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**Men's Condom Use in Higher-Risk Sex: Trends and Determinants in
Five Sub-Saharan Countries**

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Abstract

This paper examines men's condom use at last higher-risk sex (i.e., nonmarital, noncohabiting partner) in five sub-Saharan countries: Burkina Faso, Cameroon, Kenya, Tanzania, and Zambia. The two most recent Demographic and Health Surveys (DHS) in each country are analyzed to show trends in various indicators. Condom use is an important way to prevent the transmission of HIV, the virus that causes AIDS. Encouragingly, use of condoms has increased substantially in Burkina Faso, Cameroon, and Tanzania, with smaller increases in Kenya and Zambia. At the same time, levels of higher-risk sex have declined in four of the five countries, although use of a condom at last higher-risk sex remains below 50 percent in Kenya and Zambia. Multivariate analysis shows that higher education is a consistently strong, positive predictor of condom use at last higher-risk sex, whereas higher wealth status is not significant in most surveys. Knowledge that use of condoms can reduce the risk of HIV transmission is a consistently strong, positive predictor of condom use, but urban-rural residence and region are significant only in some surveys. Comparing the two most recent DHS surveys in each of the five countries, there are no clear patterns of change in the predictive strength of explanatory variables. However, there is evidence of widening gaps in condom use by level of education in Cameroon and by urban-rural residence in Kenya. One important policy finding that emerged from this study is that low wealth status is not a barrier to condom use in most countries, but lack of education is.

Background

Reducing the transmission of HIV in sub-Saharan Africa requires not only a reduction in levels of higher-risk sex (i.e., sexual intercourse with a nonmarital, noncohabiting partner), but also an increase in the use of condoms during higher-risk sex. The current low levels of condom use in sub-Saharan Africa must be increased to achieve levels of use that will be effective in bringing about a reduction in the spread of HIV. The consistent and correct use of condoms is estimated to reduce the risk of HIV transmission by about 80 to 90 percent (Hearst and Chen, 2004; Weller and Davi, 2003). To inform program efforts to increase condom use during higher-risk sex, this paper examines trends and determinants of reported condom use by men during higher-risk sex. The data are from recent Demographic and Health Surveys (DHS) in five sub-Saharan countries: Burkina Faso, Cameroon, Kenya, Tanzania, and Zambia.

Differences in levels of condom use in various population groups and settings have been identified in the literature. In particular, groups with the lowest levels of education have consistently been the least likely to use condoms, both with nonmarital partners and with all partners, including in Cameroon, Tanzania, and Zambia (Agha, 1998; Ahmed et al., 2001; Benefo, 2004; Glynn et al., 2004; Kapiga and Lugalla, 2003; Lagarde et al., 2001; and Meekers et al., 2003). The pattern is related to people with more education being more likely to know about condoms and to know a source for condoms. The findings for economic status are less clear: both positive and nonsignificant relationships are observed for both nonmarital partners and for all partners (Adetunji and Meekers, 2001; Agha and Kusanthan, 2003; Meekers and Klein, 2002; Ukwuani et al., 2003). Urban residence is usually associated with higher levels of condom use, although some studies have concluded it has no effect (Adetunji and Meekers, 2001; Benefo, 2004; Kapiga and Lugalla, 2003; Prata et al., 2005). Rural residence is usually associated with lower levels of condom use, and may reflect inequality in access to condoms.

Studies have found that younger people are generally more likely than their older counterparts to use condoms for both nonmarital partners and for all partners (Agha, 1998; Ahmed et al., 2001; Mnyika et al., 1997). Many social marketing campaigns are

aimed at young people. In the cities of Yaoundé and Douala in Cameroon, a social marketing campaign called “100% Jeune” promoted consistent use condoms among youth. Following the program’s introduction in these cities, condom use with a regular partner among men age 15-24 increased from 44 percent in 2000 to 61 percent in 2002, and condom use with a casual partner increased from 60 to 68 percent (Meekers et al., 2005).

While the association between condom use and higher-risk sex is well known, a number of studies have found that condom use is higher with casual partners than with regular nonmarital partners (Lagarde et al., 2001; Meekers, 2003; Meekers et al., 2003). These differences by type of higher-risk sex may be explained by the person having greater trust in their regular partner—even one that is a nonmarital partner—than in a casual partner. This pattern is thought to explain differences in condom use among youth in Angola (Prata et al., 2005). Another study found no difference in condom use by type of higher-risk sex (Benefo, 2004).

Knowledge that condoms can reduce the risk of HIV, the virus that causes AIDS is associated with consistent use of condoms with nonmarital partners in Zimbabwe, as is condom use at last nonmarital sex in Zambia (Adetunji and Meekers, 2001; Benefo, 2004). One measure of the increase in knowledge of HIV/AIDS in Uganda and Tanzania was found to be increased use of condoms with all partners (Ukwuani et al., 2003). For men in Kenya, knowing that a healthy-looking person can have the AIDS virus and having the self-perception of being at high risk of HIV infection are positively associated with condom use, although neither variable has an independent significant association (Dodoo and Ampofo, 2001).

A potential constraint to condom use is the availability of an adequate source of supply. In sub-Saharan Africa the majority of condoms are bought using donor funds, although national funds are often used, and a small commercial sector exists (Shelton and Johnson, 2001). Table 1 presents data from the United Nations Population Fund (UNFPA) that show an increase in donor provision of condoms in all five countries between 1998-2000

and 2001-2004.¹ The data presented in this paper cover the approximate period of the UNFPA data. Therefore, the findings on supply issues in this analysis can be discussed in the context of reported increases in donor provision of condoms in the five countries.

Table 1 Donor provision of male condoms, Burkina Faso, Cameroon, Kenya, Tanzania, and Zambia, 1998-2000 through 2001-2004

Country	Average donor provision of male condoms		Number of condoms per man age 15-49 (average 2001-2004)
	1998-2000	2001-2004	
Burkina Faso	15,427,015	25,173,672	9.4
Cameroon	12,065,167	48,635,209	12.6
Kenya	22,732,949	132,285,384	16.2
Tanzania	24,046,725	50,422,296	5.7
Zambia	13,496,133	52,243,019	20.0

Source: UNFPA (2001, 2004)

The severity of the HIV epidemic in each country varies. Table 2 shows that, according to the most recent DHS survey or AIDS Indicator Survey (AIS) in each country, HIV prevalence² among men age 15-49 ranges from 1.9 percent in Burkina Faso to 4.1 percent in Cameroon, 4.6 percent in Kenya, 6.3 percent in Tanzania, and 12.9 percent in Zambia.

This paper analyzes the two most recent DHS surveys in each of the five countries to determine: 1) the changes that occurred in the percentage of men who used a condom at last higher-risk sex, 2) the factors associated with men's condom use at last higher-risk sex, and 3) the changes in the predictive strength of these factors. These data will be useful for evaluating the population characteristics associated with increases and decreases in condom use, in recent years. The findings will facilitate implementation of programs aimed at broadening the use of condoms among men who engage in higher-risk sex.

Table 2 HIV prevalence rate (%), Burkina Faso 2003 DHS, Cameroon 2004 DHS, Kenya 2003 DHS, Tanzania 2003 AIDS Indicator Survey (AIS), Zambia 2001-02 DHS

Country/survey year	HIV prevalence rate
Burkina Faso 2003 DHS	1.9
Cameroon 2004 DHS	4.1
Kenya 2003 DHS	4.6
Tanzania 2003 AIS	6.3
Zambia 2001-02 DHS	12.9

Note: HIV data were not collected in any other DHS/AIS surveys for these countries. Source: Burkina Faso (INSD and ORC Macro, 2004); Cameroon (INS and ORC Macro, 2004); Kenya (CBS et al., 2004); Tanzania (TACAIDS et al., 2005); Zambia (CSO et al., 1997); Zambia (CSO et al., 2003)

¹ The average over a number of years is used because of some sharp fluctuations in provision from year-to-year. The 1998 data are the earliest available.

² HIV data in DHS surveys were obtained from respondents who voluntarily provided blood samples for laboratory testing, after being informed of procedures, confidentiality, and voluntary counseling and testing (VCT) services.

