Fertility preferences and contraceptive behaviors by HIV status among women and men in 19 Sub-Saharan African countries

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Abstract

Objective: To determine if there are differences in fertility preferences and contraceptive use by HIV status, taking into account whether or not people likely know their HIV status.

Design and Methods: Data are from Demographic and Health Surveys (2003-2007) in 19 Sub-Saharan African countries that include HIV test data. We examine three outcomes: 1) want more children; 2) unmet need for contraception (any method); and 3) condom use at last sex. The key independent variable combines HIV status (from test data) and likely knowledge of status (from self-reports of ever having an HIV test and receiving the results). Logistic regression models were used controlling for age, urban/rural residence, education, household wealth quintile, number of living children and union status.

Results: HIV-positive women and men are generally similar to those who are HIV negative with respect to their fertility preferences and contraceptive behavior, and men generally have similar patterns to women. Where there are differences, HIV-positive women and men are more likely to want no more children and more likely to use condoms. There is mixed evidence with regard to unmet need for contraception. For many countries, knowing your status does not make a difference. Where there are differences, they do not always follow the expected pattern.

Conclusions: Given overall similar pregnancy prevention needs by HIV status and increased demand for pregnancy prevention among those who are HIV positive and likely

know it, the evidence points toward strengthening overall family planning programs in these countries.

Introduction

From the public health perspective, preventing unintended pregnancy and the transmission of HIV is a very high priority in Sub-Saharan Africa, where HIV prevalence and unmet need for contraception are the highest in the world [1,2]. However, at the individual level not everyone who wants to prevent HIV also wants to prevent pregnancy. The expansion of anti-retroviral therapy and access to services to prevent mother to child transmission of the virus is enhancing the lives of people living with HIV and raising their hopes for a normal life, including the ability to have healthy babies. Whether and how HIV status is associated with achieving fertility preferences are not yet clear. New evidence on this relationship is needed to ensure better understanding of the implications for service needs.

This paper provides a regional overview of the extent to which fertility desires and contraceptive behaviors differ by HIV status (from biomarker testing in population-based surveys). We analyzed data from recent, nationally representative Demographic and Health Surveys (DHS) for 19 Sub-Saharan African countries. Bivariate and multivariate analyses are conducted to explore the relationships, with and without controlling for the effect of other factors. Although some studies have undertaken similar analyses, almost all have been small scale studies, and the few that are large have been limited to one country [3, 4, 5].

We examine whether HIV-positive women and men are less likely to desire more children than their HIV-negative counterparts. This is based on the assumption that

uncertainty about how long they will live to be able to take care of their children, worry about who will take care of their orphaned children should they die, fear that newborn children will be infected, and concerns that pregnancy may negatively affect the mother's health, are likely to cause those who are HIV positive to want to limit childbearing relative to those who are negative. However, there is a counter argument that HIV-positive people may desire more children because of the high value placed on having children, the desire to leave children behind to continue the family name or their need to keep their status secret and/or to prove that they are healthy and able to bear children in a culture where marriage continuity strongly depends on procreation [6, 7]. Moreover, with the rising provision of antiretroviral therapy (ART), these latter arguments around continued childbearing may grow stronger. For example, a cross-sectional quantitative, study in South Africa among HIV-positive people attending an ART service facility found that the desire to have children increased with duration of ART treatment among females, though not among males attending [8].

HIV-positive women and men may also be more likely to have unmet need for contraception than HIV-negative men and women. This is based on the assumption that given that they do not want a child soon or at all, people living with HIV may not be strongly motivated to use contraception because of fear that contraceptive use will exacerbate the progression of their infection or bring health side effects from use [9]. Consequently, they may be less likely to use a method or to use it consistently than HIV-negative people. However, evidence from studies in Kenya and Zambia found no differences between HIV-positive and HIV-negative women in their contraceptive use

[10] and a few studies that included a VCT intervention found positive effects on contraceptive use among HIV-positive women [11,12]. We also examine whether there are condom use differentials by HIV status. In terms of attitudes towards condom use, it has been found that when there is evidence of illness people are generally in favor of using condoms to prevent HIV transmission [13,14] and other studies show that HIV-positive women are more likely to use condoms than those who are HIV negative [10].

