

HIV/AIDS Knowledge and Stigma among Farmers in Ghana: A Probit Regression Analysis

¹Henry De-Graft Acquah and ²Fanny Ellis Hammond

¹Department of Agricultural Economics and Extension University of Cape Coast, Cape Coast, Ghana

²Department of Sociology and Anthropology University of Cape Coast, Cape Coast, Ghana

Abstract: Lack of knowledge and stigma regarding HIV/AIDS among farmers can affect labor productivity and food security. However limited research has been undertaken to investigate the issue. This study therefore investigates HIV/AIDS knowledge level and stigma among farmers. The results of the study revealed gaps in knowledge on awareness and misconception about the mode of transmission and prevention of the disease among farmers. The study also finds high level of stigmatization on HIV/AIDS among farmers. The probit regression analysis finds the age, years of education and income as significant and negatively related predictors of the misconception that HIV/AIDS is a spiritual disease. Implication for policy making in agriculture and economic development will be to provide specific educational programs to improve the knowledge of farmers on the modes of transmission and prevention of HIV/AIDS.

Key words: Farmers • HIV/AIDS • Stigma • Awareness • Knowledge • Probit Model

INTRODUCTION

Infection of the farming populace with Human immunodeficiency virus and Acquired immune deficiency syndrome (HIV/AIDS) can have a serious effect on agriculture and the food security of a nation. However, the impact of HIV/AIDS on agricultural sector can be ameliorated by knowledge on HIV/AIDS and its associated stigma. People with HIV/AIDS fear the stigma that may arise if others know they have the disease. This fear has a profound impact on the effectiveness of HIV/AIDS prevention, treatment and care programs because those infected may feel reluctant to use these services. Consequently the virus that causes AIDS has already infected and is infecting many Ghanaians. About 3% of the entire adult population of the country is HIV infected. Most of the people are not even aware they have the virus. In 2000, about 330,000 adults and 20,000 children were infected [1].

HIV/AIDS undermines agricultural systems, affects the nutritional situation and food security of a nation. [2] estimated that out of the 27 most affected countries in Africa, 7 million agricultural workers have been reported dead from AIDS and these deaths will increase in the next

decades. The immediate and long run effect is an unprecedented food crisis [3]. This assertion is supported by [4] as he indicates that an outbreak of HIV/AIDS in a community could result in inefficiency in the optimum utilization of labour/inputs and as such a decrease in outputs.

Although the impact of HIV/AIDS in the farming communities could affect labor productivity and food security, HIV/AIDS knowledge and stigma among farmers have extensively not been examined. The lack of studies to investigate HIV/AIDS knowledge and stigma among farmers in the central region of Ghana has culminated in a significant knowledge gap and widespread misconceptions about the modes of transmission and prevention of the disease and as a result has exacerbated its impacts on the livelihoods of the people in the country.

In attempt to address these issues, this research fills the gap by investigating HIV/AIDS knowledge level and stigma among farmers. The objectives of this paper are therefore to (1) examine HIV/AIDS awareness level; (2) examine the level of stigma on HIV/AIDS; (3) investigate the quality of knowledge on the modes of transmission and prevention; (4) determine the socio economic characteristics that influence HIV/AIDS awareness level.

Literature Review: There have been few empirical studies that have assessed the relationship between HIV/AIDS and stigma. [5] found that, among the Australian adolescents, lower perceived risks were associated with stronger stereotyping of an AIDS victim. In the United States, AIDS was first identified as a homosexual disease and, of those affected with HIV, gay men make up a substantial number of the total cases. Thus, people with HIV/AIDS in many cases carry the stigma of the disease, as well the cultural stigma associated with homosexuality. [6] proposed that the ways a person interprets the cause of an illness will influence beliefs about the illness and, thus, affect behavior. [7] examined the socio-economic correlates of sexual behavior, HIV/AIDS knowledge and stigma in India, using data from the National Family Health Surveys. The findings showed a positive relationship between HIV/AIDS knowledge level and education and wealth of the individual. However, the results showed a negative correlation between the level of education and stigmatization on HIV/AIDS.