Data and Methodology

The DHS survey is a cross-sectional survey that collects comprehensive, comparable demographic and health data in developing countries. DHS surveys used in this study are the following: the 1998-99 and 2003 surveys in Burkina Faso (INSD and Macro International, 2000; INSD and ORC Macro 2004), the 1998 and 2004 surveys in Cameroon (BUCREP and ORC Macro, 1999; INS and ORC Macro, 2004), the 1998 and 2003 surveys in Kenya³ (CBS et al., 2004; NCPD et al., 1999), the 1999 and 2004 surveys in Tanzania (NBS and Macro International, 2000; NBS and ORC Macro, 2005), and the 1996 and 2001-02 surveys in Zambia (CSO et al., 1997; 2003).

Table 3 shows the sample size and response rate for each survey. The surveys were conducted using a multi-stage sample design. One advantage of the DHS surveys is the availability of comparable data from each country at two points in time. This allows for in-depth analysis of changes in selected indicators. Using similar time periods, these changes can be compared across countries.

Table 3 Number and age of men interviewed, and eligible man response rate (%), DHS surveys in five sub-Saharan countries, 1996-2005

Country/survey year	Number of men interviewed	Age of men interviewed	Eligible man response rate (%)
Burkina Faso 1998-99	2,641	15-59	91.1
Burkina Faso 2003	3,605	15-59	90.5
Cameroon 1998	2,652	15-59	91.3
Cameroon 2004	5,280	15-59	93.0
Kenya 1998	3,407	15-54	88.6
Kenya 2003	3,578	15-54	85.5
Tanzania 1999	3,542	15-59	93.4
Tanzania 2004-05	2,635	15-49	91.8
Zambia 1996	1,849	15-59	90.5
Zambia 2001-02	2,145	15-59	88.7

Source: Burkina Faso (INSD and Macro International, 2000); Burkina Faso (INSD and ORC Macro, 2004); Cameroon (BUCREP and ORC Macro, 1999); Cameroon (INS and ORC Macro, 2004); Kenya (NCPD et al., 1999); Kenya (CBS et al., 2004); Tanzania (NBS and Macro International, 2000); Tanzania (NBS and ORC Macro, 2005); Zambia (CSO et al., 1997); Zambia (CSO et al., 2003)

This study analyzes a sub-sample of the male respondents in each DHS survey: all men age 15-49 who reported engaging in higher-risk sex in the previous 12 months. The

³ The 1998 Kenya DHS survey did not sample Northeastern province; therefore this province was not included in the analysis of the 2003 Kenya DHS survey.

outcome variable analyzed in the study is reported condom use at last higher-risk sex.⁴ UNAIDS recommends the use of this indicator for monitoring and evaluation of national AIDS programs (Slaymaker, 2004). A variable measuring frequency of condom use was not included in this analysis because it was available for only three surveys, and because it does not distinguish between higher-risk partners and other partners. Also, not all men who reported using a condom at last higher-risk sex used a condom each time they had sex. However, condom use at each intercourse was more common among men who used a condom at last higher-risk sex than among those who did not.⁵

A number of sociodemographic variables found in both surveys are analyzed in this study; these include: age, marital status,⁶ place of residence, religion, highest level of education, and household wealth quintile.⁷ For place of residence, the standard urban and rural categories are used in Burkina Faso, Kenya, Tanzania, and Zambia, while in Cameroon urban residence is divided into smaller categories. A variable for region of residence is also included. The remaining variables examined in each survey measure whether the respondent knows that condoms can reduce the risk of HIV transmission and that a healthy-looking person can have the AIDS virus, and whether the respondent knows a person who has AIDS or has died of AIDS. The type of partner variable is only used for the most recent survey and is categorized as girlfriend/fiancée, other friend,⁸ and casual/other. In Cameroon and Tanzania a variable measuring whether the respondent or partner consumed alcohol before last sexual intercourse is included in the most recent survey. Two attitudinal variables are included in the most recent survey: a measure of

⁴ There is a difference in the question on condom use in the surveys. In the earlier survey for each country, married or cohabiting men were asked whether they had used a condom at last sex with another woman in the previous 12 months; other men were asked whether they used a condom at last sex with any woman in the previous 12 months. In the later survey, male respondents were asked whether they used a condom with each of their last three partners in the previous 12 months, and their relationship to each of these partners.

⁵ In the three countries (Burkina Faso, Cameroon, and Zambia) the percentage of men who used a condom at last higher-risk sex and also reported using a condom every time they had sex with any partner is as follows: Burkina Faso 1998-99 DHS, 57.5% ; Cameroon 1998 DHS 28.0%, and Zambia 2001-02 DHS 39.5%.

⁶ The category “currently married” includes persons cohabiting with a partner. A higher-risk partner is defined as a nonmarital, noncohabiting partner.

⁷ Household wealth quintile is computed from a wealth index that measures a household’s ownership of durable assets. Rutstein and Johnson (2004) describe the methodology for calculating the index.

⁸ In Tanzania there is no “other friend” category.

positive attitudes toward people with HIV⁹ and whether the respondent thinks children should be taught about condoms in school.¹⁰

In the multivariate analysis, there are three models for each country. First, a model is conducted for each of the country's two surveys, including only the variables available in each survey. Second, a Wald test is conducted to determine if there is significant change in the strength of each odds ratio between the two surveys. And third, a model of the most recent survey is conducted including all variables. The multivariate analysis is carried out with logistic regression models using Stata 8.1 to analyze the factors associated with condom use at last higher-risk sex (StataCorp, 2003). Sample weights are applied in the regression, and standard errors are adjusted for the cluster design of the sample. The odds ratio, or exponential of the coefficient in the model, is presented. The results section below describes the trends in higher-risk sex and condom use at last higher-risk sex, and then presents the univariate results for each variable. These are followed by the bivariate and multivariate results for each country. In the bivariate analysis of each explanatory variable, a chi-square test determines if there is statistically significant variation in condom use across all categories of the variable. Last, patterns across countries are identified from the analyses.

Results

Table 4 shows that in all of the countries except Burkina Faso, the proportion of sexually active men who reported higher-risk sex in the previous 12 months has fallen in recent years. The country with the highest proportion of men engaging in higher-risk sex is Cameroon—more than 60 percent in both surveys. In Burkina Faso the figure is less than 40 percent in each survey. The largest declines are in Kenya, from 49.1 percent in 1998 to 39.3 percent in 2003, and Tanzania, from 54.5 percent in 1999 to 45.6 percent in 2004-05.

⁹ A respondent is classified as having a positive attitude toward people with HIV if he is willing to care for a relative who has the AIDS virus, believes that a woman with the AIDS virus who is a teacher should continue teaching, and would buy vegetables from a vendor who has the AIDS virus.

¹⁰ A variable incorporating HIV prevalence by measuring whether a man is aware he is HIV-positive could not be included. The small proportion of men (less than 2 percent) in each country that are HIV-positive, have been tested within the past 12 months, and have found out their test results does not allow for appropriate analysis of the variable.

Table 4 Trends in the prevalence (%) of higher-risk sex, condom use at last higher-risk sex, and condom use at last sex (all partners) among men age 15-49, DHS surveys in five sub-Saharan countries, 1996-2005

Country/survey year	Men who engaged in higher-risk sex ¹		Condom use at last higher-risk sex		Condom use at last sex (all partners)	
	Percent	Number	Percent	Number	Percent	Number
Burkina Faso 1998-99	35.2	1,553	57.6	546	23.9	1,553
Burkina Faso 2003	38.7	2,015	69.1	780	31.2	2,015
Cameroon 1998	64.2	1,879	30.3	1,207	16.9	1,879
Cameroon 2004	61.9	3,660	54.6	2,265	32.4	3,660
Kenya 1998	49.1	2,567	44.5	1,261	21.4	2,567
Kenya 2003	39.3	2,381	46.5	936	17.8	2,381
Tanzania 1999	54.5	2,602	35.1	1,419	18.2	2,602
Tanzania 2004-05	45.6	1,976	51.1	900	20.8	1,976
Zambia 1996	52.9	1,365	40.5	722	21.6	1,365
Zambia 2001-02	45.4	1,568	44.2	713	21.1	1,568

Note: Includes only sexual activity in the previous 12 months.