This study examines these issues using large-scale, nationally representative data in several countries. Such an endeavor has the important advantage of overcoming the limitations of previous studies, most of which were small-scale, by being able to contrast outcomes by HIV status across many countries using comparable data. With increasing efforts to incorporate HIV testing into the Demographic and Health Surveys, particularly in Sub-Saharan Africa, cross-national analysis is now possible.

Methods

Data are from Demographic and Health Surveys (DHS) conducted from 2003 to 2007 in 19 countries: Burkina Faso, Cameroon, Cote d'Ivoire, Democratic Republic of the Congo, Ethiopia, Ghana, Guinea, Kenya, Lesotho, Liberia, Malawi, Mali, Niger, Rwanda, Senegal, Swaziland, Tanzania, Zambia and Zimbabwe. These are nationally representative surveys of women aged 15-49 and men aged 15–59 (some surveys interviewed men aged 15-54) with large sample sizes and a wide range of sexual and reproductive health indicators. The surveys listed above are the first generation of the

DHS to include biomarker testing for HIV [15], and so we are able to link the results of the HIV test to data on respondents' sexual and reproductive behaviors and preferences. This analysis is limited to the sub-sample of women and men who were included in the bio-maker test for HIV. The relevant sample size ranged from 2,864 in Malawi to 7,494 in Zimbabwe for women and from 2,254 in Lesotho to 5,555 in Zimbabwe for men (see Table 1).

We conducted separate analyses for women and men to examine the association of HIV status with the following three indicators of fertility preferences and contraceptive behaviors. First, desire for a/another birth is obtained from responses to the question "Would you like to have (a/another) child, or would you prefer not to have any (more)?" (If pregnant, the question was prefaced by "After the child you are expecting …") and is defined for fecund, non-sterilized women and men as a two-category variable taking on the value of 1 if the respondent wants more children and 0 otherwise. Those who said they were unsure were treated as wanting more. Second, unmet need for contraception is defined as the proportion of married or unmarried sexually-active women and men who are fecund (i.e. able to have a child) and do not want to have a child soon (in the next 2 years) or who do not want any more children, and are not using any method of contraception. In this paper the analysis is limited to women and men who are at risk of unintended pregnancy: that is, they are married or unmarried and sexually-active, able to have a child and either are using a method or have an unmet need for contraception. The variable is assigned a value of 1 if the respondent has an unmet need and 0 otherwise. Third, condom use at last intercourse is measured as the proportion of women and men

who had sexual intercourse in the 12 months preceding the survey and who used the condom at last intercourse in the last 12 months. This variable takes on a value of 1 if the respondent used a condom at last sex and 0 if s/he did not use one.

HIV status, the key independent variable, is based on the results of the biomarker test administered in the survey in combination with questions on whether the respondent was tested at a prior time and whether s/he knew the result of that test. In the HIV module of the DHS, respondents were asked whether they have ever been tested. Those who answered affirmatively were then asked if they received the result, but they were told not to tell it to the interviewer. We created the measure of HIV status used in this paper with the following four categories: 1) Positive on biomarker test, tested previously and knows the results; 2) Positive on biomarker test and either tested previously and did not receive results, or no previous test; 3) Negative on biomarker test and either tested previously and did not receive results or no previous test; and 4) Negative on biomarker test, tested previously and knows the result.

Other demographic and socioeconomic variables included in the models are age, rural-urban residence, education, household wealth quintile, number of living children and union status. These covariates are selected because their measurement is comparable across countries in the DHS surveys and previous studies have found them to be important predictors of fertility preferences and/or unmet need [3]. All covariates are employed as categorical variables in the analysis. Age, number of living children, union status and education were measured at the time of the survey. Residence was obtained as

part of the sample identification information and defined as “rural” or “urban”. Household wealth quintile is a DHS-constructed variable based on information collected on a number of household possessions. Using factor analysis, the information was summarized to obtain wealth quintiles [16].

