International Journal of Research and Review
www.ijrrjournal.com E-ISSN: 2349-9788; P-ISSN: 2454-2237

Original Research Article

Determinants of the HIV/AIDS Epidemics Prevalence in Cameroon

Etengeneng Esther Agbor[1], Mbu Daniel Tambi[2]

[1]Department of Biochemistry, [2]Department of Agricultural Economics,
University of Dschang, Cameroon

Received: 03/09//2014 *Accepted: 06/10/2014*

ABSTRACT

This study attempts to carry out a comprehensive analysis of the determinants of HIV/AIDS epidemics prevalence in Cameroon. The objectives are: examine the factors influencing the prevalence of HIV/AIDS in Cameroon, explore the factors fuelling HIV/AIDS by age group, decompose the determinants of the prevalence of HIV/AIDS by educational level and suggest policies to ameliorate HIV/AIDS prevalence on the basis of our analysis. We used the OLS estimate to compute our 2011 DHS data in STATA 10.1. The results show that factors such as: marital status, education in complete years of schooling, labour participation, sex of household head, occupation, household residence, frequency of listening to the radio and wealth status are strong determinants of HIV/AIDS prevalence in Cameroon. Result by age group reveals that age group 15 to 24 years is hardest hit by HIV/AIDS and second by 25 to 34 years. This is partly due to their vulnerable characteristics (naivety, dependence, decision making, activeness, transition, tenderness, schooling, job seeking as well as attractive/beauty stage of life) and on the other part, it's due to their exploratory stage of life. The result by education level shows that HIV/AIDS affects more, people who did not go to school due to their inadequate knowledge in HIV/AIDS issues. Based on these results, we recommend that decision makers and academic authorities should design adult literacy programs and school courses gear towards HIV/AIDS awareness. This is a logical step towards poverty reduction in Cameroon due to HIV/AIDS complications.

Keywords: Determinants, HIV/AIDS epidemics, Prevalence, Ordinary Least Square, Cameroon

INTRODUCTION

The human immunodeficiency virus (HIV) has been described in rural Cameroon as a killer disease due to the number of lives and livelihoods of many people destroyed on daily basis around the world. In spite of increased funding, political commitment and progress in expanding access to HIV treatment, the acquired immune deficiency syndrome (AIDS) epidemic continues against the global response. The epidemic remains extremely dynamic. It is expanding fast and also changing its character as the virus exploits new opportunities for

transmission. Hence, the number of people living with HIV/AIDS is growing substantially from year to year. HIV/AIDS has become a major development concern in many countries and international organization (United Nations, World Bank) since the epidemic was recognized in the year 1980 (Woldemariame, 2013).

It's worth mentioning that, AIDS is a global epidemic which is caused by the virus called human immunodeficiency virus (HIV). It affects the immune system of the body of human beings. Since 1980 about 20 million people died and 38 million people are estimated living with HIV in the world (Alemayehu and Aregay, 2012). The rate of infection of the epidemic is still increasing in many countries of the world and it is distributed unevenly. For instance, Sub Saharan Africa (SSA) continues to bear a significant load of HIV patients (Garenne, 2008). In mid 2010, 68% of all people living with HIV resided in SSA, a region that represents only 12% of the world population. In 2009, one third (1/3) of all people living with HIV worldwide resided in the 10 countries of Southern Africa (South Africa, Angola, Botswana, Lesotho, Malawi, Mozambique, Namibia, Swaziland, Zambia and Zimbabwe). These 10 countries accounted for 31% of people contracting HIV, and 34% of all people dying from HIV related reason in 2009 people (Alemayehu and Aregay, 2012).

In Cameroon, the health of the population has deteriorated considerably since early 1990s, in this the mortality rate, increased by 12% between 1991 and 1998, chronic malnutrition rate for children 12 to 23 months old also rose from 23% to 29% and the rate of delivery attended by qualified practitioners (doctors and nurses) declined by 5% during the same period (Tambi, 2014). Particularly with HIV/AIDS, in 2010 there are an estimated 560,000 Cameroonians living with HIV. Cameroon has more people living with HIV than either the North Africa region or the Caribbean. HIV prevalence is growing rapidly. In 1990, there were fewer than 32,000 HIV seropositive Cameroonians. By 1995, the number of people living with HIV increased more than eight times to 264,000. At current rates, there will be about 726,000 of people living with HIV in 2020. An even larger number of people could be infected if the national response to HIV is not fully funded and implemented. The majority of infected people do not know they are infected and hence may not take precautions to protect their partners (UNAIDS, 2010).

