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MWP 2013/27
Max Weber Programme

Protection Versus Contraception: Dealing with the
Twofold Function of Condom Use

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EUI Working Paper **MWP** 2013/27

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ISSN 1830-7728

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Printed in Italy
European University Institute
Badia Fiesolana
I – 50014 San Domenico di Fiesole (FI)
Italy
www.eui.eu
cadmus.eui.eu

Abstract

The twofold function of condom use - contraception and STD protection - should be taken into account when understanding attitudes towards this practice. Emphasis on the interpretation of condom use as a protective practice conflicts with the norms of fidelity and trust that regulate marriage. The alternative interpretation of condom use as a contraceptive method may be less problematical. This paper analyses the extent to which the attitude of married individuals towards condom use with their spouses is affected by their expectations about the dominant attitudes and forms of behaviour concerning this practice in their social network. It is expected that a social consensus on understanding condom use as an HIV-preventive practice will not induce positive attitudes towards condom use within marriage, while social acceptance of modern contraception and the use of condoms for contraceptive purposes may help. Data from the Kenya Diffusion and Ideational Change Project are analysed both cross-sectionally and longitudinally. Social support for each function of condom use is measured with indicators of the proportion of social-network partners that use condoms for a particular purpose or have a positive attitude towards each of the uses, according to the respondent. The results support the hypothesis for men, but are inconclusive for women.

Keywords

Family planning, condom use, HIV/AIDS, social networks, social norms, Kenya, Malawi, panel analysis with fixed effects, marriage, fidelity.

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Max Weber Fellow, 2012-2013

Introduction

Most new HIV infections in several sub-Saharan countries are estimated to take place in serodiscordant married or cohabiting couples (Dunkle *et al.*, 2008; Gelmon *et al.*, 2009; Khobotlo *et al.*, 2009; Mngadi *et al.*, 2009; Wabwire-Mangen *et al.*, 2009). In addition, men are more likely to bring HIV infection into a concordant-negative partnership (Hugonnet *et al.*, 2002). Getting married does not work as a preventive strategy against HIV infection, since the percentage of women who are infected is much higher among married females than among single ones of the same age (Glynn *et al.*, 2001; Kelly *et al.*, 2003). Therefore, preventive behaviour within marriage is crucial for the reduction of HIV incidence in the sub-Saharan region. Notwithstanding this, spouses are often reluctant to introduce condoms into their marital relationships (Chimbiri, 2007) and the reported use of this device within marriage is usually very low (see Demographic and Health Surveys).

The twofold function of condom use - contraception and STD protection - should be taken into account when understanding attitudes towards this practice. Emphasis on the interpretation of condom use as a form of protective behaviour conflicts with the grounds of marriage. Crucial social norms that regulate marital unions in sub-Saharan Africa, as in other regions, refer to fidelity and trust (Watkins, 2004; Smith and Watkins, 2005; Chimbiri, 2007; Tavory and Swidler, 2009). To suggest condom use to a spouse is likely to be very costly when the couple lives in a social context in which condoms are considered a barrier against HIV infection, and, at the same time, unfaithfulness is socially disapproved of (Blecher *et al.*, 1995; Muhwava, 2004). Such a suggestion would be interpreted as either an admission that one has been unfaithful, or that one believes that the other has. In any case, the couple would face a serious problem of distrust. The association of condom use exclusively with protection from infection is thus self-defeating, because to propose its use necessitates the breaking of one of the norms of marriage.

However, the alternative interpretation of condom use as a contraceptive method may be less problematical, since the acceptance of family planning has dramatically increased in sub-Saharan Africa, especially in the Eastern countries. It is clear that such an interpretation would not solve the whole problem of the high rates of infection in serodiscordant married or cohabiting couples, since condom use would only be resorted to by older couples who want to stop having children or by couples that want to space births. Nonetheless, it could facilitate the negotiation of condom use in marital sex - which would reduce the likelihood of infection - and also in other sexual contexts, such as long-term extramarital relations.

Individual interpretation of condom use is thought to be strongly dependent on the prevailing meaning of condom use in the society in question and on the social approval of family planning (FP) and condom use. This paper explores the extent to which the attitudes of individuals towards protected sex in marital relations in rural sub-Saharan settings are shaped by their expectations about the socially-shared interpretation of the use of condoms in their social network. More specifically, the study is designed to examine whether the perceived social acceptance of condom use for HIV prevention fails to induce positive attitudes towards this practice within marriage, whereas the social approval of modern contraception, and specifically the use of condoms to avoid pregnancy, exerts a positive effect. This article contributes to the literature on the influence of the social group on the respondents' attitudes and decisions relating to FP, reproduction, and HIV/AIDS prevention (Entwisle *et al.*, 1996; Montgomery and Casterline 1996; Kohler *et al.*, 2001; Smith & Watkins, 2005; Kohler *et al.*, 2007), which has not yet addressed the relevance of the social network on the acceptance of condom use within marriage from a quantitative perspective (one exception is Cordero-Coma & Breen, 2012).

Married men and women in rural populations of Kenya are the units of analysis in this research. This country could be considered quite representative of the South-eastern African region in terms of several socio-economic indicators and HIV prevalence rates (World Development Indicators 2008).

The twofold function of condom use

A condom is both a barrier contraceptive method and a protective device against sexually transmitted diseases (STDs) and HIV. With regard to contraception, condoms are not so effective as non-barrier methods such as sterilisation, the Pill, and contraceptive injections, although the estimated effectiveness for preventing pregnancy is 85 per cent when couples made a typical or imperfect use of this type of device (Trussell *et al.*, 2004). Regarding protection, condom use is considered the most effective device against HIV infection through sexual contact, with an estimated risk reduction of more than 80 per cent (Davis and Weller, 1999; Holmes *et al.*, 2004).

Family planning and hiv-prevention programmes

Given the two functions of condoms, their use has been promoted through programmes with different kinds of purposes in sub-Saharan Africa. Before the onset of the HIV/AIDS epidemic, modern contraceptive methods, including condoms, had already been promoted in this region. Kenya was the first African country to adopt a FP programme (1967) and a National Population Policy (1984) (Aloo-Obunga, 2003). However, highly effective contraceptive methods were promoted much more than the less-effective barrier methods (Ali *et al.*, 2004).

On the other hand, the HIV-prevention programmes, both public and private, that have been carried out in sub-Saharan African countries have emphasised the preventive function of condom use (Maharaj, 2001). Condom use has been promoted as a particularly suitable preventive method in casual and commercial sex. Thus, HIV preventive programmes may have helped to diffuse the association between condom use and risky sexual contexts. In sub-Saharan Africa, where the main source of HIV infection is through heterosexual contact (UNAIDS and WHO, 2009), such risky contexts are commercial sexual exchanges and sexual relations outside or before marriage.

Two more features of the programmes that have helped to spread the interpretation of condom use as a protective device against infection should also be mentioned. First of all, since the HIV/AIDS pandemic became a public health problem of first order, HIV programmes have been prioritised at the expense of FP programmes (Aloo-Obunga, 2003; Mekonnen *et al.*, 2004). Thus, the meaning of condom use that sub-Saharan people have mainly received from the public and private programmes during the last two decades at least is that of its HIV protective function. Secondly, those not-so-common programmes designed to diffuse the integration of STD prevention and FP (Askew and Baker Maggwa, 2002) have usually promoted dual protection (use of non-barrier methods and condoms simultaneously). Such a strategy may re-inforce the idea that condoms are only suitable for STD prevention rather than for pregnancy avoidance. In fact, dual protection in marital sex has been found to be difficult to accept by both men and women (Maharaj, 2001; Morroni *et al.*, 2003).