¹ Denominator is all men age 15-49 sexually active in the previous 12 months.

Source: Burkina Faso (INSD and Macro International, 2000); Burkina Faso (INSD and ORC Macro, 2004);

Cameroon (BUCREP and ORC Macro, 1999); Cameroon (INS and ORC Macro, 2004); Kenya (NCPD et al., 1999);

Kenya (CBS et al., 2004); Tanzania (NBS and Macro International, 2000); Tanzania (NBS and ORC Macro, 2005);

Zambia (CSO et al., 1997); Zambia (CSO et al., 2003)

There was an increase in reported condom use at last higher-risk sex in all five countries, but the size of the increase varied. In Burkina Faso, Cameroon, and Tanzania condom use at last higher-risk sex rose by more than ten percentage points; however, in Cameroon and Tanzania, condom use levels in the first surveys were lower than those in the first surveys for the other three countries. The sharp increase in condom use at last higher-risk sex in Cameroon is important because of the high proportion of men who had higher-risk sex in the previous 12 months. The increase in condom use at last higher-risk sex in Burkina Faso to 69.1 percent in 2003, together with the low proportion of men who had higher-risk sex in the previous 12 months, is encouraging for the prevention of HIV transmission. In Kenya and Zambia the increase in condom use at last higher-risk sex was small, and remained less than 50 percent in the second survey in each country. Condom use at last sex for all partners did not necessarily change in the same proportions as condom use at last higher-risk sex. There was only a small increase in condom use in Tanzania, and in Kenya there was actually a decrease in condom use.

Table 5 shows the univariate statistics for the variables included in the multivariate analyses of condom use among men who engaged in higher-risk sex. A substantial proportion of these men are age 15-24, which is consistent with a high percentage being

Table 5 Univariate statistics for men who engaged in higher-risk sex in the previous 12 months (%), DHS surveys in five sub-Saharan countries, 1996-2005

Variable	Burkina Faso		Cameroon		Kenya		Tanzania		Zambia	
	1998-99	2004	1998	2004	1998	2003	1999	2004-05	1996	2001-02
Condom use at last higher-risk sex										
No	42.4	30.9	69.7	45.4	55.5	53.5	64.9	48.9	59.5	55.8
Yes	57.6	69.1	30.3	54.6	44.5	46.5	35.1	51.1	40.5	44.2
Age										
15-24 years	57.1	55.9	48.7	47.2	61.1	64.5	51.3	54.6	65.0	56.6
25-34 years	34.6	30.4	30.8	33.2	25.9	25.0	25.8	29.1	23.5	28.7
35-49 years	8.3	13.7	20.5	19.7	13.1	10.5	22.8	16.4	11.5	14.6
Marital status										
Never married	77.8	71.2	59.5	47.4	70.2	72.7	53.5	55.4	66.1	58.8
Currently married ¹	17.6	24.9	33.8	37.9	22.4	18.3	36.1	34.6	23.9	31.5
Formerly married	4.6	4.0	6.7	14.8	7.4	9.0	10.4	10.1	10.0	9.7
Residence										
Capital, large city	-	-	21.0	32.0	-	-	-	-	-	-
Small city	-	-	4.8	5.1	-	-	-	-	-	-
Town	-	-	19.2	29.6	-	-	-	-	-	-
Urban	39.5	43.5	-	-	26.0	29.3	27.9	28.8	47.9	46.6
Rural	61.5	56.5	55.1	33.3	74.0	70.7	72.1	71.2	52.1	53.4
Religion										
Catholic	26.2	31.2	45.7	44.9	31.6	29.5	31.8	32.7	27.4	25.6
Protestant ²	-	-	33.1	32.6	57.4	57.3	19.1	22.1	69.1	71.1
Muslim	61.0	61.7	12.7	11.8	4.7	4.4	35.4	28.7	-	-
Other	12.9	7.1	8.5	10.7	6.3	8.8	13.8	16.4	3.5	3.3
Household wealth quintile										
Lowest	8.4	10.0	8.0	6.6	13.0	11.9	16.0	15.4	16.4	17.8
Second	14.0	12.6	14.9	12.9	16.3	16.9	16.5	19.1	16.3	14.0
Middle	15.7	16.2	18.7	19.3	17.8	14.9	22.4	18.9	20.0	15.0
Fourth	16.8	13.6	26.2	25.5	25.8	24.6	19.1	20.5	21.0	26.5
Highest	45.0	47.2	32.3	35.7	27.1	31.6	26.0	26.2	26.2	26.7
Highest education level										
None/incomplete primary	68.0	58.3	17.7	18.6	34.2	40.4	33.6	33.4	35.0	35.0
Completed primary	7.7	11.7	21.5	17.3	24.4	22.2	60.2	54.9	22.8	19.7
Incomplete secondary	16.4	18.6	49.5	52.4	14.7	9.4	-	-	38.6	29.7
Complete secondary/higher	7.9	11.4	11.2	11.6	26.7	28.0	6.1	11.6	3.6	15.6
Condoms reduce risk of HIV transmission										
Don't know	20.7	18.9	30.0	21.9	35.3	26.3	16.9	21.9	37.4	28.9
Know	79.3	81.1	70.0	78.1	64.7	73.7	83.1	78.1	62.6	71.1
Healthy-looking person can have the AIDS virus										
Don't know	17.1	20.5	25.5	15.2	14.1	6.9	20.6	14.5	11.6	20.1
Know	82.9	79.5	74.5	84.8	85.9	93.1	79.4	85.5	88.4	79.9
Know person with HIV/ died of AIDS										
No	42.4	42.5	65.4	52.7	29.8	20.6	-	-	26.7	26.3
Yes	57.6	57.5	34.6	47.3	70.2	79.4	-	-	73.3	73.7
Type of partner										
Girlfriend/fiancée	-	73.3	-	74.0	-	59.2	-	56.9	-	57.4
Other friend	-	16.3	-	11.2	-	21.4	-	-	-	18.7
Casual/other	-	10.5	-	14.8	-	19.4	-	43.1	-	23.9

Continued...

Table 5—Continued

Variable	Burkina Faso		Cameroon		Kenya		Tanzania		Zambia	
	1998-99	2004	1998	2004	1998	2003	1999	2004-05	1996	2001-02
Alcohol at last sex										
No/don't know	-	-	-	72.9	-	-	-	89.7	-	-
Yes				27.1				10.3		
Positive attitude toward people with HIV										
No	-	46.1	-	56.6	-	49.9	-	56.9	-	59.0
Yes		53.9		43.4		50.1		43.1		41.0
Think condoms should be taught in school										
No	-	19.7	-	18.4	-	28.2	-	19.5	-	30.2
Yes		80.3		81.6		71.8		80.5		69.8
Region (Burkina Faso)										
Central	-	44.2	-	-	-	-	-	-	-	-
North		19.2								
West		32.8								
East		3.7								
Region (Cameroon)										
North	-	-	12.2	13.1	-	-	-	-	-	-
Central/South/East			36.4	37.6						
West/Littoral			27.6	29.2						
Southwest/Northwest			23.7	20.2						
Region (Kenya)										
Central	-	-	-	-	22.3	24.2	-	-	-	-
Coast					8.5	8.4				
West					29.5	23.1				
Rift Valley					21.5	29.7				
Eastern					18.2	14.6				
Region (Tanzania)										
Northwest	-	-	-	-	-	-	26.0	27.8	-	-
West							17.9	23.3		
Northeast							18.8	12.3		
South/Central							12.4	10.9		
Coast							17.3	13.6		
Dar es Salaam							7.6	12.0		
Region (Zambia)										
Northwest/West/South	-	-	-	-	-	-	-	-	24.1	29.8
Lusaka									16.4	17.9
Central/Copperbelt									32.6	28.1
East									14.2	10.6
Luapula/Northern									12.8	13.7
Number of cases	546	780	1,207	2,265	1,261	936	1,419	900	722	713

Note: The regions comprise the following provinces:

Burkina Faso: Central (Ouagadougou, Centre, Centre Sud, Centre Ouest, Plateau Central), North (Nord, Centre Nord, Sahel), West (Hauts Bassins, Cascades, Sud Ouest, Boucle du Mouhoun), and East (Est, Centre Est). The provinces used in Burkina Faso differ between each survey, so the region variable is only included in analysis of the 2003 DHS.

