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Factors Affecting Condom Use in Primary Sexual Relationships in Southern and Eastern Africa

By
Thomas Pullum (1), John Cleland (2), and Iqbal Shah (3)

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(1) Department of Sociology, The University of Texas, Austin, Texas, 78712, USA, tom.pullum@mail.utexas.edu
(2) Centre for Population Studies, London School of Hygiene and Tropical Medicine, 49-51 Bedford Square, London WC1B 3DP, UK, John.Cleland@lshtm.ac.uk
(3) Department of Reproductive Health and Research, World Health Organization, 1211 Geneva 27, Switzerland, shahi@who.int

Abstract

This paper uses data collected in Kenya, South Africa, Tanzania, Uganda, Zambia, and Zimbabwe in 1999 as part of a World Health Organization (WHO) initiative to investigate how couples in countries ravaged by the HIV pandemic perceive and manage the dual risks of unintended pregnancy and HIV/STI infection. In stable relationships, factors that hypothetically favor condom use include the desire to stop childbearing, a subjective sense of HIV risk, and positive attitudes toward family planning and condoms. We find that condom use is strongly associated with a favorable attitude toward condoms and with a subjective sense of HIV risk, but it is not associated with a motivation to limit or space births. A favorable attitude toward family planning and a favorable attitude toward condoms are strongly associated, perhaps implying a potential for dual use of the condom in the future, but there is little evidence of dual use at present.

1. Introduction

In Europe and the Americas, the condom has long history of use as a method to reduce the risks of unintended pregnancies or sexually transmitted infections—or to reduce both risks simultaneously. This ambiguity of function made it a common method of contraception when it was available for the ostensible purpose of disease prevention, and other family planning methods were unavailable or were illegal. In the 1960s and 1970s, its widespread familiarity and legitimation in several countries as a family planning method—although generally not one of the most popular or effective methods—has often facilitated its acceptability as a method to prevent infections.

By contrast, in most of Sub-Saharan Africa, the condom was not well established as a family planning method prior to the early 1980s. Indeed, at that time there was little acceptance of the concept of family planning in this region, let alone any specific methods. There was little evidence in nascent family planning programs that the condom was—or would become—a popular method. Couples, and particularly men, wanted large families. Vasectomy and condoms, the only male methods, were regarded as a threat to male sexuality.

During the 1980s and especially the 1990s, the condom was increasingly promoted in this region as a method to reduce the risk of HIV and other sexually transmitted infections. It was included on the roster of family planning methods, but the ambiguity of function may have worked against its acceptability for family planning. The use of condoms to prevent infection implies that at least one of the partners is concerned with the risk of infection, and the degree of trust between partners becomes a crucial determinant of condom use.

This paper will examine the use of condoms within primary sexual relationships, as described in a set of surveys conducted in 1999 in Kenya, South Africa, Tanzania, Uganda, Zambia, and Zimbabwe with the support of the World Health Organization. We will try to identify the major preconditions or pathways to condom use, and also to clarify the dual or ambiguous function of condoms as a method of family planning or a method for disease prevention—or both at the same time.

Substantial progress has been made in understanding the dynamics of condom use outside of marriage, both with commercial sex workers and with short-term partners. What is less well-documented are the dynamics within marriage that both prevent condom use and provide opportunities for introducing condoms as a form of family planning and/or STI prevention. By focusing on respondents who are married or in stable relationships, this study provides an opportunity to understand the potential for condom use within these relationships. Married women are among the most vulnerable to HIV infection but are the least able to negotiate condom use with their partners. Increasing the use of condoms among infected married men and women is imperative to prevent further spread of the disease.

Some relevant information about these six countries, from the Population Reference Bureau's World Population Data Sheet for 2003, is given below.

Country	Estimated Population in 2003 (millions)	Percent urban	Percent contracepting among married women 15-49	HIV prevalence circa 2001, ages 15-49
Kenya	31.6	20%	39%	15%
South Africa	44.0	53%	56%	20%
Tanzania	35.4	22%	25%	8%
Uganda	25.3	12%	22%	5%
Zambia	10.9	36%	34%	16%
Zimbabwe	12.6	32%	54%	34%

2. Data and methods

The WHO surveys of family planning and sexual behavior

The recent increases in contraceptive use in Eastern and Southern Africa are taking place in the context of a high prevalence of HIV/STIs. It is argued that family planning programs as well as HIV/STI control programs need to change to effectively address the needs of people for family planning and sexual health. In 1999, six surveys were conducted as part of a WHO initiative on "Family Planning and Sexual Behavior in the era of HIV/STDs: A Multi-Country Study" (see World Health Organization, 2000 for some related discussion). The participating countries were Kenya, South Africa, Tanzania, Uganda, Zambia, and Zimbabwe. These countries were selected because of a high prevalence of HIV combined with the increasing levels of contraceptive use, with profound implications for individuals, services, programs, and policies to reduce the twin risks of unintended pregnancy and HIV/STI infection. The overall aim of the project was "to inform policy makers and program managers by providing insights into the perspectives and behavior of sexually active men and women with respect to HIV/STD and reproductive intentions." In addition to a survey, each participating country conducted a series of focus groups and in-depth interviews. Those data are not included in the present paper. After editing, there were a total of 8500 respondents in the six surveys.

The study envisaged covering an urban and a rural population selected in one district from each of the participating countries. The study districts were chosen on the basis of their relatively high contraceptive use rates, their importance as foci of the HIV epidemic, and the contiguity of suitable urban and rural study sites. The urban site was to be a town or city with 50,000 to 200,000 inhabitants and the rural site was to be near the urban site. The estimated prevalence of current use of modern contraception was to be at least 10%. Within each urban and rural site, four wards (or other large sub-district locations) were chosen and then five smaller areas were selected within those wards. This multi-stage design used simple random sampling at each stage. The selected households were visited and a household listing identified the eligible respondents for structured interview. An eligible respondent was a woman aged 18-39 years or a man aged 20-49 years. For a subset of respondents with a co-resident partner, the partner was also interviewed.

The initial design planned for approximately equal numbers of respondents in each of the four possible combinations of residence (urban/rural) and sex (male/female). The Zambian survey was an exception in that it did not include a rural component. There are thus 22 combinations of country, residence, and sex. Unless noted otherwise, the results will be weighted to give equal importance to these 22 "sectors". Without weights, the relative importance of each sector in a pooled analysis would be arbitrary. Even with weights, we do not suggest that the statistics are estimates for a well-defined population, but they do give equal importance to males and females, to urban and rural respondents, and to the six countries (although Zambia, which also happens to be the country with the smallest population, has half the weight of the other countries because of the omission of rural sectors).

The sub-group of interest is sexually active persons who are married or cohabiting, comprising the great majority of the respondents in all six countries. Such respondents reported having a "regular" partner. Few respondents have more than one regular partner. There were a total of 6829 respondents (males or females) with a regular partner

The interviewing of a subset of co-resident partners was an unusual and valuable feature of the study design. It allows us to link partners' reports of behaviors, attitudes, and other characteristics in a "couples" file. The data for Zimbabwe unfortunately omitted the identification codes necessary for linking partners. Therefore the couples' file has nine "sectors", for urban and rural couples in Kenya, South Africa, Tanzania, and Uganda, and urban couples in Zambia. There were a total of 1245 linked co-resident couples.