In Cameroon, women are more likely to be HIV positive than men, roughly three in five (60%) of people living with HIV are women. Young women are especially vulnerable to HIV infection. Young women represent seven in ten (70%) of all youth ages 15–24 who are HIV positive and this higher rate of infection is projected to continue over the next ten years (UNAIDS, 2010). The number of children orphaned by AIDS children under age 18 who have lost one or both parents to AIDS has increased dramatically, rising from 13,000 orphans in 1995 to 304,000 in 2010. By 2020, this number is projected to rise to 350,000. Children orphaned by AIDS represent about 25 percent of Cameroon's total 1,200,000 orphans in 2010 (Awuba and Macassa, 2007).

To halt the devastating effects of this epidemic, Cameroon needs to expand HIV and AIDS treatment, care, and support services and prevent mother-to-child transmission and other new infections among the general population and most-at-risk groups. Cameroon's future response requires strong political commitment and the allocation of financial resources at all levels. The response to HIV and AIDS is not short term. The government, civil society, and international partners have integral and

complementary roles to play in the development of a sustainable national response

As intimated in Foretia Foundation (2012) lecture notes, the implementation of country-based preventive and therapeutic interventions has made enormous progress. In Cameroon for instance, a National and Strategic Plan to fight against HIV/AIDS and Sexually Transmitted Diseases coordinated by the Minister of Public Health focuses on individuals that are most at risk such as women, youths and disabled people. The National AIDS Control Committee designs strategies to efficiently fight against HIV/AIDS nationwide. Social Marketing has proved to be efficient especially among the youth, with initiatives such as the fun and informative '100% Jeune Magazine' and other initiatives such as 'Vacances sans SIDA', which is an interactive nationwide campaign that aims to sensitize the youth, on HIV issues during the school holidays. The Chantal Biya Foundation is also well known for various actions that aim to eradicate the pandemic, especially in the field of research on HIV as noted in Foretia Foundation (2012).

Despite prevention efforts and successes Cameroon has known so far, commitments and continuous investments are still needed to support comprehensive approaches needed to improve sexual and reproductive health. Further, Apart from the medical, NGO and support groups literature, the subject of HIV/AIDS has not yet been wide disseminated in Cameroon in terms of scientific publish articles. Some of the authors that have shared light in this domain are Awuba and Macassa (2007) they investigated the gender differentials in HIV/AIDS in Cameroon and to which extent gender was taken into account in the country's current policy on HIV/AIDS. Others include UNAIDS (2010) and Garenne (2008), however, none of this study has focus on the determinants of HIV/AIDS using the Cameroon demographic and health survey also most of the existing literature in this domain has use only primary data. This study is therefore new in that we uses econometrics model of ordinary least square in STATA 10.1 to compute our results. To do this, we examine the following objectives: (1) examine the determinants of the prevalence of HIV/AIDS, (2) explore the factors fuelling HIV/AIDS by age group, (3) decompose the determinants of the prevalence of HIV/AIDS by educational level and (4) derive policy implication on the basis of our analysis.

METHODOLOGY

Theoretical framework

In this analytical framework we apply the classical linear regression model (CLRM) that focuses on a fixed number of observations. The finite sample of the linear model contrasts with other approaches which study the asymptotic behaviour of the ordinary least square (OLS) that has infinity infinite observations. This CLRM deals with a great number of assumptions/properties that render it used in statistical analysis appropriate: firstly, the linear functional form must be correctly specified; secondly, the errors in the regression should have conditional mean zero (Graham et al., 2003). This strict exogeneity assumption implies that the errors have mean zero and that the regressors are uncorrelated with the errors. The exogeneity assumption is critical for the OLS theory. If this assumption holds then the regressor variables will be exogenous, however, if it does not, then those regressors that are correlated with the error term will be endogenous making the OLS estimates invalid. In such case the method of instrumental variables may be used to carry out inference.

The third assumption of CLRM is that the regressors must all be linearly

independent. If this assumption is violated, the regressors become linearly dependent or perfectly multicollinear. Fourthly, there is the assumption of homoscedasticity which means that the error term has the same variance in each observation. If this requirement is violated, then we will have heteroscedasticity, implying a more efficient estimator would be weighted least squares. If the errors have infinite variance then the OLS estimates will also have infinite variance (although by the law of large numbers they will nonetheless tend toward the true values so long as the errors have zero mean). In this case, robust estimation techniques are recommended (Graham et al., 2003). We equally have on the fifth position, the non-autocorrelation assumption; which mean that, the errors are uncorrelated between observations. However, this assumption may be violated in the context of time series data, panel data, cluster samples, hierarchical data, repeated measures data, longitudinal data, and other data with dependencies. In these cases, the generalized least squares provide a better alternative than the OLS. Lastly, we have the assumption of normality, where we assume that the errors should have a normal distribution condition on the regressors: This assumption is not needed for the validity of the OLS method, although certain additional finite-sample properties can be established in case when it does (especially in the area of hypotheses testing). Furthermore, when the errors are normal, the OLS estimator is equivalent to the maximum likelihood estimator (MLE), and therefore it is asymptotically efficient in the class of all regular estimators (Graham et al., 2003).