Cameroon: North (Extreme-Nord, Nord, Adamaoua), Central/South/East (Yaounde, Centre, Sud, Est), West/Littoral (Ouest, Littoral, Douala), and Northwest/Southwest (Nord-Ouest, Sud-Ouest).

Kenya: Central (Nairobi, Central), Coast, West (Nyanza, Western), Rift Valley, and East.

Tanzania: Northwest (Shinyanga, Kagera, Mwanza, Mara), West (Mbeya, Singida, Tabora, Rukwa, Kigoma), North/East (Dodoma, Arusha, Kilimanjaro, Manyara), South/Central (Morogoro, Ruvuma, Iringa), Coast (Tanga, Pwani, Lindi, Mtwara, Zanzibar North, Zanzibar South, Town West, Pemba North, Pemba South).

Zambia: Northwest/West/South, Lusaka, Central/Copperbelt, East, and Luapula/ Northern.

¹ Includes cohabiting.

² For Kenya, includes other Christian.

Source: Burkina Faso (INSD and Macro International, 2000); Burkina Faso (INSD and ORC Macro, 2004); Cameroon (BUCREP and ORC Macro, 1999); Cameroon (INS and ORC Macro, 2004); Kenya (NCPD et al., 1999); Kenya (CBS et al., 2004); Tanzania (NBS and Macro International, 2000); Tanzania (NBS and ORC Macro, 2005); Zambia (CSO et al., 1997); Zambia (CSO et al., 2003)

unmarried. Most of the sociodemographic variables show little variation between the two surveys in each country. Men in the highest wealth quintile in each country make up the largest proportion of men who engage in higher-risk sex, especially in Burkina Faso, where they comprise almost half of the sample.¹¹ In each country, well over half of the men who reported engaging in higher-risk sex know that using a condom can reduce the risk of HIV transmission and that a healthy-looking person can have the AIDS virus. In Cameroon, among men who engaged in higher-risk sex, there was an increase between the two surveys in the knowledge that using a condom can reduce the risk of HIV transmission. This increase in knowledge about the protective effects of condoms occurred along with a rise in the proportion of these men using condoms. In other countries, however, no clear association was present. Attitudes toward people with HIV do not vary much between countries.

The following description of the results of the bivariate and multivariate analyses identifies the key findings from each country; then the results are summarized across all the countries.

Burkina Faso. Table 6 shows that condom use at last higher-risk sex in Burkina Faso is positively related to both education and wealth. In 2003, 91.0 percent of men who had completed at least secondary education and 88.6 percent of men in the highest wealth quintile used a condom at last higher-risk sex. However, neither variable is strongly related to condom use in the multivariate analysis. Rural residence is associated with lower condom use. In 2003, 52.4 percent of men in rural areas used a condom at last higher-risk sex compared with 90.8 percent of men in urban areas. The odds ratio of condom use by rural men compared with urban men in the multivariate analysis is 0.24 in 1998-99 and 0.27 in 2003. There are regional differences in Burkina Faso, with men in the North and West regions being less likely to use a condom than those in the Central region (North OR=0.38, West OR=0.29). Knowledge that condoms can reduce the risk of

¹¹ Household wealth quintiles are computed based on all households in the survey. The greater likelihood that wealthier men engage in higher-risk sex explains why they comprise a high proportion of men in this analysis.

Table 6 Bivariate and multivariate analysis of condom use at last non-marital, non-cohabiting sex, males age 15-49, Burkina Faso, 1998-99 and 2003

Variable	Bivariate (% used condom)		Multivariate						
	1998-99	2003	1998-99		2003		98-03	2003	
			OR	(S.E.)	OR	(S.E.)		OR	(S.E.)
Age	*								
15-24 years	55.4	66.8	1.000		1.000			1.000	
25-34 years	65.1	74.4	1.189	(0.300)	0.967	(0.278)		0.922	(0.260)
35-49 years	41.3	66.4	0.307	(0.148)*	0.645	(0.256)		0.677	(0.306)
Marital status									
Never married	58.2	69.0	1.000		1.000			1.000	
Currently married	59.4	68.2	1.756	(0.587)	1.457	(0.478)		1.310	(0.485)
Formerly married	42.3	77.4	0.479	(0.210)	1.407	(0.899)		1.176	(0.898)
Residence	**	**							
Urban	81.7	90.8	1.000		1.000			1.000	
Rural	42.6	52.4	0.238	(0.091)**	0.269	(0.108)**		0.288	(0.119)
Religion	**	**							
Catholic/Protestant	72.0	78.6	1.000		1.000			1.000	
Muslim	56.9	67.4	0.805	(0.186)	0.844	(0.213)		1.190	(0.354)
Traditional/other	22.0	43.6	0.426	(0.150)*	0.651	(0.251)		1.014	(0.405)
Household wealth quintile	**	**							
Lowest	32.5	35.9	1.000		1.000			1.000	
Second	37.5	43.9	1.139	(0.461)	1.276	(0.498)		1.249	(0.489)
Middle	45.4	57.5	1.572	(0.685)	1.980	(0.733)		1.741	(0.655)
Fourth	43.5	63.6	1.412	(0.586)	2.166	(0.827)*		2.169	(0.883)
Highest	78.2	88.6	1.354	(0.684)	2.676	(1.348)		2.604	(1.361)
Education level	**	**							
None/incomplete primary	46.6	57.1	1.000		1.000			1.000	
Complete primary	26.0	75.8	0.910	(0.316)	1.221	(0.444)		1.218	(0.447)
Incomplete secondary	61.9	88.4	3.223	(1.180)**	1.784	(0.663)		2.122	(0.816)
Complete secondary+	78.0	91.0	2.280	(1.043)	1.742	(1.191)		1.760	(1.152)
Region		**							
Central	-	83.3			-			1.000	
North		50.0						0.383	(0.119)**
West		59.9						0.290	(0.080)**
East		81.9						2.060	(1.550)
Condoms reduce risk of HIV transmission	**	**							
Don't know	33.6	45.3	1.000		1.000			1.000	
Know	64.0	74.7	2.378	(0.667)**	2.295	(0.666)**		2.672	(0.790)**
Healthy-looking person can have the AIDS virus	**	**							
Don't know	34.4	50.3	1.000		1.000			1.000	
Know	62.4	75.7	1.503	(0.484)	1.025	(0.281)		0.991	(0.268)
Know person with HIV/died of AIDS	**	**							
Don't know	46.5	59.5	1.000		1.000			1.000	
Know	65.7	78.6	2.291	(0.547)**	1.734	(0.459)*		1.865	(0.481)*
Type of partner									
Girlfriend/fiancée	-	67.3	-		-			1.000	
Other friend		91.0						2.299	(0.914)*
Casual/other		71.7						2.750	(0.959)**
Positive attitude toward people with HIV		**							
No	-	57.7	-		-			1.000	
Yes		78.9						1.071	(0.261)
Think condoms should be taught in school									
No	-	62.7	-		-			1.000	
Yes		70.7						1.185	(0.369)
Total cases (unweighted)			591		773			773	

* p<0.05 ** p<0.01

Source: Burkina Faso (INSD and Macro International, 2000); Burkina Faso (INSD and ORC Macro, 2004)

HIV transmission increases the likelihood of condom use: 74.4 percent among men who know that condoms can prevent the transmission of HIV compared with 45.3 percent among those lacking this knowledge. If the higher-risk partner is a girlfriend or fiancée, the likelihood of condom use is lower than with another friend, or a casual/other partner (67.3 percent compared with 91.0 percent and 71.7 percent, respectively).