However, a few studies have examined the determinants of knowledge regarding HIV/AIDS epidemic. [8] examined the determinants of awareness and quality of knowledge regarding HIV/AIDS among women in India, using a probit model. The results show that there is a different process that determines a women's awareness as opposed to her quality of knowledge regarding HIV/AIDS. In particular, the results show that many of the covariates that have a significant effect on women's awareness, such as husband's education, radio exposure, caste and religion are not statistically significant in the quality of knowledge equations. Woman's education (generally beyond primary school) seems to be the strongest predictor of her quality of knowledge. [9] examined the HIV/AIDS knowledge of adolescents in Jammu in India. The chi-square values revealed the existence of a significant difference in the knowledge of adolescent girls of urban and rural areas of Jammu, regarding these issues. But urban adolescent girls had comparatively better knowledge regarding these issues than rural adolescent girls. This inadequate knowledge about sexual matters and contraception result in early pregnancy and sexual disharmony [10, 11]. These results suggest that location is important in obtaining information and knowledge about HIV/AIDS.

MATERIALS AND METHODS

Study Area Description: The Twifo- Heman Lower Denkyira District is one of the 12 District Assemblies in the Central Region of Ghana. It is located between

latitudes 5° 50'N and 5° 51'N and longitudes 1° 50'W and 1° 10'W. The District lies within the semi-equatorial zone marked by double maximal rainfall in June and October, with the mean annual rainfall being 175cm. It has fairly high temperature ranging between 70-80 percent in the dry season and 75-80 percent in the wet season. It is bounded on the north by the Upper Denkyira East Municipal, on the south by the Abura Asebu Kwamankese, Cape Coast and Komenda- Edina- Eguafo- Abirem, on the west by the Mpohor Wassa East District and the East by the Assin North Municipal. It has a total land Area of 1199 km square and 1,510 settlements. The district also has 8 area councils and 4 paramancies namely Heman, Denkyira, Twifo and Atti Morkwaa. The District had a population of 53,066 people in 1970, 95,988 people in 1984 and 107,787 people in 2000. The current population growth rate in the District is 2.2% which is higher than the corresponding regional growth rate of 1.8% but less than the national growth rate of 2.6%. The relatively high population rate is attributed to the fertile soil which supports crops like oil palm, cocoa, plantain, cassava and others, which has resulted in many settlers/migrants farmers living in the District. Agriculture and its related activities constitute the most important activities in the district. The main crops grown are sometimes inter-cropped with vegetables and other crops for both home consumption and for sale.

Jukwa: Jukwa is a town situated in Twifo Denkyira Heman district in the central region of Ghana. Its geographical coordinates are 5° 16' 0" North, 1° 20' 0" West with a population of approximately 4000 people. Figure 1 shows the districts in the central region and Twifo Denkyira Heman district which houses Jukwa.

Sampling and Sample Size: The sample for the study consists of 42 farmers in Jukwa, a town in Twifo-Heman Lower Denkyira in the central region of Ghana. The target population was farmers in central region of Ghana. Random sampling technique was used to select the sample. In attempt to examine the socioeconomic correlates of HIV/AIDS knowledge and stigma at the individual level, variables were selected to capture these effects.

Methodology: An interview schedule was the main tool for data collection while descriptive statistics and probit regression analysis were the main analytical techniques. Data was analyzed using the Statistical Package for Social Sciences (SPSS) and the R Statistical Programming Language.

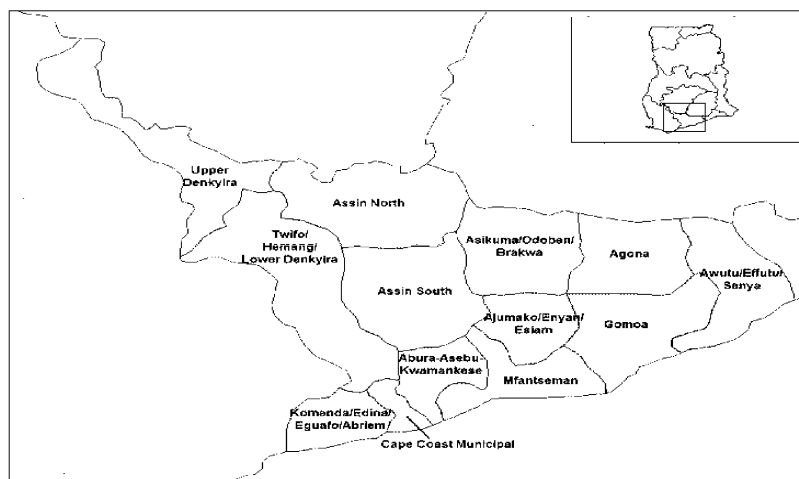


Fig. 1: Map of the Districts in the Central Region of Ghana

The probit regression analysis involves modeling the binary response using a cumulative standardized normal distribution. The standardized normal distribution is one with mean zero and a unit variance. The basic model of the probit estimation involves defining a variable Z that is a linear function of the variables that determines the probability:

$$Z = \beta_0 + \beta_1 X_1 + \dots + \beta_k X_k \quad (1)$$

$F(Z)$, the cumulative standardized normal distribution, gives the probability of the event occurring for any value of Z :

$$p_i = F(Z) \quad (2)$$

The maximum likelihood analysis is used to obtain estimates of the parameters. The marginal effect of X_i is $\partial p / \partial X_i$ and is computed as:

$$\frac{\partial p}{\partial X_i} = \frac{dp}{dZ} \frac{\partial Z}{\partial X_i} = f(Z) \beta_i \quad (3)$$

Since $F(Z)$ is the cumulative standardized normal distribution, $f(Z)$, its derivative, is just the standardized normal distribution itself:

$$f(Z) = \frac{1}{\sqrt{2\pi}} e^{-\frac{1}{2}Z^2} \quad (4)$$

This research uses information criteria as technique for providing the basis for model selection. Most commonly used information criteria such as Akaike Information Criteria (AIC) is employed. The idea of AIC

[12] is to select the model that minimizes the negative likelihood penalised by the number of parameters as specified in the equation (5).

$$AIC = -2 \log(L) + 2p \quad (5)$$

Where L refers to the likelihood under the fitted model and p is the number of parameters in the model. Specifically, AIC is aimed at finding the best approximating model to the unknown true data generating process and its applications draws from [12, 13, 14].

RESULTS AND DISCUSSION

Socio-Economic Characteristics of Farmers: Findings revealed that, 23.8% of the respondents were between 18-34 years; 50% were between 35-46 years; 11.9% were between 47-59 years; and 14.3% were between 60-72 years. The fact that 85% of the respondents fall within the productive age range (18-59 years) and since these are the age groups that are more susceptible to acquiring HIV/AIDS, special attention should be given to these segments of the population. Of the farmers interviewed, 28.6% were males while 71.4% were females. 81% were married while 19% were not married.

In an attempt to find out about their educational background, respondents were asked to indicate their level of education. The findings revealed that 31% had no formal education, 11.9% had obtained basic education, 45.2% had obtained junior secondary education and 11.9% had obtained senior secondary education. Up to 88.1% of the respondents interviewed were Christians while only 11.9% were Muslims. These results suggest that most of inhabitants of Jukwa are Christians.

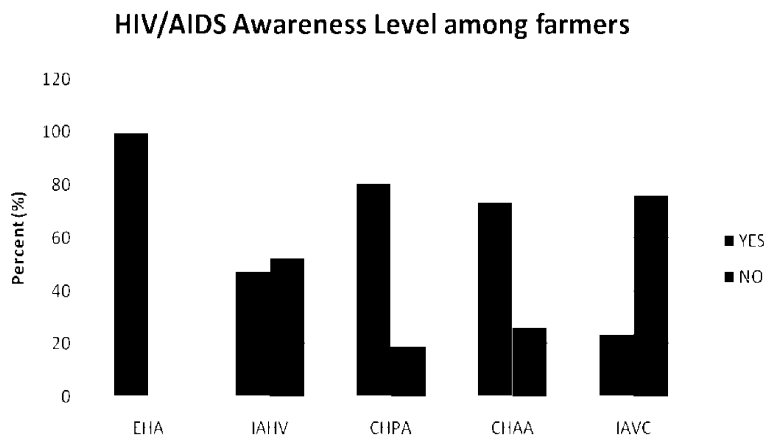


Fig. 2:

Note: EHA= Ever Heard of HIV/AIDS, IAHV= Is HIV the same as AIDS, CHPA= Can a Healthy Looking Person have AIDS, CHAA= Can HIV/AIDS Be Avoided, IAVC= Is HIV/AIDS Curable.