Appendix tables A1 and A2 give more detail about the distributions of the cases.

Overview of an integrated model for family planning and HIV protection

The data we shall employ may help to distinguish the dual—or ambiguous—functions of the condom. They include questions about motivations, attitudes, and discussion with the partner related to family planning and the condom, and parallel questions about motivations, attitudes, and discussion with the partner related to protection from the risk of HIV infection.

We postulate certain preconditions for condom use. Those preconditions serve as intervening variables that influence the relationship between other explanatory variables and the main outcome variable. We will identify differences in the degree to which the preconditions are satisfied by using them as dependent variables in logit regressions.

In a pathway to the use of any family planning method, an essential precondition is the desire to delay or terminate childbearing, at least with the current partner. The surveys include specific questions on the importance of regulating future fertility. Similarly, a precondition for condom use to reduce the risk of HIV (or other STI) infection is a subjective sense of risk of infection. These are the potential motivations for using condoms.

Another precondition for using any family planning method is a favorable attitude toward the concept of family planning. In Sub-Saharan Africa, support for this concept is increasingly favorable but remains mixed.

Finally, the use of condoms for either purpose requires a favorable attitude toward this specific method of intervention. Condoms can be disliked for many reasons, ranging from an alleged reduction of sexual pleasure to an implied mistrust of one's partner. The issue of trust is particularly important for condom use within a long-term relationship.

Another kind of precondition is discussion with the partner. The surveys include questions about communication regarding family planning, HIV risk, and the acceptability of condoms. They were used in an earlier analysis of the Kenya data (Pullum, Shah, Cleland, and Bauni, 2003), but data about communication will not be used in the present analysis. The condom, a male method,

is virtually impossible to use without the partner's knowledge or without some minimal amount of discussion. Very few users of condoms report that they have not discussed it, and there is obvious endogeneity in its relationship to condom use. To a lesser degree, the same can be said about the other kinds of discussion, so we have chosen to simplify this analysis by omitting those data. The list of preconditions could be expanded to include information and access, but they do not appear to be problematic in the study sites.

The intervening variables therefore consist of motivations and attitudes. These may be argued to be necessary preconditions, but they are certainly not sufficient to result in use. Men and women may have conflicting intentions or may not accurately perceive the preference of their partner. It is also difficult to assess the strength of a stated intention or attitude. Some people may believe they have a risk of contracting HIV infection, but may have a fatalistic attitude and not change their behavior.

We hesitate to regard the intervening variables as causes of condom use, even though we have referred to them as preconditions. Our goal is to identify potential barriers to recognizing risks and developing successful strategies to reduce those risks. If some intervening variables are more strongly associated with a desired outcome, then programs and policies that focus on those variables may be justified.

Our analyses will include a fixed set of explanatory variables. Country of residence is a proxy for many unmeasured covariates that tend to have different levels and distributions in the various countries. Type of place of residence (urban, rural) is also associated with a number of unmeasured socio-economic characteristics, including traditionalism, access to resources, etc. Sex of respondent is obviously relevant to all aspects of family formation and reproductive health; it also indicates major differences in power and control. Age (<25, 25-29, 30+) can be interpreted as an indicator of either cohort or position in the life course. Level of education (none or primary; some secondary or above) represents socio-economic status, access to schooling, and exposure to modern ideas, as well as the formal content of education.

Three other variables are regarded more as controls than as explanatory variables, although the distinction is not sharp. "Pregnant" is coded 1 (otherwise 0) if a woman believes she is pregnant or if a man believes his partner is pregnant. It is strongly predictive of current non-use of contraception *other than condoms*. Pregnant women are very unlikely to use a method for family planning, but they may be motivated to use condoms to reduce the risk of infection. "Hasnr" is another binary (0/1) variable that identifies respondents who have a "non-regular" partner, that is, another sexual relationship that is relatively short-term. It indicates a secondary risk of HIV infection and suggests a motivation to use condoms with the regular partner. "Has3kids" is coded 1 (otherwise 0) if the respondent has had three or more surviving children with the partner. It is a strong predictor of a desire to stop childbearing, and it is a strong predictor of current use of contraception even if stated desire for more children is also included as a predictor. The distributions of the explanatory and control variables are given in appendix table A3.

The following simple diagram summarizes our model:

Explanatory variables:	Intervening variables:	Outcome variables:
Country of residence	Motivation to regulate fertility	Condom use, whether for
Urban/rural residence	Subjective sense of HIV risk	fertility regulation,
Sex	Attitude toward family planning	HIV/STI risk reduction,
Age	Attitude toward condoms	or both (dual protection)
Education		
	Control variables:	
	Having a regular partner	
	Whether pregnant	
	Whether has 3+ children	

We are interested in learning how the intervening and outcome variables are related to the explanatory variables, taking into account the control variables, and in the degree to which the final outcome, condom use, is associated with the intervening variables.

3. Reported use of condoms for family planning and/or HIV protection

This section will give an overview of the use of condoms as measured by the WHO surveys. The three most useful indicators are

EverUsed: q703, Ever used condom with primary partner
Current: q411f, Condom is currently being used with primary partner
Frequent: q70401, Uses condom always or occasionally with primary partner

All three items refer specifically to condom use with the primary partner. Question q411f refers to condoms within the context of family planning, but questions q703 and q704 are not specific as to whether the purpose was family planning. Both questions q703 and q704 refer to ever-use rather than current use, but q704 attempts to be more precise than ever use. The possible categories of q704 are "always", "occasionally", "at the beginning," and "never". (The two intermediate terms are admittedly subjective.) We have constructed a binary version, q70401, which is coded 1 if the responses to q704 are "always" or "occasionally", and 0 if "at the beginning" or "never". This indicator will play a major role in our analysis. It is preferred to q411f because of internal evidence of misreporting of q411f, especially by males, and because it is neutral with respect to the purpose of use.

Overall, about 30% of respondents (weighted) reported ever-use, 18% reported current use, and 24% reported frequent use. Table 1 gives the percentages of respondents in each sector who reported each type of use. Some of the percentages appear problematic, but are presented because they may alert the reader to potential biases in the data. In some contexts, there may have been a misinterpretation of whether a question referred to ever-use with anyone, or with the primary partner; and whether it referred to use for family planning, or for some other purpose.

