

**IMPACT OF HIV/AIDS ON HOUSEHOLDS INCOME AND FOOD
EXPENDITURE IN LAGOS STATE, NIGERIA**

BY:

OSOBASE, ANTHONY ONOGIESE

MATRIC NO: 980901208

DECEMBER, 2016.

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M.PHIL (UNIVERSITY OF LAGOS), M.Sc (HONS.) (UNIVERSITY OF LAGOS)

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CERTIFICATION

This is to certify that the Thesis:

**IMPACT OF HIV/AIDS ON HOUSEHOLD INCOME AND FOOD
EXPENDITURE IN LAGOS STATE, NIGERIA**

Submitted to the
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By:

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DEDICATION

This work is dedicated to God Almighty for his wisdom, knowledge, mercy, power and grace upon me and for making it possible to realize this dream. I also give the honour that comes with this work to my sweet-loving wife, Esther Abiodun Osobase and our sons, Emmanuel Osamudiamen and Praise Adorable Osobase. Equally, I extend my dedication to my Mother Mrs. Bridget Osobase and my mentors, Mrs. Mary Anita Uyoyoh and Mr. John Osobase Ehiabhi.

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ABSTRACT

The HIV/AIDS pandemic is a global crisis threatening the survival of families' especially poor households in Sub Sahara Africa Countries. HIV mostly affects the economically active members (ages 18-49 years) of the household causing morbidity and mortality to this cohort groups. The burden of financing HIV/AIDS related illness reduces expenditures for other basic needs of the households, thereby threatening relative labour productivities, food production and consumption by PLWHAs and other household members. In this regard, quite a number of studies have exploit the impact of HIV/AIDS on household income and food security in selected states of Southern and Eastern nations of Africa, with lesser empirical studies focusing on West Africa countries especially in Nigeria. This study, therefore, analyzes the demographic characteristics of PLWHAs; ascertain the socio-economic impact of HIV/AIDS on household's income and food expenditure in Lagos State, Nigeria. The theoretical underpinning and framework are draws from theories which revolve around the household theory of production and Grossman-Wagstaff theory of health production. Primary data which cut across 10 LGAs of Lagos State, and obtained from November 2014 to January 2015 is utilized for the study. Out of a target population of 223,425 PLWHAs in the State, a sample size of 1500 respondents are drawn from ten treatment centres in each LGAs. In all, 150 respondents are selected from each of the ten treatment centres using convenient sampling technique. An average of 60 per cent response rate is recorded. Data obtained from the structured questionnaire (Household Income Dietary Scale, HIDS) is analysed through descriptive and econometric technique (logistic regression analysis). Findings from the descriptive statistics show that more females - 581 (65%) - than males - 310 (35) are found in the sampled treatment centres. The results also show that 56.6 per cent of affected households experience income decline due to health care related expenditures while 43.6 per cent do not. Similarly, 54.9 per cent of affected households experience food expenditure decline, whereas 45.1 per cent do not. The result of the logistic regression shows that of all the socioeconomic and demographic variables employed in the income model, age group 18-23 years (Odd ratios: 5.39), unemployed individuals (Odd ratios: 2.09), productivity loss (Odd ratio: 4.237) and households that incur health care expenditures (Odd ratio: 5.87) are most likely to experience income decline than other sub-categories. Furthermore, the findings from the food expenditure outcome advance that the odd of food expenditure decline is reduced by a factor of 0.42 per cent for households that incur health care expenditures against households that do not. Going by the results, it is therefore recommended that policy intervention that will assist affected households to maintain regular income should be introduced. This should include skills empowerment and cash transfer programmes that can provide financial protection for affected households.

KEY WORDS: HIV/AIDS, Household Income, Food Expenditure, Lagos State

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

Over the past two decades, there have been numerous research on the impact of Acquired Immune Deficiency Syndrome (AIDS) and Human Immuno-deficiency Virus (HIV) on household income and food security globally (Alemu & Bezabih, 2008; Kuyponiyi, 2008; Iya, Purokayo, & Gabdo, 2012; Zhang, Zhang, Aleong, Baker, & Fuller-Thomson, 2012; Baiyegunhi & Makwangudze, 2013; Feulefack, Luckert, Mohapatra, Cash, Alibhai, & Kipp, 2013; Natalia, Majula, & Nanzia, 2014). In spite of the revelations of these studies, HIV/AIDS has continued to impact negatively on household welfare, with tragic consequences on the income level, food expenditure and living standard of affected households (Musinguzi, 2012, Gubwe, Gubwe, & Mago, 2015; Shyamala, 2015).

AIDS is a life-threatening illness caused by an etiologic virus called HIV. The HIV scourge was first observed in 1981, since then, HIV/AIDS has become an epidemic, exponential in scope and magnitude (Okoli, Ezekoye, Ochiabuto, Nwafor, & Ugwu, 2013). Over time, the scourge of HIV has evolved from just a merely health issue to a serious developmental problem (Loevinsohn & Gillespie, 2003; Joint United Nations Programme on AIDS [UNAIDS], 2008). The epidemic has morphed into a leading reversal of human development in man's history, as it has drastically reduced life's expectancy and negated gains in human capital development and aggregate output growth in the worst hit countries (Isaksen, Songstad, & Spissy, 2002; Mambo, 2012).

Globally, about 78 million people have contracted HIV and approximately 39 million people have died of AIDS-related illnesses (UNAIDS, 2015). In 2014, an estimated 1.9 million people were newly infected with the disease Worldwide. The Sub-Saharan Africa (SSA) region alone accounts for 70 per cent of this statistics. In the same region (SSA),

only 37 per cent of the people living with HIV/AIDS (PLWHAs) have access to treatment, while one death is recorded in every four persons on antiretroviral therapy (ART) (UNAIDS, 2015).

Nigeria is not free from this epidemiological burden, as the first HIV case was reported in 1986 in Lagos State. Since then, several Sentinel HIV/AIDS Surveys (SHS) have been carried out in the country and recent statistics indicate that 3.4 million people were seropositive in 2014. This shows an increase of 94.2 per cent over 2013 sentinel surveys of 3.2 million persons (National Agency for the Control of AIDs (NACA), 2014; Aborisade, 2015). With about 9.4 per cent global HIV/AIDS burden and over 200,000 newly infection cases and deaths, Nigeria is thereby ranked second among leading countries that are troubled by the epidemic worldwide (World Bank, 2013; Adebola *et al.*, 2014). The nation also account for about one-third of global HIV burden among progenies born with HIV (NACA, 2014). Available reports have also shown that young people particularly those within 30 and 34 years are considered the most vulnerable group (NACA, 2011; Samuels, Blake, & Akinrimisi, 2012).

The major route of HIV transmission in Nigeria is through sexual transmission - accounting for nearly 80 per cent of HIV infections (NACA, 2014). Quite unfortunately, poverty, transfusion of poorly screened blood, early sexual debut, low condom use, multiple sexual partners, low perception of risk, poor injection safety, illiteracy, to name only a few, are risk factors that promote the spread of HIV/AIDS. Available reports show that the Most At Risk Population (MARP) are female sex workers, men having sex with men, uniformed service personnel, transport workers, injecting drug users, individuals with disability, widowed, divorced, separated and people living below the poverty line (NACA, 2014).

Available statistics on HIV/AIDS prevalence rate has show disparity in the spread among states in Nigeria. Lagos in this statistics is pegged among the top fifteen states with high incidence rate (National Bureau of Statistics [NBS], 2009; NACA, 2014). The ANC survey and the National HIV/AIDS and Reproductive Health Survey (NARHS) carried out in the state (Lagos) have shown an irregular prevalence rate, ranging from 1.9 and 6.8 per cent in 1991/2 and 1993/4 to 5.1 and 2.2 per cent in 2008/2010 and 2013 respectively. Accordingly, statistics show that the HIV/AIDS illness is higher among young people of age 15-24 years (Samuels *et al.*, 2012; NACA, 2014).

The major shocks of the HIV epidemic on households relate to the fact that the most economically active members are affected with the illness and the reality that AIDS mortality not only reduces life expectancy of young household member/s but also diminish labour productivities of the affected households (Ilebani & Fabusoro, 2011; Iya *et al.*, 2012). The shortage of manpower or man-hour loss undoubtedly affects the economic output and income earning power of the household. To buttress this view, the human capital theory, health production theory and neoclassical growth model have been conceptualized to explain how health factor affect labour, capital and technological progress at the micro and macro level (Mincer, 1974; Arndt, 2006; Weil, 2007; Ashraf, Lester, & Weil, 2008; Ngepah, 2012). At the household level, income is under threat when HIV/AIDS reduces the efficiencies of human labour, capital and skills (Ojha, & Pradhan, 2010; Ngepah, 2012). Other studies also show that affected household experiences income change when other adult members spend less time in productive activities or leave the labour force to care for AIDS patients (Booyesen & Bachman, 2003; Adeoti & Adeoti, 2008; Asenso-Okyere *et al.*, 2011).

To cope with the income change and the need to spend more on medical care, children are often withdrawn from schools to assist in caring for the sick or to work as underage

labourer so as to contribute to household income (Booyesen, 2004). This phenomenon increases the risk of household vulnerability to the HIV scourge. The expenditure on food also comes under pressure, due to increasingly medical bills relating to HIV/AIDS. This imposes regressive cost burdens on household members, as they spend a greater proportion of their income on health care therapies thereby leading to concomitant reduction in expenditures for consumable goods (food), savings and investment in human capital (Bollinger & Stover, 1999; Musinguzi, 2012). Evidence abound of affected households spending quite a larger proportion of their income on medical care in selected states in northern Nigeria and other SSA countries (Steinberg *et al.*, 2002; Canning, 2006; Iya *et al.*, 2012).

In the same vein, the reports of NACA (2014) and UNAIDS (2015) emphasised the phenomenon of free access to antiretroviral drugs and therapies (ARV) for PLWHAs. However, the burden of stigmatization and discrimination of infected individuals in the work place and at home, procurement costs, diet requirements alongside the long gestation periods from HIV to AIDS, diminishes decades of accumulated financial and other forms of capitals of household's, thereby driving marginally poor-resource households below the poverty line. Therefore, HIV/AIDS is a subject that needs to be addressed from the micro level, especially as it affects the financial capital and other means of livelihoods of affected households.

Following the consequences of HIV/AIDS infection as indicated, this study considers it worthwhile to explore the impact of HIV/AIDS on household income and food expenditure in Lagos State, Nigeria.

1.2 Statement of the Problem

There is no doubt that HIV/AIDS is having a major tragic consequence on every aspect

of household livelihoods. Several studies advanced that the income effect and food expenditure shock come under threat when age group 15 - 49 years who are active household members and head of households are infected with HIV morbidity and AIDS-mortality (Gertler *et al.*, 2004; UNAIDS report, 2011; Iya *et al.*, 2012). The psychological and emotional effects, as well as other opportunistic infections, linked with HIV negatively affect the sick person's ability to participate actively in production processes (Iya *et al.*, 2012). The continuous drop in the working hours of an infected person implies decline in household income, which will translate to permanent loss of income when AIDS mortality occurs on sick individuals. The catastrophic effect of this burden is the decline or loss in man-hour labour which may eventually translates to temporary or permanent loss of household income if the victim is the household head. In addition, it demands that when a household member is infected with chronic illness such as HIV/AIDS, income yielding assets are diverted for the purpose of financing healthcare expenditure. This further promotes loss of income.

Amidst the income shock as noted above, is the rise in health care related expenses per sick member. The household tend to respond to this shock by decreasing food expenditure; reduce number of meals taken per day or skip meals, just to favour expenditures on nutritional drugs and care. In an attempt to augment the already diminishing income and food expenditure; the households still adopt other coping strategies. These include, selling of assets, buying food on credit, borrowing from relative and friends, migration to other regions in search for jobs, withdrawing children from school to serve as under-age labour, to mention only a few.

In the context of African setting where families are agents of socialization, other active adult members abandon their jobs with a view to taking care of sick relatives and attending funerals ceremonies of victims who died of AIDS. Emphatically, AIDS –

related death and funeral expenditures tend to deepen on household income. The income shock deepens poverty level for already poor household, and also pushes poorer household, further to extreme poverty. This view is supported by a number of studies on selected countries in SSA, where considerable workforce absenteeism, consistent loss of man-hours of work and communal obligations to the dead have significant impact on income, food consumption patterns and the general welfare of individuals and households with HIV member/s or have experienced AIDS related death of members (Faisal, 2007; Tham-Agyekum *et al.*, 2011; Iya *et al.*, 2012; Muiruri 2012).

Particularly of great concern is Lagos State where the endemic problem of HIV/AIDS is noticeable, as study shows that AIDS-related death cases is ranked as second highest in the country (NBS, 2012). Since inception of the HIV/AIDS epidemic in Nigeria, the state is still saddled with high HIV incidence rate among the states in the south west region (Olusegun, 2010; NACA, 2011/2014). Alongside the rising HIV/AIDS prevalence rate and population growth, the state is faced with growing unemployment rate (7.5 % in 2010 to 11.07 % in 2012) and poverty rate of 48.6 per cent in 2012 (NBS 2012/13; Samuels *et al.*, 2012). These factors have been identified by quite a number of studies (Booyesen & Bachmann, 2003; Ganyaza-Twalo & Seager, 2005; Nkurunziza & Rakodi, 2005) as culpable in the spread of HIV, thus increasing vulnerability and reducing resilience to infection.

