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UNDERSTANDING THE CONTEXT OF HIV RISK BEHAVIOR AMONG HIV-POSITIVE AND HIV-NEGATIVE FEMALE SEX WORKERS AND MALE BAR CLIENTS FOLLOWING ANTIRETROVIRAL THERAPY ROLLOUT IN MOMBASA, KENYA

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Abstract

This study explored perceptions of HIV following local introduction of antiretroviral therapy (ART), among 30 HIV-positive and -negative female sex workers (FSWs) and 10 male bar patrons in Mombasa, Kenya. Semi-structured interviews were analyzed qualitatively to identify determinants of sexual risk behaviors. ART was not perceived as a barrier to safer sex and in some cases led to decreased high-risk behaviors. Barriers to safer sex included economic pressure and sexual partnership types. Many women reported that negotiating condom use is more difficult in long-term partnerships. These women favored short-term partnerships to minimize risk through consistent condom use. For women living with HIV, concern about maintaining health and avoiding HIV superinfection was a strong motivator of protective behaviors. For HIV-negative women, a negative HIV test was a powerful motivator. Incorporation of context- and serostatus-specific factors (e.g., self-protection for HIV-positive women) into tailored prevention counseling may support high-risk women to reduce risk behaviors.

Keywords

Antiretroviral therapy; sexual risk behavior; human immunodeficiency virus type 1; multiple and concurrent partnerships; Africa

INTRODUCTION

Access to antiretroviral therapy (ART) has increased substantially in resource-constrained settings (World Health Organization/UNAIDS/UNICEF, 2009). Given the transition of HIV to a chronic condition, questions have been raised about the potential effects of ART on sexual risk behavior and HIV transmission dynamics (Crepaz, Hart, & Marks, 2004; Smith, Okano, Kahn, Bodine, & Blower, 2010; Stolte, Dukers, Geskus, Coutinho, & De Wit, 2004; Van der Snoek et al., 2006). Although ART availability has reduced mortality in some low-income countries, resurgent HIV epidemics in high-income countries with longer durations of universally available ART suggest the need to monitor transmission risk behaviors (Bezemer et al., 2008; Jahn et al., 2008). Recent reports suggest that HIV incidence may have stabilized after a period of decline in Uganda, for example. Few studies have examined the effect of ART availability on perceived HIV risk and sexual risk behaviors in sub-Saharan Africa (Bunnell et al., 2006; Cohen et al., 2009; Eisele et al., 2009; Kennedy, O'Reilly, Medley, & Sweat, 2007).

Contributors to the HIV pandemic in sub-Saharan Africa include socio-structural, population-level determinants such as poverty, job migration, and gender inequality (Aral, Lipshutz, & Blanchard, 2007; Sarna et al., 2009). Community attitudes toward HIV, including stigma, may play a role in people's willingness to access HIV testing and treatment, potentially affecting transmission dynamics (Chiao, Mishra, & Sambisa, 2009; Genberg et al., 2009; Meiberg, Bos, Onya, & Schaalma, 2008). Concurrent sexual partnerships result in interconnected sexual networks that may contribute to rapid expansion of HIV epidemics (Morris & Kretzschmar, 1997). For most female sex workers (FSWs), concurrent sexual partnerships are inherent. Individual-level determinants such as personal health beliefs and specific behaviors (e.g., HIV testing, condom use, ART adherence patterns) also contribute to HIV transmission and acquisition risk (Denison, O'Reilly, Schmid, Kennedy, & Sweat, 2008). We examined the role of these factors in shaping the reported risk trajectories over time of FSWs in Mombasa, Kenya (Beadnell et al., 2006). The goal of this study was to explore perceptions of HIV following ART introduction, and to identify possible changes in risk behaviors, attitudes, and beliefs among HIV-positive and negative FSWs.

