HIV/AIDS: Knowledge of Existence, Attitude towards VCT and Effect on Income of Workers in Akwa Ibom State

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Abstract: *This study assessed the level of knowledge of the existence of HIV/AIDS and the attitude of workers towards Voluntary Counselling and Testing (VCT) in Akwa Ibom State, as well as analysed how their income is affected. The study employed the survey research method where two sets of questionnaire, involving 230 respondents, were administered and 15 in-depth interviews held to obtain needed data. Data collected were analysed using Tables, Percentages and Pearsons' Product Moment Correlation (PPMC) and Logit Regression Analysis. Findings revealed that there is a high level of knowledge of the existence of HIV/AIDS among workers and a negative attitude of workers towards voluntary counseling and testing (VCT). On the income of workers in the State, HIV infection has a negative and significant effect in the short run, but a positive and significant effect in the long run. It is concluded that possible reasons for low involvement in VCT could be fear of stigma, fear of marital disharmony, cost of treatment, the incurable nature of the disease or lack of information on VCT, and taking care of HIV patients and suffering from HIV/AIDS greatly reduced income of workers especially in the private sector of the economy. Based on the findings, the study recommends, among others, the need for the provision of adequate information on VCT services and centers through regular enlightenment programmes across the country, as well as the establishment of a special HIV/AIDS Corps, made up of well-trained health workers to nurse and care for HIV victims in order to reduce the time spent by non-health workers to care for infected relatives, and as such reduce the rate of absenteeism from work.*

Keywords: *HIV/AIDS, Voluntary Counselling & Testing (VCT), Stigmatization,Labour Force, Labour Supply, Income, Labour Hours and Education.*

1. INTRODUCTION

The HIV/AIDS epidemic has had a devastating effect on the demographic, economic and governance structures of the economy, and this has consequences on the overall economic development of Nigeria which are likely to be felt in the future, due to the impact of skill losses, as the scourge mostly affects the youth between the ages of 15 and 49 years who are the potential members of the labour force.

Poor people are highly vulnerable since they engage in indiscriminate and unprotected sexual activities. Besides, they are unable or incapable of taking preventive measures to protect themselves given the level of poverty and limited exposure to information. In as much as poverty spreads, the challenge of stopping and/or reversing the HIV prevalence will remain undaunting (Umo, 2012).

There are many hypotheses and a few hard conclusions about what can explain Africa's extraordinary high transmission of the disease. Perhaps, details of the sexual networks (such as the timing of having multiple sexual partners or the large number of African migrant male workers who are away from their families for long periods) account for some of the differences. The extent of male circumcisions may explain some of the differences too (since circumcision seems to protect against transmission of the disease). The extent of other untreated diseases in the African population may be conducive to a faster transmission of HIV/AIDS. The fact is that nothing sure is known about the relative importance of these possible factors. What is known is that the simple, broad-based attacks on African morals do not hold up to scientific scrutiny (Borjas, 2010).

There are many risk factors that contribute to the spread of HIV, and these include prostitution, high risk practices among itinerant workers, high prevalence of sexually transmitted infections (STI), clandestine high-risk heterosexual and homosexual practices, international trafficking of women, and irregular blood screening. With the alarming growth of the disease within Africa in general and Nigeria in particular, the study is concerned with assessing the effects of HIV/AIDS infection on labour productivity in Akwa Ibom State. It is against this background that this study examined the causes of HIV/AIDS, its effects on labour productivity, and effective measures that can be adopted to control the spread. The motivation to carry out this study was therefore borne out of the desire to solve these problems.

2. REVIEW OF RELATED LITERATURE

This contains the conceptual clarification where the concepts of key variables are discussed, the theoretical framework which synthesizes the theories that explain the relationship among variables, and the empirical literature on the variables.

2.1. Conceptual Clarifications

2.1.1. Human Immuno-deficiency Virus/Acquired Immune Deficiency Syndrome (HIV/AIDS)

HIV is spread primarily through unprotected sex (including anal and oral sex), contaminated blood transfusions, use of unsterilised needles, and from mother to child during pregnancy, delivery, or breastfeeding. HIV/AIDS has had a great impact on the society both as illness and as a source of discrimination (Alubo *et al*., 2002).

At the initial time, an infected person may experience a brief period of influenza-like illness. This is typically followed by a prolonged period without symptoms. As the illness progresses, it interferes more and more with the immune system, making the person much more likely to get infections, including opportunistic infections and tumors that do not usually affect people who have working immune systems. When the body can no longer fight infections, the disease is known as AIDS – Acquired Immune Deficiency Syndromes (Gallo, 2006). It takes between 8 to 12 years to progress from initial HIV infection to AIDS in the absence of specific treatment (Kalling, 2008).

When a person is infected with HIV, the immune system breaks down, leaving the individual exposed to the hazard of a multitude of opportunistic illnesses. In the absence of preventive measures, the education system in a country that is as seriously HIV-infected as many of those in sub-Saharan Africa is also in danger of breaking down, and being prey to myriad opportunistic problems (Dauda, 2003).

Halting the epidemic includes stopping transmission of HIV from mothers to children during pregnancy, delivery, and breastfeeding. Transmission from mother to child can be halted by making sure that mothers have access to antenatal care during their pregnancy, are tested to know their HIV status, and receive antiretroviral drugs (ARVs) if they are HIV-positive. NAIIS data show that among women who gave birth since January 1, 2015, 76.5% self-reported attending at least one antenatal care visit for their last pregnancy and 40.0% self-reported knowing their HIV status during pregnancy. Among women who self-reported knowing their HIV status, 1.4% self-reported testing HIV-positive before or during pregnancy. Among the known HIV-positive women, 82.6% self-reported receiving antiretroviral drugs during their pregnancy (NAIIS, 2016).

Nigeria has shown steady progress on increasing access to treatment for people living with HIV, with the adoption of a test and treat programme in 2016 further accelerating referrals to treatment for people who test positive for the virus. From 2010 to 2017, the country has almost tripled the number of people living with HIV having access to antiretroviral therapy, up from 360, 000 in 2010 to over 1 million people in 2018. However, the new estimates released indicate that almost half of the people living with HIV still do not have access to treatment (NAIIS, 2016).

Between 2012 and 2014, there was a significant expansion in the country's HIV response. The number of sites providing treatment doubled, prevention of mother-to-child sites increased 8-fold and HIV counselling and testing sites increased four-fold. A total of 6.7 million adults were counselled and tested for HIV in 2014, a 65% increase from the previous year (NAIIS, 2016).

Undergoing a VCT is a health related action taken to prevent the spread or contraction of HIV. Generally in Nigeria and Akwa Ibom State in particular, several factors are responsible for the spread of HIV. The main economic variables are poverty, gender inequality, income inequality and the extent of labour migration. Other associated factors include harmful traditional practices (HTP), lack of information, ignorance, illiteracy, stigmatization and social discrimination (NACA, 2012).

The AIDS epidemic has had adverse psychological and economic consequences, leading to changes in family structure (Ankrah, 1993). The psychological impact of illness and death of an individual leads to depression and lack of motivation to work hard among other family members (Fauci, 2007). The continuing discrimination and stigmatization of people living with HIV/AIDS even when a lot of sensitization has been made, makes the HIV victims experience trauma, stress and depression. The HIV/AIDS epidemic may also deepen the poverty of the most affected countries by decreasing the growth rate of per capita income and by selectively impoverishing the individuals and families that are directly affected.

2.2. Theoretical Framework

This framework synthesizes the Income-Health-Productivity Theory (IHPT), the Theory of Asymmetric Information (TAI), the Rational Choice Theory (RCT), the Health Belief Model (HBM), and the Theory of Reasoned Action (TRA) in further explaining the attitude of workers towards voluntary counselling and testing (VCT).

2.2.1. The Theory of Asymmetric Information (TAI)

The Theory of Asymmetric Information (TAI), developed by George Akerlof, Michael Spence, and Joseph Stiglitz, proposes that an imbalance of information between buyers and sellers can lead to inefficient outcome in certain markets. And through Joseph Stiglitz's work, asymmetric information was placed into contained general equilibrium models to describe negative externalities. In the case of this study, a gap or lag in information on HIV related issues such as its effects on individuals and the society at large, its incurable nature, the causative agents, the route of transmission, the protective/preventive measures, the treatment and other costs associated with it, can lead to a failure in achieving the desired results (Ibrahimo and Barros, 2010), which in this case is an HIV-free Akwa Ibom State.