Methodology

As seen from the theoretical framework, we used the weighted ordinary least square (OLS) to determine the factors fuelling HIV/AIDS in Cameroon. The OLS regression is a generalized linear modeling technique that may be used to model either a single response or multiple explanatory variables which has been recorded on an interval scale. The technique may be applied to either a single or multiple explanatory variables as well as categorical explanatory variables that have been appropriately coded (Hutcheson, 2011). OLS regression is particularly powerful as it's relatively easy to check the model assumption such as linearity, constant variance and the effect of outliers in a given data set (Hutcheson and Sofroniou, 1999). Specifically our model can assume the following simple form:

$$h_i = \alpha + \beta_1 \chi_i + \varepsilon_i \quad (1)$$

Where by h_i represent men and women tested HIV seropositive and it's the dependent variable of the study, χ_i is the multiple explanatory variables (such as education, marital status, occupation), α indicates the value of h when all values of the explanatory variables are zero, and β indicates the average change in h that is associated with a unit change in χ while controlling for the other explanatory variables in the model. Model-fit can be accessed through comparing deviance measures of nested models and ε_i is unobserved scalar random variables (errors) which account for the discrepancy between the actually observed responses h_i and the "predicted outcomes" $h_i \beta \chi_i$. This method minimizes the sum of squared vertical distances between the observed responses in the dataset and the responses predicted by the linear approximation.

From equation (1), the least squares estimates in this case can be reformulated to give the weighted ordinary least square estimator as follows:

$$\hat{\beta} = \frac{\sum \chi_i h_i - \frac{1}{n}\sum \chi_i \sum h_i}{\sum \chi_i^2 - \frac{1}{n}(\sum \chi_i)^2} = \frac{Cov[\chi, h]}{Var[\chi]} \quad (2)$$

In this case the predicted value of h when all values of the explanatory variables are zero will be as follows:

$$\hat{\alpha} = \bar{h} - \hat{\beta}\bar{\chi} \quad (3)$$

It should be noted that, the estimator $\hat{\beta}$ is linear in h, meaning that it represents a linear combination of the dependent variable h. The weights in this linear combination are functions of the regressors χ, and generally are unequal. The observations with high weights are influential in that they have a more pronounced effect on the value of the estimator. The OLS estimator is consistent when the regressors are exogenous and there is no perfect multi-collinearity, and optimal in the class of linear unbiased estimators when the errors are homoscedastic and serially uncorrelated. Under these conditions, the method of OLS provides minimum-variance mean-unbiased estimation when the errors have finite variances. Under the additional assumption that the errors be normally distributed, OLS is the maximum likelihood estimator.

Following Yule (1909), the OLS estimator is identical to the maximum likelihood estimator (MLE) under the normality assumption for the error terms. This normality assumption has historical importance, as it provided the basis for the early work in linear regression analysis. From the properties of MLE, we can infer that the OLS estimator in this study is asymptotically efficient (in the sense of attaining the Cramér-Rao bound for variance) and the normality assumption is satisfied. In this case, Graham et al (2003) revealed that, this method seems to work satisfactorily in practice but one should always remember that the aim of the analysis is to evaluate the ability to predict actual HIV/AIDS determinants and not their logarithms. Values of R^2 and other indices of concordance of observed and predicted values (see table 2 below) must be evaluated using the observed and predicted HIV/AIDS determinants (not their logarithms). More importantly, it should be noted that, even though the weighted ordinary least-squares methods used in this study, produce unbiased estimates of HIV/AIDS determinants, it's possible that the predicted actual determinants and the total determinants derived from the individual predictions can be biased (Graham et al., 2003). However, Graham et al (2003) further explained that the bias-reduction methods are available (e.g. the non-parametric method called 'smearing' as already discussed in Duan (1983), hence, this underestimation will not be a serious problem as long as it is recognized by the investigator.

Data setting

Demographic and Health Survey (DHS)

We use the 2011 DHS to analyze our result. In Cameroon, the Ministry of Economic Affairs, Programming and Regional Development is the executing agency of the DHS while the National Institute of Statistics collects the data. The 2011 DHS was realized after the first, second and third DHS in 1991, 1998 and 2004 was collected respectively. The 2011 DHS was aimed at a national representative sample of about 11732 households with women of reproductive age, alive and living within the selected zones of sample as well as a sub sample of about 50% of households for the men. The results of these surveys were presented for Cameroon, Yaounde, Douala, other towns, urban and rural zones (see Tambi, 2014).