All the above-mentioned issues of the FP and HIV programmes seem to have contributed to the widespread idea among the population that condom use is related to “illicit” sex and infidelity. This idea is reflected in the great differences in the levels of condom use depending on the type of partner. Numerous studies of sub-Saharan countries - as well as other regions (Macaluso *et al.*, 2000; de Visser *et al.*, 2003) - have shown that the highest prevalence of condom use takes place in commercial sex, while the lowest levels are observed in regular or marital relationships (Norman, 2003; Ferguson *et al.*, 2004; Westercamp *et al.*, 2010; de Walque and Kline, 2011). Moreover, condom use tends to decrease as the duration of the relationship increases (Westercamp *et al.*, 2010). Thus, condom use within marriage is still a rare phenomenon - in Kenya, the country under study in this research, the percentage of men who said they used a condom the last time they had sex with a spouse or cohabiting partner was only 3.4 in 2003 (Kenya Demographic and Health Survey 2003). This figure is smaller when female data are considered.

The meaning of condom use

As anthropologists have long pointed out, material objects are loaded with meaning (de Saussure, [1916] 1986). They may act as environmental *stimuli* that influence social perceptions and decision processes by making certain values, behavioural rules, or ideas salient. Theoretical approaches to social norms influenced by cognitive psychology affirm that individuals identify the norms that apply

to a particular situation through a mental process that uses cognitive shortcuts to categorise each situation by searching for cues about how to interpret the situation and the suitable way to behave (Bicchieri, 2006). Such a process enables us to assign a meaning to the situation, which affects our behaviour (Kay *et al.*, 2004; Liberman *et al.*, 2004). The interpretation of the context leads us to identify the behavioural rules that prescribe a specific course of action in a particular situation (Vanberg, 2002).

HIV-prevention programmes have contributed to imbue condoms with a meaning that conflicts with marital rules. Their emphasis on the preventive function of condom use has made this practice incompatible with two of the main norms that regulate marital relations: trust and fidelity. Several qualitative studies have shown that sub-Saharan people tend to agree that condoms should be used with partners who cannot be trusted - because they might be “promiscuous” (Chimbiri, 2007; Smith, 2007; Tavory & Swidler, 2009). As such, the suggestion of condom use signals that either the person proposing it should not be trusted, or that the partner is not trustworthy (Blecher *et al.*, 1995; Varga, 1997). Both of these interpretations are in conflict with the expected behaviour of spouses. Married people, especially women, are expected to be sexually faithful in sub-Saharan populations, since that is understood as the way a spouse ought to behave (Akwara *et al.*, 2003). Around 80 per cent of married men in rural Kenya report that it is acceptable for a wife to divorce an unfaithful husband (KDICP 1999). In addition, public condemnation of sexual unfaithfulness by the numerous churches that are established in these countries (Garner, 2000; Agadjanian, 2005; Parsitau, 2009), together with the serious threat of the HIV epidemic to people’s daily lives, is enforcing the normative disapproval of extramarital sex. The proposal of condom use brings out the weakness of the relationship base and may lead to divorce or physical abuse (Muhwava, 2004; Versteeg and Murray, 2008; Achan *et al.*, 2009). The meaning of condoms shapes, as Tavory and Swidler (2009) argue in their semiotic analysis, the signals that people send about themselves, their partners, and the character of their sexual relationship.

In the case of condom use, a new meaning relating to contraception would imply that the suggestion of condom use within marriage would not bring issues of fidelity and trust to the surface. Tavory and Swidler (2009) also point out that public-health interventions should promote a change in the meaning of condom use. However, they do not pay attention to the twofold function of this practice, but argue that condom use could be alternatively framed as a way of denoting care and love to a trusted partner.

Attitude towards condom use and the role of social interaction

The interpretations, on the part of individuals, of the actions and attitudes towards them are usually affected by socially-shared understandings and dominant opinions. As explained above, health campaigns have emphasised a particular aspect of condom use, which may have determined what people in general think about it. But some variation could be observed among different social environments. Interpersonal communication is a key channel through which individuals become aware of dominant opinions and forms of behaviour (Watkins, 2004; Smith & Watkins, 2005; Kohler *et al.*, 2007). With regard to protected sex, informal conversations allow individuals to update their expectations about the reasons why the people around them use condoms, the characteristics of the contexts in which they do so, and their opinions about this practice. I expect that those individuals who perceive their peers to use condoms commonly for contraceptive purposes are less likely to relate this practice to the intention of preventing HIV transmission. In contrast, the perception of condoms as being merely used for HIV protection in casual sexual relationships is expected to re-inforce the association between condoms and the prevention of sexually transmitted diseases. Interpersonal and group communication create the opportunity to re-negotiate the meaning of an action, and lead to a common understanding of the situations in which it takes place (Bicchieri, 2006).

To my knowledge, the influence of the dominant forms of behaviour and opinions in the social network on the acceptance of condom use within marriage has not been examined from a quantitative perspective. The exception would be the study by Cordero-Coma and Breen (2012), who expected to observe a positive association between the proportion of married people in the social group who are

believed to have extramarital partners and a married couple's likelihood of using condoms in rural Malawi. The authors argue that, in these contexts in which the fidelity norm is weak and extramarital sex is tolerated, condom use should be easily introduced into marital sex. They did not find, however, a conclusive result.

This paper examines the influence exerted by the acceptance in the social network of each of the uses of condoms on attitude of individuals towards protected sex within marriage. I expect married people to be more likely to have a positive attitude when modern contraception is widely accepted, and, more specifically, when they believe that their peers use condoms for contraceptive purposes. In contrast, the view of the use of condoms in marital sex is not expected to improve when these devices are believed to be commonly used in order to avoid becoming infected with HIV from extramarital sexual partners.

The benefits of condom use within marriage

Before proceeding with the analysis, it is necessary to pose the following question: Is condom use a suitable practice for married couples both to prevent infection *and* to avoid unwanted pregnancies? As mentioned above, the effectiveness of the correct and consistent use of condoms for reducing the spread of STDs and HIV in the population has been proved (Holmes *et al.* 2004). However, this high protective effect at individual level has not been observed when women and men make intermittent use of condoms (Detels *et al.*, 1990; Kiddugavu *et al.*, 2003). According to the study of 16 developing countries elaborated by Ali, Cleland and Shah (2004), condom users are more likely to experience discontinuation in their contraceptive use than users of the Pill. However, the main reason for their interruptions is the switch to another contraceptive method, usually a more effective one. Consistent condom use would increase, then, if couples became aware that the gains in terms of contraception and sexual health are not substantially reduced when using condoms instead of other modern methods. The percentage of women experiencing an unintended pregnancy during the first year of a correct use of a contraceptive method is 0.3 and 2 per cent in the cases of the Pill and condoms, respectively (Trussell *et al.*, 2009). Even when there is a clear difference, condom efficacy is still very high, and its unique benefits in protection from STDs should make this device more valuable. In fact, Ali *et al.* (2004) show that the negative reproductive consequences, in terms of abortion and unwanted births, of a radical shift from contraceptive pills to condom use in the population would be negligible, according to their study. With regard to the consequences for HIV prevention, the authors affirm that "at the population level, it is indisputable that condom use, albeit imperfect, can make a huge contribution to the containment of HIV epidemics" (Ali *et al.*, 2004). Actually, the authors defend, not only in this piece of research (Maharaj and Cleland, 2004; Cleland and Ali, 2006), a modification in the strategies of HIV preventive programmes in favour of the promotion of condom use within marriage.

In sum, a notable increase in condom use within marriage would bring benefits for the containment of the HIV epidemic with low costs in terms of reproductive health. The promotion of condom use as a contraceptive method with an implicit recognition of its protective function is likely to encourage such an increase, because it would not conflict with the fidelity norm, and modern contraception (any method) within marriage is fairly well accepted and practiced, especially in the East and South of the continent, where the HIV prevalence is highest (Cleland and Ali, 2006). It cannot be denied, however, that the wide acceptance of other more effective contraceptive methods can also hinder the spread of condom use for avoiding pregnancy. It is expected to be difficult for married individuals to justify their wish to use condoms to their spouses.

