

RESEARCH PAPER

THE INFLUENCE OF PREDISPOSING, ENABLING AND NEED FACTORS ON CONDOM USE IN IVORY COAST

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Abstract

The main objective of this study was to identify key determinants of condom use in Ivory Coast. Data stem from Ivory Coast Demographic Health Survey (DHS) conducted by ORC Macro in 2005 among a representative sample of 9,686 persons aged 15 – 49. Following the behavioral model, we use logistic regression to assess the effect of predisposing, enabling and need factors on condom use. Among our sample, only 13.7% have used condom during their last intercourse. Condom use's likelihood increases significantly with educational level, marital status and occupation. In addition, condom use is significantly high among those who know where to buy condom (OR= 5.77; $p < .001$); those who are well informed (OR= 1.52; $p < .001$); those who have always been tested for HIV (OR= 1.36; $p < .05$); those who have a sexual partner suffering from AIDS (OR= 1.2; $p < .001$) and those who know some one who has died or is suffering from AIDS (OR= 1.06; $p < .05$). Condoms must be readily available universally, either free or at low cost, and promoted in ways that help overcome social and personal obstacles to their use. Collective actions at all levels are needed to support efforts of countries, especially developing countries that depend on external assistance in condom procurement, promotion and distribution.

Keys words: Condom Use, HIV transmission, Behavioral model, AIDS related knowledge, Ivory Coast, Sub Saharan Africa.

Résumé

L'objectif principal de cette étude était d'identifier les principaux déterminants de l'utilisation du condom en Côte-d'Ivoire. Les données utilisées sont celles de l'enquête démographique et santé (EDS) réalisée par ORC Macro en 2005 auprès d'un échantillon représentatif de 9.686 personnes âgées de 15 - 49. Les facteurs associés à l'utilisation du condom ont été évalués à l'aide de la régression logistique. L'intégration des variables indépendantes s'est faite de façon séquentielle en suivant le modèle comportemental d'Andersen. Les analyses montrent que l'utilisation du condom augmente significativement avec le niveau d'éducation, l'état matrimonial et la profession. En outre, l'utilisation du condom est très élevé parmi ceux qui savent où acheter des préservatifs (OR = 5,77, $p < .001$), ceux qui sont bien informés (OR = 1,52, $p < .001$), ceux qui ont déjà été testés pour le VIH (OR = 1,36, $p < .05$), ceux qui ont un partenaire sexuel souffrant du sida (OR = 1.2, $p < .001$) et ceux qui connaissent quelqu'un qui est décédé ou qui est atteint du sida (OR = 1,06; $p < .05$). Pour une campagne efficace contre le SIDA, le condom doit être disponible et accessible à moindre coût sinon gratuitement dans les pays en développement. De plus, des campagnes doivent être intensifiées pour aider à surmonter les obstacles sociaux et personnels à l'utilisation du condom. Les actions collectives à tous les niveaux sont nécessaires pour appuyer les efforts des pays, en particulier les pays en développement qui dépendent de l'aide extérieure dans l'achat la promotion et la distribution du condom.

Mots clés : Utilisation du condom, Transmission du SIDA, Modèle comportemental, Connaissances en matière du SIDA, Côte d'Ivoire, Afrique Sub-saharienne.

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I. INTRODUCTION

Since the late 1980s, AIDS has become one of the leading causes of adult death in black African countries (De Cock et al., 2008; Meekers, Silva, & Klein, 2003; Ngamini Ngui, 2008; Zellner, 2003). In Ivory Coast, where infection with both HIV-1 and HIV-2 occurs, the epidemic of HIV/AIDS has developed exponentially since the first AIDS case was diagnosed in 1985 (De Cock et al., 1990; Vidal, 1992; Zellner, 2003) and its prevalence has reached approximately 10% by 1999 (J.-P. Moatti et al., 2003; Zellner, 2003). A minimum annual incidence of AIDS of 1447 cases per million in adult men and 340 per million in adult women is reported in Abidjan, the political capital of Ivory Coast (De Cock, Porter, & Odehouri, 1989). The rapid spread of HIV/AIDS and sexually transmitted infections (STIs) in Ivory Coast has been attributed to female sex workers and their clients (Ghys et al., 2002) and also to the political instability in the country since 2002. Researchers also state that “in Abidjan, middle-to-upper-class men freely admit to having relations with one or more women besides their wife” (Yelibi et al., 1993).