The starting point for economic analysis is the observation that information has economic value because it allows individuals to make choices that yield higher expected utility than they would obtain from choices made in the absence of information. The theory is also used, through game-theory methods to test potential public-policy applications such as mechanism design to elicit information-sharing and other welfare-enhancing behavior (Cawley and Philipson, 1999).

2.2.2. The Rational Choice Theory (RCT)

The Rational Choice Theory (RCT), also known as Choice Theory or Rational Action Theory, is a framework for understanding and often formally modeling social and economic behaviour. The basic premise of RCT is that aggregate social behavior results from the behaviour of individual actors, each of whom is making his/her own decisions. The theory also focuses on the determinant of the individual choices (Elster, 2007). Rational Choice Theory states that individuals rely on rational calculations to achieve outcomes that are in line with their personal objectives, and these decisions provide people with the greatest benefits or satisfaction, given the choices available which are also in their highest self-interest.

Also, the theory assumes that an individual has preferences among the available choices alternatives that allow one to state which option he/she prefers. The rational agent is assumed to take account of available information, probabilities of events, and potential costs and benefits in determining preferences, and to act consistently in choosing the self-determined best choice of action (Edward and Errouaki, 2011). The theory makes two assumptions of completeness, where ai is preferred to aj, or aj is preferred to ai, or the individual is intdifferent between ai and aj for any two alternatives in a set; and transitivity, where if alternative a1 is preferred to alternative a2, and alternative a2 is preferred to alternative a3, then a1 is also preferred to a3. Gary Becker was an early proponent of RCT. However, Foley (2003) criticized the concept as playing a central role in shaping and establishing the hegemony of contemporary mainstream economics.

2.2.3. The Health Belief Model (HBM)

The Health Belief Model (HBM) is a psychological health behaviour change model developed in the 1950s by Irwin M. Rosentock, Godfrey M. Hochbaum, Stephen Kegeles, and HowaraLeventhal at the U.S. Public Health Services to explain and predict health-related behaviours, particularly in regard to the uptake of health services. The model was developed in response to the failure of a free tuberculosis health screening program, and has been adopted to explore a variety of long and short term health behaviours, including sexual risk behaviour and the transmission of HIV/AIDS (Rosenstock, 1974).

The model is based on the understanding that a person will take a health related action like using a condom if he/she feels that a negative health condition like HIV can be avoided, in order to prevent it. The theory of value-expectancy and decision-making is explained by the HBM. The model also asserts that a person's motivation to undertake a health related action depends on factors such as perceived susceptibility, perceived severity, perceived benefits, perceived barriers, cues to action and self-efficacy. The destructive and disruptive effects of the HIV/AIDS pandemic have been greatly felt, as Africa's potential is reduced, its human resources are wasted, and a complex mix of social, political and economic problems are created, making life and progress more difficult (Crafts and Haacher, 2003).

2.2.4. The Theory of Reasoned Action (TRA)

The Theory of Reasoned Action (TRA) was developed by Martin Fishbein and IcekAjzen in 1967 and was derived from previous research that began as theory of attitude. The theory aims to explain the relationship between attitudes and behaviours within human action. According to this theory, intention to perform a certain behavior precedes the actual behaviour. This intention is known as behavioural intention and comes as a result of a belief that performing the behavior will lead to a specific outcome. Ajzen and Fishbein suggest that attitudes and subjective norms are the two factors that determine intention.Attitude is a person's opinion about whether a behavior is positive or negative, while subjective norm is a perceived social pressure arising from one's perception. Together, attitude and subjective norms are thought to determine behavioural intention which in turn leads to performing the behavior (Doswell and Braxter, 2011).

2.2.5. The Income-Health-Productivity Theory (IHPT)

A robust economy has a major influence on improving and maintaining the health of individuals and communities, and as such, the nation through high productivity of its workforce. For individuals with little disposable income, insufficient income may limit the ability to receive the care they need or place them in situation with additional health risks. Though classical economists view health as a product of development process, others, such as Meers *et al.* (2003), argued that the direction of causation between health and wealth remains an open issue. For instance, African Development Fund (ADF, 2000) reported that more recent researches have begun to establish that countries with healthy population tend to grow faster than the contrary. This means that health of a population is the most reliable indicator of future economic growth (Giorgianni *et al.,* 2000).

The Income-Health-Productivity Theory (IHPT) perceives health as a product of the developmental process. That is, wealth and improved health are intricately interwoven. The theory holds that in a global development, income should increase for health to improve and enhance productivity (Giorgianni *et al*., 2002). In this regard, when people have money (income), they could afford to pay for goods and services, other things being equal, this would make them healthy because they can access better food, clean water supply, efficient sanitation system and medical care.

At present pace of HIV/AIDS prevalence, there could be enormous cost on health, human capital and largely on economic development of Nigeria. Cost to economists involves not only the money spent in buying or producing something but also the alternative forgone in order to acquire/satisfy, purchase or produce a given item. It is simply the nominal money value that is paid or used to purchase an item or the money value paid out or given up/sacrificed in the process of production. The Dictionary of Modern Economics (1985) defined cost as a measure of what must be surrendered or given up in order to acquire, obtain or produce an item. Economic development refers to both quantitative and qualitative increase in a country's output of goods and services as a more equitable distribution of

income, a rise in per capita income and standard of living coupled with a fall in cost of living, people's access to basic necessities and infrastructure and so on.

Development is a social construct that can be analysed from different perspectives. It can be applied to the individual, social group, economic, political, technological points of view and so on. Development as it applies to the individual is the process by which the individual increases his/her skills and capacity, self-discipline, creativity, freedom and material well-being. At the social group level, development is an attack on the chief evils of the world today. These include malnutrition, diseases, poverty, illiteracy, unemployment, inflation, slums and inequality (Bulya, 2011).

2.3. Review of Empirical Literature

2.3.1. Level of Knowledge of the Existence of HIV/AIDS among Workers

Khan *et al.* (2011) investigated the level of awareness of HIV/AIDS among college students in Khyber Pakhtun Khwa, Pakistan and utilized cross sectional method in two colleges of Peshawan. The population of the study consisted of sixty (60) students in two colleges (public and private). Results of the study indicated that 60% of the students from the public college and 70% from the private college knew that a person appearing to be healthy might have been infected with HIV. Both public and private college students were aware that HIV/AIDS has no curative treatment.

Quite a few qualitative studies have also explored the experiences of stigma and discrimination among PLHIV. Results from focus group discussion (FGD) in Southern parts of Benue State in North Central region of Nigeria highlighted the high level of rejection and discrimination of PLHIV in the late 1990s. Isolation and avoidance of those infected by HIV were a common practice fuelled by fear of being infected by "a disease without cure." Community members believed that caring for anyone infected by HIV was waste of resources because HIV was more like a death sentence. With better awareness and availability of ART, the negative perception has waned over time such that PLHIVs also desire to fulfil social expectations about marriage and reproduction. Ethnographic case studies from South East Nigeria actually showed that marriage and reproduction by HIV-positive men and women are strategies used to confront the problem of HIV-stigma.

Omeonu and Kellie (2010) studied knowledge and attitude of Babcock University students on risk behaviours of HIV/AIDS. The aim of the study was to identify the level of knowledge and the kind of attitude that level 100 students (freshmen) at Babcock University upheld towards risk behaviours that encourage the spread of HIV/AIDS. In addition, the study sorts to identify the difference in awareness level of male and female students in the spread of HIV/AIDS.