In spite of the significant impact of HIV/AIDS in Lagos State and other states in Nigeria and the globe, there remains a relative paucity of empirical study into its impact on household income and food expenditure. So far, extant studies on HIV/AIDS have mainly focused on agricultural production and food security of households (Alemu & Bezabih, 2008; Ugwu, 2009; Odoemelam, 2011; Iya *et al.*, 2012; Musinguzi, 2012; Baiyegunhi & Makwangudze, 2013), while research on households particularly non-agricultural sectors

remains scanty. Similarly, other studies in social sciences have centred on the areas of prevention of new incidence rate, coping and mitigating strategies and demographic effects (Steinberg *et al.*, 2002; Adeyemi, 2007; Matanmi *et al.*, 2011; Laar *et al.*, 2015). Fundamentally, much of the contributions from economic point of view have focused on sectoral and macro impact (Arndt & Lewis, 2000; Ojha & Pradhan, 2010; Maijama & Mohammed 2013; Gezahegn & Upadhyay, 2014), but with limited effort towards understanding the impact from the household perspective, especially with regards to the socioeconomic and demographic characteristics impact on income level and to a great extent, food expenditure.

This empirical study is therefore designed to help reduce the gap in extant literature, by investigating the impact of HIV/AIDS on household income and food expenditure in Lagos State, Nigeria.

1.3 Objectives of the Study

The aim of this study is to propose means of reducing the financial burden of HIV/AIDS on household income and food expenditure in Lagos State, Nigeria. To achieve this aim, the study embarks on the following specific objectives:

- i. To analyse the demographic characteristics of PLWHAs in Lagos State;
- ii. To ascertain the socio-economic profiles of PLWHAs by income, food expenditure and coping strategies in Lagos State;
- iii. To gauge effect socio-demographic characteristics of PLWHAs on income of affected households in Lagos State;
- iv. To examine the effect of socio-economic profiles of PLWHAs on income of affected households at the Senatorial districts and State levels;

- v. To determine the effect of selected socio-economic characteristics of PLWHAs on food expenditure of affected households at the Senatorial districts and State levels.

1.4 Research Questions

In line with the above objectives, the following research questions are raised.

- i. What are the demographic characteristics of PLWHAs?
- ii. What are the socio-economic profiles of PLWHAs by income, food expenditure and coping strategies?
- iii. What are the effects of socio-demographic characteristics of PLWHAs on income of affected households in Lagos State?
- iv. How do socio-economic profiles of PLWHAs affect income of affected households at the Senatorial districts and State levels?
- v. How do selected socio-economic characteristics of PLWHAs affect food expenditure of affected households at the Senatorial districts and State levels?

1.5 Research Hypotheses

In line with the stated objectives and research questions, the following hypotheses are generated.

- i. There is no significant relationship between socio-demographic characteristics of PLWHAs and income of affected households in Lagos State.
- ii. The socio-economic profiles of PLWHAs have no significant impact on income of affected households in Lagos State.
- iii. There is no significant relationship between socio-economic profiles of PLWHAs and food expenditure of affected households in Lagos State.

1.6 Significance of the Study

This study is justified because it is centred on Lagos cosmopolitan state which is considered as the commercial capital of the nation, second most populous state in Nigeria with rising poverty and unemployment rates among low income earners (Samuels *et al.*, 2012; Olofinji, 2015). These factors increase the vulnerability of households within the metropolis to HIV/AIDS, thus calling for more study of this nature on the state.

The study contributes to the ongoing debate on the relationship between health and household income as well as builds a framework for future research studies on the impact of HIV/AIDS on income and food expenditure of affected HIV/AIDS households.

This study is of immense benefit to all households in Lagos State, especially those victims who are registered members in various treatment centres. This enhances knowledge of HIV/AIDS impact on household well-being as well as aid the development of their capacity to overcome or reduce the burden of the scourge on the households.

Equipped with the results of this study, medical economists and health practitioners will be able to design health related programme with economic analysis and framework that will help in behavioural change among young people, especially those who intend to engage in indiscriminate sex.

This research as well, serves as a guide to future economists and creates awareness campaigns with a view to designing a more integrated awareness and economic programmes that will take cognizance of the unique characteristics of all PLWHAs in the selected LGAs and bring about significant reduction in HIV/AIDS incidence and other health challenges.

The findings of this study, therefore, provide insights to Lagos State Government into HIV/AIDS-household income relationship, as well as interface between HIV/AIDS-food expenditure. The policy implications drawn will significantly impact policy making in the

state, especially in terms of knowing the income and expenditure levels of affected households. This re-strengthens existing policies and programmes aimed at reducing the spreads of the disease at the household level.

In particular, Lagos State AIDS Control Agency (LSACA) and other state agencies in charge of health matters will benefit meaningfully from these findings in the following ways: the determination of the magnitude of seropositive persons among various subgroups, the development of target policies and programmes for vulnerable groups, an appreciation of the need for more systematic studies and improvement in the coordination of the Network of People Living With HIV/AIDS (NEPWHAN) within the State.

In addition, this study's outcome may provide the basis for considering the inclusion of "Economics of HIV/AIDS" and "Health Economics" into the curriculum of the University of Lagos, as a course of study. This will not only lead to the overall growth and development of the institution, but Lagos State and Nigeria in general.

1.7 Scope and Delimitation of the Study

This study essentially focuses on micro (household) level impact of HIV/AIDS on incomes and food expenditure of affected households in Lagos State, Nigeria. The State is made up of 20 Local Government Areas (LGAs), which are subgrouped into three senatorial districts; Lagos Central, Lagos East and Lagos West (Samuels *et al.*, 2012). Since it is hardly possible here to cover the whole state, this study is restricted to ten Local Government Areas (LGAs) randomly selected. This research is narrowed down to ten treatment and medical centres of which, one treatment/medical centre have been purposively selected from each of the sampled LGAs. Since the focus of this study is on a rare population that is not easily observed, the study is delimited to all People Living With HIV/AIDS (PLWHAs) in the selected treatment centres. In addition, core

demographic factors such as gender, age, marital status, household size, head of household and other selected variables that influence household income and food expenditure are employed for the empirical analysis. Fundamentally too, only the respondents' opinions on the questionnaire items will be utilized to measure the impacts.

1.8 Operational Definition of terms

For the purpose of this study, the following terms were defined.

Affected households: It is a household having at least one seropositive member. It also relates to households directly affected by HIV/AIDS when a family member of productive is sick and/or lost to HIV/AIDS related illnesses.

Female-headed households: A household headed by women in which at least one family member between 18 and 65 years of age (productive age) is long-term sick as a result of HIV/AIDS.

Food expenditure: It is difference between the expenditure spend by household before the HIV incidence and the current HIV/AIDS status of the households.

Household: This is defined as group of persons living together and maintaining unique eating arrangement. Also, it is a group of individuals who live in the same household, provide for each other and often share meals.

Household income: This refers to the total income earned/ received by the adults' household members, excluding remittances from relatives and friends.

Household coping strategy: These are methods and resources employed by households to cope with or augment household income or food expenditure

Male-headed households: This stands for households headed by men in which at least one family member between 18 and 65 years of age (productive age) is long-term sick as a result of HIV/AIDS related illnesses.

Non-affected households: This refers to households in which both parents are alive, no orphans are being fostered, and no members between 18 and 65 years of age (productive age) are long-term sick as a result of HIV/AIDS or related illnesses.

Out of pocket expenditure on healthcare: This is the aggregate amount directly paid by household for medical consultation, drugs and other health-related activities. Also, it is called household health or medical expenditures.

Seropositive / infected person: This is an individual who has being confirmed to be living with HIV/AIDS.

1.9 List of some Abbreviations and Acronyms

AF	Armed Forces
AIDS	Acquired Immune Deficiency Syndrome
ANC	Antenatal Clinic
ART	Antiretroviral Therapy
ARV	Anti-Retroviral Drugs
AS	Assets sales
BBSW	Brothel- Based Sex Workers
CBN	Central Bank of Nigeria
CBO	Community – Based Organisation
CGA	Caregiving activities
CSO	Community – Society Organisation
DH	Death of household member due to AIDS.
DV	Demographic Variables
EET	Enrolment Estimation Technique
EM	Expenditure on medical care
EMT	Employment status of respondent
ES	Educational status of respondent.
FAO	United Nations Food and Agriculture Organization
FBO	Faith – Based Organisation
Fex	Food Expenditure of Household
FGM/C	Female Genital Mutilation / Cutting
FMHT	Federal Ministry of Health Technical
FMs	Free medical drugs and service
GAS	Group-Administered Survey
GDP	Gross Domestic Product
HAART	Highly Active Antiretroviral Treatment
Hh	Households
HIDS	Household Income Dietary Scale
HIV	Human Immuno Deficiency Virus
HMB	Household member below 18 years working to earn income
HSize	Household size
IDUs	Injection Drug Users
ILO	International Labour Organization
LGAs	Local Government Areas
LRT	Logistic Regression Techniques
LSACA	Lagos State AIDS Control Agency
LSASA	Lagos State AIDS Spending Assessment
WAPA	Lagos State Ministry of Women Affairs and Poverty Alleviation
MARP	Most At Risk Population
MLE	Maximum Likelihood Estimates technique
MSMs	Men having Sex with Men
NACA	National Agency for the Control of AIDS
NAART	Non-Active Anti-Retroviral Therapy
NBBSW	Non-Brothel-Based Sex Workers
NARHS	National HIV/AIDS and Reproductive Health Survey
NBS	National Bureau of Statistics
NDHS	Nigeria Demographic and Health Survey

NEPWHAL	Network of People Living With HIV/AIDS in Lagos State
NEPWHAN	Network of People Living With HIV/AIDS in Nigeria
NGO	Non-Governmental Organisation
NHp	Number of HIV/AIDS person in the household
NI	Non-household income
NAPEP	National Poverty Eradication Programme
OLS	Ordinary Least Square Technique
OOP	Out-Of-Pocket expenditure (OOP) on medical care
OECD	Organisation for Economic Co-operation and Development
PCI	Per Capita Income
PFc	Purchase Foods on credit
PLHIVs	People Living With HIV
PAHIV	People Affected With HIV
PLWHAs	People Living With HIV/AIDS
PMTCT	Prevention – of – Mother – child Transmission
PHC	Primary Health Care Centre's
RET	Residential Estimation Technique
SHS	Sentinel HIV/AIDS surveys
SEX	Sex of household head
SFG	Support from the government
SH	Sex of household head
SHs	Stage of HIV/AIDS illness
SNAP	Supplemental Nutrition Assistance Program
SSA	Sub-Sahara Africa
STDs	Sexually Transmitted Diseases
SWZ	South West Zone
TWKS	Transport Workers
UNAIDS	Joint United Nations Programme on AIDS
UNICEF	United Nations Children's Emergency Fund
WFP	United Nation World Food Programme
WHO	World Health Organisation
Yt	Income of Household

CHAPTER TWO

SOCIO-ECONOMIC AND DEMOGRAPHIC PROFILE OF LAGOS STATE

2.1 Preamble

This section examines the socioeconomic and demographic environment of Lagos State. An extension of this chapter is the discussion of HIV origin, trends of HIV/AIDS prevalence rate, most vulnerable categories of people to HIV and public policies to address the spread of the illness in the State.

2.2 Background of Lagos State

The study area is Lagos State, one of the most heterogeneous states in the country. Apart from its main ethnic group, which is Yoruba, Lagos State consists of representatives of all the ethnic groups in the country with diverse economic, social, political and cultural features. The state was created on 27th May 1967 through the State Creation and Transitional Provisions Decree No. 14 of 1967 which restructured Nigeria into a Federation of twelve states. Lagos state was once the administrative capital of Nigeria from April 11, 1968 to December 12, 1991 until the status was moved to Abuja, the Federal Capital of Nigeria (Olofinji, 2015). Equally Lagos metropolitan areas under the old Colonial Province of the defunct Western Region of Nigeria comprise: Agege, Badagry, Epe, Ikeja, Ikorodu and Mushin Divisions (Lagos population report, 2016).

The state is defined by the Atlantic coastline in the south, the Republic of Benin in the west, while the north and east boundaries are shared with Ogun state. It occupies 3,577 square kilometers, of which 22 per cent or 787 sq.km is water and only 0.4 per cent of the entire area of the country (Adeyemi, 2007). The state has an estimated population of 22 million people (See Lagos state Economics and Financial Update-report, 2013), and remains the commercial and industrial hub of Nigeria, attracting large numbers of both domestic and international migrants (Olusegun, 2010 & LSASA, 2009/10). With her

estimated population of about 22 million people as of 2013/14, the state is considered the seventh fastest growing city in the world and the second largest city in Africa after Cairo (Nwagwu & Oni, 2015; Olofinji, 2015). It extends approximately from longitude 2°45' East to 4°20' East, and from latitude 6°2' North to 6°4' North.

The state comprises twenty (20) Local Government Areas (LGAs), which are grouped into three categories (Urban, Semi-urban and rural). The urban LGAs are Lagos Island, Ikeja, Mushin, Lagos Mainland, Mushin, Somolu, Oshodi-Isolo, Surulere, Amuwo Odofin, Eti-Osa, Apapa, Ajeromi/ Ifelodun and Agege. The semi-urban LGAs are Alimosho, Ojo, Badagry, Ifako/Ijaiye, Ikorodu and Kosofe. Only two LGAs, Epe and Ibeju-Lekki are categorised as rural. Similarly, the LGAs are sub-divided into three senatorial districts; Lagos Central (Apapa, Eti-Osa, Lagos Island, Lagos Mainland and Surulere), Lagos East (Epe, Ibeju-Lekki, Ikorodu, Kosofe and Shomolu), and Lagos West (Agege, Ajeromi-Ifelodun, Alimosho, Amuwo-Odofin, Badagry, Ifako-Ijaiye, Ikeja, Mushin, Ojo and Oshodi-Isolo). The geographical location of each Local Government Areas (LGAs) is depicted in Figure 2.1.



Source: <https://www.google.com.ng/#q=Map+of+Lagos+state>
Figure 2.1: Map of Local Government Areas in Lagos state

The state has a steadily increasing GDP which is computed as N 12.091 trillion (2010), N13.71 trillion in 2012 and expected to increase to N17.64 trillion by 2016 with forecasted annual growth rate of 6.5 per cent (Lagos Bureau of Statistics; 2011).