To reduce the incidence of STIs and to curtail the spread of HIV/AIDS, both governmental and non governmental organizations have implemented AIDS-oriented health programs. The Ivory Coast Ministry of Health initiated a general information campaign in 1987, using mass media (radio, television, billboards, movies and newspapers) and in 1991, condom

social marketing was started (Ghys et al., 2002). Also in 1991, another prevention campaign directed to female sex workers was conducted in three districts of Abidjan by the PPP (‘Programme de Prévention et de Prise en Charge des MST/SIDA chez les femmes libres et leurs partenaires’) in partnership with the INSP (‘Institut National de Santé Publique’). These programs have contributed to reduce the annual prevalence rate of HIV infection particularly among female sex workers (Ghys et al., 2002). Despite this success, condom use should be increased to higher level in the whole country because condoms are effective for preventing both STIs and AIDS (Adih & Alexander, 1999; Maharaj & Cleland, 2004). To facilitate the design of effective programs and policies, scientists, program managers and policy makers must have comprehensive understanding of the factors that facilitate or deter condom use (Cassell, Mercer, Imrie, Copas, & Johnson, 2006; Crosby et al., 2007; Meekers et al., 2003).

Till now, there has been only limited information on the specific determinants of condom use in Ivory Coast. Among 401,211 inhabitants of Abobo, one of Abidjan ten “communes”, a research study carried out in 1993 revealed that 7.6% of the population never heard of a condom. Among those who knew about condom, 64.3% had never used one and 3.1% rarely used it (Yelibi et al., 1993). Studies in other African countries indicate that condom use is determined by multiple factors which may vary across

societies (Adetunji & Meekers, 2001; Bertrand et al., 1991; Meekers & Klein, 2002). In South Africa, studies have tried to demonstrate the effect of demographic variables on condom use (Reddy, Meyer-Weitz, Van den Borne, & Kok, 2000).

AIDS-related knowledge has also been found to be related to condom use but, the findings are controversial. For example, a study conducted among secondary school and college students in Tanzania found that participants with a “good” knowledge of how HIV is transmitted were unlikely to use condoms despite their awareness of the risk for HIV infection (Zellner, 2003). In contrast, among adults in rural Senegal, persons with a “good” knowledge of HIV/AIDS were more likely than persons without a “good” knowledge of HIV/AIDS to use condoms (Lagarde, Pison, & Enel, 1996).

Self-efficacy, which is a belief that one can design and execute specific behaviour, is also associated with higher levels of condom use (Meekers & Klein, 2002; Wong et al., 2003). In Sierra Leone, a survey among students reveals that low levels of anxiety about sexual negotiation was associated with higher level of condom use (Lahai & Ross, 1997). In Ghana, another study showed that young men, who were confident in their ability to use condoms consistently, were more likely than others to have used condom at their last intercourse (Estrin, 1999).

Researchers have also identified misconceptions about AIDS (Ngamini Ngui,

2008) and poor AIDS-Related knowledge (Adih & Alexander, 1999; Meekers & Klein, 2002; Meekers et al., 2003) as important determinants of condom use. In a study carried out in Tanzania, believing that their partners hate condoms was associated with inconsistent condom use among students (Maswanya et al., 1999). Also, perceived susceptibility to AIDS has been significantly related to intention to use condoms among adolescents in Ghana (Adih & Alexander, 1999). In Cameroon, it was found that belief that AIDS is transmitted by sexual relations and that condoms could effectively protect against AIDS was predictive of condom use (Meekers & Klein, 2002; Ngamini Ngui, 2008).

Even though there is an abundant literature on condom use in Africa, it may be important to note that researchers have focused predominantly on young people in urban centers rather than the population in large. Another gap in previous studies is that little is known about the psychological and behavioural factors associated with condom use. Hence, in our study in Ivory Coast we not only assess the prevalence of condom use in the whole country, but we also analyse enabling, predisposing and need factors associated with condom use. The Behavioral Model (R. Andersen & Newman, 1973; Ronald M. Andersen, 1995; Kouzis, 2005; Tjepkema, 2008) informs the conceptual framework for this study (Figure 1).

This model suggests that for condom use to take place, 1) the person must be predisposed



to accept condom; 2) there must be enabling conditions that allow that person to purchase condom; and 3) the person must perceive a need for condom use (Ronald Max Andersen, 1968; Ronald M. Andersen, 1995).