We use univariate and multivariate analysis to examine the three outcomes and associations with HIV status. We first show the distribution of respondents by background characteristics and their HIV status. Then we examine the outcome variables and their differentials by HIV status without controlling for other factors (i.e., the unadjusted or gross “effects” of HIV status). To obtain the adjusted or net “effects” of HIV status on the outcome variables and test the hypotheses specified above, we undertake multivariate analyses, controlling for age, urban/rural residence, education, household wealth quintile, number of living children and union status. Since all the outcome variables defined above are binary, logistic regression is used for all multivariate analyses.

Due to small sample sizes of people living with HIV who ever report having had an HIV test in some countries, we are able to conduct the multivariate analysis with all four categories of the HIV status variable in 10 of the 19 countries. In 8 of the remaining countries where the proportion of the respondents in the first category of the HIV status variable (i.e. who were HIV positive and likely know their status) is less than 25 cases, we combined that category with the second category of the variable (i.e. those who were HIV positive and likely do not know their status). For these countries, the HIV-positive

group is compared with the two groups of HIV-negative respondents in the analysis. For the analysis among women in Senegal, the HIV status variable was dichotomous (HIV positive versus HIV negative) because there was no information to determine whether or not the respondent likely knows her status. We are unable to include Senegalese men in the analysis because the total number of HIV-positive cases is less than 25.

All estimates presented in this paper are weighted national estimates. For the regression results, statistical significance is indicated at the .05, .01 and .001 levels, using two-tailed tests. The standard errors of the estimates were computed using the "svy" procedure in STATA to account for the complex nature of the sampling method used in selecting respondents for the surveys [17].

Results

The proportion of women under age 25 years is 40-46% in all the countries except Ghana, Guinea, Liberia and Niger (Table 1). In 12 of the 19 countries, less than four in 10 of women live in urban rural areas. This proportion is 42-48% in 5 countries and it is 50% or more only in two countries (Cameroon and Senegal). Conversely, in all countries with the exception of Lesotho, Rwanda, Swaziland and Zimbabwe, at least six in 10 women are in union. With the exception of Rwanda where the proportion is 42%, between 32-38% of women live in households that fall in the two lowest wealth quintiles in all of the countries. The proportions of men aged 15-24, living in rural areas or in households that fall in the two lowest quintiles are similar to those of women in most of

the countries. The only variable that shows substantial differences according to gender is union status. In all countries, men are less likely to be in union than women.

Table 2 presents the percentage distribution of women's HIV status and the association between HIV status and the three outcome variables with and without controlling for the effects of the respondents' characteristics. The countries in Panel A are those where we used three categories of HIV status due to small proportions of respondents who are HIV positive and likely know it. The countries in Panel B are those where we were able to include all four categories of HIV status. Not surprisingly, given overall levels of HIV prevalence, most of the countries in Panel A are in Western Africa and Central Africa while most of those in Panel B are in Eastern and Southern Africa.

The proportion of women ever tested for HIV ranges widely among the 18 countries, from 2% in Niger to 41% in Swaziland and is 20% or more only in Cameroon, Rwanda, Swaziland, Zambia and Zimbabwe. Similarly, the proportion of women who are HIV positive differs substantially across countries. It is less than 5% in all of the countries in Panel A and in Rwanda in Panel B. It is 5-10% in Cote d'Ivoire, Cameroon and Kenya and above 10% in the remaining countries with Swaziland having the highest prevalence (31%). In virtually all countries, the proportion of women who do not know their status is higher than the proportion who do.

Results of the analysis of the associations between HIV status and desire for more children, unmet need for contraception and condom use in the last 12 months among

women show mixed evidence with regard to all three outcomes (Table 2). In most of the countries, women's fertility preferences and unmet need for contraception do not differ significantly by their HIV status. When the effects of other variables are accounted for, significant differences in fertility preferences by HIV status are observed only in 4 countries (Rwanda, Swaziland, Zambia and Zimbabwe). Similarly, for unmet need for contraception, significant differences by HIV status are evident only in 5 countries (Niger, Kenya, Malawi, Swaziland and Zambia). Of the three outcome variables, condom use at last sex shows the most variation by HIV status. The difference by HIV status is significant in 9 of the 18 countries for which data are available. As in the case of the other two outcome variables, the countries where this behavior is different by HIV status are largely concentrated in Southern Africa.