Table 1. Percentage of respondents who report different types of condom use (weighted)

vcountry_by_place_by_sex	EverUsed	Current	Frequent
Kenya Urban Males	23.9	5.1	21.0
Kenya Urban Females	19.7	2.2	14.5
Kenya Rural Males	22.8	7.6	16.5
Kenya Rural Females	12.9	1.7	11.6
SA Urban Males	36.1	32.3	24.8
SA Urban Females	39.3	8.7	31.3
SA Rural Males	11.2	21.6	8.0
SA Rural Females	12.6	5.2	11.1
Tanz. Urban Males	27.4	49.1	23.4
Tanz. Urban Females	33.8	19.4	27.9
Tanz. Rural Males	13.4	34.2	13.4
Tanz. Rural Females	20.9	17.1	17.1
Uganda Urban Males	30.6	17.8	23.3
Uganda Urban Females	31.5	5.6	21.8
Uganda Rural Males	25.3	21.5	21.1
Uganda Rural Females	14.2	3.1	11.0
Zambia Urban Males	48.0	32.3	42.2
Zambia Urban Females	38.1	17.7	31.5
Zimb. Urban Males	74.9	62.3	65.0
Zimb. Urban Females	39.7	5.2	36.3
Zimb. Rural Males	45.0	24.2	32.2
Zimb. Rural Females	30.5	3.1	24.2
Urban	36.9	21.5	30.3
Rural	20.9	13.9	16.6
Male	32.6	28.0	26.5
Female	26.6	8.1	21.7
Total	29.6	18.0	24.1

Reported levels of condom use tend to be higher in urban areas than in rural areas, and higher for males than for females. Apart from sampling variation, we would expect men's and women's levels of current use, and of ever-use with the primary partner, to be fairly close. The sex differential, which is most pronounced for current use, may be due to over-reporting by men, but it is also possible that some women under-report it because it is a male method.

4. Motivations and attitudes related to the use of condoms

Desire to control fertility (vfpmotive)

The primary motivation for using family planning is of course the desire to delay or prevent future childbearing, at least with the primary partner. This is measured with a categorical variable called vfpmotive, based on the responses to q313 ("Would you like to have a/another child … or would you prefer not to have any [more] children?") and q314 ("How much would it matter if you did have another child?"). It is 0, the reference category, if the respondent wants more children. It is coded 1 if the respondent is undecided or another child would not matter much, or 2 if another child would matter somewhat or very much.

More detailed measures have been checked, taking into account the desired length of time until the next birth and distinguishing between whether having another child would matter "somewhat" or "very much." These alternatives lead to small categories and unstable estimates, and will not be used here. Overall, a majority of respondents want more children. There are significant differences across the sectors, but the main difference is that rural women are more likely than other types of respondents to equivocate, and be unsure about their intentions.

There are substantial differences across age groups. With increasing age, there is a steady decrease in the percentage wanting more and a corresponding increase in the percentage for whom it would matter somewhat or much if they had a unplanned child. The age gradient can be traced to the relationship with number of children. As expected, respondents with more children are less likely to want to continue childbearing.

Perceived risk of HIV infection (vhivchance)

The survey included several questions (q601 to q627) about knowledge of AIDS, concern about risk, and behaviors to reduce risk. Corresponding to vfpmotive, which measures the motivation to control fertility, we have constructed a variable called vhivchance, which is a subjective indicator of the risk of HIV infection. It is constructed from the responses to q606 ("Before today, have you ever thought about your own chance of contracting HIV/AIDS?"), q607, ("Considering all things, do you consider your chance of getting HIV to be high, medium, low, or no chance at all?"), and q611 ("During your relationship with <name> have you ever been concerned that you might contract AIDS from him/her? If YES, very or somewhat concerned?").

A constructed variable, named vhivchance, appears to efficiently combine the three responses. It is coded 0, the reference category, if the respondent responds "No" to q606. It is coded 1 if the sum of responses to q607 and q611 is low and 2 if the sum is high.

Favorable attitude toward family planning (vfpatt)

It is unlikely that someone will use a family planning method if they do not approve in principle of the use of methods to delay or prevent future births. Approval is not sufficient, but under most circumstances it is a necessary precondition for use.

The questionnaire included a series of statements related to family planning attitudes, q419 through q425, for which possible responses were “agree”, “mixed / no opinion”, or “disagree.” For our purposes it is sufficient to focus on two items, q419 (“It is acceptable for a couple to use a method to space between births”) and q420 (“It is acceptable for a couple to use a method to have no more children”). These two statements have the closest parallel to the questions about motivation to use family planning and they focus on the use of family planning by regular partners.

The great majority of respondents approve of family planning for both purposes. Of those who approved for one purpose but not the other, the greater approval was for spacing rather than terminating childbearing. A constructed variable, vfpatt, is coded 0 (the reference category) for "disagree" or "mixed" responses about both spacing and stopping; 1 if the respondent agrees with spacing or stopping, but not both; and 2 if the respondent agrees with both spacing and stopping.

Favorable attitude toward condoms (vcondomatt)

The questionnaire included a series of questions, q 708-q717, about specific attitudes related to condoms. Rather than analyze the responses to each of these questions separately, it would be useful to identify a single dimension that ties them together. Based on the addition or subtraction of points for the "agree," "disagree," "acceptable," and "unacceptable" responses to q710-q717, we have constructed a three-category scale called “vcondomatt”. The three groups are approximately equal in size. Category 0, the reference category, is least favorable to the condom, and category 2 is most favorable.

The responses to q710-q717 have excellent scale properties. The scale is correlated with all eight items, most strongly with q714 and q715, both of which specifically concern the use of condoms within marriage and thus are most pertinent for this population.

Overall, 24% of respondents are in the highest category of vfpmotive, 17% in the highest category of vhivchance, 75% in the highest category of vfpatt, and 29% in the highest category of vcondomatt. Table 2 gives the percentage of respondents in each sector who are in the highest category of the four scales.

Table 2. Percentage of respondents in the highest category (coded 2) of each constructed variable (weighted)

vcountry_by_place_by_sex	FPmot2	HIVrisk2	FPatt2	Condomatt2
Kenya Urban Males	33.5	10.5	75.4	16.7
Kenya Urban Females	34.2	18.9	74.1	21.3
Kenya Rural Males	34.9	5.9	71.9	24.9
Kenya Rural Females	28.5	11.3	65.0	15.7
SA Urban Males	8.5	12.2	82.0	31.3
SA Urban Females	18.7	20.7	90.7	52.7

SA Rural Males	1.7	15.2	78.4	30.6
SA Rural Females	9.6	20.9	91.1	36.4
Tanz. Urban Males	26.4	15.9	80.6	14.6
Tanz. Urban Females	11.9	17.6	85.1	11.4
Tanz. Rural Males	9.5	15.6	68.4	13.6
Tanz. Rural Females	15.0	16.3	74.3	11.1
Uganda Urban Males	35.2	15.1	72.1	42.0
Uganda Urban Females	36.8	20.8	79.6	43.2
Uganda Rural Males	30.1	24.7	61.2	41.1
Uganda Rural Females	33.3	22.6	81.1	40.6
Zambia Urban Males	29.1	21.0	66.3	29.4
Zambia Urban Females	37.0	23.7	63.6	24.0
Zimb. Urban Males	26.2	19.9	61.1	48.8
Zimb. Urban Females	18.7	19.9	78.3	39.0
Zimb. Rural Males	21.5	18.2	72.5	31.5
Zimb. Rural Females	18.4	16.3	81.9	23.8
Urban	26.2	18.0	75.7	31.3
Rural	20.4	16.7	74.6	27.0
Male	23.2	15.8	71.8	29.5
Female	23.8	19.0	78.6	29.2
Total	23.5	17.4	75.2	29.3

The associations among these four scales, and their associations with a binary indicator of ever-use of condoms with the primary partner, are given in table 3. Because the scales are ordinal, gamma is used as the measure of association. Table 3 also indicates the statistical significance of the gammas. (For an interpretation of "statistical significance" for these data, please see comments at the beginning of section 5 of the paper.) We have a set of implicit null hypotheses that all these associations are positive in the population. The critical value for a one-tailed .05 level of significance is z=1.65 and for a one-tailed .01 level of significance is z=2.33. Test statistics were calculated with unweighted data.

