Demographic and Socio-economic predictors of awareness about condom use in four regions of Ethiopia

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Abstract

Acquire Immune Deficiency Syndrome (AIDS) is an extraordinary kind of crisis in Ethiopia. The overall condition of the use of Condom for the protection of AIDS and other sexually transmitted diseases (STD) in Ethiopia calls for scaled up and coordinated activities to improve the service. It is, therefore, crucial to have on knowledge, attitude, practice and other issues related to the use of condom. The purpose of this study is in an attempt to identify Demographic and Socio-economic predictors of awareness about condom use in four regions of Ethiopia, this study focused on a sample of legislators, professionals, and unemployed individuals in the age group 15-59 years. In this study data gathered by the Central Statistical Agency (CSA) for 2010 Behavioral Surveillance Survey (BSS) were used. This presentation will describe the most influential factors on the awareness of condom use by using logistic regression model and bivariate association. From the analysis of the data it was found that the most important demographic and socio-economic predictors which determine awareness about the use of condom in the four regions considered are educational level, marital status, awareness about the availability of condom, age group, sex, region and use of other contraceptive method. In order to increase the level of awareness about condom use strategies and policies must be developed which focus on educating people, increasing distribution of condom, and encouraging governmental/ nongovernmental organizations to participate in the protection of HIV/AIDS and other sexually transmitted diseases by using condom.

Keywords: bivariate association, chi-square distribution, HIV/AIDS, logistic regression

INTRODUCTION

Background of the study

AIDS is an extraordinary kind of crisis; it is both an emergency and a long-term development issue. Despite increased funding, political commitment and progress in expanding access to HIV treatment, the AIDS epidemic continues to outpace the global response. No region of the world has been spared. The epidemic remains extremely dynamic, is expanding fast and also changing its character as the virus exploits new opportunities for transmission. Rates of infection are still on the rise in many countries. All parts of the world are not equally infected by this pandemic. There is a considerable regional variation in its distribution. Sub-Saharan Africa is the region where the highest number of victims of HIV/AIDS is found. Although the region accounts only for 10% of the world population, it comprises almost 25.8 million people of the victims of HIV/AIDS in the world. In 2005 an estimated 3.2 million people in the region became newly infected, while 2.4 million died of AIDS. Among the younger generation (15-24 years) the percentage of HIV infected women and men account for 4.6% and 1.7%, respectively (UNAIDS, 2005).

Ethiopia has one of the highest HIV prevalence's in sub-Saharan Africa. In Ethiopia, the highest prevalence of HIV (12.1%) is observed among youth whose age belongs to 15-24 years (Family Health International.FHI (2004). According to the UNAIDS 2004 report, Ethiopia stands fifth, just next to South Africa, Nigeria, Zimbabwe and Tanzania where the highest victims of the disease are found. The 2003 National Sentinel Surveillance (NSS) results document of the Ministry of Health (MOH) report on "AIDS in Ethiopia" indicated that the number of people living with HIV/AIDS was about 1.5 million out of which about 96,000 are children whose age is below 15 years. The estimated number of new HIV/AIDS cases among the adult population in 2003 was 98,000 (46% male and 54% female) while it is about 25,000 among children. Some 245,000 People Living with HIV/AIDS (PLWHA) were in need of Antiretroviral Treatment (ART) and some 90,000 adults and children died of AIDS in 2003. There were also an estimated 593,000 AIDS orphans in the same year MOH, (2004:11). Based on HIV data collected at antenatal clinics, national adult HIV prevalence in Ethiopia in 2005, the infection level was found to be more than five times higher in urban (10.5%) than in rural (1.9%) areas MOH (2004).

In general, the overall condition of the use of Condom in Ethiopia calls for scaled up and coordinated activities to improve the service. It is, therefore, crucial to have data on knowledge, attitude, practice and other issues related to the use of condom among the study group. Hence, the present study is initiated with the main objective to investigate demographic and socio economic factors on condom use among a study group. The findings of the study could be useful in designing intervention programs that will promote condom in the fight against HIV/AIDS and other Sexually Transmitted Diseases (STDS) and also unwanted pregnancy.