METHODS

POPULATION AND PROCEDURES

In-depth interviews were conducted by Kenyan social science staff in participants' preferred language (Kiswahili) among FSWs in Mombasa, Kenya. Participants were recruited from an open cohort established in 1993 to study risk factors for HIV-1 acquisition in FSWs (Martin et al., 1998). Both HIV-negative and -positive women who reported exchanging sex for payment in cash or in kind were enrolled. Participants attended monthly clinic visits where they completed a risk behavior interview, HIV testing, and physical examination including collection of specimens for diagnosis and treatment of sexually transmitted infections (STIs). The women received risk reduction education delivered by experienced clinical staff, and free condoms, at each visit. HIV-positive women received comprehensive HIV care following Kenya Ministry of Health guidelines. Additionally, HIV-positive women were invited to attend monthly meetings to discuss issues related to HIV and treatment. Antiretroviral therapy was initiated in the cohort in March 2004. At the time of this study, 2,329 women had enrolled in the cohort, including 571 HIV-positive women of whom 108 (19%) had initiated ART. This represented the great majority of those who qualified for ART based on Kenyan guidelines at the time.

Between June and August 2006, 30 women were recruited from the cohort, including 10 HIV-positive women on ART, 10 HIV-positive ART-naïve women, and 10 HIV-negative women. All cohort participants presenting to the clinic were provided with information about the study and invited to participate. Recruitment continued until the requisite number was obtained for each group.

Interviews used a semistructured guide with probes. Open-ended questions sought to elicit responses about attitudes, beliefs, and knowledge regarding HIV, ART, sexual risk behaviors, prevention strategies, gender relations, and health education sources. HIV-positive participants also were asked about adaptation to living with HIV. Interviews, which lasted an average of 1.5 to 2 hours, were audiotaped and later simultaneously translated and transcribed verbatim into English.

To triangulate the data, we conducted 10 interviews among men recruited in bars from January to March 2007. Bars were selected randomly from a comprehensive list of these establishments in the Mombasa municipal area. At each selected bar, the interviewer randomly selected men to approach using a simple predetermined spatial numbering system. These men were provided with information about the study and invited to participate. Among men approached, there were no refusals. The interview guide was shortened for these interviews, they were not audiotaped, and the men's identities were not collected. The interviewer wrote a detailed summary following each interview.

Further triangulation was made possible by a parallel quantitative behavioral survey that was conducted by several investigators in our group to assess reported sexual transmission risk behaviors among the FSW cohort prior to and following ART initiation. The cohort monthly risk behavior interview data were used to assess reported sexual risk behaviors during ART-naïve versus ART-exposed follow-up at visits from the 898 HIV-1 positive participants seen February 1993 through April 2008. Findings for this study have been published (McClelland et al., 2010) and are summarized in the discussion section of this article. These quantitative behavioral survey data and our qualitative data were analyzed separately and main findings were not revealed to the teams on each study until analyses were complete.

DATA ANALYSIS

Data were analyzed iteratively using a content analysis approach (Pope, Ziebland, & Mays, 2000). Transcripts and notes were read through multiple times by a team of three researchers. A codebook assessing attitudes, facilitators, and barriers to safer sex and ART adherence was developed prior to data collection and further refined in response to additional themes emerging during analysis (MacQueen, 2001). Eighty codes were identified, defined, and applied to the transcripts using Atlas.ti (Scientific Software Developments, Berlin, Germany, 1997). Underlying frameworks used to structure the data analysis included Connell's theory of gender and power and the social epidemiologic life course perspective to assess recalled attitudes and behaviors before and after HIV testing, seroconversion, and ART treatment decisions (Connell, 1987; Kuh, Ben-Shlomo, Lynch, Hallquist, & Power, 2003; Wingood & DiClemente, 2000). Identified themes that emerged consistently across interviews were presented in a modified member check to a group of 11 cohort participants (Meadows & Morse, 2001).

This study was approved by the ethical review committees at the Kenya Medical Research Institute and the University of Washington. All female participants provided written informed consent; male interviews gave verbal consent per institutional review board protocol.

RESULTS FROM THE INTERVIEWS WITH WOMEN

The median age of participants was 30 (interquartile range [IQR] 26 – 33 years) and they reported a median of two (IQR 1 – 5) years of sex work. Twenty five (83%) of the women were widowed or divorced. Participants reported a median of three pregnancies (IQR 1 – 3) and two (IQR 1 – 3) live births. Twenty (67%) women worked in bars, whereas the remainder worked in night clubs, brothels, or at home. Women on ART had been on treatment for a median of 13 months (IQR 11.7 – 23.6).