Table 2.1: Selected Socioeconomic Indicators in Lagos State

Socio-economic indicators	STATE
Name of State and Country	Lagos, Nigeria.
Year the State was created	1967
Local Government Areas	20
Total Nos. of Hhs	1,606,778
GDP (2012)	N13.17 trillion
GDP growth rate (Per cent: 2012)	6.5
Inflation rate (2012)	8.0
Poverty rate 2012 (%)	8.5
Unemployment rate (%)	23.9
Employment in crop farming (000)	27
Economic active (15-70 years)	61.5
Dependency group (0-14year and above 70year)	38.6
% Distribution of Hhs size (Average person per Hhs)	5.2
% Distribution of Hhs head by sex : Male	85
% Distribution of Hhs head by sex : Female	15
% Distribution of Hhs by types of housing units:	
Single	69.8
Flat	26.4
Duplex	2.1
Whole building	1.4
Others	0.3
% Distribution of Hhs by type of fuel for cooking:	
Electricity	0.0
Gas	6.2
Kerosine	91.1
Wood	2.7
Coal	0.0
Distribution of Hhs by marital Statute:	
Married	52.2
Divorced/separated	3.9
Widowed	4.7
Not married	39.2
% of Women married before 15years	17.63

Source: Author's construct (2015)

Based on its location, close to major sea ports and natural resources such as oil, natural gas, coal, fuel wood and water (Adeyemi, 2007 & Olofinji, 2015), the state accounts for

over 50 per cent of the nation's port revenues, 25.6 per cent of total GDP, over 40 per cent of non-oil GDP, and over 80 per cent of foreign trade flows (Lagos state Economics and Financial Update-report, 2013). Her annual GDP per capita is among the country's highest, as it is approximated to be over \$2,500. However, the poverty rate – 64 per cent – is substantially higher than the national average of 55 per cent (See NBS, 2009 – 2012 & Samuels *et al.*, 2012).

According to the National Bureau of Statistics (2013), Lagos state has an average household size of 5 persons in 2011. The population based on gender shows that there are more male than female in the household. Most households are dominated by male head (85 per cent). There are more married people (52.2 per cent), followed by unmarried people (39.2 per cent). Approximately 61.5 per cent of the population belongs to the economic active group (Table 2.1). The common economic activities among the very poor ranges from agriculture to vocational trade, such as: tire mending, carpentry, trading in used clothes and perishables goods, driving commercial bus and bikes. Available report has shown that one-third of the state's citizens consider themselves 'non-poor' – a higher number than the national average of 25 per cent (Samuels *et al.*, 2012).

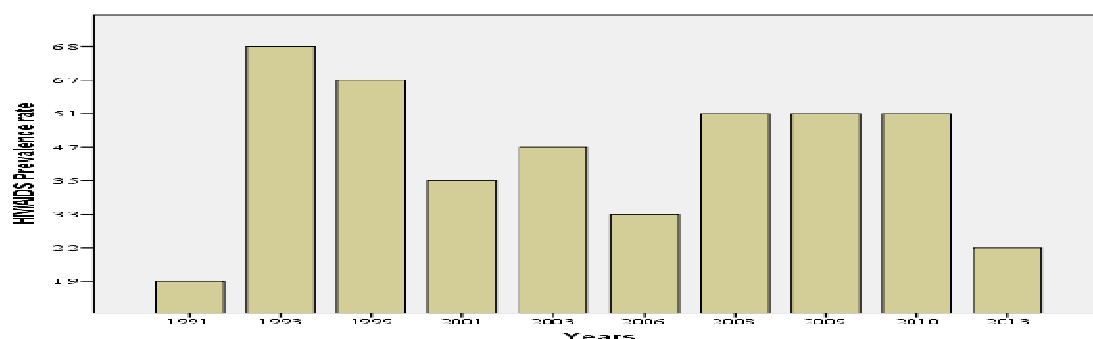
In general, women and children do better in Lagos than in other states and when compared with their rural counterparts. Over 80 per cent of children are delivered by a skilled attendant and more than half are fully vaccinated by the age of two. Child mortality rates are also significantly lower than the national average – 150 versus 205 per 1,000 live births. Similarly, nearly 80% of children attend primary and secondary schools having a net enrolment rate of over 70%, with girls accounting for about 50% of total enrolment (Lagos State Government Performance Management Report Education Sector (LSGPMR, 2011).

In terms of reproductive report, over a quarter of women are using modern methods of

contraception and only 5% have been pregnant before the age of 20, compared with 13% in rural areas and the national average of 17%. Women's educational attainment is also quite high – and closely matches that of men. Women in Lagos are also more involved in the decision-making process than many other Nigerian women: 7 in 10 make their own health care decisions and have sole control over how to spend their own cash earnings. Over 60 per cent of the state judiciary is made up of women. However, Female Genital Mutilation / Cutting (FGM/C) is quite common in Lagos, with over one-third of women reported to have been cut (NBS, 2010/12: Samuels *et al.*, 2012).

2.3 History of HIV/AIDS Prevalence Rate in Lagos State

The first case of HIV/AIDS in Nigeria was recorded in 1986 in Lagos. Since then there have been a fluctuating prevalence rate in the state. For instance, the Antenatal Clinic (ANC) survey of 1991/2 estimated the prevalence rate to be 1.9 per cent for that year. This increases to 6.8 per cent in 1993/4 and 6.7 per cent in 1999. In 2001, 2003, and 2005, the state recorded 3.5 per cent, 4.7 per cent and 3.3 per cent prevalence rates and most recently the Antenatal Clinic (ANC) survey conducted by NACA (2014) puts the figures at 5.1 and 2.2 percent in 2008/2010 and 2013 respectively (Figure 2.2).



Source: Author's construct (2015).

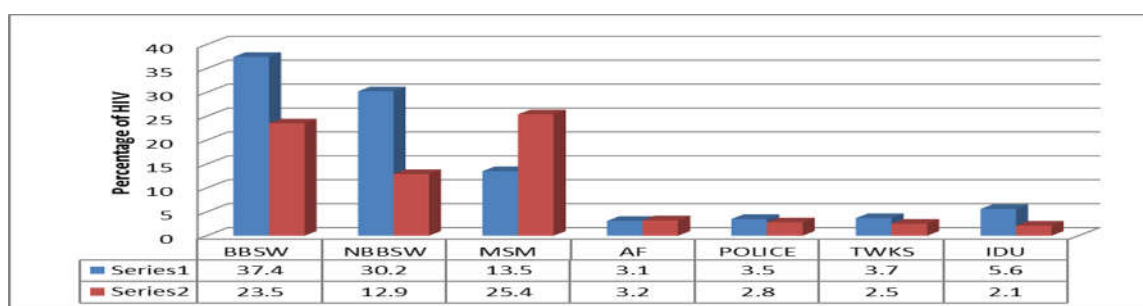
Figure 2.2: Lagos State HIV Prevalence Rates from ANC Surveys

Like in other states in Nigeria, the main drivers of the epidemic in Lagos State are multiple concurrent partners, low risk perception, informal transactional and inconsistent

condom use, and intergenerational sex, lack of effective STI services, stigmatization and discrimination as well as poor quality health services. Similarly, poverty and gender inequality are also factors that sustained the epidemic. This often implies poor living conditions, food insecurity, lack of employment prospects, unequal gender relations, and poor access to health care and education facilities. All these factors influence men's and women's vulnerability to infection, through poor knowledge on HIV and AIDS, early marriage, sexual exploitation and risky behaviours such as unprotected transactional sex (Gillespie, 2008). However, Idris (2010) emphatically explained that the surge in the number of PLWHAs in Lagos State is as a result of massive influx of people from almost all states in the federation by the day, a situation which was said to have put the Lagos State Government under undue pressure.

2.3.1 HIV/AIDS Prevalence Rate by Sub-groups

The HIV/AIDS prevalence rates in sub-groups at high risk covering brothel-based sex workers (BBSW), non-brothel-based sex workers (NBBSW), transport workers (TWKS), the armed forces (AF), the police (Police), Men having Sex with Men (MSMs) and injection drug users (IDUs) are depicted in Figure 2.3. Using data from LSACA (2012), this study compared the national and Lagos state prevalence rates for the groups at high risk of HIV/AIDS infection.



Sources: Author's construct (2015)

Figure 2.3: HIV Prevalence Rates for Sub-Groups at High Risk of Infection in Lagos State compared to National Rates

With respect to figure 2.3, records have it that, the most at risk group in Nigeria is BBSW (37.4 %) while in Lagos State, the most at risk group is MSMs (25.4 %), followed by BBSW (23.5%), NBBSW (12.9%), IDUs (3.2%), TWKS (2.8%), Police (2.5%), and AF (2.1%) (LSACA, 2012).

Particularly of keen interest, is the geographical distribution of the prevalence rate among age group, as the urban age group 15-24 years has higher prevalence of 6.1 per cent above the rural sub-group with a prevalence of 1.2 per cent (LSACA, 2009). The number of infected pregnant women are estimated to be 18,099 in 2009, while overall people receiving antiretroviral is estimated to be 54,441 (Ojoawo, *et al*, 2006 : NBS, 2009). However, available report shows that the AIDS mortality case is low in 2009 but in 2012, the state recorded the second highest death cases due to AIDS related illness (NBS, 2009/2012).

Overall, awareness of HIV is very high in Lagos state, with regard to basic knowledge of modes of transmission. According to the study of Samuale *et al.*, (2012), over 90 per cent of the sampled population knows about AIDS are aware that it can be transmitted through sex and the use of sharp objects. Slightly lower proportions (ranging from 85% to 95%) know that AIDS can be transmitted through blood transfusions. Similarly, between 75% and 80% acknowledged that a healthy-looking person could be HIV positive (Samuale *et al.*, 2012).

2.3.2 Public Programme and Policies to address HIV/AIDS spread in Lagos State

The Lagos state government in recognition of the incidence of HIV/AIDS on the local economy established the Lagos State Action Committee for the Control of AIDS (LSACA) in January 2001. This is located within the Governor's office. This agency has its own secretariat and staff, headed by the Special Assistant to the Governor on HIV and AIDS, who serves as the Chief Executive Officer. Stakeholders come from within

government, from the Non-Governmental Organisation (NGO), Community–Society Organisation (CSO), Community–Based Organisation (CBO), Faith– Based Organisation (FBO) and donor community and from Network of people living with HIV/AIDS in Nigeria (NEPWHAN).

Most programmes for PLWHAs are provided by NGOs in collaboration with government agencies and departments. The state has established 56 counselling and testing sites and several mobile initiatives providing such services. Approximately 350,000 persons have accessed these facilities to date (LSACA, 2012). There are 16 Anti-Retroviral Therapy (ART) sites providing free ART (both for adult and paediatric) services. These sites are currently being funded under the Expanded Public Response of the state government. Most are located in general hospitals, with three located within tertiary facilities/research centres (the Nigerian Institute for Medical Research, Lagos University Teaching Hospital and Lagos State University Teaching Hospital). In addition, six sites have the capacity to conduct early infant diagnosis and two are meant to conduct viral load estimations. Most treatment sites are located in urban LGAs but some (like Ikorodu, Badagry and Epe) also serve rural populations within such areas. All the ART sites offer comprehensive services, including management of opportunistic infections. To date, over 10,000 persons have been reached with ART, which include first and second line medications, with children accounting for approximately 10% of these clients.

A key component of prevention efforts among young persons in the state is the implementation of the Family Life and Health Education (FLHE) curriculum. This curriculum is implemented by the Ministry of Education with support from several partners. It is designed to be utilized for both primary and secondary schools and speaks to issues of HIV knowledge and prevention (LSACA, 2009). To date, implementation

and coverage is low. This is due to low capacity, low levels of motivation and erratic funding/support.

The Prevention – of – Mother – child Transmission (PMTCT) services are available in 28 sites, most of these centres are located in urban LGAs, although a few can be accessed by rural populations. Approximately 65,000 pregnant women have been counselled, tested and had received their results as of June 2009 (LSASA, 2012). There are about 20 positive support groups in the state, three of which receive transportation and refreshment stipends from LSACA for monthly meetings. In the last half year, 500 people (PLHIV and PAHIV) have accessed income generation training provided by LSACA in collaboration with the Lagos State Ministry of Women Affairs and Poverty Alleviation (WAPA), three of whom have accessed microcredit facilities through LSACA (LSASA, 2012).

As a follow up, the Joint United Nations Program on HIV/AIDS (UNAIDS) considers it a duty to provide nutritional services to infected children from HIV/AIDS households, while National Poverty Eradication Programme (NAPEP), on the other hand, provides economic empowerment for the very poor. WAPA was reported to be building shelters for the abused, through its poverty alleviation programmes. Furthermore, Section one (1) of the Lagos State HIV and AIDS Protection Law guarantees the protection of all persons living with HIV and or affected by AIDS by among other things providing these persons with access to health care institutions in Lagos State including access to life prolonging drugs, treatments and therapies. Persons living with HIV or affected by AIDS also have the right to voluntary counselling in all Public Health Institutions established in Lagos State in addition to HIV and anti-body tests in all Public Health Institutions established in the State. An anti-retroviral drugs trust fund is established to ensure the purchase of anti-retroviral drugs which shall be distributed free of charge to persons living with HIV or

persons affected by AIDS. Such persons include pregnant women and children living with HIV or affected by AIDS. Contributors to this Fund include the Federal, State and Local Governments, corporate bodies, philanthropic organisations and individuals, International charitable organisations, non-governmental organisations, other interested persons and other nations of the world.