Objective of the study

The overall aim of the study is to investigate demographic and socioeconomic factors on condom use.

More specifically, the study attempts to

- Investigate the awareness level of the study group about condom use
- Identify the degree of the relationships among the factors under investigation
- Select the factors which have the most significant influence on condom use
- Provide necessary suggestions and recommendations

THE DATA AND METHODOLOGY

The data

Source of the data

The data on which this thesis research is based on is the 2010 Behavioral Surveillance Survey (BSS) conducted by the Central Statistics Agency (CSA). According to the CSA survey design report, this survey was designed to collect information for the purpose of identifying risk behaviors among sub-populations in order to track behavior change, identify priorities for planning HIV prevention and control programs, and provide key information for advocacy and policy making. It was also aimed to provide information to major program inputs and evidence for the relative success of HIV prevention effects taking place in selected sites. The survey was conducted in all regions of the country. Both quantitative and qualitative methods were applied in the analysis as it was done in the first round. In this survey extensive mapping procedures were used to identify target groups.

The BSS–Ethiopia used sampling strategies that are crucial to the measurement of trends over time. Some target groups were not easily accessible through conventional household or institutional sampling techniques. For most target groups, two-stage sample designs were used. Primary units (clusters) chosen at the first stage and

individual respondents were chosen at the second stage. When members of the target group were associated with sites in a fixed manner, conventional clusters were used. When the target groups were 'floating', time-location clusters and targeted snowball sampling were used. The probability-sampling method was used for the selection of respondents. The sampling frames for the household surveys and institution-based surveys were simple and readily available. However, sampling frame development required preliminary qualitative research and some level of mapping (social and geographic mapping). The objectives of the BSS mapping were to define target groups and identify their locations, to estimate sizes of the potential target groups and systematically list 'clusters' of groups to serve as a sampling frame for the main survey. The mapping also aimed to provide information on potential target groups for immediate commencement of intervention activities by governmental and non-governmental agencies, which were planning to operate in the area. The BSS team used various methods for mapping, including interview of key informants, observation by walking through the community, review of records and reports, and discussion with experts and program managers involved in STI/HIV/AIDS control.

Variables in the Study

Variables to be included in this study are selected from the ''2010 Behavioral Surveillance Survey for HIV/AIDS/STIs, Round Two'' conducted by the Central Statistics Agency of the Government of Ethiopia.

Dependent Variable

The response/dependent variable in this study, which is ''ever-used condom'', is dichotomized as 0 if the respondent used condom before the date of the data collection and as 1 if the respondent did not use of condom before the date of data collection.

Independent Variables

Predicting whether an event will or will not occur and identifying the variables in making the prediction is an important step in carrying out the study. The independent variables/factors that are used in the study were classified as demographic, socio-economic covariates and other variables. Variables such as age, sex, etc...are considered as demographic variables, while others like economic status of the respondent are considered as socio-economic variables.

Methodology

There are different types of multivariate statistical techniques that can be used to predict a binary dependent variable from a set of independent variables. Among these multiple linear regression analysis and discriminate analysis are two related techniques that quickly come to mind. However, these techniques bring difficulties when the dependent variable is bivariate or categorical.

Different type's multivariate statistical techniques can be used to predict a dichotomous dependent variable from a set of independent variables. Among these techniques the logistic regression model is used for the data analysis in this study.