In Table 3, the association between HIV status and the three outcome variables is examined in greater detail in the countries where all four categories of HIV status are included in the models (i.e. countries in Panel B of Table 2). Odds ratios of the "effect" of HIV status on the three outcome variables are shown to demonstrate both the magnitude and the direction of the association. In the 4 countries where there are significant differences in fertility preferences by HIV status, HIV-positive women who know their status are less likely to want more children than HIV-negative women. Only in two of these countries (Swaziland and Zambia) are HIV-positive women who likely know their status significantly less likely to want more children than HIV-positive women who do not know their status.

With regard to unmet need for contraception, where this behavior differs significantly by HIV status, the evidence is mixed in terms of the direction of the association. In Swaziland and Zambia, women who do not know their status (whether HIV positive or negative) are more likely to have unmet need for contraception than those who do. In Kenya and Malawi, on the other hand, women who are HIV positive and likely know it are more likely to have unmet need than women who are HIV negative and likely know it. With respect to condom use at last sex, where there are significant differences, HIV-positive women who know their status are more likely to use condoms than the other three groups. However, in two of the countries (Lesotho and Malawi) condom use behavior of HIV-positive women who likely know their status does not differ from that of HIV-negative women who likely know their status. In Tanzania, HIV-negative women who do not know their status are less likely to use condoms at last sex than the other three groups.

Table 4 presents the percentage distribution of men's HIV status and the association between HIV status and the three outcome variables. Most men have never been tested for HIV and the proportion who have varies widely: ranging from 5% in Ethiopia and Niger to 23% in Zambia. The proportion of men who are HIV positive is less than 5% in 12 of the 18 countries. The highest prevalence (19-20%) is found in Lesotho and Swaziland. As is the case for women, the proportion of men who do not know their status is much higher than the proportion who do.

The associations between HIV status and the three outcome variables are largely similar for men as for women. In most of the countries for which data exist (11 out of 15), the desire to have more children does not differ by HIV status: the only exceptions are Ethiopia, Mali, Rwanda and Zimbabwe. Out of the 13 countries for which data are available, unmet need for contraception among men does not differ significantly by HIV status in 7 of the countries when the effect of other factors are accounted for. The countries where the behavior differs by HIV status are Liberia, Mali, Kenya, Lesotho, Swaziland, and Zambia. With respect to condom use at last intercourse, this behavior is not significantly different by HIV status in the vast majority of the countries. A difference is observed in only 5 of the 17 countries for which data are available (Rwanda, Swaziland, Tanzania, Zambia and Zimbabwe).

Table 5 presents the association between HIV status and the three outcome variables in greater detail for countries where all four categories of HIV status are included in the analysis (i.e. countries in Panel B of Table 4). The only country where HIV status is significantly associated with fertility preference in this group of countries is Rwanda. In this country, men who are HIV positive and likely know it are less likely to want more children than their counterparts who are HIV positive and do not know it and those who are HIV negative.

With regard to unmet need, the situation is more complex. The patterns of the association differ in all 4 countries where significant associations are observed. For example, in Kenya, men who are HIV positive and likely know it are more likely to have unmet need

than men who are HIV negative (whether they likely know it or not), but are not different from HIV-positive men who do not know their status. In Swaziland, on the other hand, while HIV-positive men who likely know their status do not differ from their HIV-positive counterparts who do not know their status, they are less than half as likely as HIV-negative men to have unmet need for contraception. For condom use at last sex, where there are differences, men who are HIV positive and likely know it are more than twice as likely to use a condom at last sex in Rwanda, Swaziland and Zambia than their counterparts in the other three categories. In Tanzania, men who are HIV positive and likely know it are also more likely to use condom at last sex than HIV-negative men who do not know their status.