Despite the programme and projects undertaken by the state government in collaboration with NGOs and other social partners, the study carried out by Samuels *et al.* (2012) revealed that, some respondents noted that presently, there is an increase in the supply of Anti-Retroviral Drugs (ARV) when compared to the supply three to five years ago. However, affordability and availability, arising from associated indirect costs such as traveling and laboratory tests remain a challenge to individual infected with the HIV illness (Samuels *et al.*, 2012). Similarly, a careful evaluation of both government and private programmes and projects for PLWHAs shows that much work still needs to be done in the areas of service deliveries, fundings of drugs and therapies, assisting orphans, likewise skill acquisition and empowerment agenda.

CHAPTER THREE

LITERATURE REVIEW

3.1 Preamble

This section undertakes a review of relevant literatures on the major subject matter of the study. The related literatures are structured under the following subheadings: conceptual review and theoretical for the study, the impact of HIV/AIDS scourge on household income, food expenditure, health overheads, labour supply and productivity, savings, children welfare, as well as an overview of the coping strategies adopted by affected households. In addition to the foregoing, the theoretical framework and gaps in extant studies dealings with HIV/AIDS-related issues are here discussed. For the purpose of simplification, this chapter is structured to review the impacts of HIV/AIDS at the micro level of the society.

3.2 Conceptual Issues and Framework

The subject matter of HIV/AIDS can be conceptualized from the perspective of the human health. Health, as defined by WHO report (1948), is a state of complete physical and mental well-being and not merely the absence of disease or infirmity (Cited in Mwabu, 2007). According to Mwabu (2007) and Sanglimsuwan (2012), health is an individual-specific phenomenon and a valued goal of household life which can be achieved, restored and maintained through a variety of mechanisms available to households. Health, in recent literature, is referred to as health human capital, to differentiate it from education human capital (Lopez-Casasnovas, Rivera & Currais, 2005; Schultz, 1999, 2007). The health human capital has the feature which is directly relating to other forms of human capital as healthy individuals, on the average is better nourished and better educated than individuals in poor health (Fuchs, 1992). Though,

both health and education increase wage and labour productivity, but health has the additional characteristic of reducing the time spent on sickness. It increases the total amount of time available to produce income earnings and commodities, as well as the time available for leisure (Grossman, 1972, Mwangi, 2007; Fred, Birungi, & Richard, 2012). HIV/AIDS is linked more to health issues (Adeoti and Adeoti, 2008), though it affects all sphere of human endeavour. As the illness affect human health, the ripple effect is observed on the livelihood of the individual, household, community, state, country and the globe at large. Accordingly, Todaro and Smith (2012) noted that the AIDS pandemic threatens to halt or even reverse decades of hard-won human and economic development progress in numerous countries. But in recent years, slow but steady progress has been made, and a majority of specialists now conclude that a corner has been turned on the epidemic. Though the illness is usually thought of as an issue of health care systems and delivery, AIDS is equally an issue of economic development (Todaro & Smith, 2012).

The word, AIDS as described by AIDSinfo (2015), stands for the end-stage disease and fatal stage of infection with the Human Immunodeficiency Virus (HIV). HIV attacks and destroys the white blood cells that are essential to the human immune system. When HIV infects a cell, it pools with that cell's genetic material and may lie inactive for years. Most people that are infected with HIV are still looking healthy and can live for years with no symptoms or only minor illnesses. They are infected with HIV, but they do not have AIDS. After a given period of time, the virus becomes activated and then leads progressively to the serious infections and other conditions that characterize AIDS.

Globally, there are three methods of transmitting the HIV illness, these includes: sexual intercourse (anal and vaginal), mother-to-child transmission (MTCT) and through contaminated blood and blood products, tissues and organs, needles, syringes and other

piercing instruments. However, in developing countries, such as SSA nations, heterosexual intercourse account for a greater percentage of HIV infection, followed by contact with infected blood and drug needles, both by drug abusers and in hospitals; and perinatal transmission (from mother to fetus) (UNAIDS, 2013). In low-income countries, average survival once AIDS symptoms appear has been under one year (Todaro & Smith, 2012). Although there are treatments that can extend life, AIDS is a fatal disease. Research continues on possible vaccines and, ultimately, a cure. For the moment, however, prevention of transmission remains the only method of control (UNAIDS, 2014).

An ideal starting point in the interactions between HIV/AIDS, household income and food expenditure in Lagos State is pictured using a simple conceptual framework. The basic conceptual framework (Figure 3.1) inspires thinking around these nexus and help to identify areas where intervention is needed. The arrows in Figure 3.1 show the channel in which the HIV/AIDS pandemic threatens both the economic and social status of affected household. The term 'Household' is conceived by Bender, (1967) and Budlender, (2003) to be people or individuals who dwell or eat together. The NBS report (2012) defined households as a group of people residing together and maintaining unique eating arrangement. This study considers the term 'Household' to comprised two or more people that dwell together and maintain a unique food plan. It also contains at least one income-generating activity together and acknowledging the authority of a man or woman who is the head of household. The above definitions capture the unitary household model. According to Mattila-Wiro (1999), the unitary household model is the most prevailing, widely applied model within a household, due to its assertion that all household resources are pooled together while decision taken by the households head (male or female), is binding on other members of the households. In this regard, the

unitary household is adopted in this study as it is assumed that decisions within a household in Lagos State are made jointly and that the household maximizes a single set of objectives for all its members.

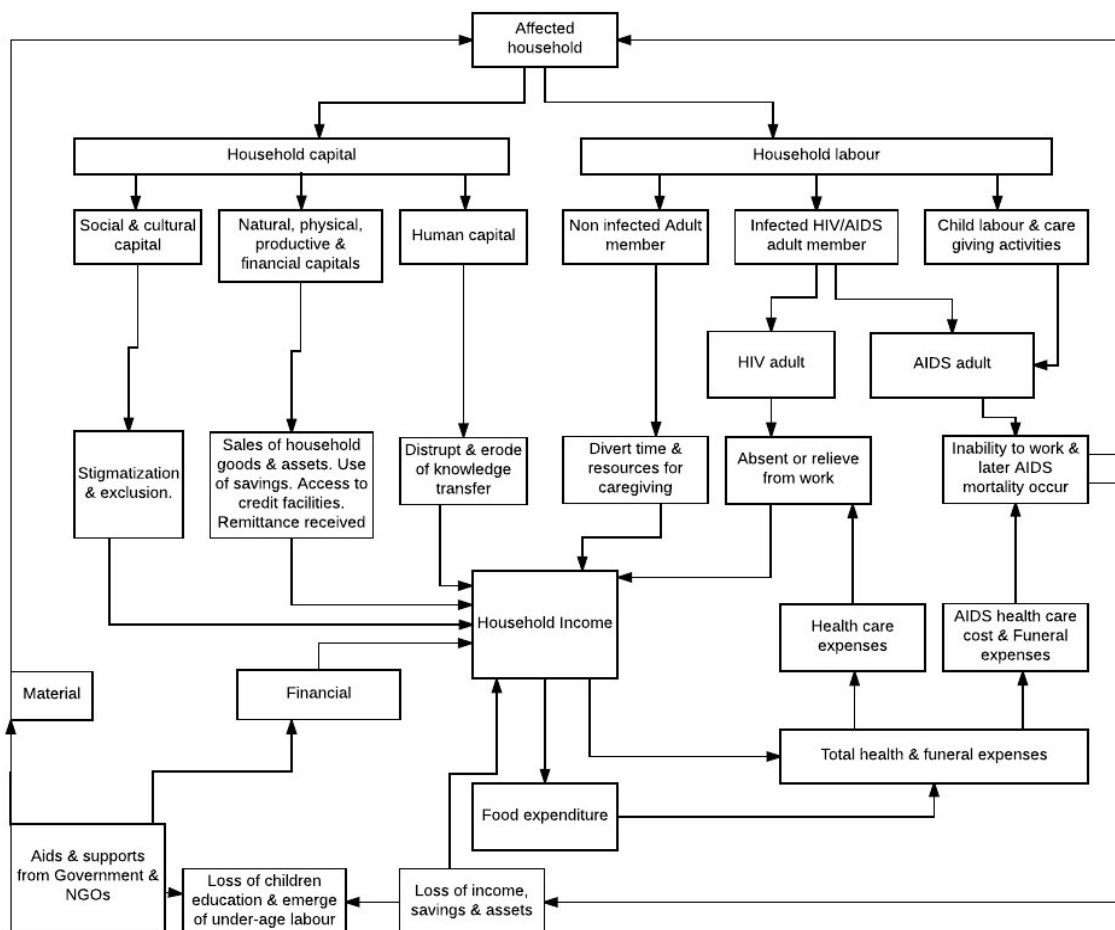
Accordingly, Oni, Obi, Okone, Thabede, and Jordaan (2001) considers affected household as an economic unit of a group of individuals who reside in the same home, dining together for at least three of twelve months and with an adult member who have suffered premature death or infected with HIV/AIDS related illness. From a different perspective, though within the same context, Freire (2004) and Casale (2005) noted that households are considered to be affected with the HIV/AIDS infection when they;

- i. Have experience morbidity or mortality as a result of HIV/AIDS,
- ii. Intervene in the life of the affected households and,
- iii. Experience the pressure and stress of HIV/AIDS illness on their economic performance even when they are not directly involved in the life of the affected household.

A closer look at Figure 3.1 shows that the household impact arises when a member is infected with HIV related illness or AIDS mortality (Bollinger & Stover, 1999). Within this scenario, the household is now called ‘affected household’. With regard to household resources, it is assumed that affected household in Lagos state, like others, is endowed with two forms of inputs which can be employed to cope with the illness. These inputs, according to the Classical theory of production, are capital and labour meant to generate income and support livelihoods.

Household capital is also construed in different terms, but has related meanings, especially in the field of finance, accounting and economics. For instance, in the field of accounting and finance, the term is viewed as household’s financial wealth specifically utilized to start up or sustain a business. To an economist, capital refers to one of the

factors of production used to create goods or services that are not themselves significantly consumed in the production process (Ironmonger, 2001; Casale, 2005; Boldizzoni, 2008). According to Bourdieu (1986), Richardson (1986), Goodwin (2003), Joyce, Martin, Robin and Chiara, (2008), Saunders, Kaye-Blake and Campbell (2010), capital can be classified into natural/physical, productive, financial, cultural, social and human capital. The identified capitals are stocks that have the capacity to produce flows of economically desirable outputs of households, firms and the aggregate economy (Goodwin, 2003). However, each forms of capital will be discussed within the context of HIV/AIDS scourge at the household levels.



Source: Author's construct (2016)

Figure 3.1: Conceptual model of HIV/AIDS impact on household income & Food expenditure

A cursory look at Figure 3.1, it is observed that the concepts of social and cultural capitals are introduced. The term social capital is defined by the Organisation for Economic Co-operation and Development (OECD, 2001) as the ‘network of shared norms, values and understanding that facilitate co-operation within and between groups’. As well, Joyce *et al.* (2008) noted that social capital deals with the social resources which people rely on to pursue livelihood objectives. They include: networks and connections, membership in formalized groups (e.g. organizations and institutions), relationships of trust, reciprocity and exchange, customs and practices that influence behaviour. Based on the notions of Perta and Uschi (2009) and Roomi (2009), social capital makes available financial and non-financial resources, information and knowledge. For his part, Hundera (2014) conceived social capital as resource derived from knowing others who are in a social network.

The cultural aspect of capital was introduced by Bourdieu (1986) who views cultural capital as interaction among individuals, families and social groups. It is a social space in which conflicts of power are enacted; social stratification is produced and transmitted intergenerationally, in interaction with economic capital (Saraceno, 2014). Similarly, Throsby (1999) noted that cultural capital is an asset that contributes to cultural value. Specifically, Throsby opined that, cultural capital is the stock of cultural value embodied in an asset. This stock may in turn give rise to the flow of goods and services over time. Similarly, Saunders, Kaye-Blake and Campbell (2010) stated that cultural capital is the set of values, tradition, history, and behaviours that links a specific group of people together.

Within the context of household capital, social and cultural capitals are put under stress by HIV-related stigmatization and exclusion of PLWHAs from various forms of gathering and meeting, as well as the scenario of increases in orphan rates and reduced

incentives for collective action (Niang, & Van Ufford, 2002; Gaffeo, 2003; David & Li, 2008). These acts tend to affect the aggregate income stream of the affected households. However, households also receive supports (financials, materials, counselling etc) from government and other informal and formal groups (Network of People Living with HIV and AIDS, Coping Centre for People Living With AIDS, National Faith-based Advisory Committee on AIDS, Positive Life Organisation of Nigeria, Faith-based Organisation etc.) that help them to mitigate the burden of HIV/AIDS scourge on income and other sources of livelihood (Nhamo *et al.*, 2011; Samuels *et al.*, 2012; Zambia Ministry of Agriculture and Cooperatives report, 2012).

Also, other forms of capital often discussed in HIV/AIDS literature which are common among households in Lagos state are natural, physical and productive capital. As noted by Joyce *et al.* (2008) natural capital refers to the natural resource stocks from which household's resource flows and services are derived. Russi and Brink (2013) conceived the term natural capital as the stock of natural assets that provide society with renewable and non-renewable resources and a flow of ecosystem services, the latter being the benefits that ecosystems provide to people. In the same vein, but in relation to physical and productive capital, Markandya and Pedroso-Galinato (2007) and Goldin (2014) defined the terms (Physical and productive capital) as an aggregate of household's goods, resources stock and producers goods required for the sustenance of livelihoods. These include assets and livestock diversities at the disposal of the households. These categories of household capitals (natural, physical and productive) are undermined by HIV/AIDS when assets are sold to raise income due to labour inability to maintain common property resources in the face of rising health care cost (Kessy, Mashindano, Mamiro, & Aiko, 2004; Ganyaza-Twalo & Seager, 2005; Natalia *et al.*, 2014).