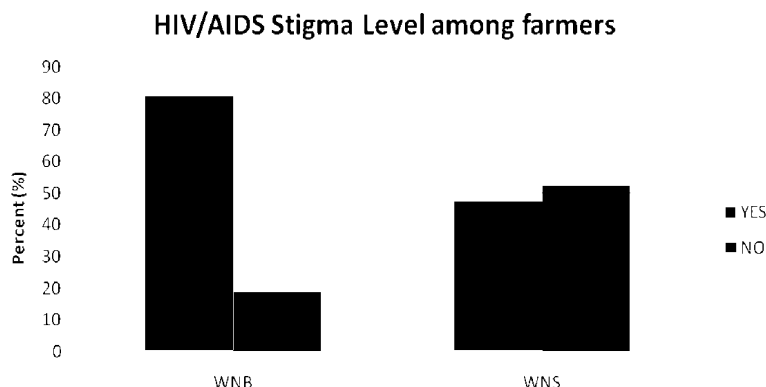


Fig. 3:

Note: WNB= Would Not Buy Vegetables from HIV/AIDS infected person, WNS= Would Not Sit among HIV/AIDS infected person

In an attempt to find out about their income distribution, respondents were asked to indicate their monthly income. Of the farmers interviewed, 85.7% had income range of GH¢8-GH¢100; 11.9% were in the income range GH¢110-GH¢200. Only 2.4% had income range of GH¢310-GH¢400. The low income distribution of most of the people could be attributed to the seasonality of their activities.

HIV/AIDS Awareness Level of Farmers: In order to investigate HIV/AIDS awareness level among farmers, four variables were employed. First, the farmers were asked if they ever heard of AIDS. The study found that all the farmers interviewed have ever heard of the disease. Secondly, the fishermen were asked if a healthy looking person can have the disease. About 19% were not aware that a healthy looking person could have the disease. Thirdly, respondents were

asked if HIV and AIDS are the same. 47.6% of the respondents were not aware of the disparity between HIV and AIDS.

On the issue of whether the disease is curable, 26.1% of the respondents still think there is a cure for the disease. Considering the variables studied, the level of awareness on HIV/AIDS needs to be improved through education.

HIV/AIDS Stigmatization Level among Farmers: HIV/AIDS stigma is being measured in this paper by asking individuals if they would not buy vegetables or sit among HIV infected person. Of the farmers interviewed, 81% stated they would not buy vegetables from an HIV infected person. 47.6% would not sit among HIV infected persons. From the results it can be emphasized that HIV/AIDS stigmatization is very high among farmers in the central region of Ghana.

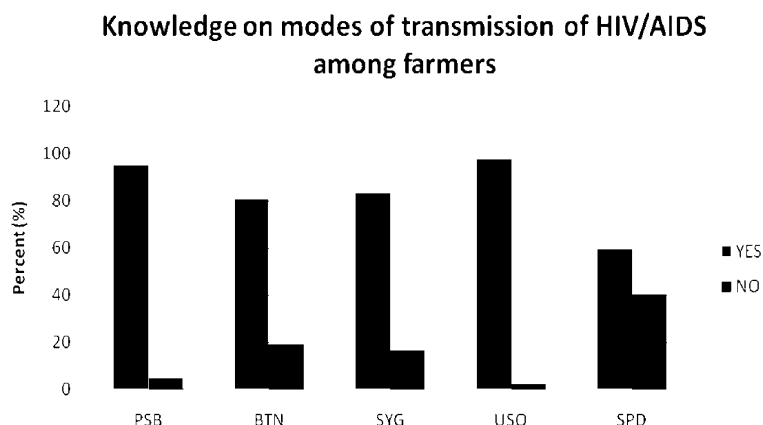


Fig. 4:

Note: PSB= Promiscuous Sexual Behavior, BTN= Blood Transfusion, SYG= Collective use of Syringe, USO= Using Sharp Objects with infected person, SPD= Spiritual Disease.

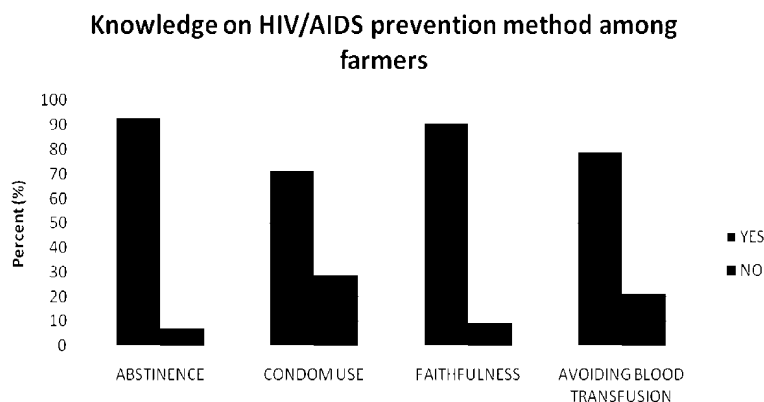


Fig. 5:

Table 1: Parameter estimates of the Probit Model

Variables	Estimates	Std. Error	z value	Pr (> z)
Intercept	4.235	1.318	3.211	0.001**
AGE	-0.055	0.022	-2.503	0.012*
GEN	-0.357	0.535	-0.667	0.504
EDU	-0.106	0.053	-1.967	0.049*
INC	-0.009	0.005	-1.694	0.090

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

NOTE: AGE= Age of respondent, GEN= GENDER, EDU= Years of education of respondent, INC= Income

Knowledge Level on Mode of Transmission of HIV/AIDS among Farmers: In an attempt to investigate the quality of knowledge on how the disease spreads, respondents were asked to express their opinion on the modes of transmission of HIV/AIDS. The results from Figure 4 shows that 95.2% thought the disease could spread through promiscuous sexual behavior. 81% indicated the possibility of spreading the disease through blood transfusion. 83.3% thought the disease can spread if

people share syringes. Most of the respondents representing 97.6% thought the disease could spread when individual use sharp objects with one another. Despite the quality of knowledge regarding the modes of transmission of the HIV/AIDS, approximately 60% still think the disease could spread through spiritual means.

Knowledge Level on Methods of Prevention of HIV/AIDS: In attempt to investigate the quality of knowledge on how the spreading of the disease can be prevented, respondents were asked to express their knowledge on the modes of prevention. Of the farmers interviewed, 92.9% thought abstinence could prevent the spread of the disease. 71.4% thought the use of condom could prevent the spread of HIV/AIDS. Of the farmers interviewed, 90.5% thought faithfulness to one's partner is a key preventive measure for the spread of HIV/AIDS. 78.6% thought avoidance of blood transfusion can prevent the spread of the disease.

However, 21.4% thought avoidance of blood transfusion is not a preventive measure for the disease stressing the fact that blood is well screened before it is given out to patients. Hence, avoiding blood transfusion may not necessarily mean preventing the spread of HIV/AIDS.

Model Estimation Results of the Probit Regression

Analysis: A probit regression analysis was employed to analyze the socio-economic factors that influence individual farmer's knowledge that HIV/AIDS is a spiritual disease. The Akaike Information Criteria [14] provided the basis for selecting the model that provided the best fit to HIV/AIDS misconception data. The model specification with HIV/AIDS as a spiritual diseases as the dependent variable and age, gender, years of education and income as the covariates provided the best fit with AIC of 49.688.

The model estimation result reveals a negative relationship between knowledge of HIV/AIDS as a spiritual disease and the regression covariates (i.e. age, gender, years of education and monthly income). Evidence from the probit regression analysis finds the age, years of education and income as significant predictors of the misconception that HIV AIDS is a spiritual disease.

The parameters of age and education were negative and significant at 5% level while income was also negative and significant at 10%. It should be emphasized that a negative sign of a parameter indicates that high values of the variables tends to decrease the probability of the misconception that HIV AIDS is a spiritual disease. A positive sign implies that high values of the variables will increase the probability of the misconception that HIV AIDS is a spiritual disease.

CONCLUSION

Lack of knowledge and stigma regarding HIV/AIDS among farmers is crucial in affecting the long term food security of a nation. Against this background this study investigated HIV/AIDS awareness level; stigmatization of HIV AIDS, quality of knowledge on the mode of transmission and prevention and the socio economic characteristics that influenced HIV/AIDS awareness level. Empirical analysis revealed gaps in the level of awareness, a high level of stigmatization on HIV/AIDS as well as limited knowledge on the mode of transmission and prevention of the disease. The probit

regression analysis finds the age, years of education and income as significant predictors of the misconception that HIV/AIDS is a spiritual disease.

Implication for policy making in agriculture and economic development will be to provide specific educational programs to improve the knowledge of farmers on the modes of transmission and prevention of HIV/AIDS. The Ministry of Agriculture should employ specific educational programs to create HIV/AIDS awareness, minimize stigmatization and spiritualization of the disease and educated farmers about misconception on the mode of transmission. There is the need for these educational campaigns to target the youth, the poor and the illiterate among others given that age, education and income were negative and significant on the misconception that HIV AIDS is a spiritual disease.

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