2.3.2. Attitude of Workers towards Voluntary Counselling and Testing (VCT)

Zakari and Abdullahi (2013) examined the economic impact of HIV/AIDS and stigmatization on women in Nigeria; a challenge for the actualization of the Millennium Development Goals (MDGs). The study was carried out using primary data among groups of Nigerian women. The data were analyzed using simple percentage method. The result of the study revealed that negative presentation by some medical personnel and the sensational captions by the Nigerian mass media on the so-call dead sentence nature of HIV/AIDS epidemic made it so scary that people found it difficult to accept its presence, and so stigmatize people especially women leaving with the disease. However, the study recommended that religious organizations, government and non-governmental organizations intensify sensitization efforts towards combating the epidemic through involvement in voluntary counseling and testing (VCT).

According to Babalola (2007), the burden of stigma among People Living with HIV (PLHIV) may be higher than documented in quantitative studies as findings from focus group discussion (FGD) participants in Lagos, Nigeria, showed that almost 75% reported that life has become very traumatic due to stigmatization from friends, family members, healthcare workers, and workplace. Studies have shown that stigma was associated with anti-retroviral therapy (ART) adherence and mental health status of PLHIV, and this results in poor attitude towards voluntary counselling and testing (VCT). Low stigma level was found to be associated with good ART adherence among participants in a cross-sectional study at a tertiary facility in South West Nigeria.

Regarding the consequences of HIV-related stigma, Adewuya *et al.* (2009) found that 27.3% of patients who had experienced stigmatizing events such as isolation and blaming had posttraumatic stress disorder (PTSD). The study was conducted at a private HIV/AIDS care facility in South West Nigeria. It is suspected that the situation could be worst in public health facility where there are larger patient population and therefore greater pressure on healthcare providers. Evidence from another study in South East region suggests that the prevalence of depression was 33.3% and this was associated with negative self-image domain on the HIV scale. Personalised or internalised stigma was also associated with lesser likelihood of status disclosure among PLHIV. These limit the self-esteem and confidence among PLHIV with a negative consequence on their overall mental health status, and also discourage others from participating in voluntary counselling and testing (VCT).

Drawing on Deacon's framework, a qualitative exploration of stigma before and after ART initiation revealed very interesting findings about the dynamic nature of stigma. The central argument of the Deacon's framework was that stigma is a dynamic socio-cultural phenomenon that changes in response to different situations. Based on this premise, stigma could be classified as self-stigma, anticipated stigma, and enacted stigma. Before ART, there were experiences of self-isolation, fear of death, family withdrawal, rejection, and abandonment, and these experiences discourage others from going for voluntary counselling and testing. After ART commencement, with better or healthier physical appearance, family and community members began to accept PLHIV and status disclosure also improved (Adebayo *et al.*, 2011).

In sum, stigma was a motivator for treatment adherence which in turn reduced self-stigma, enacted stigma, and anticipated stigma. This evidence needs to be further substantiated because participants in the study were recruited from a community-based organisation. If participants had been recruited from a public health facility, could the findings be different? Another exploratory study of stigma and survival challenges among ART patients at a secondary health facility in South West Nigeria revealed that stigmatizing experiences were low among family members but high from nonfamily members including health workers who counselled, tested and are treating them. The study also showed that some well-intentioned social interventions (such as packaged food parcels for nutritional supplementation) for PLHIV ended up stigmatizing them.

In the face of these daunting challenges of stigma and discrimination, a study in Lagos, South West Nigeria, documented the coping strategies that have been deployed by PLHIV after voluntary counselling and testing (VCT). The most common were maintaining a low public profile by avoiding public functions, avoiding seeking care in public health facilities, and nondisclosure of one's status. Of course, these approaches do not augur well for universal coverage of care, treatment, or support and it is a serious threat to secondary prevention of HIV infection.

A study conducted among men who have sex with men (MSM) and women who have sex with women (WSW) in North Central Nigeria which investigated the impact of the law prohibiting such relationship in Nigeria revealed that there was increased fear of stigma and discrimination among this key population after being tested, and as a result, access to care was affected.

2.3.3. Effect of HIV/AIDS infection on Income of Workers

Dauda (2003) investigated the effect of HIV/AIDS on farm families in Makurdi Local Government Area of Benue State in Nigeria using frequency distribution, percentages and chi-square. The study used primary data and concluded that HIV has serious adverse effect on the productivity, farm income and standard of living of the affected farm families. Education of rural households on the dangers of HIV/AIDS and ways of preventing or minimizing its spread was recommended by the study.

Barnett and Whiteside (2011) estimated the economic losses associated with HIV in three Caribbean countries (Jamaica, Saint Lucia and Trinidad and Tobago). The study found out that by 2015, HIV/AIDS would lead to a reduction of national income, by comparison with a "no-AIDS" scenario of 4.9 percent in Jamaica, 2.1 percent in Saint Lucia and 5.6 percent in Trinidad & Tobago. Those estimates assume that all infected persons would be medically covered, with an estimated per capita treatment cost of $4,000.

Ainsworth and Over (1994), using a model that distinguished between three classes of workers, and between rural and urban production, projected the macro-economic impact of AIDS on the growth

trajectories of 30 countries in sub-Saharan Africa over the period 1990-2025. The macroeconomic impact varied depending on assumptions about relative levels of HIV infection in educated and uneducated workers, and on the amount of the treatment costs taken from savings. For the assumptions the author regarded as most plausible (that 50 percent of the treatment costs were financed out of savings and that each education class of workers has double the risk of the one beneath it), the net effect of the AIDS epidemic on the annual growth rate of national income (NI) per capita was a reduction of about 0.15 percentage point on average and one third percentage point in the 10 countries with the most advanced epidemics. The effect in the 10 most affected countries would be 0.6 percentage point if all the treatment costs were financed from savings.

Bloom *et al*. (2004) found that a one year improvement in the population's life expectancy (a standard measure of health status) in sub-Saharan Africa contributes to a 4% increase in output. In another study, the same authors estimated that a one percentage point increase in adult survival rates boosts labour productivity by about 2.8%. Formal analysis suggest that a country can, on average, expect to see per capita income grow by an extra 0.3 – 0.5% points a year for every 5 years it adds to its life expectancy. This is a considerable boost, given that between 1965 and 1990, global income per capita grew by an average of 2.0% per year.

Similar studies have been done in Asia by Andrew (2002), and the effects of controls for initial income in developing Asian countries with infant mortality rates are high. The potential returns to health investment, the study concludes, appear to be substantial in the region. Moreover, studies that consider full income which assigns economic value to changes in life expectancy suggest that falling mortality rates have a more substantial positive impact on economic development than is shown by GDP per capita data. For example, in an assessment of the growth of real income per capita on the United States over the 20th century, Nordhaus (2003) concluded that over half of the growth in full income up to 1990 was attributable to mortality decline.

3. METHODOLOGY

3.1. Research Design

The survey research method was employed for the study. This involved collecting both qualitative and quantitative data from respondents on their knowledge of the existence of HIV and their attitude towards voluntary counselling and testing (VCT), as well as on the effect of HIV infection on income of workers.

3.2. Population of Study

The target population was Akwa Ibom State labour force, especially HIV/AIDS infected and affected workers. This includes HIV patients, and workers who have had at least an HIV-related sick person or have lost a person in their household due to the scourge.

3.3. Sample and Sampling Technique

- Using a combination of cluster and simple random sampling techniques, a sample of 150 respondents, drawn from each of the following Ministries in the Akwa Ibom State Civil Service: Agriculture, Education, Economic Development, Women Affairs, Health, and Works was used to obtain data to assess the level of workers' knowledge of the existence and spread of HIV/AIDS and their attitude towards voluntary counselling and testing (VCT). Cluster sampling method was chosen because it reduces the large population into a manageable size by selecting the desired sets of the population and dividing the population into separate groups of workers. Then, a simple random sampling technique was used in selecting workers from the ministries chosen.

- Using purposive sampling techniques, a sample of 80 respondents, made up of HIV infected and affected workers, and drawn from isolated wards in each of the following General Hospitals in Akwa Ibom State: General Hospital, Etinan; General Hospital, Ukpom-Abak; General Hospital, Ikot Ekpene; and General Hospital, Eket, was used to obtain needed data to assess the effect of HIV/AIDS on the income of workers in Akwa Ibom State. Purposive sampling method was chosen because it ensures the selection of respondents with the desired characteristics. The technique is simple to implement, and it saved time, as only HIV/AIDS infected and affected workers were required for the study.