Of the ten two-way associations in table 3, seven are significantly greater than zero and three are not. The motivation to use family planning is not significantly associated with either the subjective risk of HIV infection or the attitude toward condoms, although it *is* positively associated with a favorable attitude toward family planning. Strikingly, the association between vfpmotive and condom use is significantly different from zero in a *negative* direction.

Four of the associations are relatively strong. A favorable attitude toward condoms is associated with a subjective risk of HIV infection (.178) and a positive attitude toward family planning (.229). Even more strongly, condom use is associated with a subjective sense of HIV risk (.288) and a positive attitude toward condoms (.488).

Thus, table 3 suggests that condom use is not associated with the motivation to use family planning, but it is positively associated with the other three scales, and especially strongly with a

favorable attitude toward condoms. This pattern is an initial indication that family planning and HIV risk reduction tend to be distinct, non-overlapping motivations.

Table 3. Associations among the constructed variables and condom use, measured with gamma (weighted)

	vfpmotive	vhivchance	vfpatt	vcondomatt
vhivchance	.018	x	x	x
vfpatt	.113**	.058**	x	x
vcondomatt	.014	.178**	.229**	x
q70401	-.063##	.288**	.104**	.488**

** significant at one-tailed .01 level
significant at the one-tailed .01 level *in the opposite direction from hypothesized*

5. Agreement between matched partners related to family planning and condoms

This section is based on the dual reports of condom use, and of motivations and attitudes, provided by co-resident partners in Kenya, South Africa, Tanzania, Uganda, and Zambia. Agreement is measured with the gamma coefficient.

Reported use of condoms

Male and female partners generally agreed about condom use. For EverUsed, the weighted gamma was .7694 (z=25.32). For Current, gamma was still higher, .8162 (z=21.99), and for Frequent, gamma was .7564 (z=22.49). These high levels of correspondence help to validate the reports of use and also to verify that the partners have been matched correctly. Disagreements tend to take the form of the man reporting use but the woman not reporting it.

Correspondence between partners' motivations and attitudes

The partners' responses are significantly positively associated on all four scales. The associations are lower than for the behavioral measures of condom use—except for the very high agreement on the motivation for family planning, i.e. the desire to delay or prevent future births. In general, of course, one would expect a closer correspondence for behavior than for motivations or attitudes. The high level of correspondence in the motivation for family planning, i.e. the stated desire to delay or prevent another child, is partly attributable to the salience of this issue. However, much of it can be traced to the strong association between this desire and the number of living children the couple have already had together—which is the same for both partners (except for a small number of discrepancies in the data). And this motivation tends to be low; for 45.1% of all couples, both the man and the woman want more children together.

Table 4. Agreement between co-resident men and women on the four scales. Cell entries in each panel are percentages of couples (weighted to give equal weight to the nine sectors). Note:

Gamma is calculated for the weighted table but the z statistic to test the significance of gamma is calculated with an unweighted version of the table. Sample sizes differ because of differences in nonresponse.

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Motivation for family planning
                        Woman
                   Low  Medium  High
            Low     45     6     7              1134 couples
  Man    Medium     5    10     4              gamma=.71
           High     6     4    15              z=26.19


Subjective risk of HIV infection
                        Woman
                   Low  Medium  High
            Low     21    11    11              1002 couples
  Man    Medium     18    13    10              gamma=.19
           High     5     4     7              z=5.50


Favorable attitude toward family planning
                        Woman
                   Low  Medium  High
            Low      1     1     4              1233 couples
  Man    Medium     2     3    15              gamma=.26
           High     4     9    61              z=4.15


Favorable attitude toward condoms
                        Woman
                   Low  Medium  High
            Low     18    13     9              1167 couples
  Man    Medium     12    12    10              gamma=.22
           High     8    10    10              z=5.85
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For all four scales, when there is disagreement—that is, when the man and woman are not on the main diagonal of a panel of table 4--the woman tends to be higher on the scale. This pattern can be described in terms of the ratio of the number of cases above the main diagonal to the number of cases below the diagonal. In the four panels of table 4, these ratios are 1.09, 1.15, 1.31, and 1.08, respectively. The woman tends to be more favorable to the concept of family planning, in particular, than her partner. A range of 8% to 17% of couples are in maximum disagreement for each scale, with one partner "high" and the other "low".

Partners' attitudes toward and discussion about condoms

The surveys contained a series of very specific questions related to condoms. The responses of co-resident males and females to questions q706 and q709-q717 are cross-tabulated in table 5. q706 asks about discussion with the partner; q709 asks about the relative influence of men and women over condom use, and q710-q717 elicit agreement/disagreement with various attitudinal

statements. The vcondomatt scale was constructed from q710-q717, so table 5 serves largely as a deconstruction of the fourth panel of table 4.

Of all the panels of table 5, there is highest agreement on the first one, about discussion of condoms. Unfortunately, 40% of couples agree that they have *never* discussed condoms, and only 4% agree that they have discussed condoms many times. When there is disagreement about the level of discussion, the man tends to report a higher level than the woman, by a ratio of 1.25. This finding is consistent with some statements by women in focus group discussions that men tend to believe that an issue has been discussed when the man has simply stated his opinion.

The majority of couples (60%) agreed that condoms are effective at preventing pregnancy but joint endorsement of their efficacy at preventing HIV/AIDS was lower (45%). Two of the attitude questions directly addressed condom use within marriage. A wide divergence of attitudes is apparent. One-quarter of matched couples agreed that condom use in marriage is acceptable but an almost equal proportion (23%) concurred that it was unacceptable. Similarly 29% of couples agree that it was acceptable for a married woman to request condom use of her husband but this endorsement was counterbalanced by 20% of couples who agreed that it was unacceptable. Inspection of the off-diagonal cells provides no support for the view that women have more positive views about condom use within marriage than men.

As expected, attitudes to use outside of marriage are very different. Nearly three-quarters of couples agreed that an unmarried woman can ask a partner to use condoms and 63% agreed that condom use is acceptable at the start of a relationship. Nevertheless, 48% of women and 59% of men thought that condoms encouraged promiscuous behavior. There was little agreement within couples on this view (gamma = .08).

The most surprising result in table 5 concerns condom decision-making. It is widely held that the decision whether or not to use condoms rests almost entirely with the man, and much evidence supports this perspective. Yet the results from matched couples in this enquiry give a very different impression. The responses of women fell equally across the three categories: the man has more influence, the woman has more influence, and an intermediate response of equal influence or unsure. The responses of men are tilted more in the expected direction but nevertheless are dispersed across the three categories. Nearly half (47%) thought that influence was equal, or they were unsure, 34% thought the man had more influence and 19% thought that the woman had more influence.

