the *relative* risks associated with various sex acts as a benchmark across both contexts. In order to compare the risks of sex acts, Table I presents a set of risk estimates from the literature, relying on studies by Padian *et al.* (1997) and Wawer *et al.* (2005) for the estimated per-act risk from unprotected receptive vaginal intercourse in the United States (0.09%) and Africa (0.15%) respectively.<sup>16,20</sup> The estimated risk benefit from condom use is 95%, and comes from Varghese *et al.* (2000) based on data from the United States; to our knowledge there are no



studies of HIV transmission risk reduction from condoms in African settings, largely because consistent condom use is virtually non-existent.<sup>21</sup>

**Table 1** Relative risks of sex acts - estimated transmission rate per 10,000 sex acts

Setting	Unprotected receptive vaginal sex	Condom-protected receptive vaginal sex	Unprotected receptive oral sex	Source
Developed countries	9	0.45	0 to 4	Padian <i>et al.</i> (1997) <sup>16</sup> , Vittinghoff <i>et al.</i> (1999) <sup>15</sup>
Uganda	15	0.75 <sup>†</sup>	0 to 6.7 <sup>‡</sup>	Wawer <i>et al.</i> (2005) <sup>20</sup>

<sup>†</sup>Studies of vaginal HIV transmission in Africa, including Wawer *et al.* (2005), do not include any couples who used condoms consistently; Wawer *et al.* (2005) find no effect on risk from inconsistent use. This figure is computed by using the Varghese *et al.* (2002) estimate of a 20-fold risk reduction from condom use, assuming the risk reduction is constant across settings.

<sup>‡</sup>To date no studies have explored the risk of HIV transmission from oral sex in Africa. We estimate this range by assuming the same risk reduction relative to unprotected vaginal sex as in the United States.

For the risk of oral sex in developed countries, we give a range from the zero found by the majority of studies considered by Baggaley *et al.* (2008) up to the 0.04% estimate from Vittinghoff *et al.*; our preferred estimate is closer to the low end of this range. Since no research has explored the risk of HIV infection through oral sex in Africa we estimate the risk by assuming the reduction in transmission probability relative to unprotected vaginal sex is the same as in the developed world, namely between 56% and 100%.

### Local attitudes and oral sex

Based on the medical evidence on oral sex and HIV transmission risks, Cafaro and Bicknell (2009) argue for the immediate implementation of oral sex as part of a broader “safer sex” approach to HIV prevention in Sub-Saharan Africa.<sup>22</sup> However, prior to adopting oral sex as a matter of policy, it is crucial to consider how it will fit into the local con-

text of sexual activity: just as differing cultural norms about how sexual pleasure occurs can affect the use of condoms, we would also expect existing norms to have some bearing on oral sex. For example, if saliva is perceived in the same way as vaginal mucus then cultural groups that value vaginal mucus would tend to be more likely to adopt oral sex, and vice versa. “Wet” (as opposed to “dry”) sexual activity may also correlate with the expectation for male-female mutuality in sexual pleasuring. When a woman’s sexual response is more valued in the interaction, then the male partner will perceive female “wetness” as a positive indication of female arousal.<sup>23</sup> Dry sex may indicate low levels of mutual pleasuring and lower female bargaining power.

In addition to the perception of vaginal moisture, there are other local sexual practices that may have specific relevance to the uptake and perception of oral sex. Undie *et al.* (2007) found

that Malawians define the sexual act by the man's pleasure and orgasm.<sup>24</sup> In their focus groups, Malawian adolescents referred to ejaculation as "hitting water". While boys used this phrase for male climax, females simply defined it as having sex, suggesting that female pleasure may not be emphasized and female orgasm is not viewed as a part of partnered sexual activity. It is unknown whether this emphasis on male pleasure and orgasm may imply a greater willingness to adopt fellatio (from which only the man receives physical pleasure) than in a context in which female pleasure is expected to be equal to and concurrent with male pleasure; or whether, in contrast, the sort of emphasis on mutual pleasuring and female arousal and lubrication seen in Rwanda indicates a comfort with 'wetness' during sexual activity; this preference may be transferable to oral sex.