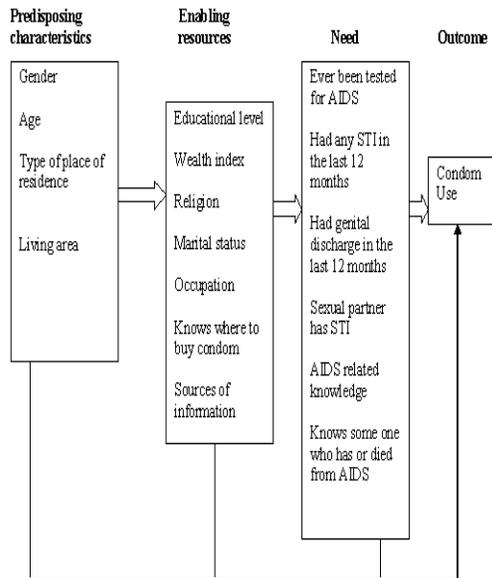


Figure 1. Conceptual framework adapted from the behavioural Model

II. MATERIALS AND METHODS

The analysis presented here is based on data from the 2005 Ivory Coast Demographic Health Survey (DHS) commissioned by ORC-Macro located in Calverton (USA). The survey gathered information from a randomly selected sample of 9,686 participants (8,109 men and 1,577 women) aged 15 – 49 living in 4,368 households.

A. Measures

Outcome Measure. The questionnaire measured whether the respondent reports having used condom in the last sexual

intercourse. The responses are coded 1 for “yes” and 0 for “no” answers.

Predictors Variables. Our predictor variables are organized in predisposing, enabling and need factors.

Predisposing factors: some persons have a propensity to use condoms and others not. This propensity toward use can be predicted by the individual characteristics which exist prior to the onset of sexual intercourse. Individuals with these characteristics are more likely to use condom. Such individual characteristics are defined as predisposing factors. In this study, they include gender, age, type of place of residence (urban / rural), living area (Abidjan / other big town / Small city / Countryside).

Enabling factors: Even though an individual may be predisposed to use condom during sexual intercourse, some means must be available for him to do so. A condition which permits the person to act upon a value or satisfy a need regarding condom use is defined as enabling. Enabling conditions make condom available to the person. Availability includes the individual means to purchase condom. It also includes the person means to get to a store where he can purchase condom. In this study, enabling resources are measured by educational level, wealth index (computed by ORC Macro), religion, marital status, occupation, if the person knows where to buy condom and his sources of information. This last variable measures if the person reads magazines; listens to the radio or watches television at least one day per week. Answers

then ranged from 0 (not informed at all) to 3 (all those three sources).

Need factors: Assuming the presence of predisposing and enabling conditions, the person must perceive AIDS as a danger for his personal health and must understand its consequences on people around him. For this study, need is measured by different variables: the person had ever been tested for AIDS; the person had any STI in the last 12 months or had genital discharge in the last 12 months; the sexual partner had STI; he/she knows someone who has or has died from AIDS and finally; the person's AIDS-related knowledge.

Using a factorial analysis we assessed the overall AIDS-related knowledge with items adapted from the DHS questionnaire. Seven items remain in the final model. Some of the items used were whether a mosquito can transmit AIDS and whether a healthier person can have AIDS. Response options were either "yes", "no" or "don't know". The total AIDS knowledge score was computed from the correct responses to the knowledge questions; score for the scale ranged from 0 to 7, with higher scores indicating higher AIDS knowledge. Cronbach's alpha for the AIDS-related knowledge scale was 0.7.

B. Statistical analysis

Data were processed using SPSS-14® for windows. Descriptive univariate analyses were performed to inspect the frequency distributions of the categorical data and the

means and standard deviation of continuous variables. Bivariate analysis was carried out to examine the associations of individual variables with condom use. The Mann-Whitney U test was used to assess the differences in means of continuous variables because there was an extreme violation of the assumption of normality and homogeneity distribution. In addition, data were scaled at a level that was not appropriate for the t test (Field, 2005; Ho, 2006; Tabachnick & Fidell, 2007). The chi-square statistic with its corresponding probability level, odds ratio (OR), and 95% confidence interval (CI) were computed to examine the magnitude and significance of the bivariate associations between pairs of dichotomous variables. Multivariate analyses were based on structured inclusion of potentially mediating variables, as hypothesized in the Andersen model. The initial model comprised predisposing variables and in the second model enabling factors were added. In the third and final model, we included need factors.