Discussion

This study set out to examine whether HIV status was associated with different fertility desires, unmet need for contraception and condom use, and whether likely knowledge of HIV status led to larger differences in these outcomes. The evidence from these 19 Sub-Saharan African countries indicates that HIV-positive and HIV-negative women and men are more similar to each other than they are different in terms of fertility preferences. HIV-positive women are as likely to want more children as HIV-negative women in 13 of 17 countries (net of other characteristics such as age, education and number of living children that also affect fertility preferences). The pattern among men is similar (there are no significant differences by HIV status in 11 of 15 countries). Where there are differences, they tend to be in the direction of HIV-positive women and men being more likely to want to limit childbearing.

The results for unmet need for contraception are mixed: in most countries there are no differences for women and in about half of the countries there are no differences for men, but where there are differences in associations between HIV status and unmet need, they are in both directions. For condom use, the gender patterns switch: in most countries there are no differences for men by HIV status and in about half of the countries there are no differences for women. However, unlike unmet need for contraception, where there are differences they are almost always (with two exceptions) in the direction of HIV-positive women and men being more likely to use condoms.

These new findings from population-based, nationally-representative data from multiple countries supplement existing evidence that is mainly based on data from health facilities with female-only samples or small qualitative studies. Of special note is that we can compare outcomes in a standardized way across HIV-positive and HIV-negative women and men, instead of focusing on the HIV and pregnancy prevention needs of HIV-positive individuals alone. While a focus on HIV-positive individuals is merited, especially to better understand ways to integrate family planning and HIV-related services, it is also important to understand whether or not their pregnancy prevention needs are qualitatively different from HIV-negative women and men. A limitation of this study is that the associations are cross-sectional in nature and cannot address the important question of fertility preference and contraceptive behavior change following a positive HIV test result. A second limitation of the study is that the proxy variable for

likely knowledge of HIV status is very broad since the self-report about having had an HIV test and having received the results may have occurred prior to actual HIV infection.

In all 19 countries, most women and men do not know their HIV status with certainty: 2-41% of women and 5-23% of men report having ever been tested for HIV. Yet HIV testing, and treatment as well, have made solid if at times slow progress in coverage and, for testing, in ease of obtaining results. HIV testing is becoming more routine (e.g., as part of antenatal services) and receipt of results more rapid. Estimates in 2007 of the percent of people with advanced HIV receiving antiretroviral therapy range from 10% in Niger to 71% in Rwanda [1]. Will the fertility preferences of women and men who are HIV positive increasingly diverge from those who are negative as more people learn their status and more people have access to life-prolonging drug therapy? We can only speculate, but in examining differences for the 10 countries with the proxy variable on HIV status and likely knowledge of status, the three countries with high levels of ART coverage (71% in Rwanda, 46% in Zambia and 42% in Swaziland) are also the countries where women who are HIV positive and likely know their status are much less likely to want more children and much more likely to use condoms compared to the other groups. The same is true for men in Rwanda (and only true with respect to condom use for men in Zambia and Swaziland).

What does this mean for meeting women's and men's pregnancy prevention needs? Given relatively similar pregnancy prevention needs, regardless of HIV status, and in countries with relatively high levels of ART coverage and HIV testing, evidence of

increased demand for pregnancy prevention among those who are HIV positive and likely know it, there is a case to be made for strengthening overall family planning programs in these countries. Moreover, strengthened family planning program efforts are cost-effective points for HIV prevention [18]. Yet donor funding for family planning has, in fact, reduced in absolute dollar amounts since 1995 and made up just 5% of total population assistance in 2007 [19]. The cross-national evidence presented in this article points toward the important role that family planning programs play for both HIV-positive and HIV-negative women and men.

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Table 1. Background characteristics of the respondents: women and men