3.4. Data Collection Technique

A survey technique, using structured questionnaire and in-depth interviews was employed in collecting required data. The process involved designing the instrument for collection of the data, selecting a sample of respondents which represents the population, and conducting the data collection through questionnaire administration and in-depth interviews. The field assessment was done in specific centres with respect to specific persons with the required characteristics.

3.5. Method of Data Analysis

Descriptive and econometric methods were used to analyse the data. Descriptive methods were used to analyse the data in Tables, Percentages and the Pearsons' Product Moment Correlation (PPMC).

Pearsons' Product Moment Correlation coefficient (PPMC) is a measure of the strength of association and direction of relationship between two variables. Pearson's 'r' can range from -1 to 1. An 'r' of -1 indicates a perfect negative linear relationship between variables. An 'r' of 0 indicates no linear relationship between variables, and an 'r' of 1 indicates a perfect positive linear relationship between variables.

The formula for Pearsons' Product Moment Correlation is

$$r = \frac{1/n \sum (x - \dot{x})(y - \bar{y})}{(\sigma x)(\sigma y)} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (3.1)$$

Where

r	=	correlation coefficient
x and y	=	the variables of interest
σ	=	standard deviation
n	=	sample size

3.5.1. The Analytical Framework

The specific econometric method employed was the logistic regression analysis. Information from the administered structured questionnaire and semi-structured questionnaire (interview guide) were extracted, coded and analysed using an e-view package, 9.0 version.

Logit regression model, which has found wide empirical application, is very useful in situations where one wants to predict the presence or absence of an outcome or occurrence based on value of a set of predictor variables (Liao, 1994; Gujarati, 2005). The logit regression model is similar to linear regression model (LRM). However, the logit regression model is limited to models in which a dependent variable is dichotomous.

Conventionally, the logit model is represented as:

$$P_i = E(Y = 1/X_i) = \frac{1}{1 + e^{-(\beta_1 + \beta_2 X_i)}} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (3.2)$$

For ease of exposition, equation 3.2 can be written as:

$$P_i = \frac{1}{1+e^{-zi}} = \frac{e^z}{1 + e^z} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (3.3)$$

Equation 3.3 represents what is known as the (cumulative) logistic distribution function. The P_i in equation 3.3 is the probability of an event occurring. However, the probability of an event not occurring is expressed as:

$$1 - P_i \;=\; \frac{1}{1 + e^{z_{ii}}} \qquad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (3.4)$$

Therefore, the odds ratio in favour of an event occurring, that is, the ratio of the probability that an event will occur to the probability that an event will not occur, can be expressed as:

$$P_i/1-P_i \;=\; \frac{1 + e^{z_i}}{1 + e^{-z_i}} \;=\; e^{z_i} \qquad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (3.5)$$

For estimation purpose, the natural log of equation 3.5 is taken, and this will give:

$$L_i \;=\; In(P_i/1-P_i) \;=\; \beta_1 + \beta_2 X_i \qquad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (3.6)$$

L in equation 3.6 is not only linear in X, but also, from the estimation viewpoint, linear in the parameters (Gujarati, 2005:596; Liao, 1994). L is therefore, called logit.

The justification for the choice of Logit Model for this study is because it is a model where the regress and Y is binary or dichotomous and qualitative. The qualitative response regression model is a probability model whose objective is to estimate the probability of event happening or not happening; therefore, Ordinary Least Square models do not fit to be used to estimate qualitative response regression because they lack these distinctive features that are embedded in probability models like logit model. Logit is therefore, a binary response regression model (Gujarati and Porter, 2009).

For example, Logit (P) $\;=\;$ $In(\frac{Pi}{1-Pi})=$ $\beta o + \beta_1 X_1 + \beta_2 X_2 + \ldots\ldots \beta_6 X_6 + \mu_i.$

If $\quad P_i \qquad =$ Probability of being Poor (i.e., when income is below poverty line),
then $\quad (1-P_i \quad =$ Probability of not being poor (i.e., when income is above poverty line).

$X_1 \ldots X_6 \qquad =$ Predictor or explanatory variables

$\mu_i \qquad\qquad =$ Error term

3.5.2. Model Specification

The annual value of income in monetary terms is used, to represent the Income of Workers which is the amount of money or wages received by a worker or workers in a given time period in exchange for producing goods or providing services; or profits realized from investments, and it is expressed as a function of HIV, Education (Edu), Age, Sex of respondents, and Labour Hours (Lab.Hrs).

Income = f (HIV, EDU, AGE, SEX, Lab.Hrs) …………………………………..………… (3.8)

$\qquad\qquad\qquad$ (-) $\quad$ (+) $\quad$ (+) $\quad$ (+) $\quad$ (+)

3.5.3. The Econometric Specification of the Log it Model

Logit Model is Stated Thus:

Logit (Income) $\;=\;$ $In(\frac{Pi}{1-Pi})=$ $\beta o + \beta_1 HIV_i + \beta_2 EDU_i + \beta_3 AGE_i + \beta_4 SEX_i + \beta_5 Lab.Hrs_i + \mu_i$

Where:

Income $\qquad =$ Income of Workers

HIV $\qquad\qquad =$ HIV/AIDS

EDU $\quad =$ Education

AGE $\qquad\qquad =$ Age of Workers

SEX $\quad =$ Sex of Workerts

Lab.Hrs= Labour Hours

$\mu i \qquad\qquad =$ Stochastic Error Term

A priori expectations for the coefficients in the model:

The signs in the parenthesis represent a priori expectations of the behavior of the independent variables in relation to the dependent variable.

$\beta_1 < 0$, $\beta_2 > 0$, $\beta_3 > 0$, $\beta_4 > 0$, $\beta_5 > 0$

HIV(-), EDU(+), AGE(+), SEX(+) and Lab.Hrs(+)

4. DATA ANALYSIS AND DISCUSSION OF FINDINGS

4.1. Descriptive Analysis of Workers' Response in the Questionnaire

Questionnaire-I addresses the level of knowledge of the existence of HIV/AIDS and the attitude of workers in Akwa Ibom State towards voluntary counseling and testing.

Initially, a set of 150 questionnaire was administered on the respondents through field survey. But 143 questionnaire were properly filled and returned. To make up the number of respondents needed for this study, another set of 7 questionnaire was administered and closely monitored. Therefore, 150 questionnaire, representing 95.5% of the 157 questionnaire administered, were used for the statistical analysis. By isolating questionnaire that were not properly completed in the course of data entry and cleaning, and replacing them with another set of properly filled questionnaire, both reliability and validity were ensured.

4.1.1. Socio-demographic Characteristics of Respondents

Table4.1. *Ministry and Sex of the Respondents*

Ministry	Male	%	Female	%	TOTAL	%
Agriculture	14	9.3333	11	7.3334	25	16.6667
Education	10	6.6667	15	10	25	16.6667
Health	8	5.3333	17	11.3334	25	16.6667
Women Affairs	5	3.3333	20	13.3334	25	16.6667
Works	21	14	4	2.6667	25	16.6667
Economic Development	13	8.6667	12	8	25	16.6667
TOTAL	71	47.3333	79	52.6667	150	100

Source: *Field Survey by the Researcher (2019).*

Table4.2. *Marital Status of the Respondents*

Marital Status	Number of Respondents	%
Married	56	37.3333
Single	77	51.3333
Divorced	4	2.6667
Widowed	13	8.6667
TOTAL	150	100

Source: *Field Survey by the Researcher (2019).*

Table4.3. *Ages of Respondents*

Age	Number of Respondents	%
16 – 25	28	18.6667
26 – 35	69	46
36 – 45	38	25.3333
46 – 55	10	6.6667
56 Above	5	3.3333
TOTAL	150	100

Source: *Field Survey by the Researcher (2019).*

Table 4.1 shows that six Ministries were chosen using the cluster sampling technique. They include: Ministries of Agriculture, Education, Economic Development, Women Affairs, Health, and Works. In each of the Ministries, 25 questionnaire were administered using the simple random sampling

technique. Of the 150 respondents, 71, representing 47.3333% were male, while 79, representing 52.6667% were female. For male, the largest number of 21 persons was drawn from the Ministry of Works, and the lowest number of five persons was drawn from the Ministry of Women Affairs. For female, the largest number of 20 persons was drawn from the Ministry of Women Affairs, and the lowest number of four persons was drawn from the Ministry of Works.