Accordingly, the concept of financial capital is included in the framework (Figure 3.1).

Van Praag (2003) viewed financial capital to include debt and equity. In the same way, Alemu and Bezabih, (2008) interpreted financial capital as financial resources owned by the household to pursue their livelihood objectives which can be obtained from different sources such as cash income, savings, livestock, jewellery, etc, employment, loans and remittances. The Zambia Ministry of Agriculture and Cooperatives (2012) also noted that financial capital includes cash and other liquid resources (e.g. savings, credit, remittances, pensions, etc.) that are essential to people's livelihoods. Within the context of HIV/AIDS, Nafula and Were (2003) and Collins and Leibbrandt (2007) explained that financial capital is undermined when HIV morbidity and AIDS mortality occur and this reduces the income level of the household. Thus, household financial resources will be shifted from financial investment to health sector expenditures and health care. Over time, household livelihoods and investment is affected to the extent that the HIV/AIDS illness diverts resources away from household investments and reduces household's financial capital like savings. Once household's savings are exhausted, the household resorts to borrowing and buying of basic household needs such as food in credits (Nyamuryekung'e, 2000; Mikael, 2004; Shyamala, 2015). The financial capital in this study includes the household financial resources such as income, savings, remittances, credit access as well as borrowing, that individual utilize to achieve their livelihood objectives.

Another important form of capital that draws scholar's attention to the HIV/AIDS literature is the human capital. The term (human capital) is conceived to be knowledge and skills that are germane to human or individual economic activities (Schultz, 1961; Becker, 1962). Becker (1993) stressed that human capital is investment in education, health, training, skills and other values that are difficult to separate from the individual. Similar to Becker's stand, a few researchers show that human capital can be closely

linked to knowledge, skills, education and abilities (Garavan, Morley, Gunnigle, & Collins, 2001; Youndt, Subramaniam, & Snell, 2004). Rastogi (2002) conceptualised human capital as ‘knowledge, competency, attitude and behavior embedded in an individual’. This view stresses on skills and knowledge obtained throughout educational activities such as compulsory education, postsecondary education, and vocational education (Alan, Altman, & Roussel, 2008; as cited in Dae-Bong, 2009).

As a follow up, quite a number of studies have utilized the educational level and age of the household head as proxies for measuring household human capital level (Barrett, Reardon, & Webb, 2001; Jagger & Pender, 2003; Kessy *et al.*, 2004; Mano, Matshe, Chipfupa, Pimhidzai, & Marimo, 2006; Quisumbing, McNiven, & Godquin, 2008; Okezie *et al.*, 2011; Musinguzi 2012; Zhang *et al.*, 2012). Following this trend, the concept of human capital is defined as the educational attainment of the household head and is measured as the current educational status of the head of household. The HIV/AIDS erodes household human capital through its impact of unexpected morbidity and premature mortality of productive and reproductive labour; *ceteris paribus*. This act impedes inter-generational knowledge transfer from parent to offspring or from experience and skilled infected adult to inexperienced younger generation (Cohen, 2002; Fortson, 2011; Adomakoh, 2012). Invariably, it is the disposable income of households that is affected.

On the other hand, the household is also endowed with labour input as noted in Figure 3.1. Labour is defined as one of the factor of production which involves mental and physical effort to create goods and services. It can also be said to be any effort of man either physical or mental employed to earn a living. The term ‘labour’ is often utilized to explain the flow of effort, skill, and knowledge that humans directly provide as inputs into productive activities. It is regarded as a flow because it is usually measured over a

period of time, such as the number of man-hours of work at a particular skill level that has been used over a week or month.

Within the context of HIV/AIDS, several authors like Booysen and Bachmann (2003), Matebesi and Meyer (2004), Russel (2004) and Musinguzi (2012) conceived the concept of healthy (non-infected adult member) and unhealthy labour (infected HIV/AIDS adult member of the household). They asserted that household tends to reallocate tasks of the sick member to other adult members to cope with the HIV/AIDS impact. Several other scholars affirmed that the illness also contributes to the scarcity of labour because both the incapacity of the sick workers and the time others have to devote to looking after them are significantly affected (Levinsohn, Shisana, McLaren, & Zuma, 2011; Ghailan *et al.*, 2010; Natalia *et al.*, 2014; Erick, Wafula, Munyi, & Njoroge, 2015). Care giving activities by non-infected adult member reduce man-hour labour of the households *ceteris paribus*. This affects the household aggregate production and income (Hilhorst *et al.*, 2004; Iya *et al.*, 2012).

In a related development, Niang and Van Ufford, (2002), Casale (2005) and Ashford (2006) stressed that when young adults or parents fall sick and die, the children and the elderly are the most vulnerable people in the households. The household may eventually dissolve, while children however, when faced with economic hardship usually have no choice but to involve in activities that will aid their survival. This brings about the phenomenon of child headed households and underage/child labour among affected households (Gubwe *et al.*, 2015).

The term child labour is defined by UNICEF report (2000) as any form of economic exploitation or any work that is likely to be hazardous or interfere with a child's mental, physical, spiritual or social development. Dessy and Pallage (2005), Emerson and Knabb (2006/07), Grossmann and Michaelis (2007), Pallage and Zimmerman (2007) modelled

child labour as child participation in worst forms of child labour activities and the residual claimant on child time outside of schooling. Dumas (2007) conceived the term, under aged or child labour as market work outside the child's household and family enterprises. The International Labour Organization (ILO) Conventions (1973, 1999, 2006 & 2009) define under age labour or child labourers as all children younger than 12 working in any economic activities, children 12–14 years old engaged in more than light work, child 17 and under who participates in activities that are "hazardous by nature or circumstance" for one or more hours per week as well as all children engaged in the worst forms of child labour – in which they are enslaved, forcibly recruited, prostituted, trafficked, forced into illegal activities or exposed to hazards (Eric, 2009).

According to Foster and Williamson (2000), Breton and Brusati (2001) HIV/AIDS in parent's increases underage labour while children affected by AIDS have an increased risk of engaging in risky livelihood strategies, such as living and working on the streets and informal sex work. Furthermore, working children are exposed to increased risk of contracting HIV through the lack of a supportive, protective working environment, sexual abuse at work, or engaging in sex as a livelihood strategy. Also, working children may miss out on messages from school-based HIV/AIDS prevention programmes. In some instances where boys earn income, it opens up opportunities for them to engage in sex (Breton & Brusati, 2001). In sum, Kaschula (2008) asserted that in affected household, child labour was utilized to augment adult labour shortages in order to generate income for household.

Similarly, in Figure 3.1, the food expenditure concept is introduced and it is assumed to be derived from household income (Emerole, Nwosu, Onyenweaku, Nwachukwu, & Ukoha, 2007; Seid, 2011; Akpan, Patrick, Udoka, Uwemedimo, & Okon, 2013; Donkoh *et al.*, 2014). Food expenditure is taken as that part of income not saved but utilized for

household food consumption. Food expenditure as proposed by Bagarani, Forleo, and Zampino (2009) is the share of consumption expenditure assigned for food consumption at household level. Following extant literatures, there is ample evidence of substitution effect of food expenditure for health care cost in affected HIV/AIDS households (Hilhorst *et al.*, 2004; Kadiyala, 2004; Mikael, 2004; & Mwakalobo, 2007). This phenomenon affects the general well-being of households.

Having discussed the components and channels of HIV/AIDS impact on household income, the term household income is defined, though complex to really explain because income definitions adopted by individual countries may be more limited in scope. This is because some elements of household income may not be collected or modelled. In simple terms, the United States Internal Revenue Code (2003) defined “Household income” to mean the adjusted gross income, of all members of a household. According to ILO (2004), household income consists of all receipts whether monetary or in kind (goods and services) that are received by the household or by individual members of the household at annual or more frequent intervals, but excludes windfall gains and other such irregular and typically one-time receipts. The Organization for Economic Cooperation and Development (OECD: 2015) also defined household income to include: the value of goods produced for own consumption as an element of self-employed income. In the light of this, household income can be taken to mean the aggregate income earned by the household member/s in a given period of time, excluding remittance. There are ample supports for the claim of HIV/AIDS significant impact on household income (Iya *et al.*, 2012; Musinguzi, 2012; Natalia *et al.*, 2014).

On the basis of the evidence currently available, affected household received aids and supports such as remittance from relatives and friends; materials, financial and child support grants from the governments, NGOs and philanthropists (Mutangadura 2000;

Booyesen *et al.*, 2004; Baidoo *et al.*, 2012; Kissi-Abrokwah *et al.*, 2015). In most cases, the financial and material aids as well as grants to households do not unswervingly help them to escape the poverty trap, since the initial impact of the scourge has eaten deep on the livelihood resources.

Following the aforementioned analysis, this present study focused on five forms of capital, to analysed HIV/AIDS impact on household income and food expenditure in Lagos State. These capitals include: natural, productive and physical, financial, human, and social. The natural, productive and physical capital herein, are employed in the empirical analysis to measure asset sale of households while financial capital captures remittances from relatives, credit accessibility, savings and loans granted to infected households. The human capital (measures educational levels of household heads), and social capital (captures aids and supports from the government). On the other hand, the non-infected adult member captures caregiver's activities of sick member by non-infected adult member/s of the households while infected adult member capture the number of adult PLWHAs in the household. The main reason for variables restriction is as a result of data accessibility and availability. However, one important influences of the conceptual framework is that it gives a green light of the variables that determine and predict household's income and food expenditure among PLWHAs households.

3.3 Review of Theoretical Literature

Several theoretical attempts have been made to explain the burden of illness on household livelihoods, especially with regard to HIV/AIDS where the illness has shown evidence of devastating results in some African countries with relatively high prevalence rate (Mason, Chapoto, Jayne & Myers, 2007; Freire, 2004; Ijaiya, Raheem, Waheed, Ijaiya, & Bello, 2010; Dorward & Mwale, 2011). Five theories are identified in this work

and they include: the traditional Classical theory of production and growth, Engel Law of food expenditure, consumer behaviour theory, Becker household theory (1965) and Grossman health production theory (1972, 2000). However, two theories (Becker household theory and Grossman-Wagstaff health production theory) are adequately discussed to inform the conceptual framework of this study.

3.3.1 The Theory of Production and Growth

The Classical and Neoclassical theory of production and growth have been adopted by several authors (Arndt, 2003; Masha, 2004; McDonald & Roberts, 2006; Okezie, Onyekanma & Baharuddin, 2011; Ngepah, 2012). They have applied this theory so as to explain how input and health variables affect output or production at the micro and macro levels. Production in this regard, is an activity of transformation which connects factor inputs and outputs (Mishra, 2015). In other word, production is the process of transforming inputs into outputs. The theory of production therefore, illustrates how several inputs (material and immaterial) determine output growth. Given this, the production function explains the technical relationship between inputs and output in physical terms. These inputs include, capital, labour and technological progress. Following national income accounting, output is said to be equal to income in turn, this is determined by the contribution of labour (workers) which consists of skilled and unskilled. Capital which may be human, health, or any forms of capital is also involved. Involved also is technological progress which captures skills and work experiences of workers. In the event of HIV/AIDS, income is affected via death of active labour, decline in labour efficiency and out of-pocket expenditure (OOP) on medical care (Ford & Evans, 2005). Also, the illness results in loss of skills and knowledge transfer due to death of experience workers in the household (Nafula & Were, 2003).

3.3.2. The Theory of Consumer Behaviour

Another theory that is often mentioned in the HIV/AIDS-household welfare literature, but not frequently applied while analysing the empirical impact of HIV/AIDS on household livelihoods, is the demand analysis and consumer behaviour theory. The theory explores how individual and household maximise their utility by directly purchasing goods and service at a particular price given their income level. Following the above analysis, Pitt and Rosenzweig's (1986) in their study, incorporate health variable into the individual and household utility function and introduce an explicit production technology for health. Formally, the extended theory relates to how expenditure and price elasticity of households react to income, price and health changes of economic active members. Assuming the household is faced with a sudden shock when, for instance, the head of a household head or other adult member contracts HIV/AIDS. This will not only affect contemporary consumption expenditure function, but also the household income earnings.

3.3.3. The Engel Law of Food Expenditure of Households

Another vital theory that is germane but not often utilized to analysed HIV/AIDS and household food expenditure is the Engel law of food expenditure. This model is justified and most relevant for this study because it relates consumption expenditure behaviour of family to the income and other key indicators of the household. Particularly, the theory posits that in an economy, households maximize utility by directly purchasing food at a given price and income level in a specific period of time. Following the work of Engel (1857), the household food expenditure is stated as an increasing function of household income and size, but the share of food budget decline with income (Lewbel, 2006). The outline from Engel law postulates that “poorer households tend to spend a greater

percentage of their budget on nourishment”. Similarly, greater propensities of households that tend to experience income increase exhaust a larger share of the household food budget on variety of diets in order to improve household member’s nutritional status. Engel noted that food expenditure is an important expenditure that occupies low income households expenditure patterns. Therefore, a reduction in household income tends to bring about crowding out of household expenditures on other non-necessary goods. Deriving from this theory is the food expenditure nexus and dependency on household income and other socioeconomic and health variables as depicted in extant studies such as Wagstaff (1986), Kinsey (1994), Bagarani, Forleo and Zampino (2009), and Donkoh, Alhassan, and Nkegbe (2014).