Cameroon. Table 7 shows the bivariate and multivariate results for Cameroon. A bivariate increase in condom use at last higher-risk sex occurred at each level of education between 1998 and 2004. The multivariate results show that in each category the odds ratio compared with the reference category increased over the time period. This increase was significant, according to the Wald test, for the two highest education categories. Condom use at last higher-risk sex remained significantly and positively associated with household wealth in the bivariate analysis for each survey, but in the multivariate analysis this relationship had disappeared by 2004. Although there was a significant relationship between condom use and place of residence and region in the bivariate analysis, this was not apparent in the multivariate analysis. The odds ratio of condom use at last higher-risk sex among men with knowledge that condoms can reduce the risk of HIV transmission was positive and significant in each survey and increased over the period between the surveys.

Table 7 Bivariate and multivariate analysis of condom use at last higher-risk sex, males age 15-49, Cameroon, 1998 and 2004

Variable	Bivariate (% used condom)		Multivariate						
	1998	2004	1998		2004		98-04	2004	
			OR	(S.E.)	OR	(S.E.)		OR	(S.E.)
Age		**							
15-24 years	31.5	57.4	1.000		1.000			1.000	
25-34 years	28.0	56.5	0.735	(0.121)	0.984	(0.121)		0.966	(0.120)
35-49 years	30.6	44.9	0.825	(0.186)	0.626	(0.094)**		0.617	(0.098)**
Marital status		**							
Never married	31.1	57.1	1.000		1.000			1.000	
Currently married	32.6	53.2	1.401	(0.275)	1.018	(0.131)		0.993	(0.131)
Formerly married	11.3	50.3	0.350	(0.141)**	0.796	(0.121)	*	0.800	(0.122)
Residence		**							
Capital/large city	38.3	68.1	1.000		1.000			1.000	
Small city	35.1	55.7	0.952	(0.242)	0.912	(0.238)		0.926	(0.250)
Town	41.1	57.7	1.149	(0.229)	1.036	(0.160)		1.055	(0.164)
Rural	23.0	38.8	0.713	(0.162)	0.730	(0.161)		0.740	(0.163)
Religion		**							
Catholic	29.3	55.7	1.000		1.000			1.000	
Protestant	31.1	54.8	1.049	(0.157)	1.066	(0.130)		1.074	(0.132)
Muslim	30.5	53.2	1.186	(0.276)	1.516	(0.318)*		1.534	(0.319)*
Other	32.4	52.1	1.163	(0.307)	1.113	(0.202)		1.132	(0.206)
Household wealth quintile		**							
Lowest	16.1	32.2	1.000		1.000			1.000	
Second	20.1	35.3	1.460	(0.540)	0.915	(0.230)		0.891	(0.229)
Middle	24.9	45.7	1.763	(0.651)	1.170	(0.323)		1.122	(0.312)
Fourth	30.5	59.5	2.106	(0.770)*	1.635	(0.507)		1.574	(0.492)
Highest	41.4	67.1	2.562	(0.968)*	1.773	(0.600)		1.733	(0.590)
Education level		**							
None/incomplete primary	23.8	33.6	1.000		1.000			1.000	
Complete primary	30.0	43.8	1.094	(0.267)	1.481	(0.265)*		1.447	(0.263)
Incomplete secondary	28.5	62.4	0.760	(0.172)	2.352	(0.376)**	**	2.249	(0.367)**
Complete secondary+	48.5	69.3	1.560	(0.417)	2.829	(0.649)**	*	2.752	(0.641)**
Region		**							
North	28.4	41.2	1.000		1.000			1.000	
Central/South/East	27.7	57.2	0.852	(0.259)	1.167	(0.268)		1.152	(0.268)
West/Littoral	35.1	65.1	0.887	(0.262)	1.400	(0.329)		1.409	(0.342)
Southwest/Northwest	29.5	43.3	0.801	(0.258)	0.827	(0.221)		0.855	(0.233)
Condoms reduce risk of HIV transmission		**							
Don't know	22.9	36.6	1.000		1.000			1.000	
Know	33.5	59.6	1.471	(0.232)*	1.982	(0.237)**		1.959	(0.236)**
Healthy-looking person can have the AIDS virus		**							
Don't know	19.2	44.8	1.000		1.000			1.000	
Know	34.1	56.5	1.833	(0.230)**	0.988	(0.136)	**	0.954	(0.135)
Know person with HIV/died of AIDS		**							
Don't know	29.8	54.0	1.000		1.000			1.000	
Know	31.3	55.5	1.023	(0.144)	1.094	(0.102)		1.090	(0.103)
Type of partner		**							
Girlfriend/fiancée	-	54.2	-		-			1.000	
Other friend		57.2						1.252	(0.187)
Casual/other		54.4						1.475	(0.225)*
Alcohol at last sex		**							
No	-	56.4	-		-			1.000	
Yes		50.0						0.989	(0.116)
Positive attitude toward people with HIV		**							
No	-	48.6	-		-			1.000	
Yes		62.6						1.098	(0.118)
Think condoms should be taught in school		**							
No	-	40.0	-		-			1.000	
Yes		57.9						1.477	(0.180)**
Total cases (unweighted)			1,258		2,316			2,316	

* p<0.05 ** p<0.01

Source: Cameroon (BUCREP and ORC Macro, 1999); Cameroon (INS and ORC Macro, 2004)

Kenya. Table 8 shows that in Kenya the relationship between condom use at last higher-risk sex and level of education remained steady from 1998 to 2003 in both the bivariate and multivariate analyses, with a positive relationship found in both surveys. However, there was a narrowing of the predictive strength of household wealth status. Although the bivariate results do not show a major change, the multivariate results indicate that the odds ratio fell substantially over the period, and was no longer significant in 2003. Comparing the poorest wealth quintile with the middle wealth quintile (1998 OR=1.88, 2003 OR=0.67, Wald test found the change in OR significant), second-highest (1998 OR=1.89, 2003 OR=0.90) and highest categories (1998 OR=2.21, 2003 OR=1.02). There was a rise in condom use at last higher-risk sex in urban areas, and the odds ratio in rural areas fell significantly from 1.23 in 1998 to 0.58 in 2003. Some regional variation was apparent, with a man living in the East region being more likely to use a condom at last higher-risk sex than a man in the Central region, in 2003. There was an increase in condom use by men age 35-49 from 1998 to 2003, and their odds ratio of condom use, compared with men age 15-24, increased in the multivariate analysis. Condom use at last higher-risk sex by those lacking knowledge of the effectiveness of condoms in reducing the risk of HIV transmission fell sharply over the period, and the odds ratio of condom use by men with this knowledge increased significantly from 1.84 in 1998 to 3.82 in 2003. Condom use was again more likely with a casual or other partner than with a girlfriend or fiancée.

Table 8 Bivariate and multivariate analysis of condom use at last non-marital, non-cohabiting sex, males age 15-49, Kenya, 1998 and 2003