Country	Women					Men				
	Unweighted N	% under age 25	% living in urban areas	% in union	% in the 2 lowest wealth quintiles	Unweighted N	% under age 25	% living in urban areas	% in union	% in the 2 lowest wealth quintiles
Western and Central Africa										
Burkina Faso (2003)	4,189	41	23	76	36	3,341	40	24	55	35
Cameroon (2004)	5,155	46	55	68	36	5,044	42	57	50	32
Congo DR (2007)	4,632	42	46	66	37	4,304	39	43	57	35
Cote d'Ivoire (2005)	4,541	46	48	58	36	3,901	42	47	43	36
Ghana (2003)	5,296	38	48	63	34	4,267	37	45	53	36
Guinea (2005)	3,846	36	32	79	38	2,930	36	38	60	34
Liberia (2007)	6,482	37	42	64	37	5,207	36	40	57	38
Mali (2006)	4,743	41	34	85	38	3,886	36	37	65	37
Niger (2006)	4,441	37	20	86	37	3,232	32	26	66	32
Senegal (2005)	4,466	44	52	65	32	x	x	x	x	x
Eastern and Southern Africa										
Ethiopia (2005)	5,928	42	17	64	38	5,097	40	14	58	38
Kenya (2003)	3,273	43	25	60	34	2,917	43	25	50	33
Lesotho (2004/05)	3,034	44	24	53	33	2,254	46	20	42	36
Malawi (2004)	2,864	43	15	74	37	2,404	35	18	66	32
Rwanda (2005)	5,663	44	17	48	42	4,728	43	17	52	36
Swaziland (2006)	4,584	47	26	41	34	3,602	55	28	28	31
Tanzania (2003)	5,969	42	31	64	36	4,774	42	30	53	35
Zambia (2007)	5,715	40	42	61	35	5,161	38	43	56	33
Zimbabwe (2005/06)	7,494	46	38	58	35	5,555	48	40	46	33

Sources: Demographic and Health Surveys, 2003-2007
x = Data are not available.

Table 2. Percentage distribution of women by HIV status and association of HIV status with fertility preferences and contraceptive behavior, unadjusted and adjusted

		HIV status				Logistic regression results					
						Want more children (ref=HIV+)		**Unmet need for any method[a] (ref=HIV+, likely know)**		**Used condom at last sex, among those who had sex in last 12 months (ref=HIV+)**	
Panel A/Country	**Ever had HIV test**	HIV positive, likely know	HIV positive, do not know	HIV negative, do not know	HIV negative, likely know	Unadjusted	Adjusted	Unadjusted	Adjusted	Unadjusted	Adjusted
Burkina Faso (2003)	x	x	1.8	98.2	x	ns	ns	ns	ns	ns	+
Congo DR (2007)	9.8	0.1	1.5	90.1	8.3	ns	ns	ns	ns	ns	ns
Ethiopia (2005)	3.5	0.2	1.7	95.0	3.2	+	ns	+	ns	--	ns
Ghana (2003)	10.0	0.3	2.4	90.2	7.1	ns	ns	ns	ns	ns	ns
Guinea (2005)	2.3	0.1	1.8	96.5	1.6	+	ns	+	ns	--	ns
Liberia (2007)	3.9	0.1	1.8	95.1	3.0	ns	ns	+	ns	--	--
Mali (2006)	7.2	0.2	1.4	92.4	6.1	ns	ns	ns	ns	+	+
Niger (2006)	2.0	0.0	0.7	97.5	1.8	ns	ns	--	--	--	ns
Senegal (2005)	3.2	0.0	0.9	96.4	2.8	ns	ns	ns	ns	ns	ns
Panel B/Country						**Want more children (ref=HIV+, likely know)**		**Unmet need for any method[a] (ref=HIV+, likely know)**		**Used condom at last sex, among those who had sex in last 12 months (ref=HIV+)**	
Cameroon (2004)	20.5	1.7	4.9	76.7	16.6	ns	ns	ns	ns	ns	ns
Cote d'Ivoire (2005)	12.0	0.9	5.5	84.3	9.3	x	x	x	x	--	ns
Kenya (2003)	14.8	1.6	7.1	79.6	11.7	ns	ns	--	--	ns	ns
Lesotho (2004/05)	14.4	4.4	21.9	66.5	7.2	ns	ns	ns	ns	--	--
Malawi (2004)	14.3	1.8	11.5	76.8	9.9	ns	ns	ns	--	--	--
Rwanda (2005)	23.5	1.5	2.1	77.0	19.4	+	+	+	ns	--	--
Swaziland (2006)	40.5	13.7	17.4	46.9	22.0	+	+	+	+	--	--
Zambia (2007)	39.9	7.3	8.8	55.4	28.5	+	+	+	+	--	--