3.3.4 Household Production Theory

Economic theories of household try to capture the complex structures of household’s production and their behaviour. Based on the complexity and definition of household, economists have dealt with a possible multiplicity of household decision makers in two ways. The first approach, is the unitary approach-- treating the household as though it were a single decision-making agent, with a single pooled budget constraint and a single utility function that includes the consumption and leisure time of every family member. The second approach (collective) is to model household demands as the solution to a cooperative bargaining game. The collective model is a nontrivial fashion, which involves two or more agents with distinct preferences in determining family production and consumption. Based on the subject matter, the unitary household production theory is adopted for the theoretical underpinning. The theory is justified based on its ability to explain two aspects of household behaviour namely: unilateral decision regarding the quantity of goods consumed and the allocation of those goods amongst household

members. The unitary model has the attribute of relative simplicity of comparative statics generated and the diversity of issues it can address within the Africa setting especially in Nigeria where decision taken by the households head (preferably male), is binding on other members of the households. Moreover, it is not inconsistent with differences in individual welfare within a household, even when these differences are exhibited systematically by some gender, age, health or relation to household head grouping.

The concept of unitary household production theory was developed by Becker (1965), a neo-classical economist. Becker's approach to the household can be termed 'unitary' because all households are seen as a collection of individuals who agree over the broad principles of intra-household resource allocation. Thus, the household acts as if there is a single decision maker (Akram-Lodhil, 1997). According to Pierre-Andre, Lawrence, Hoddinott, and Kanbur (1993), once a marital union is formed, households seek to maximize their joint utility as a unitary entity by deploying their productive resources in those activities which generate the highest relative return. As a consequence, household labour is allocated between home and market on the basis of the comparative advantage of individual members though an assessment of their respective opportunity cost of time. As a result, in equilibrium the household is maximizing both its marginal productivity and its marginal utility. Based on this, Becker is able to propose that household behaviour is in economic terms rational.

As demonstrated in the derivation of Michael and Becker (1973) presented in Ellis (1992), the household is taken to be an entity which maximizes the joint utility of its members, However, utility is not derived from the consumption of goods and services acquired in competitive markets. Rather, the household uses purchased goods and services as inputs in a household production process. Purchased inputs are combined with household resources, primarily consisting of labour, to yield a set of goods and services

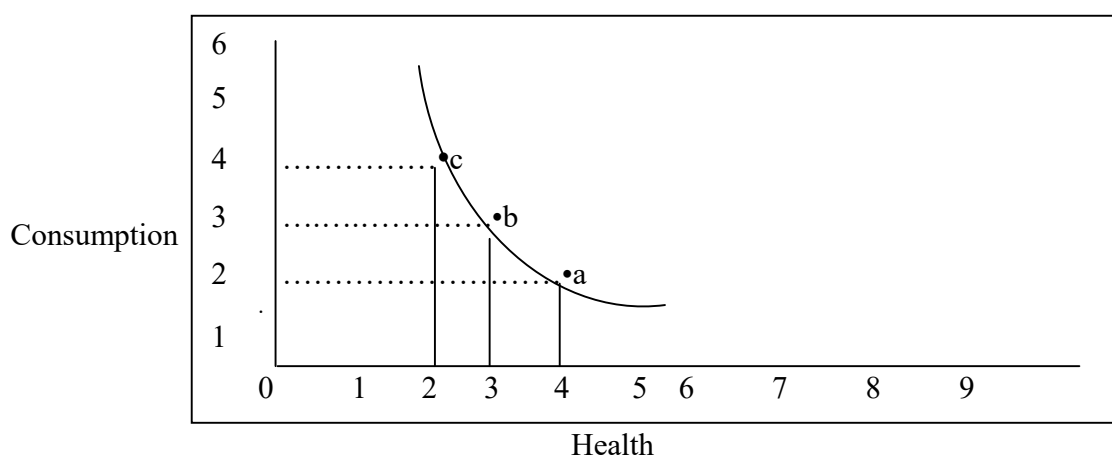
capable of being finally consumed. In other words, household production is the production of goods and services by members of a household, for their own consumption, using household capital and unpaid labor. The process of household production involves the transformation of labour, time and effort provided by household members, which involves the use of human capital. The second factor of production, capital, involve the use of physical or tangible non-human capital to generate output (Huffman, 2010). Incorporating the incidence of HIV/AIDS illness in this theoretical analysis, it is believed that the household decision is to pool her resources together either output or income in order to incur health care-related drugs especially when an active member or breadwinner is infected with the illness. If this happens, there is the tendency that productivities, income and consumption level of the unitary household tends to fall as the household face an ever increasing cost of medical care.

3.3.5 Grossman Theory of Health Production

Grossman's (1972, 2000) theory is a follow up from Becker's (1965) household-production model. He utilized the household production equation of consumer behaviour as applied by Becker (1965, 1973) to explain the gap between health as an output and medical care as one out of several inputs in health production. This theory is justified for this study because it relates how people allocate their resources such as financial capital to produce good health. Thus, Grossman (1972, 2000) theoretical analysis treats economic, environmental and social factors as major inputs of the production system. The context of investing on human capital (individual health and education) in order to improve the outcomes in both the non-market (household) and market (work) sectors was introduced in his analysis. But to Tompa (2002), investment is required to restore and maintain health stocks through household production activities that include inputs such as

exercise, nutrition and health care (Tomba, 2002).

Following the study of Grossman (1972), Wagstaff (1986) build on the health production theory, and explained that individuals exert a relatively high degree of control over their health by virtue of the fact that they can influence their health-affecting consumption patterns, health care utilisation, and their environment. Wagstaff (1986) using the indifference curve analysis shows how people value both health and consumption but do not view being in good health as so important that it takes priority over everything else (See Figure 3.2).



Source: Author's construct (2016)

Figure 3.2: Indifference Curve showing the relationship between food consumption and health

At point 'a' in figure 3.2, the individual has four units of health and two units of food consumption. The indifference curve indicates that if the individual were to move to point 'b' three units of consumption and three units of health- the individual would be well off as the individual had been at 'a'. His health would be worse, but the increase in consumption of one unit would be sufficiently large to compensate for this deterioration in health.

The welfare contour slopes downwards, therefore, because to compensate for a reduction in health, food consumption has to increase and vice versa. The indifference curve

indicates that to compensate for a reduction in health from three to two units the individual would require two (4.0 -2.0) units of consumption. At 'c' the individual would be as well off as at 'b' and 'a'. However, as one moves down the indifference curve it becomes increasingly difficult to induce the individual to accept further deteriorations in his health. To part voluntarily with one unit of health starting at point 'a', the individual has to be compensated with one unit of food consumption. Starting from point 'b', however, he has to be compensated with 2.0 units of food consumption. This reflects the assumption that as successively more units of health are taken away from the individual, the individual will require successively more units of food consumption in compensation (Wagstaff, 1986). (Or, equivalently, as the individual is given successively more units of health, he will require successively fewer units of food consumption in compensation.). The above theoretical analysis, when taken to the household level, shows that there is strong nexus between health (individual status such as HIV/AIDS) and food consumption in the form of food expenditure. Based on the above discussion, the Grossman-Wagstaff (1986) health production theory informs the empirical and theoretical framework for the study.

3.4 Empirical Review of HIV/AIDS Impact at the Household level

One way by which HIV/AIDS can be analyzed at the household level is to examine its impact on income, food expenditure, health cost, labour supply and production as well as other economics activities of the household. This section intends to throw more light on this impact.

3.4.1 Impact of HIV/AIDS on Household Income

The fundamental question that has preoccupied researchers and policy makers in HIV/AIDS-Income related literature is how to curb or reduce the effect of HIV/AIDS on

labour productivity, and by extension, the income of affected household. In an attempt to address this question, there is the need to examine the loopholes and channel of HIV/AIDS impact on household livelihoods.

According to Bollinger and Stover (1999) the first units that bears the burden of the HIV/AIDS epidemic is the household. The household impact begins when a member of that household suffer from HIV/AIDS related disease. When the head of household in particular is affected, the household experiences a loss in its propensity to earn income especially when the sick person is not productively active. Still, other members such as wives and children spend less time in productive activities in order to care for the sick. These activities also affect the income level of the household.

Prior to the above, Pitayanon, Kongsin, and Janjareon (1994) carried out a study in Thailand using 116 HIV/AIDS affected households, 100 households that have experienced death from other related causes (as control group) and 108 households that have not suffered any death case during the survey periods. The outcome suggests that the average annual income of households that have experienced AIDS mortality was 66 per cent of the income of households that suffered death from other sources and 53 per cent of households that have not suffered any death case. From this result, the study reported that more than half of the households that have experienced AIDS-related mortality have income lower than the average national annual income of the country. The study therefore calls for government assistance to prevent and reduce the further spreads of the scourge in the country. As a follow up, the study done by Baggaley and Needham (1997) on the effect of HIV/AIDS on income of affected and non-affected household in South Africa reveals that affected household experience annual income decline of about 30 – 35 per cent when compared to unaffected households.

Along similar lines, Castro, Orozco, Aggleton, Eroza, and Hernandez (1998) qualitative

study of 113 families in two communities in Mexico showed that household's burden of caring for AIDS infected member does not end with the mortality of the individual. The financial and emotional shock afterward still affects the livelihoods of the household. But with time and adjustment, household members tend to overcome the shock and normalize their lives. A study by Mutangadura, Mukurazita, and Jackson (1999), in two Africa countries (Tanzania and Cote Ivoire) and an Asia country (Thailand) indicates that HIV/AIDS affected families experienced significant income decline of about 40 to 60 per cent per annual. The authors noted that the loss is recompensed by borrowing, spending savings and reducing consumption.

In a similar study in Kenya, Bollinger, Stover, and Nalo (1999) observed that an adult AIDS mortality result to 58-78 per cent loss of income in small rural households where three adult members dwell, whereas the corresponding loss in an urban household is about 54-66 per cent. However, there is greater loss of income when two adults and an infant die from the same household as the income loss is between 116-167 per cent for rural households and 108-142 per cent for urban households. Given these significant losses, the authors opined that households are forced to adopt various coping mechanisms to mitigate the income loss (Bollinger *et al.*, 1999). In the same vein, Foster and Williamson (2000) survey of urban households affected with HIV/AIDS in Cote d'Ivoire shows that family with AIDS member experience income decline of about 60 per cent.

In Limpopo province of South Africa, Oni *et al.* (2001) conducted a survey on seven villages using 680 respondents. The findings revealed that financial asset forgone by household includes direct loss of annual income of the infected members; loss of earnings by other adult's members who act as care givers, as well as financial loss faced by other non-caregiver members of the households. The authors appeal to the government to put up poverty eradication programmes and projects, especially in rural areas so as to

consolidate household income based. In a related study, Booysen and Bachmann (2003) empirical analysis indicate that, there is decline of about 40 to 50 per cent of per capita income in household where one or more member/s are infected with HIV/AIDS in South Africa.

A survey of 771 AIDS-affected households was carried out in South Africa by Steinberg *et al.* (2002). The outcome suggests that poor people are the most adversely affected by the HIV/AIDS scourge. Likewise, the worst hit households are those underserved by basic public services such as sanitation and pipe borne water. The finding also shows that the HIV/AIDS epidemic deepens poverty among the already poor through loss of income and medical care costs, which absorb up to one-third of household income. However, the authors noted that the dearth of home based care system in line with the absence of HIV/AIDS treatments kits in public health system further worsened the problems of accessing existing government grants (Steinberg *et al.*, 2002). In a similar survey of affected HIV/AIDS households in Zambia, Barnett and Whiteside (2002) observe that AIDS affected household experience income fall of 66 – 80 per cent per month.

In Kenya, Yamano, Jayne and McNeil (2002) employed data of 1422 households to evaluate the effect of adult prime mortality on agricultural production and off farm income. The result submits that mortality of male head of household significantly affect off-farm income of the households, though this does not apply to mortality of other adult members. The authors called for urgent ways to reduce adult mortality and redress its impact on livelihoods of households in developing nations. Contributing to the debates, the International Labour Organization (ILO, 2003) study of 292 participants from HIV/AIDS affected households in four states (Delhi, Manipur, Maharashtra and Tamil) in India shows that about 20 per cent of the participants lost their income to HIV/AIDS excuses or absenteeism from work. Most households in the survey have average monthly

expenditure of Rs.3185 which is greater than the average monthly income (Rs.1117) of the households.

Grant and Palmiere (2003) carried out a study on affected households in Bulawayo districts of Zimbabwe, and the result indicates that affected households experience income fall of about 40 per cent. This inevitably affects the decision and psychological wellbeing of the household. Time constraint is noted to be a key factor to income decline of household. Even when the household tries to diversify, they still cannot access a lucrative income generating job or project. Following this development, the household may be forced to change their means of livelihood strategies to withstand the impact of income decline or loss to HIV/AIDS scourge. Furthermore, the authors opined that household may be forced to cut back on their means of livelihoods in order to get a lesser average monthly income (Cited in, Ganyaza-Twalo & Seager, 2005).

In their study, Hilhorst *et al.* (2004) employed a sample of 508 households from nine LGAs in Benue state, to evaluate the impact of HIV/AIDS on rural livelihood. The descriptive statistics result indicates that affected household loses income and other forms of contributions from the infected or dead member as well as those adults who serve as caregivers. The authors advised that the need to identify ways of strengthening existing safety net internally are urgently needed. Buttressing the above view, Gaigbe-Togbe and Weinberger (2004) stressed that the mortality of the household head may lead to loss of earnings, which in turn push the household below the poverty line.

Similarly, Booysen *et al.* (2004) carried out a survey on focus group discussion of 67 respondents in order to estimate the socio-economic impact of HIV/AIDS on household in South Africa. On the basis of the evidence currently available, the outcome depicts a significant difference between the income composition of affected households and non-affected households. The result also shows that there is no significant difference in the

share of income from remittances in affected (11.2 per cent) and non-affected households (12.7 per cent). Therefore, remittance is regarded as non-essential source of income in affected households even in the face of increasing burden of HIV illness and AIDS death (Booyesen *et al.*, 2004). In the same vein, Kessy *et al.* (2004) empirical study of 312 affected HIV/AIDS respondents in Tanzania shows that the illness reduce man-hour labour of households which leads to declines in income and purchasing power of households.