The distribution of marital status of respondents in Table 4.2 shows that 77 or 51.3333% of the respondents were single; 56 or 37.3333% were married; 13 or 8.6667% were widowed; and four workers or 2.6667% were divorced. Table 4.3, showing the ages of respondents, indicates that 28 workers, representing 18.6667% of the respondents were between the ages of 16 and 25; 69 workers or 46% of them were between 26 and 35 years; 38 workers or 25.3333% were between 36 and 45 years; 10 workers or 6.6667% were between 46 and 55 years; while only five workers or 3.3333% of them were 56 year and above.

4.1.2. Analysis of Response to Items in the Questionnaire

Table4.4. *Knowledge of the existence of HIV/AIDS and its spread*

Responses	Male	Female	TOTAL	%
Strongly Agreed	27	34	61	40.6667
Agreed	18	17	35	23.3333
Undecided	14	13	27	18
Disagreed	8	10	18	12
Strongly Disagreed	4	5	9	6
TOTAL	71	79	150	100

Source: *Field Survey by the Researcher (2019).*

Responses presented in Table 4.4 indicate that 64% of the respondents accepted that they have perfect knowledge of the existence of HIV/AIDS, its spread and transmission mechanism, while 18% of the respondents denied having knowledge of the existence, spread and transmission HIV/AIDS, and another 18% were yet to decide whether they have knowledge of HIV/AIDS. This means that there is greater awareness of HIV/AIDS among workers in Akwa Ibom State. The result further shows that the level of awareness is higher among female workers than their male counterpart. Relating this result to objective number three of the study, it is obvious that workers have knowledge about the existence and transmission mechanism of HIV/AIDS, as corroborated by the findings of Odebiyi (1992). But does this lead to positive attitude towards voluntary counseling and testing?

Table4.5. *Attitude of Workers towards Voluntary Counselling and Testing*

RESPONSES	Willing Attitude (Male)	Willing Attitude (Female)	TOTAL	%	6 Month Frequency	%
Strongly Agreed	8	12	20	12	15	10
Agreed	20	31	51	34	57	38
Undecided	15	13	28	20	30	20
Disagreed	22	18	40	27.3333	39	26
Strongly Disagreed	6	5	11	6.6667	9	6
TOTAL	71	79	150	100	150	100

Source: *Field Survey by the Researcher (2019).*

Attitude of workers towards HIV Voluntary Counselling and Testing (VCT) was viewed from willingness to participate in the counselling and testing exercise and the frequency of participation in the exercise. Table 4.5 shows that, on willingness to participate, 71 persons (46%) of the respondents accepted that they are always willing to undergo the exercise. Consequently, 51 persons (34%) of them maintained that they are not always willing to be involved in the exercise. Moreover, 28 persons (20%) of them were not certain on whether they are always willing to be involved or not. On the frequency of participants, 72 workers, representing 48% of the respondents accepted that they

undergo counseling and testing exercise every 6 months, while 48 workers, representing 32% them disagreed to participation in the testing exercise every 6 months. However, 30 workers, representing 20% of the respondents were not certain of their frequency of participation in the exercise.

Table4.6. *Stigmatization against People Living with HIV/AIDS is Rampant*

Responses	Number of Respondents	%
Strongly Agreed	35	23.3333
Agreed	78	52
Undecided	9	6
Disagreed	18	12
Strongly Disagreed	10	6.6667
TOTAL	150	100

Source: *Field Survey by the Researcher (2019).*

From Table 4.6, it is also obvious that there is high level of stigmatization against people living with HIV/AIDS among workers. The result indicates that 113 persons or 75.3333% accepted that there is high level of stigmatization against people living with the disease among workers. However, 28 persons or 18.6667% of them did not accept that there is such discrimination; while nine persons or 6% indicated that they were uncertain of such discrimination.

Table4.7. *Involvement in Risky Sexual Activities increases the chances of Infection*

Responses	Number of Respondents	%
Strongly Agreed	39	26
Agreed	70	46.6667
Undecided	21	14
Disagreed	14	9.3333
Strongly Disagreed	6	4
TOTAL	150	100

Source: *Field Survey by the Researcher (2019).*

Involvement of workers in risky sexual activities is perceived to be done in secret. However, result from Table 5.38 above indicates that 109 persons or 72.6667% of the respondents agreed that workers involve in risky sexual activities; 20 persons or 13.3333% of them disagreed to having knowledge of such exercise; while 21 persons or 14% of the respondents were not certain as to whether such exercise exist or not.

Table4.8. *Educational Qualification of 1st Degree/HND and Above*

Responses	Number of Respondents	%
Strongly Agreed	60	40
Agreed	40	26.6667
Undecided	10	6.6667
Disagreed	20	13.3333
Strongly Disagreed	20	13.3333
TOTAL	150	100

Source: *Field Survey by the Researcher (2019).*

Table 4.8 indicates that more than 60% of the respondents have at least a 1st degree or HND. This shows why majority of the respondents have the knowledge of the existence of HIV/AIDS.

4.2. Interviews with Respondents

4.2.1. In-depth Interviews on the Knowledge of Existence of HIV/AIDS Yielded the following Responses from Respondents

An interview respondent noted: "It is a well-known fact that HIV/AIDS is real. If you go to hospital, you will see a separate ward for HIV infected persons, and they look really terrible". Besides, I am aware of HIV/AIDS because I read about it in the Newspapers, hear about it on radio and TV, and it is even preached about in the church. So I am very much aware of its existence".

One of the interview respondents noted: "I don't believe it exists. It is just an American Idea of Discouraging Sex (AIDS)".

A respondent of an interview noted: "I know it exists. I know of people who were very sick and on getting to the hospital, were tested positive. Almost all of them are dead as I'm talking to you".

Another interview respondent noted: "Of course HIV/AIDS is real. A friend of mine was seriously ill for years without knowing he was HIV positive. He died two years ago some weeks after being tested positive in the hospital he went for treatment of malaria. I got to know about this because I was very close to him and his family. Since then, I have been very careful of my life, though I am afraid to go for a test".

4.2.2. In-depth Interviews on the Attitude of Workers towards VCT Generated the following information from respondents

An interview respondent noted: "Most of us are aware that VCT centres exist in Uyo in particular and Akwa Ibom State in general and we also know the importance of getting tested for HIV/AIDS. However, a large majority of workers are afraid of visiting these centres even when the services are free".

Another interview respondent noted: "One will find it difficult to partake in VCT; coping after testing positive, assuming the result so indicates, will not be easy. It is better not to know than knowing and dying out of frustration".

Over-confidence in being HIV-negative is another reason why some workers who are aware of VCT refuse to participate in it. For instance, one of those interviewed commented: "I know I do not have HIV; undergoing the test is unnecessary. Moreover, HIV does not jump into people just like that; it is rather a function of attitude. I feel I am very healthy, and undergoing VCT is for people who are not sure of themselves".

One respondent expressed his views thus during an interview: "I feel VCT is open and its confidentiality is not really guaranteed. In the first place, everybody would know you are going for the test and they will keep asking questions because they want to know your status. They might even go as far as finding out the test result from the staff in the clinic".

A respondent in an interview noted: "If you are known to be HIV-positive, nobody will like to walk with you or sit close to you, even though it is widely known that the disease cannot be contracted through walking with or talking to an infected person. This has made people to shy away from undergoing HIV test to avoid discrimination and stigmatization if tested positive".

An interview respondent who would rather not go for VCT for fear of testing positive noted: "I do not need to undergo such testing to know my status… I cannot afford to bear the cost of being HIV positive".

The benefit of knowledge of VCT and partaking in it were clearly stated by one of the respondents in an interview: "The knowledge of your HIV status removes fear from one's mind. Before undertaking the test, there is obvious fear and wondering about what the outcome of the test might be. If the test result indicates HIV negative, there is a whole lot of relieve and mental refreshment. If the result is otherwise, you start receiving the anti-retroviral therapy (ART) which is free, or kill yourself if you cannot bear the trouble".