Common themes detailed in the following sections demonstrate complex relationships between factors such as sexual partnership duration and HIV risk. Notably, antiretroviral use was not routinely mentioned as either an explicit barrier or facilitator of safer sex practices.

KNOWLEDGE OF HIV AND AIDS

All participants had some understanding of HIV disease; seropositive women had more in-depth knowledge of the relationships among viral load, CD4 count, and impaired immunity. Many had developed their own explanations of the natural history and transmission of HIV. A number of HIV-positive women discussed being “filled up with the virus” or having virus “added” to their own through unprotected sex with an infected partner. Two women described antiretrovirals’ therapeutic mechanism as making the virus leave the blood and enter the skin thus, in their belief, inactivating it.

PERCEPTIONS OF HIV IN RELATION TO ANTIRETROVIRAL AVAILABILITY

Despite universal awareness of the availability of medications to treat HIV, both HIV-positive and -negative women continued to perceive HIV as a serious threat. Two primary reasons were given. First, almost half of the women mentioned that HIV remained a concern because the medications are not curative. One HIV-positive ART-naïve woman stated:

There is cause to worry because you know this HIV has no cure...so you cannot say you will stop using condoms because the medicine is available. We are told that this thing [the medicines] (are) just to suppress those guys not to be too many so you have to protect yourself. (35 year-old)

An HIV-negative woman similarly stated:

No, I cannot say let me get it [HIV] and go use those drugs...no, because the drugs don’t cure it just adds some little time. What kind of drug is that? You are better off protecting yourself. (44 year-old)

Many women used analogies of not choosing to hurt oneself simply because of the ability to receive assistance later. One HIV-negative woman stated:

Eh, as you can see a ditch and go jump inside? Because even if you fell you will be pulled out? You cannot see a ditch and jump in it, no one likes to be sick. (34 year-old participant)

Women reported that HIV is associated with illicit sex, which contributes to discrimination and social isolation of those affected. Many considered a diagnosis of HIV to be shameful or embarrassing, even in the context of available treatment. An HIV-negative woman stated:

No. I don’t want [HIV], eh, that is an embarrassing disease. It’s embarrassing. Ah ah, how can you cut yourself? It’s like telling me to take a knife and cut myself. Even if you give me medicine for my cut the scar will remain. (26 year-old)

Additional concerns expressed by HIV-seropositive women on ART included the need to take medications “for life” and concerns over long-term drug availability.

FACTORS INFLUENCING SEXUAL RISK BEHAVIOUR

Availability of ART did not substantially change women's perceptions of the seriousness of HIV. None of the women reported an increase in sexual risk behavior linked to ART availability. In fact, there appeared to be the opposite effect, with HIV-positive women reporting that they engaged in safer sex after ART initiation because of perceived personal benefits. These included avoiding acquiring "more" virus or resistant virus, supporting their health, and extending the durability of their response to ART.

Two HIV-positive women reported that transmission risk behavior may initially increase in response to receiving an HIV diagnosis. One recalled her own behavior for a limited period, acknowledging that she felt she "must take my followers with me." She described later coming to terms with her diagnosis and reducing her risk behaviors to protect herself from HIV superinfection. Another woman described observing a similar reaction in a colleague who discovered that she was HIV-positive. Many of the women interviewed imputed this type of behavior to men. The phenomenon was frequently described in terms of someone spreading the disease because they do not want to "die alone." Similar phrases and behaviors have been reported in Uganda (King et al., 2009).

HIV testing was described by seronegative and seropositive women as a turning point after their initial entry into sex work, often following divorce, widowhood, or a violent partnership. Many reported higher risk behaviors during this earlier period when their serostatus was unknown. Women who tested negative reported that the test served as a powerful motivator to practice safer sex. Those who tested positive generally transitioned to lower risk behavior, adaptation to living with HIV and, for some, ART treatment. A natural history of risk behaviors corresponding to stages of HIV infection has been outlined (Eaton & Kalichman, 2009) pointing out the need to tailor risk reduction support over the course of infection.