### **Prevalence of oral sex in sub-Saharan Africa**

Although there has been much research on conventional HIV prevention strategies throughout Africa, it is currently not known how individuals view oral sex or view the risk of acquiring HIV through oral sex. There is also very little evidence about either the prevalence of oral sex or the extent to which it complements or substitutes for vaginal sex in sub-Saharan Africa. We are aware of only four previous studies on the topic. A survey of 273 Zambian adolescents found that while 77% had engaged in vaginal intercourse only 25% had given or received fellatio.<sup>25</sup> In a study of 521 students in Nigeria, 78% reported practicing vaginal sex, only 13% said they had had oral sex.<sup>26</sup> A

survey of 800 South African 16- and 17-year olds found that over half of boys and more than two thirds of girls had had vaginal intercourse but just one in five had tried oral sex.<sup>27</sup>

The only other data for an African country that we are aware of is Kerwin *et al.* (2010). They study two representative samples: 1216 men in rural Malawi and 1684 uncircumcised men in urban Malawi (Lilongwe). 97.1% of the rural sample reported having had vaginal sex while just 1.7% said they had ever received oral sex. For the sample of uncircumcised men in urban Malawi, they found that 86.9% had had vaginal sex while 11.7% had received oral sex. Only half of the rural sample, and less than three quarters of the urban sample, admitted having *heard* of oral sex.<sup>28</sup> By comparison, the use of condoms was significantly more common than oral sex in each group: 35.6% of the rural men and 76.1% of the uncircumcised urban men reported having ever used a condom. It is possible that perception of social desirability or embarrassment has contributed to the low rates of oral sex practice, but it is unlikely that it accounts for such a significant difference between awareness and practice.

Studies of developed countries show much higher rates of oral sex practice. Out of 3,321 respondents aged 20-39 from the 1991 National Survey of Men, 79% had ever received fellatio and 75% had ever performed cunnilingus.<sup>29</sup>

**Table 2** Oral Sex Prevalence Estimates by Country

Country	Study Population	Sample Size	Prevalence of Vaginal Sex	Prevalence of Oral Sex	Source
USA	Males Age 20-39	3321	95.4%	78.8%	Billy . (1993) <sup>29</sup>
South Africa	Males & Females Age 16-17	800	50%+	20% <sup>a</sup>	Peltzer and Pengpid (2006) <sup>27</sup>
Nigeria	Males & Females in Secondary School	521	78.1%	13.3%	Bamidele et al. (1999) <sup>26</sup>
Zambia	Male & Female Urban Youth	273	76.9%	25.2%	Feldman et al. (1997) <sup>25</sup>
Malawi	Rural Males	1216	97.1%	1.7%	Foley et al. (2010) <sup>28</sup>
Malawi	Uncircumcised Urban Males	1537	86.9%	11.7%	Foley et al. (2010) <sup>28</sup>

a. The Peltzer and Pengpid study reports approximate proportions instead of exact percentages for the practice of vaginal and oral sex.

### Known limitations and drawbacks of oral sex as a safer sex strategy

One of the potential ethical concerns about the potential promotion of fellatio alone (rather than promoting cunnilingus as well) is that it may be unfair to women. However, telling people about the pleasure and risk benefits of fellatio does not force them to use it, or use it exclusively. Rather, it gives men and women another tool for reducing their risk of harm from sex acts, and as mentioned above it benefits both partners. Formally, the introduction of oral sex as a sexual activity increases the size of women's choice sets; in standard decision theory this can only make them (weakly) better off since they can remain with their previous choices. It is possible that introducing fellatio will be harmful to some women if their partners force them do it as a substitute for other forms of sexual contact. However, this supposes that men who would force their partners to provide fellatio would otherwise be concerned with pleasuring the woman during sex – an unlikely scenario.