Our unit of observation is the men and women tested HIV seropositive in 2011. The HIV variable was imported in to the DHS from UNAIDS/WHO collected respectively in 2011 in Cameroon. The reason for importing this variable in to the data set is because the DHS 2011 did not contain the variable of individuals tested seropositive of HIV. The exogenous variables are: marital status, education in complete years of schooling, labour participation, sex of household head, occupation, household of residence, frequency of listening radio, wealth index and the use of condom in sex (see also Tambi, 2014 for detail analysis).

RESULT & DISCUSSION

We present the results of the weighted sample characteristics of determinants of HIV/AIDS; determinants of HIV/AIDS prevalence; determinants of HIV/AIDS prevalence by age groups and the determinants of HIV/AIDS prevalence by educational level.

Weighted Sample Characteristics of determinants of HIV/AIDS

As indicated in table 1 below, about 19.01 percent of the sample population was tested seropositive of HIV/AIDS for both male and female sex of age 16.5 to 71.5 years however, this value is relatively small given that only 19.5 percent of the population uses condom in sexual activities. In addition, we observed that 8.5 percent of the sample population is married with about 4.47 percent working in the agricultural sector as well as 68.45 percent currently engage in full work participation. Most of the households are headed by the male gender to about 85.9 percent with about 39.4 percent living in the urban centers; despite this percentage about 53.8 percent of households of the sample population in 2011 is non-poor. The level of education in complete years of schooling is 64.9 percent, the figure seems to be real in the sense that the level of instruction in Cameroon since 2000s has risen and the rate of family awareness so far as education is concern is high, not-with-standing, it's surprising that only 45.2 percent is listening to radio to at least once a week.

Considering the variables identifying age group, we observe that in 2011 CDHS, a greater portion of the population is concentrated in the age group 25 to 34 years with about 47 percent. This age group is second by 15 to 24 years to 31.4 percent while on the third position is 35 to 44 years with about 19.5 percent and lastly above 45 years that made up 1.7 percent of the total sample population in 2011 respectively.

Making allusion to variables identifying education level, we realized that though generally the level of education in completed years is high, about 66 percent of the sample households for both male and female headed individuals did not actually go to school. The highest category is those that attended primary school with about 69.8 percent confirming the high percentage of those that completed school. About 55.8 percent attended secondary school while 7.8 percent pursued higher education in Cameroon as computed in the demographic and health survey 2011 respectively.

Determinants of HIV/AIDS Prevalence

Table 2 presents estimates of the HIV/AIDS function under different assumptions using individuals tested seropositive of HIV/AIDS as the main dependent variable, while controlling for other correlates. We assume that (i) since our dependent variable is negative (individuals seropositive), it means the positive values of our explanatory variables signify an inverse relationship while negative values stands for direct relationship, (ii) the linear functional form is correctly specified; (iii) the errors in the regression has conditional mean zero, (iv)

the weighted OLS solves the problem of heteroscedasticity while the nature of our variables (linearly independent) takes care of the multicolinearity. This has much to do with explaining our results. The result of linear regression (OLS) estimates of the structural parameters reveals that education in complete years of schooling, occupation, marital status, current employment, the used of condom/preservatives for sexual activities, sex of household, listening to radio and wealth status of households are variables significantly correlating with seropositive of HIV/AIDS while age and household residence are not correlating with HIV/AIDS tested positive.

Table 1: Weighted Sample Descriptive Statistics

Variable	Obs	Weight	Mean	Std. Dev.	Min	Max
HIV/AIDS (1= tested seropositive, 0 otherwise)	11732	92436.0211	0.1901	3021.169	200	8700
Education of respondents in complete number of years	11732	92436.0211	0.649997	7.977975	0	17
Age of respondents given in years	11732	92436.0211	0.55582	16.00054	16.5	71.5
Respondents occupation (1=agriculture, 0 otherwise)	11732	92436.0211	0.0447721	0.218775	0	2
Marital status (1= married, 0 otherwise)	11732	92436.0211	0.0854546	0.2795689	0	1
Respondents currently working (1= working, 0 otherwise)	11732	92436.0211	0.6845337	0.4647211	0	1
Use of condom during sex (1= actually used condom, 0 otherwise)	11732	92436.0211	0.1950856	0.3962835	0	1
Sex of household sex (1= male, 0 otherwise)	11732	92436.0211	0.8590341	0.3480012	0	1
Listen to radio (1= actually listen to radio, 0 otherwise)	11732	92436.0211	0.4524449	0.4977546	0	1
Wealth status of households (1= non-poor households, 0 otherwise)	11732	92436.0211	0.5383972	0.4985447	0	1
Household residence (1= urban, 0 otherwise)	11732	92436.0211	0.3943723	0.4887363	0	1
Variables Identifying Age Group						
Age group15_24	11732	92436.0211	0.3149176	0.4645029	0	2
Age group25_34	11732	92436.0211	0.4727361	0.4992774	0	2
Age group35_44	11732	92436.0211	0.1951183	0.3963086	0	2
Age group > 45	11732	92436.0211	0.017228	0.1301255	0	2
Variables Identifying Educational Level						
No education	11732	92436.0211	0.6642033	0.8140004	0	2
Primary education	11732	92436.0211	0.6982458	0.7543898	0	2
Secondary education	11732	92436.0211	0.5586485	0.7214986	0	2
Higher education	11732	92436.0211	0.0789023	0.314065	0	2