Logistic Regression

For a binary response Y_j and quantitative explanatory variable X_{ij}, i= 1,2,…,m and j= 1,2,…,n let $\pi_j=P(X_{ij})$ denote the ''success probability'' when X_{ij} takes the values x_{ij}. The problem with linear model is that the probability model $E(y) = X\beta$ (where β is the vector of parameters to be estimated) is used to approximate a probability value, $\pi_j = P(Y_j=1)$ within the interval 0 and 1, while $E(Y_j=1)$ is not so constrained .Therefore, we apply the logit transformation where the transformed quantity $Ln(\pi_j/(1-\pi_j)$ lies in the interval $(-\infty,\infty)$ and it is modeled as

$$\log it\left(\prod_j\right) = \ln\left(\frac{\prod_j}{1-\prod_j}\right) = \beta_0 + \beta_1 X_{1j} + \beta_2 X_{2j} + \ldots + \beta_m X_{mj}$$

where the parameter β_i determines the rate of increase or decrease of X_{ij} on the log of odds that Y_j=1, controlling for other X's. Furthermore, exp (β_i) is the multiplicative effect on the odds of unit increase in X_{ij}, at fixed levels of the others X's. In the linear regression we estimate the parameters of the model using the method of least squares. That is, we select regression coefficients that result in the smallest sums of squared distances between the observed and the predicted values of the dependent variables. In logistic regression the parameters of the model are estimated using maximum-likelihood method. That is, the coefficients that make our observed results most'' likely'' are selected. Since the logistic regression model is non-linear, an iterative algorithm is necessary for parameter estimation.

STATISTICAL DATA ANALYSIS

Introduction

The purpose of this chapter is to measure the effect of the different demographic and socio-economic determinants of condom use in Addis Ababa, Oromia, Amhara, and SNNPR. An attempt has been made to provide estimates for the factors that influence the tendency of individuals towards condom use. The research is made using the 2004 Behavioral Surveillance Survey (BSS) data. The BSS used sampling strategies that are essential to the measurement of trends over time. Some target groups were not easily accessible through conventional household or institutional sampling techniques. For most target groups, two-stage sample designs were used. Primary units (clusters) were chosen at the first stage and individual respondents were chosen at the second stage. When members of the target group were associated with sites in a fixed manner, conventional clusters were used. When the target groups were 'floating', time-location clusters and targeted snowball sampling were used. The probability-sampling method was used for the selection of respondents. The sampling frames for the household surveys and institution-based surveys were simple and readily available. After removal of observations with missing values, a total of 2713 observations were included in the analysis.

Variables Selection

Bivariate findings

To determine these factors, which are significantly correlated with the dependent variable a preliminary assessment was used using the chi-square test. The results in table 3.1 show that the variables selected for the study were strongly associated with the dependent variable Ever-used condom. From the table all explanatory variables are significant except the variable ''condom not comfortable for sex ''.

Table 3.1. Bivariate association between Ever-used condom and independent variables

Independent variables	Description	d.f	Chi-Square Value	Sig. (p-value)
Region	Region where the respondent lived	3	118.497	0.000
Sex	Sex of the respondent	1	23.265	0.000
Agegroup	Age group of the respondent	2	47.830	0.000
MarStat	Marital Status	3	167.349	0.000
Edus	Educational level completed	3	209.979	0.000
Relig	Religious affiliation	2	26.587	0.000
MaOccu	Major occupation of the respondent	2	16.35	0.000
Income	Income from main work of the respondent	3	39.827	0.000
ConNotConf	Condom not comfortable initiating	1	1.677	0.195
No.sexInter	Number of sexual intercourses	3	61.574	0.000
FriAlco	Frequency of alcohol drinking	2	9.281	0.010
UseOthCont	Used other contraceptives	1	4.832	0.028

DuLaKnApCon	Due to lack of knowledge of applying condom	1	13.362	0.000
AwePlPeSoCon	Awareness of place or person of source of condom	1	104.148	0.000
EvHeDiSTI	Ever heard of diseases that can be transmitted through sexual intercourse	1	25.616	0.000
ComMessHIVAIDSRadTelv	Comment on the messages on HIV or AIDS delivered by radio/television	3	18.441	0.000

Multivariate Findings

The main problem with the bi-variate approach is that it ignores the possibility that a collection of variables, each of which could be weakly associated with the outcome, can become an important predictor of the outcome when taken together Hosmer and Lemeshow (1989). Hence, multivariate logistic regression approach that takes into account the drawback mentioned by the bi-variant technique is considered in the following analysis. Using this method, the model that best describe the dependent variable Ever-used condom is fitted using the explanatory variables. The forward stepwise technique is used to select the best model. The result of logistic for the model is given in table 3.2. The final (optimal) logistic regression model includes only those significant variables.