Another ethical consideration is the spread of other sexually transmitted infections by oral sex. Gonorrhoea, syphilis, hepatitis C, and herpes simplex are all transmissible through oral sex. Beyond the direct health costs of these STIs, all of them also increase the risk of HIV transmission.<sup>30</sup> One could argue that this means only condom-protected intercourse should be introduced as a method for HIV prevention, but while condoms greatly reduce the risk of many STIs relative to vaginal intercourse, they are also not perfectly protective against herpes or HPV.



Moreover, this viewpoint ignores the reality that in many places condom promotion has not succeeded in stopping the HIV epidemic, and it implicitly assumes that promoting oral sex means abandoning condom promotion entirely. In fact both strategies can succeed at the same time, and would be most effective when promoted together. Teenagers in the United States have increasingly substituted oral sex for vaginal intercourse while at the same time using condoms more often when they decide to have vaginal sex.<sup>31,32</sup>

## Discussion

The existing evidence indicates that relative to its prevalence in the United States, oral sex is very rare throughout Africa. To the extent that the cultural and social norms as well as individual sexual preferences allow, the current low rates of practice could represent a large potential for the adoption of oral sex as an additional tool in the fight against HIV transmission. Not only is it highly effective at preventing HIV transmission, existing evidence indicates it is quite rare in Africa, relative both to the prevalence of vaginal intercourse in the countries studied and to how common it is in the United States.

Due to the low measured rates of oral sex practice in Africa, there is substantial scope for an increase in its use. Based on Kerwin *et al.* (2010), among Malawian men oral sex is between six and thirty times less common than the use of condoms. For risk reduction, the crucial variable is the extent of *substitution* of oral sex for riskier behaviors; as the HIV epidemic in sub-Saharan Africa is predominantly spread through vaginal

sex, oral sex will only reduce risk if it takes the place of unprotected vaginal sex.

The comparison with other strategies is very favorable. The per-act reduction in risk is very similar for condom use and yet fellatio currently is rarely practiced. A simple estimate, using results from the Bracher *et al.* (2004) simulation of condom adoption, shows that adoption of oral sex by half of Malawian men for their riskiest sexual encounters could drop the prevalence of HIV by up to 60%.<sup>33</sup> Male circumcision has been widely promoted as a means to cut the per-instance rates of HIV transmission, but the risk reduction is at most 60% as opposed to between 80% and 100% for oral sex.

Fellatio has particularly large potential benefits for women relative to other safer sex strategies. Whereas male circumcision cuts transmission risks only for men, oral sex lowers risk for both sex partners. And in situations where women have limited power to negotiate condom use, fellatio may serve as a more attractive option from the male's perspective, thus making it more likely to succeed. This advantage is heightened for unplanned sexual encounters: concurrent partnerships have been identified as a major contributor to the HIV epidemic in sub-Saharan Africa,<sup>34</sup> and extramarital couplings are likely to involve less planning.<sup>35</sup> Without premeditation, condom use can be difficult or impractical, and oral sex can provide a way for a woman to satisfy a man's sexual demands while protecting herself from the risk of HIV infection. Finally, oral sex can also serve as an alternative form of birth control, helping to fill the unmet need for contracep-

tion in sub-Saharan Africa demonstrated by high rates of induced abortion.

Oral sex should not be thought of as a panacea for Africa's fight against HIV, and it is not without its drawbacks. However, the evidence suggests that it should be explored further as another alternative HIV-prevention strategy. Not nearly enough is known about the prevalence, perceptions, or practice of oral sex in Africa. Future research is needed to explore the potential benefits and downsides of oral sex as a part of HIV prevention in sub-Saharan Africa: qualitative work to explore its interaction with local social, cultural, and relationship-specific factors, and quantitative surveys to establish the knowledge of, attitudes toward, and prevalence of oral sex in the region as well as understanding whether oral sex serves as a complement to, or a substitute for, riskier sexual behaviors.