Source: Computed by authors from 2011 DHS.

Considering education, we observed that the higher the level of education in complete years of schooling, the lesser the level of HIV/AIDS prevalence in the range 16.5 to 71.5 years. This means that the more an individual is inform about the dangers of HIV/AIDS the greater they will avoid the epidemic, implying that the lower the level of education, the more the spread of HIV infection. In consistent with this observation, Tiruneh (2009) noted that more often than not, many people in SSA do not fully understand the connection between unsafe sexual practices and sexually transmitted diseases. thus, the lack of education seems to contribute to the spread of the HIV infection, since less educated migrant workers in particular and less educated populous of a given society in general are likely to practice unsafe sex. Further, Tiruneh (2009) cited that Brockerhoff and Biddlecom (1999) explained that persons with higher education in Kenya are likely to avoid risky sexual behavior.

From table 2, the age of adolescence and adults is insignificant, revealing that age singularly does not play any major role in determining HIV/AIDS. However, we understand that any community where the rate of rape, sexual harassment, promiscuity and juvenile delinquency is high irrespective

of the age, the probability of HIV/AIDS prevalence will be high. Further poor cultural practices (promotion of early marriage, genital mutilation, and home delivery before marriage) encourage HIV prevalence. Household residence is insignificant meaning that one can contract HIV any where there is unsafe activity. However, it's easier to have HIV/AIDS in the villages than the cities given that some of the local communities are so remote to the extent that it's difficult to find preservatives or access information (radio, newspaper, television), consequently the tendency will be for the people to indulge in unsafe sex. The rationale for age and resident is that these factors singly can not affect HIV/AIDS prevalence in Cameroon but can be complemented by other factors to influence HIV/AIDS prevalence.

Occupation and employment status of an individual can determine HIV/AIDS prevalence as revealed in table 2. Considering, the agricultural sector, we observe that HIV/AIDS are inversely related meaning that those working in this sector are less affected by the epidemic. This may be due to the fear of the disease, in most agricultural community in Cameroon, HIV/AIDS is commonly called the 'killer disease' and many believed that there is still no cure; this fear makes them cautious towards sex. However, following the Government of Cameroon, GOC (2011) occupations such as teaching, military and driving precisely camion drivers are noted to be promoting HIV/AIDS prevalence in Cameroon.

The statement that the teaching core is correlating with HIV/AIDS prevalence seem to be confusing with the point on education noted above because teachers are instructors who are suppose to understand the intricacies centered around the epidemic. This cannot always be the case, in the sense that teachers have great access to the unmarried school girls, thus by virtue of communing they turn to practice unsafe sex. The driving and military profession is time consuming and stressful jobs that can separate couples for days, weeks, months and even years; hence the quest for partners to satisfy their sexual appetite may result to unsafe sex and consequently contracting HIV/AIDS. In the same line, the quest for seeking for employment as well as the lack of money for survival or the search for better welfare especially from the feminine sex may engender illegal sex and so increasing the prevalence of the epidemic.

Other factors similarly affecting HIV/AIDS as those mentioned above are: the use of condom, in this case where the tendency is for condom to be use in every act of sex then the probability of transmission will reduce but where the reverse occurs then the prevalence will increase. Listen to the radio constantly or once in a while help individuals to be informed on the science/mechanism of HIV/AIDS and so reducing its prevalence as to otherwise. The wealth status of an individual also influences the prevalence of the epidemic. Where individuals are poor, they turn to practice different means of survival including cohabitation, prostitution and other methods of sex working. By so doing they turn to fuel the prevalence of HIV/AIDS epidemic. On a final note singlehood promote HIV/AIDS prevalence as compared to married people.