Data and measures

The empirical analysis is based upon a quantitative study, using a dataset that comes from the *Kenya Diffusion and Ideational Change Project* (KDICP). The characteristics and aims of this longitudinal survey have been described in Watkins *et al.* (2003), and the quality of the data has been thoroughly analysed by Bignami-Van Assche *et al.* (2003). The data were collected in three waves: 1994, 1996, and 1999. Only the last two waves are analysed here, because the first wave does not provide enough relevant information for the present research study. In spite of the fact that more recent data would be

preferable, this dataset offers a unique opportunity to examine the influence of social interactions on personal attitudes. The sampling frame in these surveys is consisted of ever-married women of childbearing age and their husbands (if currently married) in rural sites in the South Nyanza District. Given the aim of this research, the units of analysis are married individuals, both men and women.

The dependent variable is a proxy measure of the respondent's attitude towards condom use in marital sex. Respondents are asked: "*Would you feel comfortable suggesting to your spouse that you and he/she use condoms?*". The possible answers are *yes* or *no*. It could be argued that such an indicator measures not only the respondent's attitude towards this practice, but some other characteristics of the respondent and his/her marital relationship. It might be related to the skills of the man and the woman at spousal communication about intimate matters, or to the balance of the bargaining power in the couple. Thus, the model also includes the following control variables: a two-category indicator that measures whether the respondent reports *having ever talked to his/her spouse about the chances that his/her spouse or himself/herself might get infected with AIDS*, and the dichotomous response to the question: *Do you think it is acceptable for a woman to divorce an unfaithful husband?*

With regard to the explanatory variables, the KDICP survey asked with how many people the respondent had ever chatted about family planning (FP), on the one hand, and about AIDS, on the other. Then, the survey asked for information on up to four persons with whom the respondent had chatted about each of the two topics. Those respondents who reported having talked about FP with someone are specifically asked: *Does [each of these people or network partners] use modern family-planning with her/his spouse?, Which method is it?* Condom use is one among various options. Those respondents who have talked about AIDS are asked: *What does [each network partner] think is the best way to protect herself/himself from getting AIDS?*, and "condom use with extramarital partners" is one of the answers formulated. It should be noted that it is possible for us to observe two communication networks: about FP and about AIDS. However, these networks may overlap, so that reported interlocutors in the discussion on one of the topics could be the same people mentioned as interlocutors in conversations about the other. The responses to the questions about all the partners in each network are used to construct the following indicators. The first one measures the proportion of people in the network that are perceived to use modern contraceptive methods. The second indicator refers to the proportion of network partners who use condoms as a contraceptive method, according to the respondent. Finally, the models include a measure of the proportion of network partners who are believed to consider the use of condoms with all extramarital partners as one of the best strategies against HIV infection. The continuous measures are categorised, since the aim of this research is to estimate the effect of perceived dominant opinions and forms of behaviour. Then, each indicator has three categories that distinguish those married men with a network in which more than half of the partners are perceived to use modern contraception or to consider condoms to be a good HIV-preventive method, from the rest. In the case of the variable on the proportion of users of condoms for contraception, networks in which half or more, instead of more than half, of the individuals who are believed to have this form of behaviour are distinguished from the rest, because this category would represent less than 5 per cent of the sample otherwise. A third category in all these indicators includes those married men who have no network partner. Respondents who have chatted about FP are also asked whether they think that each of the network partners approves of FP. This information is also used in the analysis to construct an alternative measure of the dominant attitude towards FP in the social group. The categorisation of this variable is analogous to that of the indicators explained above, as can be seen in Table 1, which shows the summary statistics of all the variables included in the analysis.

[Table 1]

The above-mentioned information has been used to construct proxy measures of the dominant attitudes and forms of behaviour in the individual's social network in relation to modern contraception and HIV-preventive sexual practices. In fact, even when the two communication networks (FP and

AIDS) might not be made up of the same network partners, they are both considered proxies of the respondent's reference group. It is important, then, to be aware of the interlocutors' features. Table 2 shows some characteristics of the respondents concerning their networks. The uncensored size of the networks, which refers to the average total number of people with whom the respondent has chatted about each topic, is smaller for the women in the two waves, and bigger in 1999 than in 1996 for both men and women. The increase in the number of people ever chatted with between waves may be due to the fact that there is a partial overlap of the samples, since most respondents were interviewed in both waves. A great part of the married men and women have talked about FP and/or AIDS to more than four people in both waves, although they are asked to provide information about only four of them at most in each case. These limited samples of network partners compose what I call "censored networks", which have an average size of more than three in all the cases. The KDICP survey does not allow us to know the respondents' criteria for selecting certain interlocutors to give information about, but Table 2 shows that censored networks are mainly composed of individuals of the same sex as the respondent, who are linked to him/her by strong ties (for example, 71 per cent of married men in 1996 have a FP communication network in which all the interlocutors are men and 81 per cent of married men have a FP communication network in which all the partners are reported to be confidants or friends, as opposed to acquaintances). Finally, about one out of three respondents in the two waves, except in the case of women in 1999, for which the ratio is lower, have an AIDS communication network that overlaps with the FP network to some extent. Therefore, it seems reasonable to consider that the indicators used in the paper about the proportion of network partners who have a particular form of behaviour or opinion are proxy measures of dominant aspects in the immediate social network or peer group.

[Table 2]

In addition to the variables already mentioned, the models include other factors that are expected to have a relevant influence on the attitude towards condom use within marriage. First of all, it is crucial to take the variables that refer to the respondent's *interest* in the outcomes of condom use into account. For this reason, the suspicion of the spouse being unfaithful, as an indicator of the perceived risk of getting infected through non-protected intercourse, and the reported desire to stop having children are included. A lack of data availability also prevents us from considering birth spacing intentions. The current use of other modern contraceptive methods that are more effective than condoms - the Pill, contraceptive injections, IUD, or sterilisation - is also taken into account, because it is expected to hinder the negotiation of condom use for pregnancy avoidance within marriage.

Other control variables are also included in the model: respondent's age, level of education, type of marriage (monogamous or polygamous), and religion. The positive influence of education on the use of modern contraception and condoms has been observed in numerous empirical studies (Ainsworth *et al.*, 1996; Lagarde *et al.*, 2001; Zellner, 2003; de Walque, 2007). Age is usually negatively related with the use of innovations such as modern contraception, and older women also have a lower risk of pregnancy. It should be noted, however, that the analysis is restricted to women aged between 15 and 49. Concerning the type of marriage, it might be that the capacity of women to discuss issues relating to reproductive and sexual health with their husbands is different in monogamous and polygamous marriages. Finally, the strong general opposition of the Catholic Church to artificial contraception is expected to induce more negative attitudes among its followers in comparison with other religions.

Method

A first approach to the study of the attitude towards suggesting condom use to a spouse is made through a cross-sectional analysis. The data from the two waves have been pooled in order to avoid working with small sets of cases. This technique seems appropriate since there are no particular reasons to believe that the effects of the explanatory variables substantially vary from the first wave to

the successive one. The relaxation of the assumption that errors are uncorrelated is possible by using clustered standard errors.

The estimation of the influence of social interactions on individual behaviour is challenging since it must deal with a potential self-selection problem. Social networks are rarely randomly distributed because individuals tend to select their interlocutors, usually preferring those with whom they share certain characteristics, attitudes and preferences. A positive correlation in a cross-sectional analysis between the respondent's attitude and the behaviour and opinions of his/her network partners may simply reflect this systematic selection rather than provide evidence of the influence exerted by the social environment. The panel analysis with fixed effects is a suitable tool in this case, given that it allows us to control for time-invariant observed and unobserved characteristics that may affect both the respondent's attitude and his/her likelihood of interacting with specific people (Behrman *et al.*, 2001; Helleringer & Kohler, 2005). Therefore, both the cross-sectional and the longitudinal analyses are presented in the following section.