Zimbabwe (2005/06)	26.3	5.6	15.6	62.3	16.6	+	+	--	ns	--	--

Sources: Demographic and Health Surveys, 2003-2007

[a] Among those at risk of unintended pregnancy (i.e., fecund, sexually-active and want to delay or stop childbearing)

Notes: For data sets with less than 25 unweighted cases in the category "HIV positive, likely know" we used a combined category of all HIV positive cases as the reference group in the unadjusted and adjusted estimates. Covariates in models for adjusted estimates are age, urban/rural residence, education, household wealth quintile, number of living children and union status.

x = Data are not available.

ns = Association is not significant.

+ = Association is significant and positive.

- = Association is significant and negative.

Table 3. Odds ratios of the association between HIV status and fertility preferences and contraceptive use among women

	Logistic regression results: odds ratios																	
	Want more children (ref=HIV+, likely know)						**Unmet need for any method[a] (ref=HIV+, likely know)**						**Used condom at last sex, among those who had sex in last 12 mos. (ref=HIV+, likely know)**					
Country	HIV+ DK		HIV- DK		HIV- know		HIV+ DK		HIV- DK		HIV- know		HIV+ DK		HIV- DK		HIV- know	
Cameroon (2004)	1.35		1.31		1.04		2.07		1.78		1.68		0.78		1.09		0.97	
Cote d'Ivoire (2005)	x		x		x		x		x		x		0.71		0.68		0.94	
Kenya (2003)	1.01		1.17		0.79		0.82		0.49		0.29	*	1.36		0.96		1.85	
Lesotho (2004/05)	1.22		1.28		1.02		1.18		1.36		0.65		0.54	*	0.52	*	0.63	
Malawi (2004)	1.63		1.63		1.96		0.49		0.38		0.26	*	0.30	*	0.24	**	0.30	
Rwanda (2005)	1.44		2.44	**	2.23	**	1.75		2.05		1.86		0.14	**	0.09	***	0.08	***
Swaziland (2006)	1.94	***	3.53	***	1.63	**	1.55	*	1.88	***	1.07		0.56	***	0.49	***	0.45	***
Tanzania (2003)	x		x		x		x		x		x		0.94		0.49	**	0.58	
Zambia (2007)	1.82	**	2.37	***	2.09	***	2.97	**	2.45	**	1.47		0.38	***	0.42	***	0.38	***
Zimbabwe (2005/06)	1.15		2.80	***	1.96	***	0.88		0.80		0.68		1.03		0.74		0.56	*

Sources: Demographic and Health Surveys, 2003-2007

[a] Among those at risk of unintended pregnancy (i.e., fecund, sexually-active and want to delay or stop childbearing)

Notes: Odds ratios are net of age, urban/rural residence, education, household wealth quintile, number of living children and union status.
* p < .05 ** p < .01 *** p < .001
x = Data are not available.

Table 4. Percentage distribution of men by HIV status and association of HIV status with fertility preferences and contraceptive behavior, unadjusted and adjusted