## Acknowledgments

This article is part of a broader effort to study oral sex in sub-Saharan Africa, funded by an Eva L. Mueller New Directions in Economics and Demography Fund Grant through the University of Michigan Population Studies Center; the funding source did not have any role in the drafting of this article or the decision to publish it. Valuable research assistance was provided by Worried Mbene, Jessica Kraft, Arija Jarvenpaa, and Jennifer Hesse.

## References

1. The ABC of HIV prevention [Internet]. [cited 2010 Sep 21]; Available from: <http://www.avert.org/abc-hiv.htm>
2. Introduction to HIV prevention [Internet]. [cited 2010 Sep 20]; Available from: <http://www.avert.org/prevent-hiv.htm>
3. CDC NPIN - HIV/AIDS - Prevention Today [Internet]. [cited 2010 Sep 20]; Available from: <http://www.cdcnpin.org/scripts/hiv/prevent.asp>
4. Sinding SW. Does 'CNN' (condoms, needles and negotiation) work better than 'ABC' (abstinence, being faithful and condom use) in attacking the AIDS epidemic? *International Family Planning Perspectives*. 2005;31(1):38–40.
5. Tavory I, Swidler A. Condom semiotics: Meaning and condom use in rural Malawi. *American Sociological Review*. 2009;74(2):171.
6. Chimbiri AM. The condom is an "intruder" in marriage: Evidence from rural Malawi. *Social Science & Medicine*. 2007;64(5):1102–15.
7. Thege B. Rural black women's agency within intimate partnerships amid the South African HIV epidemic. *African Journal of AIDS Research*. 2010;8(4):455–64.
8. Woodsong C, Alleman P. Sexual pleasure, gender power and microbicide acceptability in Zimbabwe and Malawi. *AIDS Education & Prevention*. 2008;20(2):171–87.
9. Taylor BM. Gender-power relations and safer sex negotiation. *Journal of Advanced Nursing*. 1995;22(4):687–93.
10. Thornton R. Flows of "sexual substance" and representation of the body in South Africa. In: *Seminar Series On the Subject of Sex*. WISER

- and the Graduate School for the Humanities and Social Sciences, University of the Witwatersrand. 2003.
11. Munthali AC, Zulu EM. The Timing and role of Initiation Rites in Preparing Young People for Adolescence and Responsible Sexual and Reproductive Behaviour in Malawi. *African Journal of Reproductive Health*. 2007;11(3):150.
  12. Bizimana N. Another way for lovemaking in Africa: Kunyaza, a traditional sexual technique for triggering female orgasm at heterosexual encounters. *Sexologies*. 2010;
  13. Veldhuijzen N, Nyinawabega J, Umulisa M, Kankindi B, Geubbels E, Basinga P, *et al*. Preparing for microbicide trials in Rwanda: Focus group discussions with Rwandan women and men. *Culture, Health & Sexuality: An International Journal for Research, Intervention and Care*. 2006;8(5):395.
  14. Carballo-Diéguez A, Bauermeister JA, Ventuneac A, Dolezal C, Balan I, Remien RH. The use of rectal douches among HIV-uninfected and infected men who have unprotected receptive anal intercourse: implications for rectal microbicides. *AIDS and Behavior*. 2008;12(6):860–6.
  15. Vittinghoff E, Douglas J, Judon F, McKiman D, MacQueen K, Buchinder SP. Per-Contact Risk of Human Immunodeficiency Virus Transmission between Male Sexual Partners. *American Journal of Epidemiology*. 1999;150(3):306.
  16. Padian NS, Shiboski SC, Glass SO, Vittinghoff E. Heterosexual transmission of human immunodeficiency virus (HIV) in northern California: results from a ten-year study. *American Journal of Epidemiology*. 1997;146(4):350.
  17. Baggaley RF, White RG, Boily M-C. Systematic review of orogenital HIV-1 transmission probabilities. *Int J Epidemiol*. 2008 Dec;37(6):1255–65.
  18. del Romero J, Marincovich B, Castilla J, García S, Campo J, Hernando V, *et al*. Evaluating the risk of HIV transmission through unprotected orogenital sex. *Aids*. 2002;16(9):1296.
  19. Giesecke J, Ramstedt K, Granath F, Ripa T, Rådö G, Westrell M. Partner notification as a tool for research in HIV epidemiology: behaviour change, transmission risk and incidence trends. *AIDS*. 1992 Jan;6(1):101–7.
  20. Wawer MJ, Gray RH, Sewankambo NK, Serwadda D, Li X, Laeyendecker O, *et al*. Rates of HIV-1 Transmission per Coital Act, by Stage of HIV-1 Infection, in Rakai, Uganda. *The Journal of Infectious Diseases*. 2005;191:1403–9.
  21. Varghese B, Maher JE, Peterman TA, Branson BM, Steketee RW. Reducing the risk of sexual HIV transmission: quantifying the per-act risk for HIV on the basis of choice of partner, sex act, and condom use. *Sexually Transmitted Diseases*. 2002;29(1):38.
  22. Cafaro C, Bicknell WJ. Uncomfortable Knowledge: PEPFAR, HIV Risk Reduction and Safer Sex. *GLOBAL HEALTH*. 2009;3(1).