A limitation of fixed-effects panel analysis with a binary dependent variable is that the sample size might decrease notably, given that only those individuals who experience a change between the waves in the outcome variable are analysed. This could lead to wrong conclusions, especially if the distribution of the explanatory variables in the sub-sample changes substantively. For this reason, I also use linear probability models, because the estimation of linear models with fixed effects does not imply a reduction in the number of cases analysed. I adjust for the violations of the classical OLS model assumptions (normality and homoscedasticity of the disturbance term) by using robust standard errors (Behrman, Kohler and Watkins 2001).

Results

The results of the multivariate logistic analysis with clustered standard errors of men and women who feel comfortable suggesting condom use to the spouse are displayed in Table 3.

Models 1, 2, and 3 differ from each other in the variable that they include to measure the acceptance in the social network of one of the aspects of condom use: to wit, contraception. Model 1 (Table 3) includes the most suitable measure, considering the aim of this research. According to the results of this model, networks in which half or more of the network partners are identified by the respondent as users of condoms for contraceptive purposes strongly increase the likelihood of reporting a positive attitude towards condom use within marriage. Conversely, networks in which more than half of the partners are believed to consider that condom use outside marriage is the best HIV preventive strategy do not make any relevant difference to the man's attitude towards condom use with a spouse. This result is coherent with the research hypothesis, according to which a perceived rooted interpretation of condoms as HIV-preventive devices does not facilitate the acceptance of its use in marriage, whereas a favourable social environment for condoms as contraceptive devices makes individuals more willing to introduce condoms in their marital sexual relations. I interpret this finding as a piece of evidence that spousal discussion on using condoms is more compatible with the rules that regulate marital relations when the socially-shared understanding of condom use does not emphasise its HIV protective function.

[Table 3]

Unfortunately, Model 1 cannot be estimated for women, because there is not enough variability - only 0.5 per cent and 1.3 per cent of married women in 1996 and 1999, respectively, have a network in which half or more of the network partners are believed to use condoms to prevent pregnancy. This limitation can only be partially solved with the introduction of alternative proxy measures. Model 2 shows that having a social network in which most people use modern contraception clearly increases both married men's and married women's likelihood of reporting a positive attitude towards the suggestion of condom use to their spouse. The effect is especially strong in the case of men. Thus, spouses are unlikely to feel comfortable negotiating condom use when they are immersed in a social group in which the use of modern contraception is not a prevailing form of behaviour, while whether

they perceive an extensive support of condom use for HIV preventive purposes or not has no influence on their attitude. It should also be noted that, according to Models 1 and 2, for men, the lack of informal interpersonal conversations about family planning negatively affects their attitude towards condom use within marriage. It makes sense to interpret this finding as some evidence of the damaging consequences of social isolation.

Model 3 includes another alternative measure: the proportion of network partners who approve of family planning according to the respondent. The conclusion about the importance of perceiving a wide acceptance of modern contraception in the social network seems to be robust. According to Models 2 and 3, perceiving an extensive favourable attitude towards family planning, on the one hand, or a widespread use of these methods, on the other, is positively related to married men's and married women's attitude towards suggesting condom use to their spouses. Not only dominant forms of behaviour in the social network relating to family planning, but also prevalent attitudes towards it are statistically relevant, whereas the perceived dominant acceptance of condoms for HIV protection makes no difference.

Concerning the control variables in the models, some findings should be highlighted. The level of education is, as expected, statistically associated with the respondent's attitude, and the suspicion of infidelity has a very strong effect in all the models in Table 3. The perceived risk of getting infected by a potentially infected partner is also a relevant factor, as has already been observed in previous studies of condom use in marriage (Westercamp *et al.*, 2010). Nonetheless, the desire for stopping having births is only statistically significant in Model 1, so it seems that that the desire for protection may be the main motivation for the suggestion of condom use within marriage, even when it is proposed in terms of contraception intentions. Models 1 to 3 control for the respondent's recognition of women's bargaining power to divorce an unfaithful husband. This variable is not statistically significant however. In contrast, having ever had a conversation on AIDS with a spouse has a strong impact on reporting feeling comfortable proposing the use condoms within marriage for both married men and women. It must be noted that the dominant attitudes and forms of behaviour relating to modern contraception and the use of condoms for this purpose in the social group are statistically relevant, even when we control for previous spousal communication on related issues.

As explained in the section entitled "Method", estimations from a cross-sectional analysis may be incorrect if certain variables that make individuals more prone to having a positive attitude towards condom use within marriage also increase their likelihood of having a particular social network. The panel analysis with fixed effects, however, allows us to deal with the potential selection problem. The results are displayed in Tables 2 and 3. Given that the analysis cancels out the (observed and unobserved) characteristics that do not change from one wave to the successive one, only time-variant variables are included in the model. Models 4, 5 and 6 are similarly specified, but they differ in the indicator with which the social acceptance of the contraceptive function is measured. They are, therefore, analogous to Models 1, 2 and 3, respectively. Both linear probability (LP) estimates and logit estimates are provided for each model. The longitudinal analysis for men supports the main hypothesis in this research. The linear probability models and the logit models provide similar results in this regard.

[Table 4]

The analysis for women, however, does not offer conclusive results. While the cross-sectional analysis was in line with the research hypothesis, none of the variables about social interactions are statistically significant in Models 5 and 6 for women. Thus, there is not enough evidence to support the hypothesis that the acceptance in the social network of the contraceptive function of condoms has an effect on the attitude of women in rural Kenya.

It should also be noted that the suspicion of infidelity notably increases the likelihood of reporting a positive attitude towards the suggestion of condom use to a spouse, as observed in the cross-sectional analysis. The perceived risk of getting infected from an unfaithful spouse seems to be the most important motivation for the suggestion of this device.

[Table 5]

Discussion

The empirical analysis has shown that, in rural Kenya, the attitude of married men towards suggesting condom use to their spouses is very much affected by some attitudes and forms of behaviour that are prevalent in their reference group. A man's belief that most people in the social network use condoms as a contraceptive device notably increases his likelihood of reporting that he would feel comfortable suggesting condom use to his spouse. In contrast, a perceived widespread opinion within the network that condom use with extramarital sexual partners is a good strategy against HIV infection has no statistically significant effect on the attitude of the respondents. The panel analysis with fixed effects allows us to affirm that the results are unlikely to be affected by the tendency of individuals to interact with people who have similar opinions and forms of behaviour.

It has not been possible to apply the same model to married women because only a small proportion report that some of their network partners use condoms for contraceptive purposes. It could be that the contraceptive function of condoms is much less salient for women than for men in rural Kenya, perhaps because they are more aware of other contraceptive methods. The dataset, however, has allowed me to use alternative measures that are related to the acceptance of family planning in the network, albeit not specifically of condom use for this purpose. The results for men are in line with those mentioned above, since a social environment favourable to family planning has a positive impact on the attitude of men towards condom use in marital sex. Nonetheless, the longitudinal analysis for women provides inconclusive evidence.

The models have been specified to test the theoretical argument that a person's attitude towards condom use within marriage, which is supposed to depend on her interpretation of the situation, varies according to the meaning that she thinks this practice has for the people around her and the perceived social acceptance of its use or the use of other devices that fulfil similar functions. Through interpersonal communication, individuals are able to update their beliefs about the socially-shared interpretation of condom use and the type of contexts in which this practice usually takes place.