We have not tested for interactions because the initial model of Andersen does not anticipate any. Because the choice of sampling scheme may introduce potential biases (Zunzunegui et al., 2004), we re-examined these associations using SUDAAN because this software is specifically designed to correct for this bias. This analysis did not produce changes in the estimated standard errors of the coefficients in the regression



equations. Results reported here were therefore not corrected for the sampling bias.

III. RESULTS

The socio-demographic and behavioral characteristics of the sample are described in annex 1. Respondent are mostly men (83.7%) and ranged in age from 15 to 49 years, with a mean age of 28.06 years (SD \pm 9.5). About forty-three percent of the respondents live in towns, with 21.5% concentrated in Abidjan, and 56.7% in countryside. Less than 50% are educated with 23.5% and 21.1% receiving primary and secondary education respectively. Only 2.9% have attended post-secondary school.

In addition, 37.1% of the respondents can be considered as "rich" and 42.5% as poor. Muslim and Christian constituted respectively 43.6 % and 37.0% of the sample. As for marital status, 43.7% are single, 53.3% are married and 3.0 % are divorced. Sixty percent know where to buy condom. Senior executive, middle ranking executive, agricultural labourers and craftsmen formed respectively 0.9%; 2.7%; 35.9% and 33.1% of the respondents, and 27.4% were unemployed. Ninety-two percent have never been tested for AIDS; about four percent had an STI during the last twelve months and 76.5% have a sexual partner who has an STI. More than eight percent know someone who has died. But in general, AIDS-related knowledge is very low with a mean of 3.81

(S.D \pm 1.84). A considerable proportion of the sample (66.6%) reported not having used condom during their last intercourse. In sum, apart from "having genital discharge in the last 12 months", almost all variables are associated with the outcome. (Annex 2)

Table 2 in annex indicates the main effects of each variable without controls. The results show that almost all variables that were significant in the table 1 remain significant here even if some differences appear within them. Women are nearly 1.5 times as likely as men to use condom. Those living in urban areas are twice as likely as those living in rural areas to use condom. The education effect on condom use is remarkable. As educational level increases, the likelihood of using condom increases too. Compared to those who are not educated, the odds ratio for condom use during the last intercourse is respectively 3.06 ($p < .001$) for those who have primary education, 6.08 ($p < .001$) and 10.16 ($p < .001$) for those who have high level education. Wealth is also associated with condom use and its effect is gradual. Those who are poorer are 1.5 as likely as the poorest to have used condom ($p = .001$) while those in the middle are 2.09 ($p < .001$) and those who are richer are 3.07 ($p < .001$) as likely as the poorest to have used condom. Finally, the richest are 4.5 ($p < .001$) as likely as the poorest to have used condom. Christians are nearly twice as likely as the animists and other religions to use condom and there is no difference between Muslims and animists. In comparison with single, divorcee don't use



condom and the odds ratio for married is 1.43 ($p = .014$). Those who know where they can buy condom are 14.52 time more likely to have used condom than those who don't know where they can buy it. Four variables of need factors - ever been tested for AIDS, having had any STI in the last 12 months, have sexual partner who has STI and knowing some one who has or died from AIDS - are associated with condom use.

Table 1 indicates that the probability is very small that the medians for those who used condom during last intercourse and those who did not use a condom was the same in terms of age, sources of information and AIDS-related knowledge.

Table 1. Bivariate relationships between Sociodemographic and Behavioral variables (Continuous variables) and Condom Use

| Variable | Used condom | U | P-value |
|------------------------|-------------|-----------|---------|
| Age (year) | | | < .001 |
| Mean | 24.01 | 4030117.4 | |
| SD | 6.9 | | |
| Sources of information | | | < .001 |
| Mean | 2.28 | 300678.5 | |
| SD | 0.84 | | |
| AIDS related knowledge | | | < .001 |
| Mean | 4.70 | 3780598.5 | |
| SD | 1.40 | | |

The multivariate logistic regression (Annex 3) shows that after all adjustments in model 3 only age remains significant among predisposing factors. Condom use increases significantly with age ($p < .001$). Among enabling factors, five variables are associated with condom use after controlling for all others variables. They are educational level, marital

status, knowing where to buy condom, occupation and information. Being tested for AIDS, having a sexual partner who has STI and knowing some one who has or died from AIDS are variables for need factors associated with condom use.