Table 5. Agreement between co-resident men and women on specific items related to condoms. Cell entries in each panel are percentages of couples (weighted to give equal weight to the nine sectors). Note: Gamma is calculated for the weighted table but the z statistic to test the significance of gamma is calculated from an unweighted version of the table. Sample sizes differ because of differences in nonresponse.

q706: Have you and <name> ever discussed using condoms?

Man	Woman: never	once or few	many times	
never	40	10	4	1117 couples
once or few	13	12	5	gamma =.48
many times	6	6	4	z= 12.99

q709: Who usually has the most influence over whether or not to use a condom?

Man	Woman: man	equal or dk	woman	
man	16	11	7	1143 couples
equal or dk	14	18	15	gamma=.32
woman	4	5	10	z=8.78

q710: "Using condoms is an effective way of preventing AIDS".

Man	Woman: agree	mixed/no opinion	disagree	
agree	45	10	7	1164 couples
mixed/no opinion	9	5	3	gamma=.27
disagree	13	4	5	z=5.61

q711: "Condoms encourage promiscuous behavior"

Man	Woman: agree	mixed/no opinion	disagree	
agree	30	12	17	1156 couples
mixed/no opinion	5	3	6	gamma=.08
disagree	13	6	9	z=1.74

q712: "Using condoms is an effective way of preventing pregnancy"

Man	Woman: agree	mixed/no opinion	disagree	
agree	60	12	5	1159 couples
mixed/no opinion	7	3	1	gamma=.31
disagree	7	2	2	z=6.17

q713: "The only reason to use a condom is because you don't trust your partner"

		Woman		
	agree	mixed/no opinion	disagree	
Man				
agree	38	7	13	1156 couples
mixed/no opinion	6	3	4	gamma=.28
disagree	14	4	11	z=6.41

q714: "Is it acceptable for a married couple to use a condom?"

		Woman		
	acceptable	mixed/no opinion	unacceptable	
Man				
acceptable	25	5	18	1158 couples
mixed/no opinion	4	1	4	gamma=.27
unacceptable	15	5	23	z=6.14

q715: "Is it acceptable for a married woman to ask her husband to use a condom?"

		Woman		
	acceptable	mixed/no opinion	unacceptable	
Man				
acceptable	29	4	16	1161 couples
mixed/no opinion	5	1	3	gamma=.27
unacceptable	17	4	20	z=6.13

q716: "Is it acceptable for a woman who is not married to ask her partner to use a condom?"

		Woman		
	acceptable	mixed/no opinion	unacceptable	
Man				
acceptable	73	7	5	1163 couples
mixed/no opinion	6	1	0	gamma=.16
unacceptable	7	1	1	z=2.15

q717: "Is it acceptable to use a condom with someone at the beginning of a relationship?"

		Woman		
	acceptable	mixed/no opinion	unacceptable	
Man				
acceptable	63	8	7	1157 couples
mixed/no opinion	6	2	2	gamma=.38
unacceptable	8	2	3	z=6.66

6. Integrated model

Multivariate analysis of motivations, attitudes, and condom use

Thus far we have described condom use and plausible correlates or pre-conditions for use, but we have not considered how these behaviors, motivations, and attitudes are related to characteristics that are available in the surveys—specifically, the explanatory variables listed above. This section will attempt to answer the following question: what are the effects of the explanatory variables, after adjusting for sector and control variables?

Sector will be represented as a categorical variable, for all combinations of country, type of place of residence, and sex. As stated earlier, there are a total of 22 sectors in the individual-level data. All sectors will be given equal weight. Never-use and the low end of each scale will be reference categories for condom use and the four scales. Tables will give odds ratios, with significance indicated by symbols --, -, +, and ++.

A brief comment is required on the meaning of "significance" for these data. The households in these surveys were sampled randomly within their respective clusters, but there were only a few clusters (typically four) in each country, and these clusters were not selected at random. Estimates cannot be interpreted as national estimates; indeed, they do not refer to any well-defined population other than the clusters from which they were drawn. Standard methods to test whether a coefficient or a measure of association is zero in the reference population do not have the usual interpretation. We will use some of the terminology of statistical significance, but it should be understood that the intention is simply to describe the deviation of a statistic from zero in a way that takes account of the sample sizes.

We have arbitrarily decided to use the symbol "+" if the usual test statistic is between 1.65 and 2.33, and "++" if it is greater than 2.33. Similarly, "-" indicates that the usual test statistic is between -1.65 and -2.33, and "—" indicates that it is less than -2.33. No symbol, or blank, indicates that the usual test statistic is between -1.65 and +1.65. The cutoffs +/-1.65 and +/-2.33 are the critical values for one-tailed z tests with significance .05 and .01. If hypothesis tests were legitimate, most of our hypotheses, such as those involving age or education, would be one-tailed tests. However, we emphasize that we are not making tests, but are simply marking off arbitrary ranges for the usual test statistics. The models are essentially descriptive.

The five panels of table 6 give the results of five logit regressions, one for each of the four scales and one for the question about ever-use of condoms with the primary partner (q70401). The four scales are ordinal but are not consistent with the assumptions for ordinal logit models, so we use multinomial logit regression for them. Condom use is binary, and is described with a binary logit regression. We repeat that fixed effects for sectors are included in these regressions, although omitted from table 6, and the pseudo R^2 values are partly due to those effects.

The first panel of table 6 shows that the odds of having a moderate or high desire to stop or delay childbearing increase monotonically and substantially as parity and/or age (30+) increase. Education (beyond primary) increases the odds of this desire by 20% to 30%. Respondents with a non-regular partner tend to be less likely to be highly motivated to stop or delay childbearing.

This model has a much larger pseudo R^2 than any of our other regressions. About 23% of the original deviance in the motivation to use family planning is accounted for. Much of this can be traced to the role of family size and age, but there are also many large effects for the various sectors.

The subjective sense of HIV risk (see panel 2) increases substantially with age (25-29 and 30+) and education. We suggest that both of these effects are due mainly to a greater awareness of generalized risk. Older respondents are more likely to have witnessed the devastating effects of HIV infection, and better educated respondents tend to have more accurate knowledge of its prevalence and risk factors. Beyond these effects, however, respondents who have had at least one non-regular partner during the past three years have twice the odds of believing they have high personal risk. Vhivchance is based completely on questions about risk that refer to the regular partner, but there is a clear indirect effect from having (or having had) a non-regular partner.

A favorable attitude toward family planning (see panel 3) is positively associated with age (30+) and education. Number of children has no effect on this attitude, despite its very strong effect (see panel 1) on the motivation to limit or space future births. The effect of education is monotonic and very strong; respondents with more than primary education have odds of fully accepting family planning that are 2.44 times as great as respondents with less education. Respondents who have a non-regular partner have large odds of favoring family planning (1.41 and 1.51), but the z scores are not large because of low frequencies in some combinations.