Women reported several barriers to safer sex including economic pressures, sexual partnership changes (e.g., a partner who was initially a new client subsequently demanding 'intimacy' without condoms), physical violence, concurrent partnerships, and alcohol use (Table 1). Women also reported a number of facilitators of safer sex, including individualized strategies for mitigating risk (Table 2). Facilitators included HIV testing, a desire to avoid superinfection, belief that men who do not want to use condoms must be infected, and avoidance of long-term partners, who often want to give up condom use when a partnership has become "regular." Women reported they are the primary promoters of condom use within their sexual relationships.

The need for resources to support themselves and their children was an important barrier to women's ability to practice safer sex. An HIV-negative woman described her dilemma:

I don't have money in the house. Yesterday I had a guy, he refused to give me money because I told him to use a condom. Today also, I get a guy he doesn't want to use a condom...what am I going to do and I don't have money in the house? Let me try without [a condom]...because I don't have money. (33 year-old)

Despite this, some women reported resisting men who do not want to use condoms even if it meant giving up income. One HIV-positive woman stated:

If you are greedy you will see the money you can go with a man with a condom, then he tells you, "I had told you I would give you 500 (Kenyan shillings), now I will give you 1,000 if I eat (have sex) without." If you are a fool, and not thinking of your life, you will accept the one without and get 1000. But if you are clever you

will say let me leave with my 500...(you are looking at) your future life. (34 year-old)

Partner type strongly influenced women's ability to negotiate condom use. Condom use was easier to negotiate with one-time or short-term clients. Negotiating safer sex became more difficult with long-term partners (paid or unpaid). Women routinely mentioned the difficulty of bringing up condom use with regular partners. An HIV-positive woman on ART explained:

that "one only" [the regular partner] is the one who will refuse to use a condom completely and finish me. I cannot have a man for more than 4 months and continue using a condom. He will refuse and call you his...and him I cannot trust and then I will not use a condom and then my immunity will start reducing. (25 year-old)

Many of the women, particularly those who are HIV-positive, discussed avoiding or leaving regular or long-term sexual partnerships to avoid this problem. An HIV-positive woman on ART explained:

He will use a condom for a short while. I have seen many men someone comes and tells you he likes you then you use a condom a short while. After like a month he starts saying now he trusts you, he doesn't want to use a condom with you anymore, now he wants to have a child and get married, and he is just trying to get a way to sleep with you without a condom. And yet you don't know him and he doesn't know you so when someone starts that I get a reason to leave him completely. (35 year-old participant)

Among HIV-positive women, 17 (85%) reported a concern over the potential for "adding on more virus" (superinfection) as a result of unprotected sex. An HIV-positive woman stated:

It weakens when you move around carelessly [have sex without a condom] because I could say today I have the virus and want to infect you and maybe he has more than mine so he will add onto mine. (42 year-old)

HIV-negative women also seemed aware of the potential for superinfection:

Those too [HIV-positive women] need to protect themselves so that they don't get reinfected with the virus. They just stay with what they already have because if they have the virus and still move out with someone with the virus they multiply. (40 year-old)

RESULTS FROM THE INTERVIEWS WITH MEN

The median age of male participants was 32 years (IQR 26–36). Seven were Christian and three were Muslim. Half were married. All had heard of HIV and AIDS, which they universally described in terms of a "disease that kills." Four men had tested for HIV. All but one had heard of ART. Despite the availability of medications, the men believed that getting the disease was very serious, primarily because HIV is a "shameful" disease.

All 10 men discussed the importance of using condoms to prevent HIV infection. Like the women, many reported condom use with casual partners as a strategy to avoid HIV. Several admitted to inconsistent condom use with casual partners, particularly when alcohol was involved. However, they were unable or unwilling to use condoms with long-term partners and spouses, as this would constitute evidence or suspicion of outside sexual relationships.

The men reported that women are the primary initiators of condom use. Male participants were more likely than women to report engaging in stigmatized behaviors such as anal sex.

None mentioned the risk of HIV superinfection. These results may not be directly comparable to those of the women, because we did not ask the HIV status of male participants.

Men's perceptions of monogamy generally paralleled those described by the women; they felt that monogamy was unnatural for men but preferred by most women. The perceived universality of concurrent sexual partnerships among men was unquestioned by both men and women. One man said:

All men are polygamous, no matter how hard they try to hide this from themselves, and outside relationships are always there.