The lack of data prevent us from examining whether a positive attitude towards suggesting condom use within marriage finally leads to a higher likelihood of using this device with a spouse. The question about condom use with the current spouse is not included in any wave of the longitudinal survey of Kenya. Given that spouses are expected to be faithful and trust their partners, a positive attitude towards using condoms in marital sex to specifically prevent HIV infection is less likely to spread among the female and male populations, and much less likely to translate into more condom use within marriage.

The point of departure in this research is the idea that the promotion of condom use as an HIV-preventive method has contributed to the widespread association between condoms and commercial and casual sex. It seems that prevention campaigns should revise their strategies, since a large part of the new HIV infections in sub-Saharan Africa takes place in stable couples. Moreover, the interpretation of condom use as a preventive practice may discourage married couples from using this device, given that HIV is mainly transmitted through heterosexual contact in the region and that sexual infidelity is normatively disapproved of. The evidence provided in this study is coherent with the idea that suggesting condom use to a spouse is perceived as an easier task, at least by men, when condoms are commonly used as a contraceptive method. Unfortunately, the connection between condoms and infidelity is not the only obstacle for the use of this device. Several qualitative studies have observed that individuals complain about the reduction in sexual pleasure that condoms involved (Bauni & Jarabi, 2000; Hunter, 2002; Dilger, 2003; Thomsen *et al.*, 2004). Moreover, fears about the possible side-effects and health risks believed to be caused by condom use are quite extensive (Maharaj, 2001; Tavory & Swidler, 2009). Nonetheless, the promotion of condom use as a basically efficient contraceptive method should be more helpful for increasing the acceptability of this practice in formal relations.

This finding has important policy implications. The promotion of condom use should highlight its contraceptive benefits rather than continue to emphasise the suitability of this device for HIV protection in high-risk sexual encounters. This would make condom use more compatible with the norms that regulate not only marriage, but also other steady relationships. In addition, prevention campaigns should take into consideration the fact that the attitudes of men, at least, towards condom use within marriage are clearly affected by the prevailing attitudes and forms of behaviour within the network. Peer education programmes and activities addressed to groups might be more efficient than visiting people at their homes, since they facilitate group communication and help to update expectations about what the others know and think.

Another finding of this research must be highlighted. The suspicion of the spouse being unfaithful plays a key role in the explanation of the attitude towards condom use within marriage. It seems that the principal motivation for the acceptance of condom use is still the perception of the risk of infection. However, this does not imply that condoms are suggested in these terms to the spouse

References

- Achan, S.F., P. Akweongo, C. Debuur, & J. Cleland** (2009), "Coping Strategies of Young Mothers at Risk of HIV/AIDS in the Kassena-Nankana District of Northern Ghana", *African Journal of Reproductive Health* 13(1): 61-78.
- Agadjanian, V.** (2005), "Gender, Religious Involvement, and HIV/AIDS Prevention in Mozambique", *Social Science & Medicine* 61: 1529-1539.
- Ainsworth, M., K. Beegle, & A. Nyamete** (1996), "The Impact of Women's Schooling on Fertility and Contraceptive Use: A Study of Fourteen sub-Saharan Countries", *The World Bank Economic Review* 10(1): 85-122.
- Akwara, P.A., N.J. Madise & A. Hinde** (2003), "Perception of Risk of HIV/AIDS and Sexual Behavior in Kenya", *Journal of Biosocial Science* 35: 385-411.
- Ali, M.M., J. Cleland & I.H. Shah** (2004), "Condom Use within Marriage: a Neglected HIV Intervention", *Bulletin of the World Health Organization* 82: 180-186.
- Aloo-Obunga, C.** (2003), *Country Analysis of Family Planning and HIV/AIDS: Kenya*, Washington DC: The POLICY Project.
- Askew, I., & N. Baker Maggwa** (2002), "Integration of STI Prevention and Management with Family Planning and Antenatal Care in sub-Saharan Africa: What More Do We Need to Know?", *International Family Planning Perspectives* 28(2):77-86.
- Bauni, E.K., & B.O. Jarabi** (2000), "Family Planning and Sexual Behavior in the Era of HIV/AIDS: The Case of Nakuru District, Kenya", *Studies in Family Planning* 31(1): 69-80.
- Behrman, J.R., H.-P. Kohler & S. Watkins** (2001), "How can we Measure the Causal Effects of Social Networks Using Observational Data? Evidence from the Diffusion of Family Planning and AIDS Worries in South Nyanza District, Kenya", *MPIDR Working Paper* 22.
- Bicchieri, C.** (2006), *The Grammar of Society: The Nature and Dynamics of Social Norms*, New York: Cambridge University Press.
- Bignami-Van Assche, S., G. Reniers & A.A. Weinreib** (2003), "An Assessment of the KDICP and the MDICP Data Quality: Interviewer Effects, Question Reliability and Sample Attrition", *Demographic Research*, Special Collection 1: 31-76.
- Blecher, M., M. Steinberg, W. Pick, M. Hennink & N. Durcan** (1995), "AIDS Knowledge, Attitudes and Practices among STD Clinic Attenders in the Cape Peninsula", *South African Medical Journal* 85(12): 1281-1286.
- Chimbiri, A.M.** (2007), "The Condom is an 'Intruder' in Marriage: Evidence from Rural Malawi", *Social Science & Medicine* 64: 1102-1115.
- Clark, S.** (2010), "Extra-Marital Sexual Partnerships and Male Friendships in Rural Malawi", *Demographic Research* 22(1): 1-28.
- Cleland, J., & M.M. Ali** (2006), "Sexual Abstinence, Contraception, and Condom Use by Young African Women: a Secondary Analysis of Survey Data", *Lancet* 368: 1788-1793.
- Cordero-Coma, J., and R. Breen** (2012), "HIV Prevention and social desirability: husband -wife discrepancies in reports of condom use", *Journal of Marriage and Family*, 74(3): 601-613.
- Davis, K.R., & S.C. Weller** (1999), "The Effectiveness of Condoms in Reducing Heterosexual Transmission of HIV", *Family Planning Perspectives* 31(6): 271-279.
- De Saussure, F.** ([1916] 1986), *Course in General Linguistics*, New York: Open Court.
- De Visser, R.O., D.E. Rissel, J. Richters & A.E. Grulich** (2003), "Heterosexual Experience and Recent Heterosexual Encounters among a Representative Sample of Adults", *Australian and New Zealand Journal of Public Health* 27(2): 146-154.
- de Walque, D.** (2007), "How does the Impact of an HIV/AIDS Information Campaign Vary with Educational Attainment? Evidence from Rural Uganda", *Journal of Development Economics* 84(2): 686-714.
- de Walque, D., & R. Kline** (2011), "Variations in Condom Use by Type of Partner in 13 Sub-Saharan African Countries", *Studies in Family Planning* 42(1): 1-10.