IV. DISCUSSION

Since the advent of the AIDS pandemic, extensive research has been carried out, in both developed (Amirkhanian et al., 2001; Catania et al., 1992; J. P. Moatti, Bajos, Durbec, Menard, & Serrand, 1991; Morrison, Gillmore, & Baker, 1995) and third world countries (Olley, Seedat, Gxamza, Reuter, & Stein, 2005; Paulo, Dias, Souto, & Page-Shafer, 2006) with the main objective to overcome the propagation of HIV / AIDS. They have come to the same conclusion that the HIV prevention strategy with the potential to have the greatest impact would be an HIV vaccine. Unfortunately, no effective vaccine exists, nor is one expected for many years (Auerbach, Hayes, & Kandathil, 2006). Condom use is then the main, if not, the only way to prevent HIV / AIDS.

This study aimed to gain a better understanding of the determinants of condom use in Ivory Coast. It was the first study that has used the behavioral model to assess the determinants of condom use. Results show that all the three components of Andersen's behavioral model (predisposing, enabling and need factors) are pertinent in the study of

condom use. Although it is the first study of condom use based on Andersen's model, our results are similar to findings from many other researches. As presented by previous studies on condom use in Ivory Coast, educational level, age and religion are associated with condom use (Yelibib et al., 1993; Zellner, 2003). Zellner showed that being Catholic increases the odds of using condom by 44% and, at the same time, secondary or higher education appears to be an important characteristic in determining condom use (Zellner, 2003). According to Zellner, education helps with the ability to better comprehend the complex information about HIV transmission and protection methods. Educated persons also understand the consequences of AIDS and are more able to take more precaution. Contrary to our findings, Yelibib and colleagues found that younger-age-groups (15 – 34) use condoms more than the older ones (35 – 49). But, the study of Meekers and Klein in Cameroon supports our results. They found that condom use increase with age both for males and females (odds for males =.98 and .86 for females). In KwaZulu-Natal, it had been found that the odds of using condom is 2.96 ($p < 5\%$) for those living in urban area in comparison with those living in countryside (Maharaj & Cleland, 2004).

Poverty and access to condom are also related to condom use. In Cambodia, the odds of using condom among those with monthly income between 50 and 90 \$ US and those with more than 100 \$ US was respectively 1.61 ($p < 5\%$)

and 1.92 ($p < 5\%$) (Wong et al., 2003) and in Madagascar, the odds of using condom was 2.9 ($p = .002$) among males who had good access to condoms (Meekers et al., 2003). In the United Republic of Tanzania, it has been reported that young women in the highest income quintile were more than twice as likely to have used a condom during their last intercourse than the young women in the lowest quintile (Monasch & Mahy, 2006). This situation may be explained by the fact that lower socioeconomic status may result in lower educational attainment, which may result in gaining less information and skills to protect oneself from HIV (Monasch & Mahy, 2006). At the other hand, it has also been noted that lower socioeconomic status also provides a reason for engaging in sexual relationship in exchange for financial compensation or support (MacPhail & Campbell, 2001; Yelibib et al., 1993). Until now, less is known about need factors and condom use. In South Africa nevertheless, those who perceived indirect risk of HIV / AIDS from a partner and other persons are more likely to use condom (OR =6.05; ** $p < 1\%$) in comparison with those who did not perceived any risk from others.

The findings from this study confirm that condom use is a complex phenomenon to study but, making condom available and accessible can increase the number of users. There is also evidence that mass media information increases consistency of condom use, in part because it improves attitudes towards condoms and awareness of condom efficacy. For mass

media to be most effective, it is important to use different media support and local languages to break linguistic barriers. In addition, promotion of condom use must be disseminated in both rural and urban communities.