However both sexes noted that some women also engage in concurrency. As one HIV-positive woman on ART said:

We also do; maybe you husband doesn't move out [have sex with others] but you do more than even your husband...it's [concurrency] for both.

DATA TRIANGULATION

The qualitative study findings were presented in a modified member check to women in the research cohort (n=11). These women were in consensus with the reported themes. The women emphasized gender relations distrust as the most important strategy to avoid getting infected with HIV. An overarching concern was for those with HIV to “live positively” and have a source such as children or religion to sustain their drive for life.

Finally, findings from the in-depth interviews were compared with findings from the quantitative behavioral survey conducted in the same cohort of women (McClelland et al, 2010). That study found that among n=129 women who started ART there was no increase in unprotected sex compared to the pre-ART period (adjusted odds ratio [AOR] 0.86, 95% confidence interval [CI] 0.62–1.19, p=0.4). Thus, the main qualitative and quantitative study findings – of no increased sexual transmission behavioral risk following ART initiation – were supported by congruity from both data sources.

DISCUSSION

The objective of this qualitative study was to examine contextual factors that influence sexual behaviors among high-risk HIV-positive and negative women in the ART era. We were particularly interested in evaluating whether the introduction of ART may have led to changes in attitudes including sexual risk disinhibition. We found no thematic evidence that the women or their perceived peers engaged in increased risk behavior as a result of the ART availability. This echoes findings from several epidemiologic studies finding no association between ART initiation and reported increased sexual risks (Bateganya et al., 2005; Bunnell et al., 2006; Kaida et al., 2008; Luchters et al., 2008; McClelland et al., 2010; Moatti et al., 2003).

Women and men interviewed still considered HIV a serious condition. Contrary to some studies in Kenya and South Africa, ART was not seen by any of the participants as a “cure” (Bailey et al., 2009; Cohen et al., 2009; Nachega et al., 2005). The disease was described as treatable but highly stigmatized. Some of the women's descriptions of their own understanding represent “folk models” about how they believe HIV and ART work in the body. These “folkways” are important in ART adherence and may also be relevant to understanding secondary HIV transmission risk (Sankar, Golin, Simoni, Luborsky, & Pearson, 2006).

Self-protection motivations were strong drivers of risk reduction behaviors among women living with HIV. A major facilitator of condom use among these women was the perceived adverse health risks of superinfection. Few women mentioned concern about transmitting HIV as a major motivator for risk reduction. As noted in HIV and non-HIV literature, people commonly engage in risk-benefit calculations, but salient factors may vary (Richardson et al., 2004; Rothman & Salovey, 1997). Individuals with chronic conditions often respond to loss-framed messages (e.g., “getting another strain of HIV will hurt my health”), whereas people without these conditions may respond more to gain-framed messages (e.g., “if I use condoms and stay HIV-negative I will remain healthy”).

Ongoing counseling of the female research cohort participants regarding condom use to avoid STI and HIV (re)infection appeared to be incorporated into their behavioral heuristics and repertoire. This suggests that structured “positive prevention” counseling may be effective in helping high-risk HIV-positive individuals who are economically dependent on transactional sex to reduce risk behaviors. Similarly, HIV testing may serve as a teachable moment for high-risk women who test negative. These issues may be particularly relevant in the context of increased calls for expanded HIV testing and earlier ART treatment (“test and treat”) strategies for HIV control (Granich, Gilks, Dye, De Cock, & Williams, 2009). Interestingly, no women on ART mentioned reduced sexual infectivity as an advantage of being on these medications, though that is often thought of as a primary benefit in the context of test and treat approaches (De Cock, Crowley, Lo, Granich, & Williams, 2009).