- Detels, R., B.R. Visscher, L.P. Jacobson, L.A. Kingsley, J.S. Chmiel, L.J. Eldred, et al.** (1990), "Sexual Activity, Condom Use, and HIV-1 Seroconversion", in: B.R. Voeller, J.M. Reinisch & M. Gottlieb (eds.), *AIDS and Sex: An Integrated Biomedical and Biobehavioral Approach*, New York: Oxford University Press.
- Dilger, H.** (2003), "Sexuality, AIDS, and the Lures of Modernity: Reflexivity and Morality among Young People in Rural Tanzania.", *Medical Anthropology* 22: 23-52.
- Dunkle, K., R. Stephenson, E. Karita, E. Chomba, K. Kayitenkore, C. Vwalika, L. Greenberg & S. Allen** (2008), "New Heterosexually Transmitted HIV in Married or Cohabiting Couples in Urban Zambia and Rwanda: An Analysis of Survey and Clinical Data", *Lancet* 371: 2183-2191.
- Entwisle, B., R.R. Rindfuss, D.K. Guilkey, A. Chamrathirong, S.R. Curran & Y. Sawangdee** (1996), "Community and Contraceptive Choice in Rural Thailand: A Case Study of Nang Rong", *Demography* 33(1): 1-11.
- Family Health International** (2004), "Integrating Services", *Network* 23(3).
- Ferguson, A., M. Pere, C. Morris, E. Ngugi & S. Moses** (2004), "Sexual Patterning and Condom Use among a Group of HIV Vulnerable Men in Thika, Kenya", *Sexually Transmitted Infections* 80: 435-439.
- Garner, R.C.** (2000), "Safe sects? Dynamic religion and AIDS in South Africa", *The Journal of Modern African Studies* 38: 41-69.
- Gelmon, L., P. Kenya, F. Oguya, B. Cheluget & G. Haile** (2009), *Kenya HIV Prevention Response and Modes of Transmission Analysis*, Nairobi, Kenya: National AIDS Control Council.
- Glynn, J.R., M. Carael, B. Auvert, M. Kahindo, M. Chege & R.M. Musonda** (2001), "Why do Young Women have a Much Higher Prevalence of HIV than Young Men? A Study in Kisumu, Kenya and Ndola, Zambia", *AIDS* 15 (Suppl.4): S51-S60.
- Granovetter, M.S.** (1973), "The Strength of Weak Ties", *American Journal of Sociology* 78(6): 1360-1380.
- Granovetter, M.S.** (1978), "Threshold Models of Collective Behavior", *American Journal of Sociology* 83(6): 1420-1443.
- Helleringer, S., & H.-P. Kohler** (2005), "Social Networks, Perceptions of Risk, and Changing Attitudes towards HIV/AIDS: New Evidence from a Longitudinal Study Using Fixed-Effects Analysis", *Population Studies*, 59(3).
- Holmes, K.K., R. Levine & M. Weaver** (2004), "Effectiveness of Condoms in Preventing Sexually Transmitted Infections", *Bulletin of the World Health Organization* 82(6): 454-461.
- Hugonnet, S., F. Mosha, J. Todd, K. Mugeye, A. Klokke, L. Ndeki, D. Ross, H. Grosskurth & R. Hayes** (2002), "Incidence of HIV Infection in Stable Sexual Partnerships: A Retrospective Cohort Study of 1802 Couples in Mwanza Region, Tanzania", *Journal of Acquired Immune Deficiency Syndromes* 30(1): 73-80.
- Hunter, M.** (2002), "The Materiality of Everyday Sex: Thinking beyond 'Prostitution'", *African Studies* 61(1): 99-120.
- Kay, A.C., C.S. Wheeler, J.A. Bargh & L. Ross** (2004), "Material Priming: The Influence of Mundane Physical Objects on Situational Construal and Competitive Behavioral Choice", *Organizational Behavior and Human Decision Processes* 95: 83-96.
- Kelly, R.J., R. Gray, N. Sewankambo, D. Serwadda, F. Wabwire-Mangen, T. Lutalo & M.J. Wawer** (2003), "Age Differences in Sexual Partners and Risk of HIV-1 Infection in Rural Uganda", *Journal of Acquired Immune Deficiency Syndrome* 32: 446-451.
- Kiddugavu, M., F. Makumbi, M. Wawer, D. Serwadda, N. Sewankambo, F. Wabwire-Mangen, T. Lutalo, M. Meehan, E. Xianbin, R. Gray & Rakai Project Study Group** (2003), "Hormonal Contraceptive Use and HIV-1 Infection in a Population-Based Cohort in Rakai, Uganda", *AIDS* 17(2): 233-240.
- Khobotlo, M., R. Tshello, J. Nkonyana, M. Ramoseme; M. Khobotle, A. Chitoshia, M. Hildebrand & N. Fraser** (2009), *Lesotho: HIV Prevention Response and Modes of Transmission Analysis*, Maseru, Lesotho: National AIDS Commission.

- Kohler, H.P., J.R. Behrman & S.C. Watkins** (2001), "The Density of Social Networks and Fertility Decisions: Evidence from South Nyanza District, Kenya", *Demography* 38(1): 43-58.
- Kohler, H.-P., J. Behrman & S. Watkins** (2007), "Social Networks and HIV/AIDS Risk Perceptions". *Demography*, 44 (1), 1-33.
- Lagarde, E., M. Caraël, J.R. Glynn, L. Kanhonou, S.C. Abega, M. Kahindo, R. Musonda, B.H. Auvert & A. Buvé** (2001), "Educational Level is Associated with Condom Use within Non-Spousal Partnerships in Four Cities of sub-Saharan Africa", *AIDS* 15(11): 1399-1408.
- Liberman, V., S.M. Samuels & L. Ross** (2004), "The Name of the Game: Predictive Power of Reputations versus Situational Labels in Determining Prisoner's Dilemma Game Moves, *Personality and Social Psychology Bulletin* 30: 1175-85.
- Macaluso, M., M. Demand, L. Artz & E.W. Hook** (2000), "Partner type and condom use", *AIDS* 14(5): 537-546.
- Maharaj, P.** (2001), "Obstacles to negotiating dual protection: Perspectives of men and women", *African Journal of Reproductive Health* 5: 150-161.
- Maharaj, P., & J. Cleland** (2004), "Condom Use within Marital and Cohabiting Partnerships in Kwazulu-Natal, South Africa", *Studies in Family Planning* 35(2): 116-124.
- Mekonnen, Y., S. Bradley, M. Malkin & K. Hardee** (2004), *Country Analysis of Family Planning and HIV/AIDS: Ethiopia*, Washington DC: The POLICY Project.
- Mngadi S., N. Fraser, H. Mkhathshwa, T. Lapidos, T. Khumalo, S. Tsela, N. Nhlabatsi & H. Odido** (2009), *Swaziland: HIV prevention response and modes of transmission analysis*, Mbabane, Swaziland: National Emergency Response Council on HIV/AIDS.
- Morrioni, C., J. Smit, L. McFadyen, M. Mqhayi & M. Beksinska** (2003), "Dual protection against sexually transmitted infections and pregnancy in South Africa", *African Journal of Reproductive Health* 7: 13-19.
- Muhwava, W.** (2004), "Condom Use within Marriage and Consensual Unions in the Era of HIV/AIDS in Zimbabwe", *African Population Studies* 19(1): 119-141.
- Norman, L.R.** (2003), "Predictors of Consistent Condom Use: A Hierarchical Analysis of Adults from Kenya, Tanzania and Trinidad", *International Journal of STD & AIDS* 14: 584-590.
- Parsitau, D.S.** (2009), "Keep holy distance and abstain till he comes: Interrogating a Pentecostal Church's engagements with HIV/AIDS and the youth in Kenya". *Africa Today* 56: 45-54.
- Pogrebin, L.C.** (1987), "Competing with Women", in: V. Miner & H.E. Longino (eds.), *Competition: A Feminist Taboo*, New York: Feminist Press.
- Rogers, E.M.** (1995), *Diffusion of Innovations*, 5th ed., New York: Free Press.
- Schelling T.C.** (1971), "Dynamic Models of Segregation", *Journal of Mathematical Sociology* 1: 143-186.
- Schelling, T.C.** (1978), *Micromotives and Macrobehavior*, New York: Norton.
- Sinding, S.W.** (2005), "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* 31(1): 38-40.
- Smith, D.J.** (2007), "Modern Marriage, Men's Extramarital Sex, and HIV-Risk in Southeastern Nigeria", *American Journal of Public Health* 97: 997-1005.
- Smith, K.P., & S.C. Watkins** (2005), "Perceptions of Risk and Strategies for Prevention: Responses to HIV/AIDS in Rural Malawi", *Social Science & Medicine* 60: 649-660.
- Tavory, I., & A. Swidler** (2009), "Condom Semiotics: Meaning and Condom use in rural Malawi", *American Sociological Review* 74(2): 171-189.
- Tawfik, L.** (1993), *Soap, Sweetness, and Revenge: Patterns of Sexual Onset and Partnerships amidst AIDS in Rural Southern Malawi*, unpublished Ph.D Dissertation, Bloomberg School of Public Health, Johns Hopkins University, Baltimore MD.
- Tawfik, L., & S.C. Watkins** (2007), "Sex in Geneva, Sex in Lilongwe, and Sex in Balaka", *Social Science & Medicine* 64 (5): 1090-1101.
- Thaler, R.H., & C.R. Sunstein** (2008), *Nudges: Improving Decisions about Health, Wealth, and Happiness*, New Haven CT: Yale University Press.