Older respondents (age 30+) tend to be more negative about the acceptability of condom use (see panel 4), probably because of a cohort effect; younger cohorts (age <25) are more favorable. Education has a strong positive relationship to attitudes about condoms; respondents with more than primary education have odds of strong approval that are 80% greater than respondents with less education. Respondents with a non-regular partner are more likely to be favorable to condoms, with odds that are 23% to 40% above those without a non-regular partner. Respondents with three or more children tend to be less favorable toward condoms.

Consistently with attitudes, frequent use of condoms with the primary partner (see panel 5) is more likely for younger respondents (age25-29 as well as age <25). The odds of frequent use are 88% greater for respondents with more than primary education. The odds are 34% greater for respondents who have (or have had) a non-regular partner, suggesting protection of the primary partner from indirect exposure to HIV risk. Frequent use is negatively related to currently being pregnant (or the man's partner being pregnant). This would be easy to understand if condoms were an important family planning method, but they are not. We suggest that there is an actual antipathy between condom use and favorable attitudes toward them, on the one hand, and the process of family formation, on the other hand.

It may be emphasized that all components of this model are positively associated with education, as indicated by the simple distinction of having more than primary education. This effect is very strong, especially upon family planning attitudes.

Table 6. Odds ratios for logit regressions of motivations, attitudes and condom use on explanatory and control variables, controlling for sector (weighted).

PANEL 1: Dependent variable: vfpmotive
Multinomial regression — Number of obs = 6200; Wald chi2(54) = 1540.40; Prob > chi2 = 0.0000; Log likelihood = -4551.2787; Pseudo R2 = 0.2317

Outcome vfpmotive==Wants more is the reference group

vfpmotive	Coef.	z	Coef.	z
	DK or would not matter		*Would matter much*	
vage25to29	1.2798		1.4940	++
vage30up	2.6429	++	3.3451	++
vmore_ed	1.3088	+	1.2031	+
vhasnr	1.0139		0.7337	-
vpregnant	0.9623		1.0123	
vhas3kids	3.8371	++	7.9521	++

PANEL 2: Dependent variable: vhivchance
Multinomial regression — Number of obs = 5817; Wald chi2(54) = 974.10; Prob > chi2 = 0.0000; Log likelihood = -5635.6517; Pseudo R2 = 0.1057

Outcome vhivchance=Never thought about it is the reference group

vhivchance	Coef.	z	Coef.	z
	Low Concern		*High Concern*	
vage25to29	1.2476	+	1.4005	++
vage30up	1.3042	+	1.5342	++
vmore_ed	1.4069	++	1.2855	++
vhasnr	1.2988	+	2.0763	++
vpregnant	0.9172		0.9491	
vhas3kids	0.9310		0.9724	

PANEL 3: Dependent variable: vfpatt
Multinomial regression — Number of obs = 6464; Wald chi2(54) = 326.75; Prob > chi2 = 0.0000; Log likelihood = -4282.4132; Pseudo R2 = 0.0472

Outcome vfpatt= Not ok to limit nor to space is the reference group

vfpatt	Coef.	z	Coef.	z

```
-------------+-------------------------------------------------------------------
             | Ok to limit OR space |Ok to limit AND space
  vage25to29 |      1.1276          |      1.2058
    vage30up |      1.2542          |      1.2799
    vmore_ed |      1.6867     ++   |      2.4360     ++
      vhasnr |      1.4134          |      1.5128      +
   vpregnant |      0.9616          |      1.0152
   vhas3kids |      0.9279          |      1.1132
-------------------------------------------------------------------------------


PANEL 4: Dependent variable: vcondomatt
Multinomial regression                          Number of obs   =       6295
                                                Wald chi2(54)   =     542.19
                                                Prob > chi2     =     0.0000
Log likelihood = -6506.3403                     Pseudo R2       =     0.0556

Outcome vcondomatt= Negative is the reference group

-------------------------------------------------------------------------------
  vcondomatt |      Coef.       z   |      Coef.       z   |
-------------+-------------------------------------------------------------------
             |     Moderate         |     Positive
  vage25to29 |      0.9484          |      0.9743
    vage30up |      0.7487     --   |      0.8070      -
    vmore_ed |      1.4095     ++   |      1.8036     ++
      vhasnr |      1.4044     ++   |      1.2275
   vpregnant |      1.0011          |      1.0368
   vhas3kids |      1.0388          |      0.8610      -
-------------------------------------------------------------------------------

PANEL 5: Dependent variable: q70401
Multinomial regression                          Number of obs   =       6513
                                                Wald chi2(27)   =     594.40
                                                Prob > chi2     =     0.0000
Log likelihood = -3291.4125                     Pseudo R2       =     0.0906

Outcome q70401= Never or at beginning is reference group

-------------------------------------------------------------------------------
      q70401 |      Coef.       z
-------------+-----------------------------------------------------------------
             |Use Condom Always or Occasionally
  vage25to29 |      1.2741      +
    vage30up |      0.9913
    vmore_ed |      1.8788     ++
      vhasnr |      1.3375      +
   vpregnant |      0.7867      -
   vhas3kids |      0.9113
-------------------------------------------------------------------------------
```

The Appendix includes a table (table A4) that describes how the measures of motivations, attitudes, and use vary across the 22 sectors, after adjusting for the explanatory and control variables, but that table will not be discussed.

Associations among motivations, attitudes, and condom use, controlling for sector

As stated earlier, these survey data are not appropriate for causal analysis. The relationships among motivations, attitudes, and behavior are complex, and the behavioral measure of condom use has an uncertain reference to time. In the introduction we described the motivations and attitudes as intervening variables, which modify the effect of the explanatory variables upon condom use, but we cannot justify the causal models that are sometimes applied to such frameworks. It may be useful, however, to describe the pairwise associations among the five outcomes of interest after adjustment for sector and the other explanatory variables.

Table 3 presented the gamma coefficients without any adjustments; table 7 gives partial or adjusted gamma coefficients. These were calculated using a Stata module written by Lauritsen and Kreiner (1999). The partial gamma is essentially a pooling of the gammas that could be calculated for each combination of a set of covariates. In the first panel of table 8, the partial gamma is a pooling of 22 gammas for each combination of country, type of place of residence, and sex (i.e. "sector"). In the second panel of table 8, the pooling is across the 24 combinations of age (<25, 25-29, 30+), education (primary or less, some secondary and above), having a non-regular partner, and number of children (<3, 3+).

[Note: the partial gamma requires the construction of a subtable for each combination of the control variables. With more combinations than in table 7, the subtables are too sparse. It is not possible to control simultaneously for all covariates using this approach. A later version of this paper may use another method to describe pairwise associations with controls for other variables.]