Although the introduction of ART may not have increased these women’s risk behaviors, numerous factors persist as drivers of risk behavior in the ART era. As predicted by our analysis theoretical framework of gender and power, we saw that poverty continues to pressure women towards taking greater sexual risk. Consistent with the life course perspective, we saw that many women’s partnerships and related risk changed over time, (e.g., from having a single spouse or main partner, to having multiple partners) once women left those earlier relationships and now needed to support themselves and their children. Partner type and duration played an important role in women’s risk behavior. They perceived unprotected sex as risky in both short-term and long-term relationships. The distinction between relationships with “clients” or “non-clients” (e.g., boyfriend or spouse) was not one that the women emphasized; resource exchange was seen as a common thread in both kinds of sexual relationships. However, the women reported being better able to convince short-term sexual partners to use condoms. As a result, many HIV-positive women actively chose short duration relationships and avoided long-term relationships. Similar strategies have been documented among women in Tanzania (Lees et al., 2009). However, the efficacy of these strategies has not been demonstrated, and they have not been part of standard HIV prevention messages.

Motivations for women to engage in multiple and concurrent sexual partnerships appeared to be economic. Men’s motivations were less explicit, other than the overriding societal expectation that men should have multiple partners. Similar socially entrenched explanations have been made in southern Africa (Mah & Halperin, 2010). Multiple and concurrent partnerships appeared normative for men, especially if they had money. Expected economic ties between women and male “patrons” may reflect accepted underlying norms about resource distribution inherent in transactional sex (i.e., that women trade sex in order to obtain resources from men who have them) (Swidler & Watkins, 2007). Further research among men to understand specific influences could inform the socioculturally grounded design of effective concurrency risk reduction strategies (Mah & Halperin, 2010).

Study generalizability limitations include recruitment of women from a research cohort in which participants regularly receive HIV testing and risk reduction counseling. Men were

recruited from bars, which may over-represent risky attitudes and behaviors. An additional limitation was assessment at one time point. Risk behavior is not static, and disinhibition may occur after longer periods, reinforcing the need for longitudinal behavioral surveillance in key populations.

Study strengths include use of male participant data to triangulate against themes identified among women, and assessment of quantitative data from a parallel study that allowed a mixed-method comparison of findings (McClelland et al., 2010).

SUMMARY

As evidenced in our study population, ART-associated risk disinhibition may not occur in every setting. For women on ART, there may be strong motivations to reduce sexual exposure to avoid STIs and HIV reinfection. For both HIV-positive and -negative women, HIV risk is a result of structural, sexual network, and individual-level factors. Beyond ART availability there remain ongoing behavioral risk and incomplete risk reduction strategies that contribute to HIV hyperendemicity in East Africa.

This study adds to our understanding of barriers and facilitators to safer sex in high-risk women living in sub-Saharan Africa. Importantly, we found that the HIV-positive women's perception of personal risk was a more salient driver of sexual risk reduction behavior than concern over transmitting HIV to male partners. This finding suggests that risk reduction counseling for HIV-positive FSWs may be more effective if it focuses on individual-level risks and benefits for the women, rather than stressing condom use primarily as an obligation to avoid transmitting HIV to others. These data can inform development of intervention strategies for prevention with positives, a vital component of HIV control in sub-Saharan Africa (Atuyambe et al., 2008; Bunnell, Mermin, & De Cock, 2006).

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Table 1

Barriers to safer sex after antiretroviral rollout, interviews with female Kenyan sex workers 2006