23. Masters WH, Johnson VE. Human sexual response. Little Brown & Co; 1966.
24. Undie CC, Crichton J, Zulu E. Metaphors we love by: Conceptualizations of sex among young people in Malawi. *African journal of reproductive health*. 2007;11(3):221.
25. Feldman DA, O'Hara P, Baboo KS, Chitalu NW, Lu Y. HIV prevention among Zambian adolescents: developing a value utilization/norm change model. *Social Science & Medicine*. 1997;44(4):455–68.
26. Bamidele JO, Abodunrin OL, Adebimpe WO. Sexual behavior and risk of HIV/AIDS among adolescents in public secondary schools in Osogbo, Osun State, Nigeria. *Int J Adolesc Med Health*. 2009 Sep;21(3):387–94.
27. Peltzer K, Pengpid S. Sexuality of 16-to 17-year-old South Africans in the context of HIV/AIDS. *Social Behavior and Personality*. 2006;
28. Kerwin JT, Thornton RL, Foley SM. Prevalence and Correlates of Oral Sex among Rural and Urban Malawian Men. University of Michigan; 2010.
29. Billy JO., Tanfer K, Grady WR, Klepinger DH. The sexual behavior of men in the United States. *Family Planning Perspectives*. 1993;25(2):52–60.
30. Weiss HA, Thomas SL, Munabi SK, Hayes RJ. Male circumcision and risk of syphilis, chancroid, and genital herpes: a systematic review and meta-analysis. *British Medical Journal*. 2006;82(2):101.
31. Remez L. Oral Sex among Adolescents: Is It Sex or Is It Abstinence? *Family Planning Perspectives*. 2000 Dec;32(6):298–304.
32. Santelli JS, Lindberg LD, Abma J, McNeely CS, Resnick M. Adolescent sexual behavior: estimates and trends from four nationally representative surveys. *Family Planning Perspectives*. 2000;32(4):156–94.
33. Bracher M, Santow G, Watkins SC. Assessing the potential of condom use to prevent the spread of HIV: a microsimulation study. *Studies in family planning*. 2004;35(1):48–64.
34. HELLERINGER S, KOHLER HP, KALILANI-PHIRI L. The association of HIV serodiscordance and partnership concurrency in Likoma Island (Malawi). *AIDS*. 2009;23(10):1285.
35. Swidler A, Watkins SC. Ties of Dependence: AIDS and Transactional Sex in Rural Malawi. *Studies in Family Planning*. 2007 Sep 1;38(3):147–62.