Table 7. Associations among the constructed variables and condom use, measured with partial gamma (weighted)

PANEL 1: Controlling for 22 sectors

	vfpmotive	vhivchance	vfpatt	vcondomatt
vhivchance	.041	x	x	x
vfpatt	.134**	.122**	x	x
vcondomatt	-.020	.152**	.297**	x
q70401	-.094##	.224**	.167**	.586**

PANEL 2: Controlling for all 24 combinations of age, education, having a non-regular partner, and number of children

	vfpmotive	vhivchance	vfpatt	vcondomatt
vhivchance	.026	x	x	x
vfpatt	.074*	.064*	x	x
vcondomatt	-.011	.171**	.266**	x
q70401	-.035	.283**	.055	.474**

* significant at one-tailed .05 level
** significant at one-tailed .01 level

significant at the one-tailed .01 level *in the opposite direction from hypothesized*

There are some differences between table 7 and table 3, and between the two panels of table 7, but the most important findings discussed earlier for table 3 are seen again. Condom use is strongly associated with a favorable attitude toward condoms, which is in turn strongly associated with a favorable attitude toward family planning. It is also strongly associated with a subjective sense of HIV risk. However, it is *not* associated with a motivation to limit or space births; indeed, we again see (in panel 1 of table 7) that the relationship with that motivation is *negative*. It appears that condom use is much more likely to accompany a subjective sense of HIV risk than to accompany a family planning motivation. There is little suggestion, if any, that condoms are used as a simultaneous response to both motivations. Respondents who wish to space or limit their fertility are drawn to other methods (not detailed in this paper) and rather conspicuously *not* to the condom.

We find a strong positive association between a favorable attitude toward family planning and a favorable attitude toward condoms. This association may imply a potential for dual or ambiguous use of the condom in the future, but there is little evidence of such use at the time of this survey.

7. Conclusions

This paper has combined six African surveys, using virtually identical questionnaires and designs, to examine condom use and related motivations and attitudes for men and women who are married or cohabiting with a regular partner. Relatively little research on condom use has focused on stable relationships and has had responses from both partners. We have looked at condom use in relation to one or both of two possible motivations: a desire to limit or space future births, and a desire to reduce the perceived risk of HIV/STI infection. We have also considered the role of two parallel sets of attitudes, regarding family planning in general and condoms in particular.

Overall, only 24% of respondents (weighted) were in the highest category of vfpmotive, that is, said that it would matter "very much" if they had another child. The other 76% either wanted more children or said that another child would matter "not much" or "somewhat". The fact that a large majority of respondents want more children (or are indifferent) is a major obstacle to condom use in long-term relationships, especially considering that there is a high level of agreement between partners on fertility preferences. The condom has a contraceptive function, even when that is not the reason for using it.

The general desire for more children is thus in itself a reason why condom use is low. Nevertheless, it would be reasonable to expect that condom use would be positively associated with a desire to limit future childbearing. We find that the relationship is not positive. If anything, across sectors, couples who want to limit childbearing are *avoiding* the condom.

Condom use with the regular partner is positively related to a subjective sense of HIV risk, as indicated by having thought about this risk before the interview, considering the risk to be medium or high, and/or being concerned about the risk of contracting HIV from the regular partner. This sense of risk is much greater if the respondent has had a non-regular partner within the last three years.

As would be expected, respondents who are more favorable toward condoms are more likely to use condoms. In some cases, the favorable attitude may actually be a consequence of use, rather than a facilitating factor that preceded use. However, less obviously, there is a strong positive association between attitudes toward condoms and attitudes toward the generalized concept of family planning, as indicated by whether it is "acceptable" to limit and/or space births. This association suggests that condoms could perhaps become more acceptable in the future, specifically as a family planning method or as a supplement to a family planning method to give dual protection.

There is presently very little evidence of dual protection through condoms, either alone or in conjunction with another method. Only a very few respondents reported that they had ever used the condom simultaneously with a (another) family planning method, and our analysis indicates that the family planning function of the condom is quite subordinate to the prevention of infection.

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Appendix 1. Distributions of the explanatory and control variables

Table A1. Distribution of individual respondents across the 22 sectors (unweighted). "Urb", "Rur", "M", and "F" refer to Urban, Rural, Male, and Female, respectively.

Sector	Frequency	Percent
Kenya UrbM	276	4.04
Kenya UrbF	228	3.34
Kenya RurM	224	3.28
Kenya RurF	303	4.44
SA UrbM	133	1.95
SA UrbF	150	2.20
SA RurM	125	1.83
SA RurF	135	1.98
Tanz UrbM	175	2.56
Tanz UrbF	222	3.25
Tanz RurM	231	3.38
Tanz RurF	187	2.74
Uganda UrbM	219	3.21
Uganda UrbF	216	3.16
Uganda RurM	289	4.23
Uganda RurF	318	4.66
Zambia UrbM	564	8.26
Zambia UrbF	898	13.15
Zimb UrbM	406	5.95
Zimb UrbF	534	7.82
Zimb RurM	487	7.13
Zimb RurF	509	7.45
Total	6829	100.00

Table A2. Distribution of co-resident couples across the 9 sectors (unweighted).

Sector	Frequency	Percent
Kenya Urban	99	7.95
Kenya Rural	102	8.19
SA Urban	115	9.24
SA Rural	115	9.24
Tanz. Urban	111	8.92
Tanz. Rural	136	10.92
Uganda Urban	147	11.81
Uganda Rural	268	21.53
Zambia Urban	152	12.21
Total	1245	100.00

Table A3: Percentages of respondents in each category of age, and in the criterion categories of vmore_ed, vhyasnr, vpregnant, and vhas3kids, within each of the 22 sectors (unweighted).

	Age						
Sector	<25	25~29	30+	more_ed	hasnr	pregnant	has3kids
Kenya Urban Males	12.7	27.9	59.4	67.8	24.3	10.3	36.0
Kenya Urban Females	37.7	24.1	38.2	45.6	5.3	11.4	36.4
Kenya Rural Males	8.9	21.0	70.1	41.5	17.9	10.5	54.1
Kenya Rural Females	31.4	31.4	37.3	25.4	3.3	11.2	55.1
SA Urban Males	3.0	9.8	87.2	90.2	17.3	3.0	37.9
SA Urban Females	8.7	16.7	74.7	88.7	8.0	6.0	45.3
SA Rural Males	1.6	13.6	84.8	49.6	16.8	11.2	44.8
SA Rural Females	17.0	20.7	62.2	37.0	5.2	8.9	46.7
Tanz. Urban Males	18.9	19.4	61.7	34.9	1.7	11.3	27.3
Tanz. Urban Females	25.2	26.6	48.2	14.9	10.4	7.9	38.0
Tanz. Rural Males	11.7	21.6	66.7	4.8	2.6	18.2	36.6
Tanz. Rural Females	29.9	28.9	41.2	0.5	10.2	14.3	47.8
Uganda Urban Males	12.8	19.6	67.6	67.9	11.9	12.4	43.5
Uganda Urban Females	36.6	30.1	33.3	44.4	4.2	9.9	48.5
Uganda Rural Males	17.0	22.8	60.2	35.3	15.9	17.6	53.7
Uganda Rural Females	42.1	28.0	29.9	12.3	5.0	17.6	62.8
Zambia Urban Males	8.5	19.3	72.2	85.0	7.4	14.8	46.7
Zambia Urban Females	26.6	25.8	47.6	60.9	1.9	12.1	51.6
Zimb. Urban Males	11.3	20.7	68.0	80.0	11.3	11.9	25.1
Zimb. Urban Females	36.5	25.1	38.4	78.1	0.2	12.5	30.3
Zimb. Rural Males	9.0	16.4	74.5	52.0	9.4	10.8	32.4
Zimb. Rural Females	25.9	21.8	52.3	40.5	0.4	13.4	48.9
Total	21.1	22.9	55.9	51.8	7.2	12.3	43.4

Comments on appendix table A4:

Table A4 describes the results of exactly the same five regressions as table 6 in the text, but with a focus on the effects for the 22 sectors, or combinations of country, type of place of residence, and sex. The sector effects are now adjusted for the effects of the explanatory variables and controls.