Some limitations of this research have to be acknowledged. The cross-sectional design makes it difficult to evaluate the effect of changes over time on condom use. In addition, assessment of condom use was based on self-reports which may be biased by socially desirable responding, and we can't exclude that these biases may have been more pronounced among users than non-users. Moreover, it should be recalled that this survey was carried out during a period of political and social instability in Ivory Coast. There is often an increase in the incidence of rapes during these periods. And with rapes, the decision to use condom is out of victims' control. Another limitation is that this study doesn't control for social factors such as social network and social support, since previous studies showed that they were associated to condom use (Meekers & Klein, 2002; Meekers et al., 2003). These factors were not included because the data we used was collected by other researchers for another purpose which was not similar to ours. Thus, some variables which could predict condom use were not available.

Nevertheless, our findings are consistent with other studies and can be generalized to other populations in developing countries. Condom

use is a critical element in a comprehensive, effective and sustainable approach to HIV prevention and treatment. Condoms are an integral and essential part of comprehensive prevention and care programmes, and their promotion must be accelerated (WHO, 2004). Condoms must be readily available universally, either free or at low cost, and promoted in ways that help overcome social and personal obstacles to their use. Collective actions at all levels are needed to support efforts of countries, especially developing countries that depend on external assistance in condom procurement, promotion and distribution.

V. CONCLUSION

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Annex 1. Description of the sample: Sociodemographic and Behavioral characteristics (N=9686)

| Variable | % | P-value |
|--------------------------------------|------|---------|
| Predisposing factors: | | |
| <i>Gender</i> | | < .001 |
| Man | 83.7 | |
| Women | 16.3 | |
| <i>Age (year)</i> | | < .001 |
| Mean | | |
| SD | | |
| <i>Place of residence</i> | | < .001 |
| Urban | 43.1 | |
| Rural | 56.9 | |
| <i>Living area</i> | | < .001 |
| Abidjan | 21.5 | |
| Other big town | 6.2 | |
| Small city | 15.6 | |
| Countryside | 56.7 | |
| Enabling factors: | | |
| <i>Educational level</i> | | < .001 |
| No educated | 52.5 | |
| Primary | 23.5 | |
| Secondary | 21.1 | |
| Post-secondary | 2.9 | |
| <i>Wealth index</i> | | < .001 |
| Poorest | 21.0 | |
| Poorer | 22.5 | |
| Middle | 19.5 | |
| Richer | 18.2 | |
| Richest | 18.9 | |
| <i>Religion</i> | | < .001 |
| Christian | 37.0 | |
| Muslim | 43.6 | |
| Animist | 19.4 | |
| <i>Marital status</i> | | < .001 |
| Single | 43.7 | |
| Married | 53.3 | |
| Divorced | 3.0 | |
| <i>Knows where to buy condom</i> | | < .001 |
| Yes | 60.3 | |
| No | 39.7 | |
| Enabling factors (continued): | | |
| <i>Occupation</i> | | < .001 |
| Unemployed | 27.4 | |
| Senior executive | 0.9 | |
| Middle ranking executive | 2.7 | |
| Agricultural labourer | 35.9 | |
| Craftsman | 33.1 | |

| | | |
|--|------|--------|
| Sources of information | | < .001 |
| Mean | | |
| SD | | |
| Need factors: | | |
| <i>Ever been tested for AIDS</i> | | < .001 |
| Yes | 7.1 | |
| No | 92.9 | |
| <i>Had any STI in the last 12 months</i> | | 0.004 |
| Yes | 3.9 | |
| No | 96.1 | |
| <i>Had genital discharge in the last 12 months</i> | | 0.60 |
| Yes | | |
| No | 11.6 | |
| | 88.4 | |
| <i>Sexual partner has STI</i> | | < .001 |
| Yes | | |
| No | 76.5 | |
| | 23.5 | |
| <i>AIDS related knowledge</i> | | < .001 |
| Mean (3.81) | | |
| SD (1.84) | | |
| <i>Knows some one who has or died from AIDS</i> | | < .001 |
| Yes | | |
| No | 18.4 | |
| | 81.6 | |
| Dependent variable: used condom at last intercourse | | |
| Yes | | |
| No | 33.4 | |
| | 66.6 | |