As concerning the tests of joint significance of coefficients on linear, and squared term for R, χ^2/F statistics (p-values), the value of Chi2/F^2 (480.75 [10, 11721; 0.0000]) reveals that the result of the HIV/AIDS function is valid and acceptable for inference. This is also supported by the value of the R-squared (0.2909) to showing that our result is relevant and significance

for analysis. This result is clearly demonstrated in table 2 below:

Table 2: Factors determining HIV/AIDS Prevalence, Dependent variable: HIV/AIDS

Variable	Coef.	Std. Err.	T	P>|t|
	HIV/AIDS Tested Seropositive			
Education of complete years of schooling	0.1417***	0.6785	38.10	0.000
Age of respondents given in years	0.6949	0.5177	0.46	0.647
Respondents occupation (1=agriculture, 0 otherwise)	0.9751**	0.1199	2.26	0.024
Marital status (1= married, 0 otherwise)	0.5637***	0.3064	18.56	0.000
Respondents currently working (1= working, 0 otherwise)	0.3702***	0.7151	3.47	0.001
Use of condom during sex (1= actually used condom, 0 otherwise)	0.5208***	0.7635	5.59	0.000
Sex of household sex (1= male, 0 otherwise)	0.8041***	0.6676	-8.08	0.000
Listen to radio (1= actually listen to radio, 0 otherwise)	0.7281***	0.5706	10.06	0.000
Wealth status of households (1= non-poor households, 0 otherwise)	0.1296***	0.6898	11.49	0.00
Household residence (1= urban, 0 otherwise)	0.6227	0.7976	-1.27	0.205
Tests of Joint Significance of Coefficients on Linear, and Squared Term for R, χ^2 /F statistics (p-values)				
Constant	0.2288***	0.9734	14.28	0.000
R-squared	0.2909	n/a	n/a	n/a
Chi2/F^2: Prob > chi2	480.75 [10, 11721; 0.0000]	n/a	n/a	n/a
Number of observation	11732			

Source: Computed by authors from 2011 DHS; *,**, *** represent 10%, 5% and 1% significance level, while n/a simply means not applicable

Parameter Estimate of HIV/AIDS function by the Age group.

Correlates of age groups 15-24, 25-34, 35-44 and age group greater than 45

Considering the results according to age group, Table 3 below reveals that the age group 15 to 24 is the most affected by HIV/AIDS, closely second by age group 24 to 34. In these age groups, almost all of the determinant factors are significance at one percent level apart from household resident that is insignificant confirming the fact that singularly the place of residence does not influence HIV/AIDS. It does so through other complementary factors such as education, cultural practices or environmental malpractice. In the case of age group 24 to 34, household residence and occupation are insignificant.

As can be expected, the age group 15 to 24 is the most exploratory stage of life; full of naives, dependence, tenderness and discoveries and school going/job seeking as well as the most attractive/beautiful stage of human life. By virtue of these qualities and characteristics, many take the advantage to abuse their youthfulness, by so doing they contract the epidemic and become seropositive of HIV/AIDS. In the other hand, in Cameroon the age group 25 to 34 is characterized as: job seeking, marriage, activeness and dynamism as well as the stage of decision making in human life. It's also a transition stage and so many exploit it wrongly to find themselves in the pool of HIV/AIDS.

The age group 35 to 44 has few determinants significant at a lower magnitude. It's a mature age group, however, factors such as occupation, singlehood, poverty, education and negligence to information can prompt some individuals to practice unsafe sex that result to increase prevalence of HIV/AIDS. However, the age group greater than 45 is the least affected by HIV/AIDS as shown in Table 3.

Parameter Estimate of HIV/AIDS function by educational level

We examine the issues of HIV/AIDS with respective to the different educational level such as individuals with no education, those with primary education, secondary

education level and higher education level for both men and women respectively.