The coefficients for sector in the five regressions were effect-coded. That is, instead of selecting an arbitrary reference category and giving it a coefficient of 0 (or omitting it), the coefficients were coded so that they add to zero. The coefficients and z values describe the amount of deviation from the pooling of all 22 sectors (with equal weight for every sector). Those coefficients were then exponentiated to give odds ratios, which are given in the table. With effect coding, approximately equal numbers of odds ratios in each panel will be greater than one or less than one. The results were then put in a tabular form to facilitate interpretation.

Table A4. Odds ratios for logit regressions of motivations, attitudes and condom use on sectors, adjusted for explanatory and control variables (weighted).

PANEL 1: Dependent variable: vfpmotive
Multinomial logit regression — Number of obs = 6200; Wald chi2(54) = 1540.40; Prob > chi2 = 0.0000
Log likelihood = -4551.2787 — Pseudo R2 = 0.2317

Outcome vfpmotive==Wants more is the reference group

	Urban		Rural	
	Male	Female	Male	Female
Undecided or would not matter much				
Kenya	0.8250	1.0443	0.8736	3.0890 ++
South Africa	5.3033 ++	6.2953 ++	2.3439 ++	3.6103 ++
Tanzania	1.2989	0.7122	0.5331 --	0.6227 -
Uganda	0.1720 --	0.5146 -	0.2347 --	0.7003
Zambia	1.3549 +	2.2921 ++		
Zimbabwe	1.0881	0.4001 --	0.9618	0.2620 --
Would matter much				
Kenya	2.1872 ++	2.8850 ++	1.4669 ++	2.0655 ++
South Africa	0.6002	1.6028 +	0.0574 --	0.5111 -
Tanzania	1.8148 ++	0.5201 --	0.2860 --	0.5421 --
Uganda	1.4599 +	2.3929 ++	0.9632	1.7357 ++
Zambia	1.1546	2.7666 ++		
Zimbabwe	1.5822 ++	0.8614	1.0071	0.4943 --

PANEL 2: Dependent variable: vhivchance

Multinomial logit regression	Number of obs	5817
	Wald chi2(54)	974.10
	Prob > chi2	0.0000
Log likelihood = -5635.6517	Pseudo R2	0.1057

Outcome vhivchance=Never thought about it is the reference group

	Urban		Rural	
	Male	Female	Male	Female
Low Concern				
Kenya	1.7088 ++	0.4716 --	0.7058 --	0.5613 --
South Africa	0.3609 --	2.3336 ++	0.2689 --	0.2576 --
Tanzania	1.1736	0.7701	0.7267 -	0.5167 --
Uganda	1.7344 ++	1.1497	3.2206 ++	1.3276 +
Zambia	2.2905 ++	1.6845 ++		
Zimbabwe	3.4466 ++	1.1646	0.9036	1.3267 +
High Concern				
Kenya	0.5554 --	0.5723 --	0.1507 --	0.3192 --
South Africa	0.0538 --	2.1052 ++	0.1181 --	0.7344
Tanzania	1.3517	1.8894 ++	0.7617	1.2902
Uganda	1.5561 ++	2.5961 ++	2.7081 ++	2.6113 ++
Zambia	2.4765 ++	3.0178 ++		
Zimbabwe	2.5213 ++	3.9208 ++	0.3497 --	3.5966 ++

PANEL 3: Dependent variable: vfpatt

Multinomial logit regression	Number of obs	6464
	Wald chi2(54)	326.75
	Prob > chi2	0.0000
Log likelihood = -4282.4132	Pseudo R2	0.0472

Outcome vfpatt= Not ok to limit nor to space is the reference group

	Urban		Rural	
	Male	Female	Male	Female
Ok to limit OR space				
Kenya	1.5050	1.5791	1.0088	0.7670
South Africa	2.1003	0.1404 --	1.0074	0.6849
Tanzania	1.7079	0.7309	1.1213	0.6542
Uganda	1.6091	1.0994	1.3646	1.1310
Zambia	0.7415	1.4325 +		
Zimbabwe	1.1894	1.2201	0.5074 --	1.3666
Ok to limit AND space				
Kenya	1.0293	1.1857	0.7364	0.5101 --
South Africa	2.0313	0.7996		2.4534 +
Tanzania	3.1767 +	1.5687 +	0.8932	0.8046
Uganda	1.0325	1.3587	0.6272 -	1.6954 +
Zambia	0.3528 --	0.6504 --		
Zimbabwe	0.4293 --	1.1445	0.5276 --	1.7227 ++

PANEL 4: Dependent variable: vcondomatt

Multinomial logit regression — Number of obs = 6295; Wald chi2(54) = 542.19; Prob > chi2 = 0.0000; Log likelihood = -6506.3403; Pseudo R2 = 0.0556

Outcome vcondomatt= Negative is the reference group

	Urban		Rural	
	Male	Female	Male	Female
Moderate				
Kenya	0.4884 --	0.6336 --	0.8188	0.6027 --
South Africa	0.8722	1.9313 ++	1.3990	1.6068 +
Tanzania	0.5481 --	0.6110 --	1.0308	0.9742
Uganda	1.0449	1.7787 ++	1.4316 +	1.6894 ++
Zambia	0.8818	0.7549 --		
Zimbabwe	2.1593 ++	0.9416	1.1032	0.7662 --
Positive				
Kenya	0.3385 --	0.5599 --	0.8350	0.4239 --
South Africa	0.9403	3.7275 ++	1.3834	2.0376 ++
Tanzania	0.3292 --	0.3160 --	0.4712 --	0.3761 --
Uganda	1.8066 ++	2.6648 ++	2.3988 ++	2.7758 ++
Zambia	0.8458	0.6833 --		
Zimbabwe	3.4845 ++	1.3800 ++	1.2486 +	0.7359 --

PANEL 5: Dependent variable: q70401

Logit regression — Number of obs = 6513; Wald chi2(27) = 594.40; Prob > chi2 = 0.0000; Log likelihood = -3291.4125; Pseudo R2 = 0.0906

Outcome q70401= Never or at beginning is reference group

	Urban		Rural	
	Male	Female	Male	Female
Use Condom Always or Occasionally				
Kenya	0.7558 -	0.5735 --	0.6909 -	0.5057 --
South Africa	0.8610	1.2205	0.2836 --	0.4506 --
Tanzania	1.4955 +	1.5858 ++	0.7767	0.9834
Uganda	0.9581	0.9873	1.0029	0.5178 --
Zambia	2.2459 ++	1.4651 ++		
Zimbabwe	5.6399 ++	1.6292 ++	1.5732 ++	1.1617