Annex 2. Bivariate relationships between Sociodemographic and Behavioral variables (Categorical variables) and Condom Use

| Variable | % reporting condom used | OR | 95% CI | P-value |
|------------------------------|-------------------------|-------|--------------|---------|
| Predisposing factors: | | | | |
| <i>Gender</i> | | | | |
| Man | 43.0 | ----- | | |
| Women | 17.1 | 1.37 | 1.18 – 1.59 | < .001 |
| <i>Place of residence</i> | | | | |
| Urban | 18.4 | 2.01 | 1.78 – 2.26 | < .001 |
| Rural | 10.1 | ----- | | |
| <i>Living area</i> | | | | |
| Abidjan | 21.3 | 2.43 | 2.12 – 2.80 | < .001 |
| Other big town | 14.2 | 1.78 | 1.52 – 2.10 | < .001 |
| Small city | 16.2 | 1.50 | 1.72 – 1.91 | .001 |
| Countryside | 10.0 | ----- | | |
| Enabling factors: | | | | |
| <i>Educational level</i> | | | | |
| No educated | 5.8 | ----- | | |
| Primary | 15.9 | 3.06 | 2.60 – 3.60 | < .001 |
| Secondary | 27.3 | 6.08 | 5.22 – 7.08 | < .001 |
| Post-secondary | 38.6 | 10.16 | 7.79 – 13.26 | < .001 |
| <i>Wealth index</i> | | | | |
| Poorest | 6.5 | ----- | | |
| Poorer | 9.3 | 1.47 | 1.17 – 1.84 | .001 |

| | | | | |
|--|------|-------|---------------|--------|
| Middle | 12.8 | 2.09 | 1.67 – 2.61 | < .001 |
| Richer | 17.7 | 3.07 | 2.48 – 3.80 | < .001 |
| Richest | 24.0 | 4.51 | 3.67 – 5.54 | < .001 |
| <i>Religion</i> | | | | |
| Christian | 18.9 | 1.86 | 1.58 – 2.20 | < .001 |
| Muslim | 10.4 | 0.92 | 0.77 – 1.10 | N.S |
| Animist | 11.2 | ----- | | |
| <i>Marital status</i> | | | | |
| Single | 13.7 | ----- | | |
| Married | 18.5 | 1.43 | 1.07 – 1.90 | .014 |
| Divorced | 7.6 | 0.52 | 0.33 – 0.80 | .003 |
| <i>Knows where to buy condom</i> | | | | |
| Yes | 21.5 | 7.52 | 11.39 – 18.51 | < .001 |
| No | 1.8 | ----- | | |
| Enabling factors (continued): | | | | |
| <i>Occupation</i> | | | | |
| Unemployed | | | | |
| Senior executive | | | | |
| Middle ranking executive | | | | |
| Agricultural labourer | 19.4 | 1.28 | 1.11 – 1.46 | < .001 |
| Craftsman | 23.5 | 1.79 | 1.09 – 2.93 | .02 |
| | 16.8 | 1.07 | 0.76 – 1.50 | N.S |
| | 6.8 | 0.38 | 0.33 – 0.45 | < .001 |
| | 15.9 | ----- | | |
| Need factors: | | | | |
| <i>Ever been tested for AIDS</i> | | | | |
| Yes | 25.6 | 2.35 | 1.96 – 2.81 | < .001 |
| No | 12.8 | ----- | | |
| <i>Had any STI in the last 12 months</i> | | | | |
| Yes | | | | |
| No | 18.7 | 1.50 | 1.13 – 1.92 | .004 |
| | 13.5 | --- | | |
| <i>Had genital discharge in the last 12 months</i> | | | | |
| Yes | | | | |
| No | 14.2 | 1.05 | 0.88 – 1.25 | N.S |
| <i>Sexual partner has STI</i> | | | | |
| Yes | 13.6 | ----- | | |
| No | | | | |
| | 16.0 | 2.84 | 2.37 – 3.40 | < .001 |
| <i>Knows some one who has or died from AIDS</i> | | | | |
| Yes | 6.3 | ----- | | |
| No | | | | |
| | 20.6 | 1.72 | 1.44 – 2.06 | < .001 |
| | 13.1 | ----- | | |