- Thomsen, S.C., M. Stalker, C. Toroitich-Ruto, B.M. Ndugga & P. Mwarogo** (2004), "Fifty Ways to Leave your Rubber: How Men in Mombasa Rationalize Unsafe Sex", *Sexually Transmitted Infections* 80: 430-434.
- Trussell, J., A.M. Lalla, Q.V. Doan, E. Reyes, L. Pinto, & J. Gricar** (2009), "Cost Effectiveness of Contraceptives in the United States", *Contraception* 79: 5-14.
- UNAIDS & WHO** (2007), *AIDS Epidemic Update*. Geneva: UNAIDS/WHO.
- UNAIDS & WHO** (2009), *UNAIDS Annual Report 2008: Towards Universal Access*. Geneva: UNAIDS/WHO.
- Vanberg, V.J.** (2002), "Rational Choice vs. Program-Based Behavior: Alternative Theoretical Approaches and Their Relevance for the Study of Institutions", *Rationality and Society* 14: 7-54.
- Varga C.A.** (1997), "The condom conundrum: barriers to condom use among commercial sex workers in Durban, South Africa", *African Journal of Reproductive Health* 1 :74-88.
- Versteeg, M., & M. Murray** (2008), "Condom Use as Part of a Wider HIV Prevention Strategy: Experiences from Communities in the North West Province, South Africa", *Journal of Social Aspects of HIV/AIDS* 5(2): 83-93.
- Wabwire-Mangen F., M. Odiit, W. Kirungi, D.K. Kisitu, J.O. Wanyama** (2009), *Uganda: HIV modes of transmission and prevention response analysis*, Kampala: Uganda National AIDS Commission.
- Watkins, S.C.** (2004), "Navigating the AIDS epidemic in rural Malawi", *Population and Development Review* 30(4): 673-705.
- Watkins, S., P. Behrman, H.-P. Kohler & E.M. Zulu** (2003), "Introduction to 'Research on Demographic Aspects of HIV/AIDS in Rural Africa'", *Demographic Research* SC1(1): 1-30.
- Westercamp, N., C.L. Matsson, M. Madonia, S. Moses, K. Agot, J.O. Ndinya-Achola, E. Otieno, N. Ouma & R.C. Bailey** (2010), "Determinants of Consistent Condom Use Vary by Partner Type among Young Men in Kisumu, Kenya: A Multi-Level Data Analysis", *AIDS and Behavior* 14(4): 949-959.
- Zellner, S.L.** (2003), "Condom Use and the Accuracy of AIDS Knowledge in Côte d'Ivoire", *International Family Planning Perspectives* 29(1): 41-47.

Table 1. Summary statistics for the variables in the models, waves 1996 and 1999

	Men		Women	
	1996	1999	1996	1999
<i>N</i>	521	564	652	676
<i>Comfortable suggesting CU to spouse</i>	26.9	27.7	28.5	29.9
<i>Age</i> ¹	42.6 (12.9)	43.5 (13.4)	31.3 (8.0)	31.4 (8.6)
<i>Educational level</i>				
Never attended school	10.0	8.1	19.6	15.4
Primary	59.1	57.1	66.3	70.1
Secondary or more	30.9	34.8	14.1	14.5
<i>Monogamous marriage</i>	66.0	68.4	61.4	62.6
<i>Religion</i>				
Catholic	23.4	21.6	22.7	20.1
Protestant	64.5	69.5	67.6	73.1
Others	12.1	8.9	9.7	6.8
<i>Suspects of infidelity</i>	12.5	8.7	32.8	30.2
<i>Wants no more children</i>	27.4	31.6	35.6	38.0
<i>Uses other modern contraceptive methods</i>	12.5	9.0	13.2	17.0
<i>Acceptable for a woman to divorce an unfaithful man</i>	63.0	77.8	60.6	71.7
<i>Prop. of NP who support CU for HIV prevention</i>				
Half or less	72.5	80.3	68.2	82.7
More than half	10.2	10.8	8.3	7.1
No AIDS network	17.3	8.9	23.5	10.2
<i>Prop. of NP who use condoms as contraception</i>				
Less than half	66.4	77.3		
Half or more	9.2	5.0		
No FP network	24.4	17.7		
<i>Prop. of NP who use modern contraception</i>				
Half or less	44.5	59.1	44.2	60.5
More than half	30.5	23.2	37.9	28.1
No FP network	25.0	17.7	17.9	11.4
<i>Prop. of NP who accept modern contraception</i>				
Half or less	34.9	27.2	31.9	22.5
More than half	40.1	55.1	50.2	66.1
No FP network	25.0	17.7	17.9	11.4

¹ Since Age is a continuous variable, the mean and the standard error are shown in parentheses, instead of percentages.

The abbreviations CU and NP stand for condom use and network partners, respectively.

Table 2. Description of the networks

	Men		Women	
	1996	1999	1996	1999
<i>Family planning network</i>				
<i>N</i>	521	564	644	674
Uncensored size	5.09	6.49	4.47	5.21
	(6.02)	(6.95)	(4.73)	(5.24)
Proportion with at least one network partner	0.76	0.82	0.82	0.89
N (only those with one network partner at least)	391	464	531	598
Censored size	3.18	3.39	3.09	3.23
	(1.00)	(0.90)	(1.02)	(1.00)
Proportion with a censored network in which:				
All network partners are men	0.71	0.69		
All network partners are women			0.85	0.87
All network partners are respondent's confidants or friends	0.81	0.86	0.76	0.88
<i>AIDS network</i>				
<i>N</i>	521	559	643	674
Uncensored size	6.61	9.22	4.91	6.36
	(8.02)	(10.23)	(6.07)	(7.05)
Proportion with at least one network partner	0.83	0.91	0.77	0.90
N (only those with one network partner at least)	431	511	493	604
Censored size	3.28	3.59	3.10	3.31
	(0.96)	(0.77)	(1.05)	(0.99)
Proportion with a censored network in which:				
All network partners are men	0.50	0.45		
All network partners are women			0.64	0.63
All network partners are respondent's confidants or friends	0.79	0.90	0.73	0.86
At least one network partner is part of the FP network	0.35	0.38	0.35	0.19

Table 3. Multivariate logit regression of feeling comfortable suggesting CU to spouse, men and women, 1996-1999