Another respondent said: "In order not to face stigmatization and discrimination, HIV-related cases in Nigeria are hidden or kept secret. So, I would rather not go for VCT".

4.2.3. In-depth Interviews on the Effect of HIV/AIDS infection on Income of Workers Generated the Following Information from Respondents

An interview respondent noted: "I am HIV positive and a businessman. With many openings here and there in the area of business I operate, I am not strong enough to travel round the country to attend trade fairs and market my products as before, and my income is dwindling as a result".

Another respondent noted: "I have been in this hospital for two years now looking after my husband who is HIV positive. My business is suffering as a result and my income is hugely reduced".

An interview respondent noted: "I operate a restaurant in Uyo, but because of staying here most of the time with my husband who is HIV positive, I have few hours for my business which is the only source of income for the family of 5. I have also lost my customers, and my income is reducing day after day".

A respondent also noted: "I am a trader, and I used to travel far to buy my goods. Sometimes, I come back after four days. But today, I cannot go far because I have to take care of my son who is sick. My income has reduced as a result".

From the above interviews, it is observed that there is a high level of knowledge of the existence of HIV/AIDS among workers in Akwa Ibom State. The findings also show that majority of those that have knowledge about the existence of HIV/AIDS have 1st degree/HND and above, just as more female workers have knowledge about the existence of the disease than their male counterparts.

It can also be deduced from the findings that the attitude of workers towards VCT differs. It is obvious that attitude of workers towards voluntary counseling and testing is a function of what they believe about the exercise, and this is believed to determine their willingness to participate in it. Thus, some workers who are fully aware of the importance of knowing their HIV status prefer not to undergo VCT than face the stigma that may arise from the publicizing of their test results.

Also, it is observed that HIV/AIDS infection has greatly affected income of workers (employees and self-employed) in Akwa Ibom State.

4.3. Analysis of Results

4.3.1. Analysis of Data from Questionnaire

Information used for the analysis is derived from item 1 and item 6 in the questionnaire and as presented in Table 4.4 and Table 4.5 respectively. Pearson Product Moment of Correlation (PPMC) is used for the estimation as follows:

Table4.9. *Analysis on the Level of Knowledge of the Existence of HIV/AIDS and Involvement in Voluntary Counselling and Testing*

X	Y	$(x - \dot{x})$	$(y - \bar{y})$	$(x - \dot{x})(y - \bar{y})$	$(x - \dot{x})^2$	$(y - \bar{y})^2$
61	20	31	-10	-310	961	100
35	51	5	21	105	25	441
27	28	-3	-2	6	9	4
18	40	-12	10	-120	144	100
9	11	-21	-19	399	441	361
∑= 150	∑= 150			∑=80	∑=1,580	∑= 1,006

Source: *Field Survey Data by the Researcher (2019)*

$$\text{PPMC } (r) = \frac{1/n \sum (x - \dot{x})(y - \bar{y})}{(\sigma x)(\sigma y)} = \frac{1/5(80)}{(\sqrt{316})(\sqrt{201.2})} = \frac{16}{(17.78)(14.18)}$$

$$= 16 / 252.12 = 0.063$$

From the result, the correlation coefficient (r) is 0.063. This is a low correlation between knowledge existence of HIV/AIDS and involvement in voluntary counseling and testing among workers in Akwa Ibom State.

Information used for further analysis is derived from item 6 and item 10 in the questionnaire and as presented in Table 4.5 and Table 4.6 respectively. Pearson Product Moment of Correlation (PPMC) is used for the estimation as follows:

Table4.10. *Analysis on the Level of Involvement in Voluntary Counselling & Testing and the Degree of Stigmatization in Akwa Ibom State*

X	Y	(x - ẋ)	(y - ȳ)	(x - ẋ)(y - ȳ)	(x - ẋ)^2	(y - ȳ)^2
20	35	-10	5	-150	100	25
51	78	21	48	1008	441	2,304
28	9	-2	-21	42	4	441
40	18	10	-12	-120	100	144
11	10	-19	-20	380	361	400
∑ = 150	∑ = 150			∑ = 1,160	∑ = 1,006	∑ = 3,314

Source: *Field Survey Data by the Researcher (2019)*

$$\text{PPMC (r)} = \frac{1/n \sum (x - ẋ) (y - ȳ)}{(\sigma x)(\sigma y)} = \frac{1/5(1160)}{(\sqrt{201.2})(\sqrt{662.8})} = \frac{232}{(14.18)(25.74)}$$

= 232/364.99　　= 0.64

From the result, the correlation coefficient (r) is 0.64. This is a high correlation between involvement in voluntary counseling & testing and stigmatization in Akwa Ibom State.

4.3.2. Model Results

Table4.11. *Logit Regression Results for Model 1a (Early Stage of Discovery)*

Dependent Variable: Income

Variables @ early stage of discovery of the disease		Coefficients	Standard Error	P – Value
C		629268.2	125434.0	0.0000***
HIV = 0		-86174.20	61448.79	0.0165**
EDU		24257.08	22300.09	0.0282**
AGE		-8592.934	3216.177	0.0093***
SEX		-229290.9	127947.5	0.0772*
Lab.Hrs		211914.1	161693.2	0.1940
McFadden R-Squared		0.872513		
Log Likelihood		1104.722		
LR Statistics		3.085469		0.013868**

Source: *Field Survey Data by the Researcher (2019)*

Note: *C = Intercept; (***) = 1% Significance; (**) = 5% Significance; (*) = 10% Significance*

Table4.12. *Logit Regression Results for Model 1b (Later Stage of Discovery)*

Dependent Variable: Income

Variables @ later stage of discovery of the disease		Coefficients	Standard Error	P – Value
HIV = 0		715442.4	127666.3	0.0000***
HIV = 1		629268.2	125434.0	0.0000***
EDU		24257.08	22300.09	0.0282**
AGE		-8592.934	3216.177	0.0093***
SEX		-229290.9	127947.5	0.0772*
Lab.Hrs		211914.1	161693.2	0.1940
McFadden R-Squared		0.872513		
Log Likelihood		1104.722		

Source: *Field Survey Data by the Researcher (2019)*

Note: *(***) = 1% Significance; (**) = 5% Significance; (*) = 10% Significance*

From the results, HIV at the early stage of discovery is negatively related to Income and is significant at 5% significance level, meaning that due to the sudden shock and reduced work time at the initial stage of knowing the positive status of the disease, income of workers was negatively affected. Private business owners and participants are mostly affected here, as their income is not fixed but only depend on profit/revenue realized from transactions and other economic activities. But in the long run or later stage of discovery, HIV is positively related to Income and is significant at 1% significance level. This means that the reality of how deadly HIV/AIDS is, prompted infected persons to seek medical attention which could help improve their health condition and boost their confidence to fully involve in normal economic activities, hence, increase in income. Interestingly, HIV, in a combined long run and short run result is also positively and significantly related to Income at 1% significance level.

Education and Labour Hours have positive relationship with Income in both early and later stages of discovery results. But, while EDU is significant at 5% significance level, Lab.Hrs is insignificant. This means that increase in education improves income. Increase in labour hours may also increase income. However, Age and Sex are negatively related to Income. Both are significant but at different levels of significance. While Age is significant at 1% significance level, Sex is significant at 10% significance level.

Also, the McFadden R-squared of 0.872513 in both the long run and short run results means that over 87% of the changes in Income is accounted for by changes in all the explanatory variables, while the remaining 13% or less is explained by other variables which were not captured by the model but are included in the error term, thus indicating that the model is a good fit. The LR-statistics shows that the overall model was significant at 5% level.

4.4. Discussion of Findings

4.4.1. Level of Knowledge of the Existence of HIV/AIDS

The study reveals that 64% of the respondents accepted having perfect knowledge of the existence of HIV/AIDS, its spread and transmission mechanism. This means that there is greater awareness of HIV/AIDS among workers in Akwa Ibom State. This awareness includes knowledge of causative agents of HIV/AIDS; knowledge of disease transmission routes such as unprotected sexual activities, use of unsterilized needles and contaminated blood transfusion; and knowledge of preventive/protective measure such as avoidance of pre-marital sex and condom use. The findings of this study correspond with investigation by Khan, S. *et al.* (2011) which indicates that between 60% and 70% of respondents knew that a person appearing to be healthy might have been infected with HIV. The result further shows that most of the workers with high level of knowledge of the existence of HIV/AIDS have 1st Degree/HND and above, and the level of awareness is higher among female workers than their male counterparts.