Naidu and Harris (2006) study in South Africa revealed that HIV/AIDS has reduced both regular and irregular income of households. The regular income impact comes in the form of temporary absence from work by the infected person/worker, loss of earning by other member/s through caregiving activities, stopping of pension grant as a result of the death of the sick person and permanent loss of employment due to illness or death. The impact on irregular income includes earnings from investments and property (assets sale), earning from non-market activities (such as profit from sale of household production, children maintenance and remittances from people outside the home), and earning due to death (income from burial societies and life insurance).

In Zimbabwe, Mano *et al.* (2006) employed a cross sectional data of 350 farm households. The aim is to develop policy on how to mitigate the impact of HIV/AIDS on agricultural growth of affected households. The regression result suggests that there is evidence of HIV/AIDS adverse impact on family income and assets. As part of policy recommendations, the authors proposed that government should recognize the importance of sustained agricultural policies that are free from price distortions- and see it as the best resource for farmers to combat HIV/AIDS impact on household welfare. Likewise, Whiteside *et al.* (2006) and Smit (2007) in their separate studies assert that the long duration of the HIV/AIDS illness can lead to decline or loss of household income which

in turn can deepen household poverty. The authors pointed out that the illness affect household budget by diminishing the sources of family income and increasing its aggregate expenditures.

Contrary to other findings, Das, Mukhopadhyay, and Ray (2007) employed primary data of 371 households with HIV/AIDS and 479 households without HIV/AIDS. This is done so as to estimate the family utility function parameters which measure the relative significance of consumption, physical and mental health and schooling of children effects of HIV/AIDS illness in India. The OLS result drawn from this study revealed that there is no significant difference between per capita income of households with HIV/AIDS and without HIV/AIDS.

Collins and Leibbrandt (2007) employed 152 respondents to estimate the financial impact of HIV/AIDS illness on poor households in three low income provinces (Langa, Diepsloot and Lugangeni) of South Africa. The findings suggest that funeral expenditure takes almost seven months of income earned by household. Virtually, all households take funeral insurance portfolio to cover funeral costs. In spite of this, about 61 per cent of the households were observed to be underinsured against funeral cost. Almost half of the households depend on wage earners; a quarter relied on grant recipient. The authors also noted that about 80 per cent of the household might lose half or more of their household income when the highest income earner dies. Going by the result, the study suggests that households are completely uninsured and called for innovative financial tools that will be beneficial to address this inadequacy (Collins & Leibbrandt, 2007).

Adeoti and Adeoti (2008) carried out a comparative study of HIV/AIDS impact on 155 households (55 with HIV/AIDS and 100 without HIV/AIDS) in rural areas of Benue state. The regression and variance parameters results shows that farm profit, average gross revenue and average gross margin were lower in households with HIV/AIDS than

farm household without the illness. Similarly, Mahal *et al.* (2008) did a study of 482 persons affected with HIV/AIDS and a random control group of 6400 persons in Oyo and Plateau States. The outcome advanced that the illness is associated with considerably loss of work time, rising morbidity rate, increase utilization of public health facilities, loss of time for care giving and indirect loss of income. The authors opined that it is important to protect the financial assets of PLWHAs. They also advised the Nigerian government to assist in promotion of HIV/AIDS preventive programmes because they are more cost-effective than cost of treatment.

Alemu and Bezabih (2008) empirical report of 1245 rural households in Ethiopia revealed that HIV/AIDS related costs reduce income of households accommodating person(s) living with the illness. The authors opined that government and all stakeholders in health related issues should integrate HIV/AIDS issues into the core business of developmental activities. Considering it from the point of view of remittance and food assistance, the United Nations World Food Programme (thereafter WFP) report (2008) revealed that on the average 9.3 per cent of income of affected household comes from remittances compared to 7.2 per cent of non-affected household. Also, 9.5 per cent of aggregate income of affected household comes from food assistance as against 6.3 per cent for non-affected holds.

In the same vein, Faisal (2008) using 65 districts in Uganda employed consumer utility function and multinomial logistic regression to estimate the effects of HIV/AIDS on household's investments and welfare. The outcome shows that the illness affects the capacity of families to earn income and invest in asset holding and accumulation. The author suggested that sound policies reform that will address the spreads of the illness on household's assets accumulation should be carried out. The work of Ugwu (2009) on feminine labour in Enugu state also shows that majority of the participants interviewed

experienced decline in family income due to HIV/AIDS illness of member. The author noted that fall income lead to malnutrition, food insecurity and occurrence of new opportunities infections.

An impact assessment of under-aged and older caregivers was carried out by Apata, Rahji, Apata, Ogunrewo, and Igbalajobi (2010) using 320 rural HIV/AIDS affected households in Benue state. The descriptive statistics shows that a greater number of older caregivers (64.45%) were categorized as poor and were living on one dollar per day. The regression result using household income as dependent variable shows that HIV/AIDS reduces farm income of households. Furthermore, the authors called for policy that will restructure orphans into an effective and efficient individuals and empowerment programme in the form of entrepreneurial schemes for older caregivers. This will enable them generate sustainable income for their households.

Contrary to Das *et al.* (2007) finding, Ojha and Pradhan (2010) study in India indicates that HIV/AIDS illness bring about decline in household income for all group of occupation especially unskilled labour. The fall in household income is more severe among rural non-agricultural self-employed individuals, accompanied by rural agricultural workers, rural non-agricultural worker, rural agricultural self-employed and urban casual workers. In sectoral categories, the authors noted that the sectors that utilize unskilled labours are the most hit by the HIV/AIDS epidemic.

Following other works done in Kenya, Agatha, Walingo, and Othuon (2010) survey of 160 respondents (from both affected and non-affected HIV/AIDS households) indicate that monthly income earned by affected households were lower than monthly income earned by non-affected households. The income difference has been traced to HIV/AIDS illness of household member.

Mphumuzi (2011) employed Social Accounting Matrix (SAM) and Computable General

Equilibrium model to analyse the possible economic effects of HIV/AIDS epidemic on Swaziland economy. The result shows that disposable income of household is expected to decline as a result of the spread of the disease. The author maintained that household income will fall due to loss of economic active member. As part of policy recommendation, the study recommends that there is the need for policy measures that will target areas that are hard hit with the economic impact of the epidemic. It also advocates the need to increase expenditures in education and human capital development which tend to boost productivity in the economy.

Mutangadura (2000), Drimie, (2002) and Te Lintelo, (2008), Odoemelam (2011), explore the effect of HIV/AIDS on productivity and welfare of 150 farm women in Abia state. The descriptive statistics shows that majority of the participants are married individuals with formal education. Respondents identified stigmatization, decline in family income, and inability to work as major challenges confronting the households. Furthermore, the inferential statistics (T-Statistics) demonstrated that, there is significant difference between the income of household with and without HIV/AIDS. The study also noted that all stakeholders should review agricultural policies through an HIV-Lens in order to respond efficiently and effectively to rising HIV/AIDS incidence.

A study carried out by Iya *et al.* (2012) using descriptive statistics and logistic regression on 120 affected households in Adamawa state shows that out-of-pocket expenditure on health care increases the odds of income decline among households accommodating PLWHAs. In a related study in Uyo, Akwa Ibom state of Nigeria, Ofonime (2012) exploits the financial implications of HIV/AIDS scourge on 331 PLWHAs. The descriptive statistic shows that the median monthly income for all respondents was ₦7,500 (\$50). This is below the minimum wage of ₦18,000 in the Country. Given this result, it is deduced that most respondent earned below \$2 per day, therefore the income shock

of HIV/AIDS impact is high among the survey respondents. Based on this, the author called for further study that will determine the current impact of HIV/AIDS on the financial capacity of PLWHAs in the region.

In support of Faisal (2008) finding, Musinguzi (2012) studied the impact of HIV/AIDS on 613 household in Bushanyi district, Uganda. The multinomial logit regression result indicates that HIV/AIDS illness diminishes earning of affected households. Conversely, Masuku and Sithole (2009) empirical study of 847 household in Swaziland noted a general increases in income of affected HIV/AIDS household. Corroborating the preceding view, the study by Feulefack *et al.* (2013) centering on the impact of community based Antiretroviral Therapy (ART) on incomes of 134 affected households in Uganda shows that treatment and improved health conditions of patients causes household income to increase by 30 to 40 per cent irrespective of the income quintile. The regression outcome revealed greater impacts of ART programme on incomes of affected households. In turn, this signifies greater return to public investment in Antiretroviral Therapy (ART).

Zhang *et al.* (2012) employed 866 PLWHA to examine factors associated with Per capita Income (PCI) of affected HIV/AIDS households in three provinces (Yunnan, Anhui and Henan) in rural China. The descriptive statistics and linear regression result reasoned that there is higher PCI for respondents with HIV illness than those AIDS illness. The authors called for improved work place policy and government initiative so as to increase income of PLWHAs and help reduce the economic burden on affected households. In a related study in the Asia continent, Singh (2013) worked on HIV/AIDS impact on the India economy. His study shows that income of affected household suffers a decline of 0.46 percentage points. Furthermore, the author noted that, an inter-group comparison of the growth rate of household income indicates that all groups experience a slower growth in

their incomes. However, the extent of decline in the growth rate of income varies widely across the household groups.

Gezahegn and Upadhyay (2014) panel data analysis of HIV/AIDS effect on the Southern African nation's shows that the illness significantly and negatively affect human capital accumulation and thereby impedes per capita income growth. In the same way, Moges (2013) finding among HIV/AIDS respondents in Addis Ababa, Ethiopia, suggest that the major economic challenges confronting PLWHAs includes inappropriate utilization of income due to loss of hope and dearth of income due to morbidity and mortality of the breadwinner. In addition, the study suggested that the illness impact could be reduced or minimized when PLWHAs are treated in such a way that they are motivated to contribute their own quota without been discriminated. Also, It also adds that strategies to support PLWHAs should be designed and developed.

In view of other studies, Natalia *et al.* (2014) assessed the impact of HIV/AIDS on household income in Dodoma Municipal in Tanzanian using a sample size of 150 PLWHAs. The finding demonstrated that respondents with low financial status experience income decline due to greater part of their income (62%) spent on medications and transportation. Similarly, income fall is observed in high financial status respondents as they spend 64 per cent of their income on special foods and transportation. The authors suggested that, there should be joint multidisciplinary efforts from all stakeholders (Non-government and government organisations) to overcome the problems of HIV/AIDS. Also, control program and activities should be augmented with poverty relief measures (Natalia *et al.*, 2014). In a like manner, Burke, Gong, and Jones (2014) explore the impact of income shocks on HIV prevalence rate using 200,000 individuals from 19 countries in Africa. The regression result submits that income shock increases the probability of HIV infection for women than in men. Also, the findings indicated that

for every recent income shock in the rural areas in Africa, there is an increase in HIV incidence by 11 per cent. Conclusively, the study reported that income shocks explain about 20 per cent of changes in HIV prevalence rate across Africa nations and suggest help that will assist households to cope with income shock better.

More so, Shyamala (2015) explores the economic impact of HIV using 200 participants with HIV and a similar number of respondents without HIV in India. Going by the result, household with HIV reported decline in income of about 50 per cent owing to decrease or loss of jobs, compulsions of caregiving activities, absenteeism as result of morbidity and mortality of infected household members. Another important revelation relates to the fact that female household head tend to experience greater decline in income than their male counterpart. They suffer significant loss in earnings due to mortality of household members. This results in lesser spending on food consumption and other basic necessities. However, the author emphasizes the need for education on prevention, better outreach of antiretroviral treatments early diagnosis and better mechanisms to address issues of stigmatization and discrimination in the work place.

Furthermore, Kissi-Abrokwah, Agbesi, Andoh-Robertson, and Tutu-Danquah (2015) consider the impact of HIV/AIDS on 18 female respondents in Lower Manya Krobo District, Ghana. Their analyses show that the HIV/AIDS illness and related cost lead to significant loss of income of the infected person and reduction of income of other working adult household's members who act as caregivers. Following the finding, the study recommended that financial support, acceptance and visitation from relatives as well as counselling will assist PLWHAs to cope with the illness.

3.4.2 Impact of HIV/AIDS on Food Expenditure

One significant impact of HIV/AIDS on household income is its effect on food expenditure and consumption of household that are already poor. According to Haworth

(1991), about 59.8 per cent of household affected by the epidemic are experiencing food shortages, while 102 households from a total of 116 sampled households are faced with economic problems. To buttress this view, a survey of 49 families in Zambia revealed that half of the surveyed families face food shortages while 31 per cent experiences breakup (Haworth, 1991; cited in Stover & Bollinger, 1999).

In line with the above discussion, Mikael (2004) observed that there have been decline in spending on domestic food items and more on non-consumable goods as a result of HIV/AIDS impact on a household member. The author proposed that government should develop a framework and programme to explore food security and ensure to monitoring the trends of the disease as well as changes in the structure of household, especially in areas where there is high HIV/AIDS prevalence. Likewise, a study carried out in South Africa by Booysen and Bachmann (2003) shows that there is a decline in per capita food expenditures of about 20 to 30 per cent in HIV affected household. Also, Gertler, Martinez, Levine, and Bertozzi (2003) using Indonesian family life survey data of about 7200 households, investigates parental mortality on children's well-being. The empirical result predicts about 27 per cent decline in per capital consumption of household that experience adult male mortality in each household.

As a follow up, Kessy *et al.* (2004) utilized primary data of 312 respondents to examine the impact of HIV/AIDS on food security of farmers in Ludewa district of Tanzania. The findings using descriptive statistics and regression analysis shows that HIV/AIDS variable adversely affect the key pillar of food security in the study area. The authors noted that time loss to own sickness, caregiving activities and attending funeral tend to deplete food availability of households. The authors suggested that Government, NGOs and religious bodies should increase their campaign efforts in order to reduce the spread of HIV/AIDS. To them, effort should be made to support and empower affected

households economically.