Variable	Bivariate (% used condom)		Multivariate						
	1998	2003	1998		2003		98-03	2003	
			OR	(S.E.)	OR	(S.E.)		OR	(S.E.)
Age	*								
15-24 years	43.0	46.7	1.000		1.000			1.000	
25-34 years	51.2	46.4	0.936	(0.199)	1.072	(0.238)		1.125	(0.257)
35-49 years	39.4	45.9	0.424	(0.135)**	1.270	(0.387)	*	1.190	(0.366)
Marital status	**	**							
Never married	43.2	48.9	1.000		1.000			1.000	
Currently married	55.7	45.3	2.697	(0.666)**	0.789	(0.209)	**	0.702	(0.193)
Formerly married	24.7	29.8	0.661	(0.221)	0.367	(0.104)**		0.353	(0.098)**
Residence	*	**							
Urban	50.8	59.4	1.000		1.000			1.000	
Rural	42.5	41.2	1.228	(0.250)	0.580	(0.138)*	*	0.565	(0.133)*
Religion		**							
Catholic	44.6	43.1	1.000		1.000			1.000	
Protestant/other Christian	43.7	50.8	0.895	(0.138)	1.445	(0.253)*	*	1.490	(0.256)*
Muslim	52.5	41.5	1.465	(0.572)	0.840	(0.376)		0.898	(0.418)
Traditional/other	46.8	31.7	1.159	(0.341)	0.987	(0.295)		0.876	(0.264)
Household wealth quintile	**	**							
Lowest	31.0	39.1	1.000		1.000			1.000	
Second	36.7	39.3	1.272	(0.332)	0.836	(0.296)		0.806	(0.263)
Middle	43.8	33.7	1.876	(0.531)*	0.674	(0.203)	*	0.700	(0.211)
Fourth	46.6	47.8	1.890	(0.497)*	0.900	(0.282)		0.829	(0.248)
Highest	54.7	58.2	2.209	(0.673)**	1.015	(0.364)		0.963	(0.330)
Education level	**	**							
None/incomplete primary	31.0	36.5	1.000		1.000			1.000	
Complete primary	44.8	44.0	1.521	(0.286)*	1.147	(0.226)		1.195	(0.244)
Incomplete secondary	53.8	56.8	2.120	(0.462)**	1.968	(0.585)*		2.106	(0.647)*
Complete secondary+	56.8	59.5	2.311	(0.511)**	1.735	(0.436)*		1.749	(0.465)*
Region	**	*							
Central	48.9	50.0	1.000		1.000			1.000	
Coast	50.5	55.5	0.934	(0.236)	1.611	(0.471)		1.408	(0.432)
West	41.7	38.1	0.959	(0.236)	1.031	(0.252)		0.877	(0.233)
Rift Valley	50.6	49.1	1.404	(0.363)	1.441	(0.337)		1.309	(0.305)
Eastern	34.4	43.7	0.761	(0.206)	1.750	(0.472)*		1.774	(0.495)*
Condoms reduce risk of HIV transmission	**	**							
Don't know	35.1	22.8	1.000		1.000			1.000	
Know	50.0	55.0	1.844	(0.294)**	3.816	(0.789)**	**	4.003	(0.882)**
Healthy-looking person can have the AIDS virus	**								
Don't know	23.7	37.5	1.000		1.000			1.000	
Know	48.2	47.2	2.000	(0.474)**	0.871	(0.295)	*	0.962	(0.337)
Know person with HIV/died of AIDS	**	**							
Don't know	36.5	36.5	1.000		1.000			1.000	
Know	48.3	49.2	1.431	(0.253)*	1.358	(0.293)		1.349	(0.292)
Type of partner		*							
Girlfriend/fiancée	-	45.1	-		-			1.000	
Other friend		42.3						0.763	(0.164)
Casual/other		55.2						2.056	(0.434)**
Positive attitude toward people with HIV		**							
No	-	39.6	-		-			1.000	
Yes		53.3						1.144	(0.211)
Think condoms should be taught in school									
No	-	45.5	-		-			1.000	
Yes		47.0						0.829	(0.153)**
Total cases (unweighted)			1,303		892			892	

* p<0.05 ** p<0.01

Source: Kenya (NCPD et al., 1999); Kenya (CBS et al., 2004)

Tanzania. In Tanzania, Table 9 shows very low condom use at last higher-risk sex for the least educated men in 1999 (20.8 percent). By 2004-05, however, use increased for all levels of education. In the multivariate analysis, the relationship between education and condom use is strong and positive in both surveys, with a slight increase in the odds ratio over the period. For wealth status, although there is a significant bivariate relationship, and condom use is low among those in the poorest wealth quintile (23.2 percent in 1999), this relationship is weak in the multivariate models. Condom use at last higher-risk sex increased over the period 1999 to 2004-05 in both urban and rural areas; however, in the multivariate analysis the odds ratio of condom use in rural areas declined to less than half that in urban areas. There is no multivariate relationship between region and condom use. For religion, people identified as having “other” religions were less than half as likely to use a condom at last higher-risk sex, compared with Muslims. The relationship between condom use at last higher-risk sex and knowing that condoms can reduce the risk of HIV transmission is positive in both surveys. However, there was a sharp increase in use of condoms among men who lack this knowledge, and the odds ratio fell. Condom use was again higher with a casual or other partner compared with a girlfriend or fiancée.

Table 9 Bivariate and multivariate analysis of condom use at last higher-risk sex, males age 15-49, Tanzania, 1999 and 2004-05

Variable	Bivariate (% used condom)		Multivariate						
	1999	2004-05	1999		2004-05		99-04-05	2004-05	
			OR	(S.E.)	OR	(S.E.)		OR	(S.E.)
Age	**	**							
15-24 years	31.3	45.5	1.000		1.000			1.000	
25-34 years	43.3	48.5	1.679	(0.469)	1.338	(0.322)		1.394	(0.342)
35-49 years	34.6	56.6	1.365	(0.405)	1.134	(0.351)		1.186	(0.372)
Marital status									
Never married	34.2	48.6	1.000		1.000			1.000	
Currently married	36.2	52.1	0.909	(0.253)	1.292	(0.355)		1.196	(0.333)
Formerly married	35.8	61.8	0.798	(0.242)	1.206	(0.444)		1.198	(0.433)
Residence	**	**							
Urban	53.2	69.1	1.000		1.000			1.000	
Rural	28.2	43.8	0.851	(0.258)	0.457	(0.134)**		0.460	(0.134)**
Religion	**	**							
Muslim	37.3	56.7	1.000		1.000			1.000	
Catholic	37.3	56.0	1.150	(0.304)	0.761	(0.191)		0.755	(0.186)
Protestant	44.8	53.8	1.413	(0.360)	0.636	(0.184)		0.634	(0.185)
Other	11.3	28.1	0.349	(0.164)*	0.388	(0.125)*		0.426	(0.135)**
Household wealth quintile	**	**							
Lowest	23.2	29.4	1.000		1.000			1.000	
Second	20.0	34.1	0.095	(0.274)	0.862	(0.227)		0.863	(0.224)
Middle	26.2	55.4	1.031	(0.322)	2.164	(0.589)**		2.233	(0.616)**
Fourth	31.8	54.7	1.304	(0.435)	1.446	(0.431)		1.463	(0.448)
Highest	48.8	70.4	2.249	(0.867)*	1.737	(0.692)		1.810	(0.722)
Education level	**	**							
None/incomplete primary	20.8	33.6	1.000		1.000			1.000	
Complete primary	40.1	56.2	1.607	(0.350)*	1.987	(0.422)**		1.983	(0.424)**
Incomplete secondary+	66.3	77.6	2.972	(0.955)**	3.400	(1.350)**		3.669	(1.438)**
Region	**	**							
Northwest	28.8	49.2	1.000		1.000			1.000	
West	38.6	45.1	1.215	(0.335)	1.068	(0.299)		1.007	(0.292)
Northeast	33.1	61.2	0.863	(0.314)	1.523	(0.535)		1.558	(0.558)
South/Central	38.6	54.6	0.982	(0.284)	0.913	(0.310)		0.945	(0.326)
Coast	28.2	40.8	0.736	(0.268)	0.586	(0.207)		0.579	(0.207)
Dar es Salaam	64.3	65.7	1.535	(0.766)	0.580	(0.296)		0.583	(0.305)
Condoms reduce risk of HIV transmission	**	**							
Don't know	13.4	36.1	1.000		1.000			1.000	
Know	39.7	55.3	2.930	(0.933)**	1.988	(0.426)**		1.907	(0.418)**
Healthy-looking person can have the AIDS virus	**	**							
Don't know	14.4	32.0	1.000		1.000			1.000	
Know	40.5	54.6	2.172	(0.587)**	1.323	(0.399)		1.274	(0.394)
Type of partner		*							
Girlfriend/fiancée	-	47.6						1.000	
Casual/other		55.8						1.514	(0.281)*
Alcohol at last sex									
No/don't know	-	50.1	-		-			1.000	
Yes		59.8						1.029	(0.316)
Positive attitude toward people with HIV		**							
No	-	44.4	-		-			1.000	
Yes		60.1						1.031	(0.215)
Think condoms should be taught in school									
No	-	44.8	-		-			1.000	
Yes		52.7						1.335	(0.332)
Total cases (unweighted)				1,258		768			768