4.4.2. Attitude of Workers towards Voluntary Counselling and Testing

Attitude of workers towards HIV Voluntary Counselling and Testing (VCT) was viewed from willingness to participate in the counselling and testing exercise and the frequency of participation in the exercise.

On willingness to participate, 46% of the respondents said they are always willing to participate in the exercise, while the rest of them are either not willing to be involved in the exercise or were not certain on whether they would involve or not. On the frequency of participation, 48% of the respondents support the idea of undergoing counselling and testing exercise every 6 months, and the rest are either not interested in participating in the testing exercise every 6 months or are not certain of their frequency of participation in the exercise.

Possible reasons for low involvement in VCT could be fear of stigma, fear of marital disharmony, cost of treatment, the incurable nature of the disease or lack of information on VCT. The result of this study also conforms to the findings of Zakari and Abdullahi (2013) which revealed that negative presentation by some medical personnel and the sensational captions by the Nigerian mass media on the so-call dead sentence nature of HIV/AIDS epidemic made it so scary that people found it difficult to go for VCT.

The study shows that only 25% of the infected workers discovered they HIV positive through voluntary counseling and testing (VCT). This reveals workers' apathy towards VCT, and without regular involvement in VCT, it means many workers do not even know their HIV status. Therefore, with adequate information on HIV voluntary counseling and testing and treatments, workers who are infected but are not aware they are, can now respond to VCT positively. Also, 50% of the infected workers said that the condition of their health has improved due to the treatments they are receiving, and this justifies further investment in the fight against HIV/AIDS through continuous and adequate supply of needed vaccines.

Also, there is high level of stigmatization against people living with HIV/AIDS among workers, as indicated by 75.3333% of the respondents, and 72.6667% of them agreed that workers involve in risky sexual activities. Moreover, this study reveals that despite the high knowledge of workers about HIV/AIDS, the rate of involvement in voluntary counseling and testing is still low. Thus, there is an insignificant relationship between knowledge of existence of HIV/AIDS and involvement in voluntary counseling and testing. There is also an insignificant relationship between involvement in voluntary counseling & testing and degree of stigmatization in Akwa Ibom State.

4.4.3. Effect on Income of Workers in Akwa Ibom State

It was discovered that time spent on nursing HIV/AIDS patients had effect on the work of 77 persons or 96.25% of the care givers. This implies that, for most people who are engaged in nursing AIDS patients, there is always an effect on their work, hence, an effect on their income. This is as a result of spending a lot of time looking after the patients, as 60% of them said that the act of taking care of AIDS patients reduces the time they spend at work. This implies that most of the people taking care of HIV/AIDS patients in Akwa Ibom State spend most of their time looking after, and thinking about the patients and where they can get resources to facilitate the treatment process, and this leads to reduction of time spent working and loss of concentration, which results in reduced income. This is confirmed by 92.5% of the respondents who agreed to the fact that being absent from work has negative effect on their income.

The study also revealed that most of the care-givers are women – including wives, mothers, daughters and sisters whose income have reduced as a result of reduced labour hours and output. The value of more than 50% of the respondents' income in monetary terms was above ₦200,000 per annum. This means that on the average, the income of people taking care of the HIV/AIDS patients is high as it is above ₦200,000, and about 100% of them said that the value of their income is affected, and this occurs at different levels. The study also reveals the effect of nursing patients on labour productivity in the household as follows: (i) the amount of output produced by 15% of the caretakers reduced; (ii) the amount of labour time of 40% of them reduced; and (iii) the efficiency of 42.5% of the caretakers reduced.

This means that taking care of AIDS patients reduces labour productivity in terms of reduced output, labour time and efficiency, and this in turn, affects their income negatively, as revealed by the study that the entire family income of 95% of the respondents is affected as they partially or fully stay off work to nurse their infected relatives. This result is also in line with the findings of Finkle and Finkle (1993) which indicate that household income decline as household members are obliged to take money from productive or income generating activities to take care of the sick relatives. The savings of the HIV affected persons are also affected as 95% of them agreed to their savings being affected. However, 68.75% of the respondents said that taking care of HIV victims did not hinder them from pursuing further training to improve their productivity and income, and results from the study reveal that the health condition of 72.5% of the respondents was affected by their long stay in the hospital. All these result in negative effect on income of HIV affected workers.

Moreover, the logit regression results show that HIV, at the early stage of discovery, is negatively related to Income and is significant at 5% significance level, meaning that due to the sudden shock and reduced work time at the initial stage of knowing the positive status of the disease, income of workers was negatively affected. This is true, especially for private business owners whose income are not fixed but only depend on profit/revenue realized from business transactions and other economic activities. But in the long run or later stage of discovery, HIV is positively related to income

and is significant at 1% significance level. This means that the reality of how deadly HIV/AIDS is, prompted infected persons to seek medical attention which could help improve their health condition and boost their confidence to fully involve in normal economic activities, hence, increase in income. Interestingly, HIV, in a combined long run and short run result is negatively and significantly related to Income at 1% significance level.

Education and Labour Hours have positive relationship with Income in both early and later stages of discovery results. But, while EDU is significant at 5% significance level, Lab.Hrs is insignificant. This means that increase in education improves income. Increase in labour hours may also increase income. However, Age and Sex are negatively related to Income. Both are significant but at different levels of significance. While Age is significant at 1% significance level, Sex is significant at 10% significance level.

4.5. Policy Implications of Findings

The findings of this study indicate that workers in Akwa Ibom State have a high level of knowledge of the existence of HIV/AIDS, but a negative attitude towards voluntary counselling and testing (VCT). The findings also show that HIV/AIDS has negative and significant effect on income of workers in Akwa Ibom State in the short run but positive and significant effect in the long run. These have some policy implications, as factors that affect labour productivity are multi-dimensional. HIV/AIDS has significant negative effect on productivity of labour through reduced labour hours and output of workers. So, improving the labour hours and output, as well as reducing the effect of HIV/AIDS on income of workers in the state, therefore, require making multi-sectoral target in order to bring complementary solutions.

For example, (i) since there is high level of knowledge of the existence of HIV/AIDS among workers in Akwa Ibom State, sensitization programmes on HIV/AIDS awareness should be sustained in order to maintain or increasethe level of knowledge; (ii) since there is low involvement of workers on voluntary counselling and testing (VCT), there is the need for the provision of adequate information on its services and centers through regular enlightenment programmes across the country. This would make people to respond to such information and get their status confirmed, and those tested positive would get to use ART-drugs; (iii) since taking care of infected relatives reduces the time devoted to work, and reduced work hours affect productivity negatively, there is the need to invest in the establishment of a special HIV/AIDS Corps, made up of well-trained health workers to nurse and care for HIV victims, as this would reduce the time spent by non-health workers to care for infected relatives, and as such, reduce absenteeism from work, as well as, negative effect on income of workers.

5. CONCLUSIONS AND RECOMMENDATIONS

5.1. Conclusions

Findings from the study show that there is high level of knowledge about HIV/AIDS among workers. This high level of knowledge can be attributed to the various HIV enlightenment programmes carried out within the state, but the rate of involvement in voluntary counseling and testing is still low, and this may be as a result of unavailability of adequate information on VCT.

Nursing HIV/AIDS patients does not only affect the productivity of workers, it also leads to unemployment in the long run, discrimination at work, depression, loss of concentration and lack of motivation at work. This effect occurs to both the patients and the care-givers.

In general, the study clearly shows that taking care of HIV/AIDS patients and suffering from HIV/AIDS greatly reduce labour productivity through reduced output, reduced labour time, and reduced efficiency, and as such, reduced income.