		HIV status				Logistic regression results					
						Want more children (ref=HIV+)		**Unmet need for any method[a] (ref=HIV+, likely know)**		**Used condom at last sex, among those who had sex in last 12 months (ref=HIV+)**	
Panel A/Country	**Ever had HIV test**	HIV positive, likely know	HIV positive, do not know	HIV negative, do not know	HIV negative, likely know	Unadjusted	Adjusted	Unadjusted	Adjusted	Unadjusted	Adjusted
Burkina Faso (2003)	7.1	x	2.0	92.3	5.8	ns	ns	--	ns	+	ns
Congo DR (2007)	9.7	0.1	0.8	90.9	8.2	ns	ns	x	x	ns	ns
Ethiopia (2005)	5.0	0.1	0.9	94.7	4.4	ns	--	+	ns	+	ns
Ghana (2003)	8.9	0.2	1.4	91.4	7.0	ns	ns	--	ns	ns	ns
Guinea (2005)	6.3	0.1	1.0	93.4	5.5	ns	ns	ns	ns	+	ns
Liberia (2007)	5.3	0.1	1.1	94.3	4.5	ns	ns	+	+	--	ns
Mali (2006)	7.4	0.1	1.0	92.8	6.1	--	--	--	--	ns	ns
Niger (2006)	4.8	0.1	0.6	95.5	3.8	ns	ns	ns	ns	--	ns
Panel B/Country						**Want more children (ref=HIV+, likely know)**		**Unmet need for any method[a] (ref=HIV+, likely know)**		**Used condom at last sex, among those who had sex in last 12 months (ref=HIV+)**	
Cameroon (2004)	15.5	0.9	3.0	83.4	12.7	x	x	x	x	ns	ns
Cote d'Ivoire (2005)	9.4	0.7	2.2	90.0	7.2	x	x	x	x	ns	ns
Kenya (2003)	15.6	1.0	3.6	82.3	13.1	ns	ns	--	--	ns	ns
Lesotho (2004/05)	9.7	2.9	15.8	76.0	5.3	ns	ns	+	+	x	x
Malawi (2004)	17.8	2.0	8.3	75.5	14.3	ns	ns	ns	ns	+	ns
Rwanda (2005)	20.7	0.7	1.5	79.5	18.3	+	+	x	x	--	--
Swaziland (2006)	17.8	5.7	14.0	69.7	10.6	ns	ns	+	+	--	--
Tanzania (2003)	15.8	1.3	5.0	81.3	12.4	x	x	x	x	--	--

Zambia (2007)	22.5	3.6	8.7	70.9	16.8	ns	ns	+	+	--	--
Zimbabwe (2005/06)	18.1	2.8	11.9	72.3	13.0	+	+	ns	ns	--	--

Sources: Demographic and Health Surveys, 2003-2007

[a] Among those at risk of unintended pregnancy (i.e., fecund, sexually-active and want to delay or stop childbearing)

Notes: For data sets with less than 25 unweighted cases in the category "HIV positive, likely know" we used a combined category of all HIV positive cases as the reference group in the unadjusted and adjusted estimates. Covariates in models for adjusted estimates are age, urban/rural residence, education, household wealth quintile, number of living children and union status.

x = Data are not available.

ns = Association is not significant.

+ = Association is significant and positive.

- = Association is significant and negative.

Table 5. Odds ratios of the association between HIV status and fertility preferences and contraceptive use among men

	Logistic regression results: odds ratios																	
	Want more children (ref=HIV+, likely know)						**Unmet need for any method[a] (ref=HIV+, likely know)**						**Used condom at last sex, among those who had sex in last 12 mos. (ref=HIV+, likely know)**					
Country	HIV+ DK		HIV- DK		HIV- know		HIV+ DK		HIV- DK		HIV- know		HIV + DK		HIV- DK		HIV- know	
Cameroon (2004)	x		x		x		x		x		x		1.52		0.87		1.26	
Cote d'Ivoire (2005)	x		x		x		x		x		x		0.50		0.33		0.38	
Kenya (2003)	0.83		0.56		0.73		0.46		0.16	**	0.15	**	0.93		0.89		0.99	
Lesotho (2004/05)	0.86		0.63		0.46		2.83	*	2.87	*	0.97		x		x		X	
Malawi (2004)	1.42		1.21		1.48		0.38		0.38		0.42		1.12		0.71		1.63	
Rwanda (2005)	4.07	*	3.15	*	3.02	*	x		x		x		0.03	***	0.02	***	0.03	***
Swaziland (2006)	0.99		1.24		1.61		1.88		2.39	**	2.73	**	0.42	***	0.43	***	0.41	***
Tanzania (2003)	x		x		x		x		x		x		0.48		0.39	**	0.57	
Zambia (2007)	1.20		1.20		1.08		1.83		2.16	*	1.43		0.35	***	0.27	***	0.35	***

Sources: Demographic and Health Surveys, 2003-2007

[a] Among those at risk of unintended pregnancy (i.e., fecund, sexually-active and want to delay or stop childbearing)

Notes: Odds ratios are net of age, urban/rural residence, education, household wealth quintile, number of living children and union status.
* p < .05 ** p < .01 *** p < .001
x = Data are not available.