* p<0.05 ** p<0.01

Source: Tanzania (NBS and Macro International, 2000); Tanzania (NBS and ORC Macro, 2005)

Zambia. Table 10 shows that level of education is the strongest predictor of condom use in Zambia. In both 1996 and 2001-02, a man who has completed at least secondary education is almost four times as likely to have used a condom at last higher-risk sex as a man who has not completed primary school. There was a decline in condom use at last higher-risk sex among those in the poorest wealth quintile, from 30.6 percent in 1996 to 24.5 percent in 2001-02, and the odds ratio in the multivariate analysis increased for the two highest wealth quintiles, compared with the poorest wealth quintile. In the bivariate analysis, condom use among those living in rural areas was lower than among those in urban areas, but this difference is not apparent in the multivariate analysis. Regional differences in condom use at last higher-risk sex are inconsistent. Condom use decreased in Lusaka from 64 percent in 1996 to 56 percent in 2001-02, and increased sharply in the East region from 30 percent in 1996 to 56 percent in 2001-02. The odds ratio of use in the East region showed a significant increase compared with the Northwest/West/South region. As in the other countries, knowledge that condoms can reduce the risk of HIV transmission is positively related to condom use at last higher-risk sex, although the odds ratio declined.

Table 10 Bivariate and multivariate analysis of condom usage at last higher-risk sex, males age 15-49, Zambia, 1996 and 2001-02

Variable	Bivariate (% used condom)		Multivariate						
	1996	2001-02	1996		2001-02		96-01-02	2001-02	
			OR	(S.E.)	OR	(S.E.)		OR	(S.E.)
Age									
15-24 years	39.0	42.3	1.000		1.000			1.000	
25-34 years	44.7	49.0	0.975	(0.242)	0.796	(0.218)		0.809	(0.217)
35-49 years	41.0	42.3	0.703	(0.215)	0.471	(0.153)*		0.456	(0.151)*
Marital status									
Never married	39.2	41.8	1.000		1.000			1.000	
Currently married	46.8	46.7	1.790	(0.411)*	1.964	(0.549)*		1.839	(0.514)*
Formerly married	34.7	52.2	0.593	(0.222)	2.097	(0.757)*		1.935	(0.689)*
Residence	**	**							
Urban	50.0	52.1	1.000		1.000			1.000	
Rural	31.9	37.3	1.342	(0.429)	1.410	(0.366)		1.413	(0.368)
Religion									
Catholic	41.6	48.9	1.000		1.000			1.000	
Protestant	41.0	42.8	0.931	(0.204)	0.885	(0.208)		0.858	(0.204)
Muslim/other	40.0	39.1	0.961	(0.555)	1.130	(0.646)		1.098	(0.633)
Household wealth quintile	**	**							
Lowest	30.6	24.5	1.000		1.000			1.000	
Second	24.8	35.2	0.744	(0.260)	1.131	(0.367)		1.196	(0.387)
Middle	32.5	37.4	1.147	(0.313)	1.409	(0.416)		1.564	(0.485)
Fourth	50.4	49.1	1.707	(0.655)	2.188	(0.833)*		2.462	(0.972)*
Highest	55.0	61.2	1.886	(0.862)	2.789	(1.207)*		3.200	(1.419)**
Education level	**	**							
None/incomplete primary	29.1	29.7	1.000		1.000			1.000	
Complete primary	35.8	33.9	0.877	(0.230)	0.963	(0.297)		1.184	(0.355)
Incomplete secondary	50.7	54.5	1.581	(0.386)	1.905	(0.463)**		2.352	(0.582)**
Complete secondary+	74.2	70.6	3.919	(2.400)*	3.850	(1.336)**		5.224	(1.770)**
Region	**	**							
Northwest/West/South	30.6	30.3	1.000		1.000			1.000	
Lusaka	63.9	55.7	2.691	(0.860)**	1.718	(0.578)		1.720	(0.565)
Central/Copperbelt	43.8	51.6	1.289	(0.326)	1.709	(0.538)		1.969	(0.535)
East	30.4	55.6	0.996	(0.311)	2.996	(1.088)**		2.713	(1.023)
Luapula/North	32.7	36.0	0.954	(0.279)	1.327	(0.416)		1.381	(0.440)
Condoms reduce risk of HIV transmission	**	**							
Don't know	25.4	31.6	1.000		1.000			1.000	
Know	50.0	49.4	2.690	(0.475)**	1.923	(0.377)**		1.781	(0.348)**
Healthy-looking person can have the AIDS virus	**	**							
Don't know	15.7	27.5	1.000		1.000			1.000	
Know	44.0	48.8	3.100	(1.028)**	1.360	(0.323)		1.382	(0.334)
Know person with HIV/died of AIDS		**							
No/don't know	37.5	35.1	1.000		1.000			1.000	
Know	41.9	47.8	1.395	(0.300)	1.195	(0.244)*		1.217	(0.252)
Type of partner									
Girlfriend/fiancée	-	44.5						1.000	
Other friend		48.4						1.328	(0.315)
Casual/other		40.5						1.581	(0.380)
Positive attitude toward people with HIV		**							
No	-	38.3						1.000	
Yes		52.7						1.085	(0.230)
Think condoms should be taught in school		**							
No	-	34.0						1.000	
Yes		48.8						1.505	(0.335)*
Total cases (unweighted)			733		692			692	

* p<0.05 ** p<0.01

Source: Zambia (CSO et al., 1997); Zambia (CSO et al., 2003)

Of the sociodemographic variables in the multivariate analysis for each country, education has the strongest relationship with condom use at last higher-risk sex. Education has a significant and positive association with condom use in most surveys. The only clear change in the strength of the odds ratio over time was the significant increase in Cameroon. Household wealth quintile has a consistently positive relationship with condom use at last higher-risk sex in the bivariate analyses; however, this association does not remain in the multivariate analysis for each survey. There was a decline in the odds ratio of wealth status in Cameroon and Kenya and a rise in Zambia. As with wealth status, urban residence has a strong and consistent bivariate relationship with condom use. In the multivariate analyses, this relationship is seen only in some surveys. There is some regional variation in condom use at last higher-risk sex within countries. The relationship between age and condom use is not consistent, although in less than half of the multivariate analyses a man age 35-49 is significantly less likely to use a condom than a man age 15-24. There are no strong patterns for the association between marital status and condom use; some surveys show a greater likelihood of condom use among those who are currently married, while other surveys show less likelihood of condom use among those who are formerly married. The association of religion with condom use is also inconsistent.

Of the other variables, knowledge that condoms can reduce the risk of HIV transmission is positively associated with condom use at last higher-risk sex in the multivariate analysis for each survey, although there is no clear pattern of change in strength over time. Knowledge that a healthy-looking person can have the AIDS virus is positively and significantly related to condom use in the first survey for four of the five countries. There was a sharp rise in condom use among men lacking this knowledge in the bivariate analysis for each of these countries, and this variable was no longer significant in the multivariate analysis in the second survey in any country. Knowing a person with HIV or a person who has died of AIDS has a positive relationship with condom use in some surveys, but the association is inconsistent. Men's condom use is consistently associated with type of partner. Men are more likely to use a condom with a casual partner than with a girlfriend or fiancée in four of the five countries. The measures of attitudes toward

people with HIV have little association with condom use in the multivariate analyses, although there is a small positive relationship in some of the bivariate analyses. Men who think that children should be taught about condoms in school are more likely to use a condom in only two of the five countries. Alcohol use at last sex was not significant in either Cameroon or Tanzania, the two countries with data on this variable.

Discussion

This study has sought to determine in five sub-Saharan countries: 1) changes in the percentage of men who used a condom at last higher-risk sex, 2) factors associated with men's use of a condom at last higher-risk sex, and 3) changes in the predictive strength of these factors. The data used in the study are from the two most recent DHS surveys in each country. The discussion will address these research objectives by analyzing some distinct findings from each country, and then will examine patterns observed across countries.