	Men			Women	
	Model 1	Model 2	Model 3	Model 2	Model 3
<i>Age</i>	-0.028*** (0.009)	-0.030*** (0.008)	-0.026*** (0.008)	-0.013 (0.010)	-0.012 (0.010)
<i>Educational level: Never attended school (ref)</i>					
Primary schooling	0.558 (0.371)	0.629* (0.362)	0.613 (0.376)	0.342* (0.202)	0.318 (0.202)
Secondary schooling	0.925** (0.387)	0.930** (0.382)	0.968** (0.396)	0.544** (0.250)	0.515** (0.250)
<i>Monogamous marriage</i>	-0.137 (0.186)	-0.159 (0.190)	-0.181 (0.188)	0.143 (0.141)	0.127 (0.142)
<i>Religion: Catholic (ref)</i>					
Protestant	0.461** (0.198)	0.432** (0.198)	0.392* (0.203)	0.194 (0.172)	0.203 (0.172)
Others	0.319 (0.351)	0.283 (0.345)	0.265 (0.340)	0.399 (0.267)	0.401 (0.272)
<i>Suspects of infidelity</i>	0.948*** (0.226)	0.931*** (0.229)	0.921*** (0.222)	0.782*** (0.132)	0.776*** (0.133)
<i>Wants no more children</i>	0.380* (0.201)	0.233 (0.202)	0.152 (0.200)	0.136 (0.152)	0.108 (0.153)
<i>Uses other modern contraceptive methods now</i>	(0.066) (0.257)	(0.074) (0.266)	0.129 (0.262)	-0.045 (0.181)	-0.054 (0.179)
<i>Acceptable for a woman to divorce an unfaithful man</i>	0.275 (0.171)	0.282 (0.172)	0.206 (0.167)	-0.046 (0.142)	-0.061 (0.142)
<i>Has ever talked to spouse about AIDS</i>	0.645*** (0.229)	0.558** (0.227)	0.489** (0.225)	0.556*** (0.150)	0.547*** (0.149)
<i>Proportion of NP who support CU for HIV prevention¹: Half or less (ref)</i>					
More than half	0.200 (0.219)	0.274 (0.214)	0.248 (0.221)	0.265 (0.225)	0.266 (0.226)
Has no AIDS network	-0.453 (0.336)	-0.492 (0.335)	-0.441 (0.323)	-0.127 (0.203)	-0.121 (0.204)
<i>Proportion of NP who use condoms for contraception: Less than half (ref)</i>					
Half or more	1.630*** (0.257)				
Has no Family-Planning network	-0.551** (0.251)				
<i>Proportion of NP who use modern contraception</i>					
Half or less (ref)					
More than half		0.879*** (0.162)		0.346** (0.140)	
Has no Family-Planning network		-0.425* (0.253)		-0.304 (0.226)	
<i>Proportion of NP who accept modern contraception</i>					
Half or less (ref)					
More than half			1.013*** (0.183)		0.537*** (0.154)
Has no Family-Planning network			-0.129 (0.280)		-0.088 (0.244)
<i>Constant</i>	-1.767*** (0.664)	-1.728*** (0.657)	-2.050*** (0.672)	-1.836*** (0.436)	2.037*** (0.441)
<i>N</i>	1094	1085	1093	1318	1320

* significant at 10%; ** significant at 5%; *** significant at 1%

Clustered standard errors in parentheses

¹ The abbreviations CU and NP stand for 'condom use' and 'network partners', respectively

Table 4. (Male) Panel analysis (linear probability and logit models) with fixed effects of feeling comfortable suggesting CU to the spouse, 1996-1999

	Model 4		Model 5		Model 6	
	LPM	Logit M	LPM	Logit M	LPM	Logit M
<i>Monogamous marriage</i>	-0.001 (0.072)	0.077 (0.552)	-0.019 (0.072)	-0.473 (0.592)	0.009 (0.071)	-0.210 (0.579)
<i>Suspects of infidelity</i>	0.131* (0.064)	1.124** (0.490)	0.133* (0.063)	1.176** (0.529)	0.130* (0.063)	0.875* (0.497)
<i>Wants no more children</i>	0.004 (0.056)	0.039 (0.397)	-0.009 (0.056)	0.107 (0.427)	-0.034 (0.056)	-0.105 (0.418)
<i>Uses other modern contraceptive methods</i>	-0.046 (0.064)	-0.572 (0.484)	-0.125* (0.065)	-1.276 (0.541)	-0.098 (0.063)	-0.764 (0.486)
<i>Acceptable for woman to divorce an unfaithful man</i>	0.073* (0.044)	0.606* (0.352)	0.063 (0.043)	0.371 (0.369)	0.058 (0.043)	0.478 (0.369)
<i>Has ever talked to spouse about AIDS</i>	(0.061)	0.939* (0.564)	0.062 (0.058)	0.724 (0.546)	(0.046)	(0.736) (0.559)
<i>Proportion of NP who support CU for HIV prevention: Half or less (ref)</i>						
More than half	0.019 (0.073)	-0.209 (0.514)	0.042 (0.071)	-0.037 (0.530)	0.038 (0.072)	-0.153 (0.529)
Has no AIDS network	0.015 (0.071)	0.558 (0.625)	0.017 (0.070)	0.49 (0.624)	0.005 (0.070)	0.307 (0.633)
<i>Proportion of NP who use condoms for contraception: Less than half (ref)</i>						
Half or more	0.220** (0.080)	1.329** (0.626)				
Has no Family-Planning network	-0.086* (0.058)	-0.932* (0.541)				
<i>Proportion of NP who use modern contraception</i>						
Half or less (ref)						
More than half			0.212*** (0.049)	1.602*** (0.460)		
Has no Family-Planning network			-0.058 (0.058)	-0.717 (0.574)		
<i>Proportion of NP who accept modern contraception</i>						
Half or less (ref)						
More than half					0.202*** (0.047)	1.233*** (0.381)
Has no Family-Planning network					-0.009 (0.061)	-0.443 (0.592)
<i>Year</i>	-0.006 (0.010)	-0.061 (0.076)	-0.001 (0.010)	-0.043 (0.081)	-0.014 (0.009)	-0.140* (0.081)
N	818	234	812	230	818	234

* significant at 10%; ** significant at 5%; *** significant at 1%

Standard errors in parentheses

Table 5. (Women) Panel analysis (linear probability and logit models) with fixed effects of feeling comfortable suggesting condom use (CU) to the spouse, 1996-1999

	Model 5		Model 6	
	LPM	Logit M	LPM	Logit M
<i>Monogamous marriage</i>	0.020 (0.082)	-0.145 (0.617)	0.014 (0.083)	-0.228 (0.625)
<i>Suspects of infidelity</i>	0.184*** (0.046)	1.298*** (0.346)	0.186*** (0.046)	1.364*** (0.350)
<i>Wants no more children</i>	0.031 (0.048)	0.242 (0.357)	0.039 (0.048)	0.251 (0.357)
<i>Uses other modern contraceptive methods</i>	-0.063 (0.059)	-0.521 (0.377)	-0.071 (0.060)	-0.599 (0.383)
<i>Acceptable for a woman to divorce an unfaithful man</i>	-0.027 (0.041)	-0.047 (0.277)	-0.024 (0.041)	-0.078 (0.279)
<i>Has ever talked to spouse about AIDS</i>	0.068 (0.051)	0.450 (0.348)	0.073 (0.051)	0.513 (0.353)
<i>Proportion of NP who support CU for HIV prevention</i>				
Half or less (ref)				
More than half	0.049 (0.070)	0.514 (0.491)	0.049 (0.070)	0.435 (0.496)
Has no AIDS network	-0.012 (0.059)	-0.008 (0.496)	0.000 (0.059)	0.088 (0.491)
<i>Proportion of NP who use modern contraception</i>				
Half or less (ref)				
More than half	-0.022 (0.044)	-0.024 (0.287)		
Has no Family-Planning network	0.014 (0.067)	0.054 (0.581)		
<i>Proportion of NP who accept modern contraception</i>				
Half or less (ref)				
More than half			0.019 (0.048)	0.337 (0.352)
Has no Family-Planning network			0.013 (0.069)	0.118 (0.590)
<i>Year</i>	0.000 (0.010)	0.027 (0.069)	0.000 (0.010)	0.022 (0.069)
N	919	286	922	290

* significant at 10%; ** significant at 5%; *** significant at 1%

Standard errors in parentheses