Table 3: Factors determining HIV/AIDS Prevalence by age group

Variable	Group15_24	Group25_34	Group35_44	> Group45
	HIV/AIDS Tested Positive			
Education of respondents in complete number of years	0.5816*** (23.81)	0.4588*** (26.02)	0.617*** (15.00)	0.1997*** (6.52)
Age of respondents given in years	n/a	n/a	n/a	n/a
Respondents occupation (1=agriculture, 0 otherwise)	0.8906*** (2.88)	-0.1151 (-0.28)	0.8377* (1.68)	0.797 (1.52)
Marital status (1= married, 0 otherwise)	0.363*** (14.73)	0.259*** (10.78)	0.378*** (3.68)	0.584* (1.78)
Respondents currently working (1= working, 0 otherwise)	0.613** (2.38)	0.2379*** (2.99)	0.1235 (1.52)	0.9317 (0.42)
Use of condom during sex (1= actually used condom, 0 otherwise)	0.5454** (2.24)	0.5313** (2.56)	0.4049*** (4.75)	0.1591 (0.95)
Sex of household sex (1= male, 0 otherwise)	-0.1323*** (-5.64)	-0.1169*** (-6.58)	-0.5567 (-0.86)	0.1514 (0.53)
Listen to radio (1= actually listen to radio, 0 otherwise)	0.551*** (6.40)	0.6157*** (4.81)	0.3993*** (6.53)	0.1108 (1.56)
Wealth status of households (1= non-poor households, 0 otherwise)	0.1512*** (6.39)	0.5912*** (8.75)	0.8078*** (3.81)	0.1272 (0.40)
Household residence (1= urban, 0 otherwise)	-0.1257 (-0.52)	0.9477 (0.13)	-0.4511 (-1.63)	-0.8975 (-0.18)
Tests of Joint Significance of Coefficients on Linear, and Squared Term for R, χ^2 /F statistics (p-values)				
Constant	0.212*** (13.84)	0.845*** (15.76)	0.8300*** (6.77)	0.1458 (0.76)
R-squared	0.2895	0.2965	0.2757	0.4223
Chi2/F^2: Prob > chi2	182.58 [9, 4032; 0.0000]	258.43[9, 5519; 0.0000]	83.92 [9, 1984; 0.0000]	12.75[9, 157; 0.0000]
Number of observation	4042	5529	1994	167

Source: Computed by authors from 2011 DHS; *,**, *** represent 10%, 5% and 1% significance level, while n/a simply means not applicable while robust linearized t-statistics in parentheses, except otherwise specified.

Correlates of no education, primary, secondary and higher education

Following the results of Table 4, we observed that most of the determinant factors are significance for people with no education, primary and secondary school with only few significant and of a lower magnitude for people in higher education. Generally, the magnitude of significance is stronger in no education, second by primary and then secondary education. This means that, people who have not gone to school have a higher probability of contracting HIV. For instance, among the responses given in the 2011 DHS questionnaire, some of the respondents believe that HIV/AIDS can be contracted by drinking, eating and smoking together and others believed it's by sharing the same bed or seat. In some of the localities of Cameroon, some individuals look at HIV/AIDS to be something of witchcraft, others said the virus is found in the condom itself while some others noted that one cannot attain orgasm with the use of condom, all these believe urges them to practice unsafe sex.

According to an interview conducted on the media of Cameroon radio and television, precisely the radio, the resource person underscored that a majority of the sex workers in Cameroon are primary and partly secondary school leavers. He noted that some of these sex workers will accept preservatives if their client wish or otherwise. This story is different with those in the tertiary level of education, who understands the actual dangers of HIV epidemic. This result is shown if Table 4 below.

Table 4: Factors determining HIV/AIDS Prevalence by educational level

Variable	No education	Primary	Secondary	Higher
	HIV/AIDS Tested Positive			
Education in complete years	n/a	n/a	n/a	n/a
Age of respondents given in years	0.8816*** (15.38)	0.771*** (25.47)	0.8487*** (12.48)	0.24155 (1.12)
Respondents occupation (1=agriculture, 0 otherwise)	-0.8581 (-0.20)	0.8505*** (2.88)	-0.2539 (-0.62)	0.5608 (0.64)
Marital status (1= married, 0 otherwise)	0.778*** (12.23)	0.724*** (11.53)	0.857*** (10.37)	0.129*** (3.11)
Respondents currently working (1= working, 0 otherwise)	-0.0102 (-1.29)	0.4626*** (5.35)	0.6417 (0.72)	-0.622** (-2.30)
Use of condom during sex (1= actually used condom, 0 otherwise)	0.7747*** (3.50)	0.8177*** (5.01)	0.4321** (2.04)	0.1082 (0.40)
Sex of household sex (1= male, 0 otherwise)	-0.4199*** (-4.07)	-0.0747*** (-8.32)	-0.4884*** (-3.07)	0.1718 (0.75)
Listen to radio (1= actually listen to radio, 0 otherwise)	0.0999*** (3.39)	0.1679*** (9.05)	0.7201*** (7.57)	0.5272 (1.60)
Wealth status of households (1= non-poor households, 0 otherwise)	0.104*** (9.02)	0.9796*** (5.36)	0.1312*** (7.46)	-0.882 (-0.64)
Household residence (1= urban, 0 otherwise)	-0.0464*** (-4.08)	0.0387 (0.31)	0.2296** (2.13)	0.9468** (2.29)
Tests of Joint Significance of Coefficients on Linear, and Squared Term for R, χ^2 /F statistics (p-values)				
Constant	0.045*** (12.86)	0.977*** (13.81)	0.831*** (16.86)	0.733*** (8.24)
R-squared	0.3967	0.1951	0.1016	0.0341
Chi2/F^2: Prob > chi2	260.17[9, 3561; 0.0000]	169.65[9, 6299; 0.0000]	68.79[9, 5475; 0.0000]	3.33[9, 848; 0.0005]
Number of observation	3571	6309	5485	858

Source: Computed by authors from 2011 DHS; *,**, *** represent 10%, 5% and 1% significance level while robust linearized t-statistics in parentheses, except otherwise specified.