Level	Quotes	Respondent
STRUCTURAL DETERMINANTS		
Economics	I don't have money in the house. Yesterday I had a guy he refused to give me money because I told him to use a condom. Today also, I get a guy he doesn't want to use a condom mm what am I going to do and I don't have money in the house? Let me try without. For me, I have kids in the house so let me just sleep with the guy so that he gives me money for my kids to eat tomorrow.	35 year-old divorced HIV-negative woman
Gender Attitudes	Sometimes you agree (to sex without a condom) because you know sometimes it's economic problems if we are to say the truth. Maybe I haven't paid rent I will be forced to have sex with that man because I am in business.	27 year-old divorced HIV positive woman on ART
Violence/Coercion	It's like if it's a man who is [HIV] infected they will think he really liked women and if it's a woman [who is HIV+] then she was a prostitute. I am trying to protect myself but you know in this country of ours men mistreat us, so like if you tell a man we use a condom he will agree but later on he will treat you like as in once you get to the room the story changes he doesn't want to use the condom and sometimes he will use force and even rape you in the room so you see? So you will get the disease.	35 year-old divorced HIV positive woman on ART 35 year-old divorced HIV negative woman
SEXUAL NETWORK DETERMINANTS		
Multiple and Concurrent Partnerships	You know men don't have one woman, there is no man who has one woman so maybe his girlfriend whom he thinks is healthy maybe is sick so if he goes for testing with his wife he will be found to be sick. A man is greedy he can leave you here and see a nice girl and sleep with her and maybe he has been infected and then bring it for you.	34 year-old divorced HIV positive woman on ART 35 year-old divorced HIV positive on ART
INDIVIDUAL DETERMINANTS		
Alcohol Use	Sometimes when you get a man and he sees this woman is so drunk he will do to you whatever he wants... Because of drinking I got gonorrhea so I decided at the end I will carry the dangerous disease [HIV]. Then I left drinking.	28 year-old divorced HIV negative woman
Gendered Roles re: Condom Use	You know a man is a person who infects and he is always in a hurry and when he boils he has boiled so he will not have the thought of let me use this [a condom] because it's the man's body that is hotter than the female one. ... you know most men don't like condoms so I don't understand if they don't know that there are diseases killing people or what. Some understand if you explain to him well and say "We will go with you but you know life nowadays you have to put on socks."	40 year-old divorced HIV positive woman on ART 44 year-old divorced HIV positive woman on ART
Partnership Type (difficulties with longer-term relationships)	It's good to use the condoms but men...well, we agree we are using condoms then after 2-3 times [the man] starts telling me "Where are we at now and the love we have. There is no need to use these things."	34 year-old divorced HIV positive woman, ART naive

Table 2
Facilitators and strategies of safer sex after antiretroviral rollout, interviews with female Kenyan sex workers 2006

Level	Quotes	Respondent
STRUCTURAL DETERMINANTS		
Gender Attitudes (distrust)	A man of that nature [who refuses to use a condom] you note that he has something he wants to infect you with so someone like that you leave him.	36 year-old divorced HIV positive woman ART naïve
	Nowadays men are very harsh [and] when you see a man refusing that thing [a condom] he is not well.	29 year-old divorced HIV negative woman
	If you get someone who doesn't want to use the condom you have to fear them. Why don't they want to use the condom? Is that person OK, really?	40 year-old divorced HIV positive woman on ART
SEXUAL NETWORK DETERMINANTS		
Multiple and Concurrent Partnerships	I haven't told him [my HIV status] he has his wife so it's like we are stealing what we do.... yes you just tell him I don't know you and you don't know me, I may be sick or you are sick and you have a family and I do too so let's use the condom.	46 year-old never married HIV positive woman not on ART
	Some you will find when a man goes out of his marriage will carry a condom to use... [Women who "move out" engage multiple partnerships]... carries her own condoms so you will find these are people with something they are protecting so they don't get infected so that they don't infect also.	34 year-old divorced HIV positive woman on ART
INDIVIDUAL DETERMINANTS		
Knowledge of Serostatus (HIV testing)	After I was told I don't have the virus I got encouraged and said "No man will joke around with me." I will protect myself.	35 year-old divorced HIV negative woman
	I tell someone if they have never gone for VCT they should go because it is very good whether you are affected or not. When you go there and find that you are negative you will change your behavior very fast and if you are positive you will also change your behavior.	37 year-old never married HIV positive woman ART naïve
Partnership Type (focus on short-term relationships)	[I do not have a friend living with me]... nowadays if you have a friend and you live with [him] for a month he will not agree to use [a condom] anymore he will refuse so I don't like. I am cunning it's better if I stay without.	35 year-old never married HIV positive woman on ARV
Concern about Co-infections (including HIV superinfection)	[I use a condom] because I know my status and we were told here [study clinic] that now we are on drugs, when you go with someone you don't know him and maybe he has his, and you have yours if you don't use a condom he will give you another that you didn't have, so you will add more onto what you already have.	44 year-old divorced HIV positive woman on ART
	Ah but when you don't use that [condom], that is when they will add onto you, you may have it [HIV] and they also have it [HIV] and yours is little his is much so you will be added.	35 year-old divorced HIV positive woman on ART
	Even for me when I was tested positive I stayed for almost 2 years without having sex with anyone because of fearing and also I was imagining like everyone I had would add onto me the disease and then I would die faster.	32 year-old divorced HIV positive woman ART naïve