Table 3.2 Estimates for the final Logistic Regression Model

		$\hat{\beta}$	S.E.	Wald	df	Sig.	Exp($\hat{\beta}$)
Step 1(a)	Edus	-	-	162.448	3	.000	-
	Edus(1)	2.336	.250	87.053	1	.000	10.336
Step 2(b)	MarStat	-	-	83.696	3	.000	-
	MarStat(1)	-.200	.355	.317	1	.574	.819
Step 3(c)	AwePlPeSoCon(1)	1.577	.317	24.796	1	.000	4.841
Step 4(d)	Agegroup	-	-	17.438	2	.000	-
	Agegroup(1)	-.842	.410	4.217	1	.040	.431
Step 5(e)	sex(1)	-.661	.154	18.402	1	.000	.516
Step 6(f)	Region	-	-	23.538	3	.000	-
	Region(1)	.266	.188	2.007	1	.157	1.305
Step 7(g)	UseOthCon(1)	.786	.317	6.159	1	.013	2.195
	Constant	1.138	.667	2.908	1	.088	3.121

Variables in the equation are entered Educational level completed, Marital Status, Awareness of place or person the source of condom, Age group, Sex, Region, Use other contraceptive method in step one, step two, step three, step four, step five, step six, step seven, respectively.

The logit regression becomes

Logit $(Y_i) = 1.138 + 2.336X_{i1} - .200X_{i2} + 1.577X_{i3} - .842X_{i4} - .661X_{i5} + .266X_{i6} + .786X_{i7}$

The significance of the Wald statistics (under the column with heading Sig.) indicates the importance of the predictor variable in the model. A high value of the Wald statistics shows that the corresponding predictor variable is significant.

DISCUSSION, CONCLUSION AND RECOMMENDATION

Discussion

Region where the respondent lived, sex of the respondent, age group of the respondent, marital Status, educational level completed, religion of the respondent, major occupation of the respondent, income from main work of the respondent, number of sexual intercourses, frequency of alcohol drinking, lack of knowledge of applying condom, awareness of about source of condom, ever heard of diseases that

can be transmitted through sexual intercourse, comment on the messages on HIV or AIDS delivered by radio/television show a significant association with condom use.
The result of logistic regression analysis show the determinants of condom use (Ever-used condom) as given in the logistic regression table. As shown in, the positive value of educational level completed implies that condom use increased as educational level increased. The same can be said about condom use and the awareness of the people the source of condom. Condom use is very high in Addis Ababa than in the others regions. This may be due to the fact that a large number of educated people live in Addis. It is noted that more males use condom than females, the age group in 15-50 years are more likely to use condom than the others. Also, the respondents using other contraceptive method are not willing to use condom as a contraceptive method. The interactions of educational level and major occupation, educational level and income, and frequency of alcohol drinking and income are not associated with the dependent variable as confirmed by the results in the Annex.

Conclusion

The logistic regression results indicated some determinants of condom use. Educational level, marital status, awareness of the person or people about sources of condom, age group, sex, region, use other contraceptive method are identified as the significant factors/variables. The results of the analysis imply that strategies and policies aimed at raising awareness about condom use, higher educational status, increasing the source of condom, and also the awareness of contraceptive method must be developed.

Recommendation

Condom is the basic means for protecting HIV/AIDS and other sexually transmitted diseases (STDS).Condom is not only protecting against STDS but also against unwanted pregnancy. The need for condom is growing as HIV/AIDS and other STDS spread. We will recommend for increasing condom use, strategies and policies focused on educating people in order to create awareness about condom use; Facilitating VCT services; Encourage hotels, shops, supermarkets, etc to distribute condoms; Encourage governmental/non governmental organization to participate in the protection of HIV/AIDS and other STDS by using condom.

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