CONCLUSION

From the foregoing, this study is entitle; the determinants of the HIV/AIDS epidemics prevalence in Cameroon. The objectives targeted are: (1) examine the factors influencing the prevalence of HIV/AIDS in Cameroon, (2) explore the factors fuelling HIV/AIDS by age group, (3) decompose the determinants of the prevalence of HIV/AIDS by educational level and (4) suggest policies to ameliorate HIV/AIDS prevalence on the basis of our analysis. Methodologically, our unit of observation is the men and women tested HIV positive in 2011. The HIV variable was imported in to the DHS from UNAIDS/WHO collected respectively in 2011 in Cameroon. We used the Ordinary Least Square (OLS) estimate computed in Stata 10.1 to determine our result.

The results show that factors such as: marital status, education in complete years of schooling, labour participation, sex of household head, respondent occupation, place of residence, frequency of listening to the radio and wealth index are strong determinants of HIV/AIDS prevalence in Cameroon using 2011 DHS. The result by age groups reveals that age group 15 to 24 years is hardest hit by HIV/AIDS and second by age group 25 to 34 years. The results by education level reveal that, HIV/AIDS affects more people, who did not go to school, second by primary and secondary. Based on these results, we recommend that decision makers and academic authorities should design adult literacy programs and school courses gear towards HIV/AIDS awareness. This is a logical step towards increasing productivity, poverty/inequality reduction as well as increasing the stock of health of Cameroonians due to HIV/AIDS complications.

REFERENCES

- Alemayehu B and Aregay A (2013): Desire to procreate among people living with HIV/AIDS: Determinants in Ethiopia: A cross-sectional study. Journal of AIDS and HIV Research Vol. 4(5), pp. 128-135, May 2012
- Awuba J and Macassa G (2007): HIV/AIDS in Cameroon: Rising gender issues in policy-making matters, *African Journal of Health Science.* 2007; 14:118-128
- Brockerhoff M and Biddlecom A (1999): Migration, Sexual Behavior and the Risk of HIV in Kenya. *International Migration Review,* 33 (4): 833-856.
- Duan A (1983): Smearing Estimate: A Nonparametric Retransformation Method. Journal of the American Statistical Association, Volume 78, Issue 383, 1983
- Foretia Foundation (2012): HIV/ AIDS in Cameroon – 2012 update.
- Garenne M (2008): Long-term population effect of male circumcision in generalized HIV epidemics in sub-Saharan Africa. *African Journal of AIDS Research* 2008, 7(1): 1–8
- Government of Cameroon (GOC) (2011): Government of Cameroon, global gender gap – country profile report, 2011. 23rd September, 2011.
- Graham D, Mirandola M, Amaddeo F and Transella M (2003): Describing, explaining or predicting mental health care costs: a guide to regression models. British Journal of P Psychiatry, Vol 183, No 398, pp 404
- Hutcheson G and Sofroniou N (1999): The Multivariate Social Scientist; London: Sage Publications.
- UNAIDS (2010): The Impact of HIV and AIDS in Cameroon through 2020 - National AIDS Control Committee - Central Technical Group. September, 2010
- Tambi D M (2014): Effects of Maternal Immunization on Birth Weight in Rural Cameroon. Extract from chapter three of PhD Dissertation-Thesis, pp 50 – 55, unpublished.
- Tiruneh G (2009): Determinants of Adult HIV/AIDS Prevalence in Africa: Do Cultural Variations Matter? *Midsouth Political Science Review,* 2009, Vol. 10
- WFP (World Food Programme) (2010): *Getting started: HIV/AIDS education in school feeding programmes.* Rome, Italy, WFP.
- Woldemariame S (2013): Factors Determining the Prevalence of HIV/AIDS in Ethiopia; Masteruppsats Matematisk statistic, www.math.su.se
- Yule G (1909): The application of the method of correlation to social and economic statistics. *J. Boy Statist. Soc. Ser.* A 73 644-647

How to cite this article: Agbor EE, Tambi MD. Determinants of the HIV/AIDS epidemics prevalence in Cameroon. Int J Res Rev. 2014; 1(2):8-19.

****