Burkina Faso has a combination of factors that are conducive to keeping the level of HIV infection low; these are the small proportion of men who engage in higher-risk sex, and a level of condom use at higher-risk sex that has increased over the study period from an already high base. In addition, the multivariate results for 2003 indicate that there are no barriers to condom use by level of education or wealth status. However, there are large disparities in condom use by urban-rural residence and region. The likelihood that a rural man will use a condom, compared with an urban man, is about one in four. This low level of condom use in rural areas needs to be addressed to prevent the spread of HIV. The reported high level of condom use in urban areas (90.8 percent in 2003) is encouraging. Comparing the Central region (which includes the capital Ouagadougou) with the North and West regions, it is apparent that there is a need to increase levels of condom use among men who engage in higher-risk sex in the North and West regions.

The strong increase in condom use at last higher-risk sex in Cameroon is important because of the initial low level of condom use in 1998. However, the increasing disparity in condom use by level of education points to a need for further increases among men

who have little or no education. In contrast, the decreasing differentials in condom use by wealth status indicate that wealth is no longer a barrier to condom use in Cameroon. Neither place of residence (urban-rural) nor region was effective in predicting condom use in the two Cameroon surveys, despite exhibiting a bivariate relationship. This indicates that there are no apparent geographic barriers to condom use in Cameroon.

In Kenya, condom use at last higher-risk sex remains below 50 percent, which is a cause for concern despite the decline in higher-risk sex. In particular, the significant and increasing differential in condom use between urban and rural areas needs to be addressed. Given that about three-quarters of the Kenyan men who engage in higher-risk sex live in rural areas, and that condom use levels have stabilized in recent years, it is important to focus on increasing condom use in rural areas. Lack of education is a barrier to condom use in Kenya, and differentials by level of education are seen in both surveys. Differentials by wealth quintile are only seen in the 1998 survey. The decreasing gap in condom use by wealth quintile is encouraging, but in 2003 less than 40 percent of men in the three lowest wealth quintiles used a condom at last higher-risk sex. The low level of condom use by men in the Central region, compared with those in the Eastern region, is another problem that needs addressing.

Tanzania's marked increase in condom use at last higher-risk sex, while encouraging, began with a low base in the 1999 survey. As with Cameroon and Kenya, in the later Tanzania survey, the multivariate analysis showed that lack of education is a major barrier to condom use, while being in a lower wealth quintile is not. Unlike Cameroon, however, this rise in condom use did not occur in association with an increase in the education gap. Instead, there was an increase in the differential in condom use between urban and rural areas. Future condom promotion efforts will need to address this important differential.

In Zambia, condom use at last higher-risk sex remains below 50 percent, which is of concern given the high level of HIV infection in that country (12.9 percent). Furthermore, the likelihood of using a condom in 2001-02 was lowest among men who had the least

education and lived in the poorest households. The increase in the odds ratio of condom use for the two highest wealth quintiles is partially explained by a decline in use among men in the lowest (poorest) wealth quintile. However, there was no apparent differential in condom use by urban-rural residence. Further efforts to increase condom use among men who engage in higher-risk sex are important to prevent the spread of HIV in Zambia.

The consistent strength of education as a predictor of condom use at last higher-risk sex, compared with wealth status, has been reported in the literature and has important policy implications (Glynn et al., 2004; Lagarde et al., 2001). This study suggest that cost is not a consistent barrier to men's use of condoms, which, together with the declining differentials in condom use by wealth status seen in Cameroon and Kenya, is encouraging to program efforts to increase condom use. However, where there are large differentials in condom use by wealth status, as in Zambia, strong efforts are needed to reduce these differentials and increase equity in the use of condoms. The strong association between education and condom use can be seen even after controlling for knowledge of condoms. This factor suggests that, compared with those who have less education, men who are more educated have greater awareness of and better access to condom promotion programs. Furthermore, men with more education may have greater awareness of the risks associated with engaging in higher-risk sex.

In a number of surveys there is an age differential in condom use. Men age 35-49 have lower levels of condom use at last higher-risk sex than younger men. This finding has been reported in the literature, and illustrates that while many condom programs are targeted at youth, the condom needs of older men should also be given programmatic consideration (Agha, 1998).

Residential as well as individual factors were found to be associated with condom use at last higher-risk sex. In a number of the multivariate analyses it was found that residence in a rural area reduces the likelihood of condom use compared with residence in an urban area. The finding indicates that there is insufficient distribution of condoms in some rural areas. In Kenya, the increase in condom use in urban areas but not in rural areas between

1998 and 2003 may have resulted from social marketing campaigns that targeted urban populations. The findings by region also point to the targeting of condom programs to account for the differentials in condom use by region.

One way to increase condom use among men is to improve their knowledge of condoms, particularly the knowledge that condoms can reduce the risk of HIV transmission. In each of the surveys, there was a strong association between such knowledge and condom use; although, over the period of the analysis, there was no clear pattern of change in the strength of this variable. In Cameroon, the increase in knowledge that condoms can reduce the risk of HIV transmission may have contributed to the increase in condom use at last higher-risk sex. Further steps should be taken to increase condom awareness among all population subgroups. It is likely however that future increases in knowledge about condoms will not be great because in all five countries at least 70 percent of the men in the study were already aware of the effectiveness of condoms in reducing the risk of HIV transmission.

Between the two surveys, there was an increase in condom use among men who were not aware that a healthy-looking person can have the AIDS virus. As a result, there was a sharp decline in the likelihood that a man who knows that a healthy-looking person can have the AIDS virus used a condom at last higher-risk sex in four countries, with a significant decline in Cameroon and Kenya. This finding suggests that condom use is increasing substantially among those with less knowledge of HIV; although the mixed findings on knowledge that condoms reduce the risk of HIV transmission prevents firm conclusions.

While there is some evidence that knowledge of condoms contributes to increased use of condoms, this does not appear to be the case with attitudes toward people with HIV. Having a positive attitude toward people with HIV, or believing that information about condoms should be taught in schools, have no clear relationship with condom use. Looking at the type of partner, in many surveys there is greater likelihood of condom use among men who have sex with a casual partner than those who have sex with a regular

partner/ spouse. This result suggests that men have less trust in the HIV status of a casual partner compared with a regular partner. Literature on the subject has found that trust is an important factor influencing whether a condom is used during sex (Prata et al., 1995).

Interpretation of these findings should take into consideration that only condom use at last higher-risk sex was measured, not consistent and correct condom use. However, condom use at every instance of sexual intercourse was more common among men who used a condom at last higher-risk sex than among those who did not. This indirect measure does provide some insight into the patterns of consistent condom use.

The use of some of these findings—for example, the low level of condom use in certain regions—by programs, can be enhanced by reviewing the effectiveness of interventions designed to increase condom use. Bollinger et al. (2004) carried out such a review; it showed that in a number of studies of school-based and workplace programs the social marketing of condoms and the public-sector distribution of condoms have been effective in increasing condom use. The increase in donor-supplied condoms in recent years (see Table 2) is encouraging because maintenance of an adequate source of supply is important for consistent use of condoms. However, the data on donor-supplied condoms do not show a correlation with levels of condom use. In Kenya, for example, condom use remained steady between 1998 and 2003 despite a sharp increase in donor provision of condoms. Burkina Faso, the country with the highest level of condom use (according to the most recent survey), has the second-lowest level of condom provision per man. Despite there being no apparent association between levels of condom use and donor provision of condoms, a lack of donor-supplied condoms in some circumstances may limit condom use.

The decline in reported higher-risk sex in four of the five countries in this analysis is encouraging for the reduction of HIV transmission in sub-Saharan Africa, and it is thought to be related to the increased use of condoms in these countries. However, there is considerable room for improvement. Of particular importance is increasing condom use among men who engage in higher-risk sex, especially in Kenya and Zambia, where

the increases so far have been small. Increased condom use is also important in countries that have a high level of HIV infection, such as Zambia. With much of the HIV-prevention effort focused on other ways to reduce the transmission of HIV, including circumcision, abstinence, and being faithful to one uninfected partner, it is important that policymakers recognize that condoms remain an important resource in the fight against HIV/AIDS.

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