Annex 3. Adjusted odds ratios for condom used with a multivariate logistic regression model

| | OR | Model 1 95% CI | OR | Model 2 95% CI | OR | Model 3 95% CI |
|--|-------|-------------------|-------|-------------------|-------|-------------------|
| Predisposing factors: | | | | | | |
| <i>Gender</i> | | | | | | |
| Man | --- | | | | | |
| Women | 1.17 | 1.01 - 1.5* | 1.1 | .93 - 1.29 | 1.09 | .92 - 1.28 |
| <i>Age (year)</i> | | | | | | |
| <i>Place of residence</i> | | | | | | |
| Urban | .94 | .93 - .95** | .94 | .93 - .95** | .94 | .93 - .95** |
| Rural | .85 | .45 - 1.60 | 1.15 | .57 - 2.31 | 1.18 | .59 - 2.37 |
| <i>Living area</i> | | | | | | |
| Abidjan | ----- | | | | | |
| Other big town | | | | | | |
| Small city | 2.71 | 1.43 - 5.16* | .98 | .48 - 2.0 | .97 | .48 - 1.99 |
| Countryside | 2.00 | 1.07 - 3.74* | 1.02 | .51 - 2.04 | 1.01 | .51 - 2.02 |
| | 1.62 | .82 - 3.17 | .74 | .35 - 1.57 | .72 | .34 - 1.51 |
| | ----- | | | | | |
| Enabling factors: | | | | | | |
| <i>Educational level</i> | | | | | | |
| No educated | | | ----- | ----- | | |
| Primary | | | 1.26 | 1.05 - 1.52* | 1.22 | 1.02 - 1.48* |
| Secondary | | | 1.48 | 1.20 - 1.83** | 1.37 | 1.11 - 1.69* |
| Post-secondary | | | 2.89 | 2.06 - 4.06** | 2.45 | 1.73 - 3.47** |
| <i>Wealth index</i> | | | | | | |
| Poorest | | | ----- | ----- | ----- | |
| Poorer | | | 1.05 | .82 - 1.34 | 1.06 | .83 - 1.36 |
| Middle | | | .99 | .77 - 1.28 | 1.01 | .78 - 1.31 |
| Richer | | | 1.18 | .90 - 1.54 | 1.19 | .91 - 1.56 |
| Richest | | | 1.04 | .79 - 1.37 | 1.04 | .79 - 1.37 |
| <i>Religion</i> | | | | | | |
| Christian | | | .99 | .82 - 1.19 | .96 | .80 - 1.16 |
| Muslim | | | .85 | .70 - 1.04 | .86 | .70 - 1.05 |
| Animist | | | ----- | | | |
| <i>Marital status</i> | | | | | | |
| Single | | | ----- | | | |
| Married | | | 1.38 | 1.01 - 1.90* | 1.02 | 1.0 - 1.88* |
| Divorced | | | 1.02 | .68 - 1.46 | 1.37 | .63 - 1.63 |
| <i>Knows where to buy condom</i> | | | | | | |
| Yes | | | | | | |
| No | | | 6.54 | 5.05 - 8.46** | 5.77 | 4.44 - 7.49** |
| | | | ----- | | | |
| <i>Occupation</i> | | | | | | |
| Unemployed | | | | | | |
| Senior executive | | | .75 | .63 - .89* | .76 | .64 - .90* |
| Middle ranking | | | .89 | .51 - 1.52 | .92 | .53 - 1.58 |
| Agriculture | | | .56 | .38 - .82* | .57 | .39 - .84* |
| Craftsman | | | .71 | .58 - .87* | .73 | .60 - .90* |
| | | | ----- | | | |
| <i>Sources of information</i> | | | | | | |
| | | | 1.55 | 1.42 - 1.70** | 1.52 | 1.39 - 1.67** |
| Need factors: | | | | | | |
| <i>Ever been tested for AIDS</i> | | | | | | |
| Yes | | | | | | |
| No | | | | | 1.36 | 1.11 - 1.67* |
| | | | | | ----- | |
| <i>Had any STI in the last 12 months</i> | | | | | | |
| Yes | | | | | | |
| No | | | | | 1.17 | .85 - 1.61 |
| | | | | | ----- | |
| <i>Had genital discharge in the</i> | | | | | | |

| | | |
|---|-------|---------------|
| <i>last 12 months</i> | | |
| Yes | | |
| No | | |
| | 1.06 | .85 – 1.32 |
| | ---- | |
| <i>Sexual partner has STI</i> | | |
| Yes | | |
| No | | |
| | 1.47 | 1.20 – 1.80** |
| | ----- | |
| <i>AIDS related knowledge</i> | | |
| <i>Knows some one who has or died from AIDS</i> | | |
| Yes | | |
| No | | |
| | 1.0 | .80 – 1.19 |
| | | |
| | 1.06 | 1.01 – 1.11* |
| | ----- | |

* p < 5% ** p < 1%

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