5.2. Recommendations

Based on the findings of the study, the following recommendations are made:

i. Sensitization programmes on HIV/AIDS awareness should be sustained to maintain or increase the level of knowledge of the existence of the disease among workers in Akwa Ibom State.

ii. There should be sufficient information on Voluntary Counseling & Testing (VCT) services and centers through regular enlightenment programmes across the state to sensitize workers on the relevance of participating in the exercise.

iii. The establishment of a special HIV/AIDS Corps, made up of well-trained health workers to nurse and care for HIV victims is necessary, as this would reduce the time spent by non-health workers to care for infected relatives, reduce absenteeism, and as such, reduce the negative effect on income of workers.

iv. There should be continuous and adequate supply of needed vaccines for HIV treatment in order to suppress the disease among victims and thus, limit its spread in the state.

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Appendix I

QUESTIONNAIRE I - Workers' Response

SECTION A: **Personal Information of Respondent**

Sex: Male ☐ Female ☐

Ministry: Agriculture ☐ Education ☐ Health ☐

Woman Affairs ☐ Works ☐ Economic Development ☐

Marital Status: Single ☐ Married ☐ Divorce ☐ Widowed ☐

Age: 16 -25 ☐ 26-35 ☐ 36-45 ☐ 46-55 ☐ above 55 ☐

SECTION B:

SA= strongly agreed, A = agreed, UD = undecided, D = disagreed, SD = strongly disagreed

S/N	ITEMS	SA	A	UD	D	SD
1.	**I have perfect knowledge of the existence, spread and transmission of HIV/AIDS**					
2.	There are other means of contracting HIV/AIDS apart from sexual intercourse with infected persons					
3.	I understand that there is no cure for HIV/AIDS					
4.	Persons with HIV/AIDS can be managed and helped to live life happily					
5.	One can be free from HIV/AIDS contact and infection if he/she avoids HIV/AIDS related activities					
6.	**I am willing to undergo HIV/AIDS voluntary counselling/testing**					
7.	**I subscribe to undergoing the test every six months to keep one in check against the disease**					
8.	Regular testing for HIV/AIDS could protect one from contracting the disease					
9.	There is tendency for one to be stigmatized if he/she undergoes regular counseling/testing					
10.	The degree of stigmatization of those living with HIV/AIDS could discourage voluntary counselling/testing					
11.	Voluntary counselling/testing could help in early detection of HIV/AIDS					

12.	It is wrong to discriminate against people living with HIV					
13.	Stigmatizing and discriminating HIV/AIDS patients can shorten their lives					
14.	Involvement of workers in risky sexual activities increases the risk and chances of HIV/AIDS infection					
15.	Use of body piercing instruments with persons living with HIV/AIDS can increase one's chance of contracting HIV					
16.	Using untreated syringe and clippers with HIV/AIDS patient can increase one's chance of being infected with HIV					
17.	Drug abuse and addiction could be a means of contracting HIV					
18	Cumulatively, I have stayed off work for 30 days or more in the last one year because of HIV/AIDS related issues					

19	Information on HIV/AIDS can also be obtained from the mass and social media					
20	Health classes could be the most effective mode of information transmission on HIV/AIDS					
21	One's HIV/AIDS status, if positive, can be exposed by the health workers after VTC					
22	Early detection of HIV can help in the proper management of the disease and therefore limit damages caused by the disease					
23	Voluntary Counseling/Testing does not have any impact on people living with HIV/AIDS					
24	There is HIV/AIDS counseling and testing week for workers in Akwa Ibom State					
25	Use of condoms during sexual intercourse with HIV infected persons can prevent HIV infection and transmission					
26	My educational qualification is 1st degree/HND and above					

Appendix II

QUESTIONNAIRE I I - Workers' Response

SECTION A: **BIO-DATA**

1. **Sex of the Respondent:**   **Male** ☐   **Female** ☐

2. **Age of Respondent: 16–25** ☐ **26–35** ☐ **36–45** ☐ **46-55** ☐ **Above 55** ☐

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3. Marital Status of the Respondent: Married ☐ Single ☐ Divorced ☐ Widowed ☐

4. **Highest Education level attained by respondent: Primary ☐ Secondary ☐ Other**

   Tertiary ☐ University ☐ None ☐

5. Employment status of the respondent: Self-employed ☐ Employee ☐

SECTION B: **HIV/AIDS AND EFFECT ON TIME SPENT AT WORK**

6. **Was the HIV status of the patient you are nursing discovered at the early stage of the disease? Yes ☐ No ☐**

7. If yes, was the patient nursed in hospital or at home? Home ☐ Hospital ☐
   Both ☐ Other(s) ☐

8. Who took care of the patient? Spouse ☐ Parent ☐ Child ☐ Other relative ☐

9. How long have you been in the hospital with your loved one? 1 – 6 month(s) ☐
   6 – 12 months ☐ 1 – 2 years ☐ 2 – 5 years ☐

10. **Did this affect the work of the person who took care of patient?**

    Yes ☐ No ☐

11. What was exact effect on work? Left Work ☐ Lost Concentration ☐
    Reduced Time of Work ☐ Indifference ☐

[12. **Is your income affected as a result of your absence from work?**

    Yes ☐ No ☐

[13. **How much was the annual value of your income in monetary terms?**

    N50,000–N200,000 ☐ N200,000–N500,000 ☐ N500,000–N1,000,000 ☐

    Above N1,000,000 ☐ No Source of Income ☐

14. **How much of this value was affected: 10% -25% ☐ 25% -50% ☐**

    50%-75% ☐ 75%-100% ☐

15.   What was the effect on general family productivity?   Reduced Efficiency

Reduced Labour Time   ☐   Reduced Output   ☐   No Effect   ☐

16.   **Did this affect the entire family income?   Yes   ☐   No   ☐**

17.   Has your savings suffered the consequences of your not being able to continue

working?   Yes   ☐   No   ☐

18.   Has taking care of your loved one deprived you of embarking on any form of training /

education?   Yes   ☐   No   ☐

19.   Has your health been affected by your long stay in the hospital?

Yes   ☐   No   ☐

Appendix III

LOGIT REGRESSION RESULTS

Dependent Variable: INCOME
Method: ML - Binary Logit (Quadratic hill climbing)
Date: 06/13/19   Time: 10:56
Sample: 1 80
Included observations: 80
Convergence achieved after 9 iterations
Covariance matrix computed using second derivatives

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	629268.2	125434.0	5.016726	0.0000
LABHRS	211914.1	161693.2	1.310594	0.1940
SEX	-229290.9	127947.5	-1.792070	0.0772
AGE	-8592.934	3216.177	-2.671785	0.0093
EDU	24257.08	22300.09	1.087757	0.0282
HIV=0	-86174.20	61448.79	-1.402374	0.0165

McFadden R-squared	0.872513	Mean dependent var	375000.0
Deviance	32.84351	S.D. dependent var	265947.1
S.E. of regression	249961.8	Akaike info criterion	7.76804
Sum squared resid	4.622512	Schwarz criterion	7.94669
Log likelihood	1104.722	Hannan-Quinn criter.	7.83967
LR statistic	3.085469	Restr. Deviance	62.33071
Prob(LR statistic)	0.013868		

Dependent Variable: INCOME
Method: ML - Binary Logit (Quadratic hill climbing)
Date: 06/13/19   Time: 10:55
Sample: 1 80
Included observations: 80
Convergence achieved after 9 iterations
Covariance matrix computed using second derivatives

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LABHRS	211914.1	161693.2	1.310594	0.1940
SEX	-229290.9	127947.5	-1.792070	0.0772
AGE	-8592.934	3216.177	-2.671785	0.0093
EDU	24257.08	22300.09	1.087757	0.0282
HIV=0	715442.4	127666.3	5.604003	0.0000
HIV=1	629268.2	125434.0	5.016726	0.0000

McFadden R-squared	0.872513	Mean dependent var	375000.0
Adjusted R-squared	0.816601	S.D. dependent var	265947.1
S.E. of regression	249961.8	Akaike info criterion	7.76804
Sum squared resid	4.626412	Schwarz criterion	7.94669
Log likelihood	1104.722	Hannan-Quinn criter.	7.83967
LR statistic	37.77381	Restr. Dev.	65.82443
Prob(LR statistic)	0.000001		