Agbola, Maylene, Damoense, and Saini (2004), employed demand equation and simulation analysis to estimate the impact of HIV/AIDS on food demand in South Africa economy. The findings show that HIV/AIDS scourge would have a significant impact on selected food items in South Africa. Therefore, it is recommended that government should assist in the provision of coping mechanism for households in response to the HIV/AIDS epidemic, especially for households headed by females. Gillespie and Kadiyala (2005) noted that a common practise among affected HIV/AIDS household is reduction in food expenditure of the households. As well, Mano *et al.* (2006) study of HIV/AIDS impact on food security of 350 households revealed that the illness hampers food security prospect among smaller farm holders in Zimbabwe.

Bukusuba, Kikafunda and Whitehead (2007) carried out a survey on food security status of 144 respondents infected with HIV/AIDS (aged 15-49 years) in the Eastern urban area of Ugandan. The chi-square and correlation results show that the illness through high medical costs has increased the inability of household to secure enough food for members. The study called for government and other concerned bodies to come to the aids of households in the area of combining income-generating activities with food aids so as to reduce the burden of access to food for affected households. Similarly, Mwakalobo's (2007) study of 119 households in Rungwe, Tanzania noted that households that have experienced AIDS mortality reduced expenditure on food when compared with other households and they have the tendency of falling below the poverty line.

In their study in India, Das *et al.* (2007) using probit technique demonstrated that household per capita consumption is not affected by the HIV/AIDS illness in widow and married HIV households. However, welfare loss due to HIV/AIDS for all households

exceeds the annual health expenditure of the country and this constitutes seven per cent of the Gross Domestic Product of that year (2004). In a related development, Alemu and Bezabih (2008) employed multivariate analysis to examine the impact of HIV/AIDS on food security of 1245 households in 12 rural districts in Ethiopia. In contrast to other studies, the result shows that expenditures on medical care and funeral ceremony do not significantly reduce food and non-food expenditures among affected households.

The survey conducted by Masuku and Sithole (2009) among households in Swaziland shows that affected household substitute income meant for food consumption on non-food items such as; medical care, funerals and transportation costs. In addition, Kaschula (2008) noted that there is greater food insecurity among affected HIV/AIDS households than household without HIV/AIDS member. This, the author attributed to inadequate food quantity among household with the illness. With regard to the finding, policies that gear toward reducing short-term safety nets in the ever increasing number of HIV/AIDS among household members were recommended.

Wayne, Laura, and Lori (2009) employed 290 households to evaluate prime-age adult mortality and food security in rural South Africa. The logistic regression result shows that AIDS –related death is associated with declining food security. However, mean number of meal taken by affected households is significantly lower in household with an unexpected non-AIDS death in the previous year. The authors recommended that development and intervention policies aimed at increasing food security in vulnerable household should be undertaken by the government. Along similar lines, Agatha *et al.* (2010) survey of 160 respondents in Kenya revealed that mean expenditures on foods and other basic needs were higher in non-affected HIV/AIDS households as compared to affected households. By implication, household with infected member(s) tend to spend less on food and other basic needs compared to household without an HIV/AIDS

member. Also, the survey carried out by Ofonime (2012) on PLWHAs in Uyo, Nigeria shows that about 56.9 per cent of the participants currently could not afford the variety of food they were consuming before the incidence of the illness.

Akrofi (2012) investigated the frequency and severity of food-related coping behaviours adopted by 80 rural farm households in Ghana. The findings showed that affected farm households were more vulnerable to food insecurity than non-affected farm households. The author noted that, it is essential that concerted efforts are made to improve the general well-being of farm households with HIV and AIDS by empowering rural affected households with access to livelihood assets and finance. Muiruri (2012) empirical study exploits the effect of HIV/AIDS on food security of 383 respondents drawn from HIV/AIDS affected and non-affected households in Makuyu division, Kenya. The finding indicates that a greater number of affected households are food insecure (86.7%) when compared to non-affected household (23.6%). The author suggested that there is the need to expand ART to include nutritional supplement for PLWHAs. Additionally, relevant government and non-governmental organisations should give assistance to affected households in the forms of kind. This, to him, will go a long way in improving their nutrition and food security.

Ayele, Tefera, Fisehaye, and Sibhatu (2012) carried out a cross sectional study on 319 PLWHAs, in order to examine the risk factors associated with food insecurity among adults (> 18 years) presence in ART Centre in Ethiopia. The multivariable logistic regression result shows that inadequate spending on food and nutritional in-take are major problems among infected people on Highly Active Antiretroviral Treatment (HAART). Furthermore, lower household income and educational status were observed to be useful predictors of food insecurity of household. In the same way, Baiyegunhi and Makwangudze (2013) employed linear regression to estimate the impact of home garden

on food security status of 33 affected HIV/AIDS households in Kwaszulu-Natal Province of South Africa. The result shows that majority of the households (96%) are food insecure. Though, home gardening variable is found to be statistically significant in reducing food insecurity of household. However, the food expenditure coefficient was not found to be statistically significant (95%) in predicting food insecurity among household. The authors proposed that government in partnership with other non-governmental commission should scale up its activities and put in place measures that will encourage people involvement in home garden projects. Similarly, Wafula *et al.* (2013) reported high out of pocket expenditures on food intake requirement and funeral costs in household, where the AIDS illness is at advanced stage.

Taking it from the angle of Supplemental Nutrition Assistance Program (SNAP), Hatsu *et al.* (2014) carried out a study on 123 HIV infected SNAP respondents and 52 potentially non SNAP respondents' in the USA. The findings show that less SNAP respondents tend to experience food insecurity when compared with non-SNAP respondents. Also, the result suggests that infected respondents who experience food insecurity tend not to adhere to treatment and therapy when compared to their food secured counterparts. As part of policy suggestion, outreach programmes targeted especially for the needs of PLWHAs should be undertaken by government and all concerned bodies.

Laar *et al.* (2015) employed 1,745 respondents to investigate the negative coping strategies among affected households in the rural and urban areas of Ghana. The result using bivariate analysis demonstrated that HIV/AIDS illness causes households to skip an entire day's meal, reduces food portion sizes, harvest immature crops and beg for a living. A policy focusing on helping HIV-affected households to gradually build up their asset base, or target households care for chronically ill member(s) with conditional household -level support is suggested by the authors. To buttress the above view,

Shyamala (2015) also noted that there is significant increase in food expenditure of affected household (51 per cent) than in non-affected household (37 per cent). However, the average amount spent on food consumption is lower in spite of the food aid allocated to affected households by government and non-governmental organisations.

In a related study of 60 farm households in Niger state of Nigeria, Nmadu and Nwawulu (2015) pointed out that there is substantial difference between the average daily food consumption of affected farm households living below the poverty line and those living above poverty line. This difference is attributed to the extra cost incurred by households in treating member(s) with HIV/AIDS illness and other opportunistic illness.

3.4.3 HIV/AIDS and Health Expenditures

There is a growing literature on increasing health expenditures due to HIV/AIDS impact on household's income and food consumption. As noted by Stover and Bollinger (1999), the HIV/AIDS illness causes diversion of expenditure to non-consumable goods and increases medical expenditure when a household member is affected. In their study of affected households in South Africa, Arndt and Lewis (2000) argued that affected households spend more on health-related goods and the long-run consequence is loss of savings.

Similarly, Sukhontha (2001) study in Thailand indicate that medical expenditures of affected HIV/AIDS household were approximately six months of their annual income. Liere (2002) noted that direct cost of HIV/AIDS to the infected person and household includes medical and transportation costs as well as funeral cost. Equally, Booysen *et al.* (2003) revealed that households spend more on expensive health care drugs in order to keep affected member alive. The ILO (2003) report in India revealed that the average monthly medical expenditures (Rs. 468) of affected household almost double the average

food consumption expenditure (Rs.350) of household. The study pointed out that households tend to reduce expenditures on entertainment and other socio-economics activities for health care cost.

Accordingly, Russel (2004) carried out a study on diseases in developing countries and the result shows that in resource-poor settings, HIV/AIDS and other related illness imposed regressive cost burdens on patients and their families. The cost of HIV/AIDS was estimated to be over 10 per cent of household aggregate income. Based on this, the author called for a broader intervention strategy by government and non-governmental establishments, so as to reduce the significant indirect expense associated with the illness. In the same vein, Hilhorst *et al.* (2004) and Mikael (2004) added that affected household incurred direct cost which comes in the form of increased medical expense and funeral expenditures and decline in food consumption.

Wyss, Hutton, and N'Diekhon (2004) employed 193 infected patients to estimate the economics cost of HIV/AIDS illness at the household levels in Chad. The empirical result suggests that AIDS-related death was estimated as \$836 per individual. Also, health care-related cost (56%) takes more than half of the total expenditure of household, while funeral expenses account for 16 per cent of total outlay. The study called for more innovative strategies that can assist households to cope with the illness. And this, includes strengthening of existing care and treatment centres that render services to HIV/AIDS cases. In the same vein, Naidu and Harris (2006) estimated the cost burden of HIV/AIDS on 113 households (61 with HIV/AIDS and 52 without) in urban Soweto of South Africa. The result suggests that financial expenditures of morbidity and mortality were approximately two to three times higher for affected households as against non-affected households. Also, the finding indicates that the financial costs incurs by all

households from mortality is 15 times greater than the cost experience from other forms of morbidity.

Rosen, Feeley, Connelly, and Simon (2006) carried out a study on HIV/AIDS and the private sector growth using data from 14 parastatal and private companies in Ethiopia, Kenya, South Africa, Uganda and Zambia. The descriptive statistics result indicates that the mean cost per worker that is lost to AIDS related illness ranges from 0.5 to 5.6 times the mean annual compensation for the affected worker. The AIDS-related case increases labour cost for all countries and varies from 6 per cent to 10.8 per cent, but surpassed 3 per cent in only two of the fourteen companies. While the treatment of qualified workers with antiretroviral drugs was estimated at \$360 per employees annually, this was observed to have positive financial returns for most of the companies.

As a follow up, Ashford (2006) explained that employers are mostly affected by the loss of employees to AIDS. As employees are often absent from work, they spend a considerable amount of company revenue to provide health care benefits (including expensive HIV/AIDS drugs) to sick workers and in the event of death, they pay demise benefits to relative of employees. Drawing data from the Kenya National Bureau Survey, the National AIDS Control Council (2006) study of HIV/AIDS impact on households, suggest that only twelve per cent of affected households were able to fund their health care expenditures from their salaries, while approximately fifty eight per cent spend their own savings on health care-related expenses.

In the light of the above, Batteh *et al.* (2008) and Michielsen *et al.* (2008) maintained that affected households spend a greater part of their budget on health care cost and funeral ceremony and little or nothing is left for children education. Mahal *et al.* (2008) also estimated the direct private health cost incurred by infected persons in Oyo and Plateau states of Nigeria to be N36, 065. This is around 56 per cent of the yearly per

capita income of the affected households.

Masuku and Sithole (2009) explore the impact of HIV and AIDS on food security of 847 farm households in Swaziland. The finding using descriptive statistics and vulnerability index suggests that affected households sell assets to finance health care expenditures. The authors demonstrated that there is substitution effect between expenditures on farm inputs and costs of funeral ceremony. Furthermore, the authors suggested that there is need for government assistance in area of food security and production to reduce the household shock to the illness (Masuku and Sithole, 2009). Ghailan *et al.* (2010) reported that the average out of pocket health care cost per individuals in Malaysia is 14.7 per cent of the individual's average annual income. They added that the aggregate HIV/AIDS related expenditures of all households is approximately 0.06 per cent of the country Gross Domestic Product (GDP) as of 2007.

Ojha and Pradhan (2010) applied the two sector neoclassical model and Computable General Equilibrium (CGE), to analyse the impact of HIV/AIDS on the Indian economy. Their finding, like previous studies, revealed that HIV/AIDS increases health cost of both households and government. This results in decline in the savings of both units' which crowds out private and public investments. In a related development, Tham-Agyekum *et al.* (2011) interviewed 25 respondents with HIV/AIDS illness in Accra Ghana and the participants identified increases in health expenditures as a major constraint facing their households. Similarly, Mphumuzi (2011) asserts that HIV/AIDS illness prompt household to divert income to health care expenditures thereby not satisfying the basic immediate wants and needs of members.

In a similar survey, Ofonime's (2012) demonstrated that about 46.5 per cent of the infected respondents spend about N10000 - N15000 (\$67-\$100) on laboratory tests before initial therapy while 22.3 per cent spend about \$33 on HIV-related drugs and

medications. The respondents admitted that the amount spent on health care is having negative impact on the household's welfare (Ofonime, 2012). Like in other studies, Natalia *et al.* (2014) observed that most affected HIV/AIDS participants spend less on health treatment because some health expenditure like antiretroviral drugs are supplemented by the government.

In India, Shyamala (2015) study shows that medical expenditures incurred by affected household account for 50 – 80 per cent of the family annual income. This is approximately five times greater than the expenditures incurred for all members of household without HIV. Nmadu and Nwawulu (2015) also evaluate the impact of HIV/AIDS on rural farm households using 60 farmers in five communities in Shiroro LGA of Niger State. The result suggested that medical expenditures increase by 30 per cent in affected household, while household income dropped by 30 per cent. In view of this, government is advised to support farm households in the areas of good access to roads and modern farm equipment. This phenomenon encourages commercialisation (Nmadu & Nwawulu, 2015).

3.4.4 Impact of HIV/AIDS on Labour Supply and Food Production

The impacts of HIV/AIDS on labour supply and productivities are most instant, since in this subsector, there are generally few opportunities for substituting a declining labour supply with capital. Basically, the impact of HIV/AIDS on household income and food expenditure starts with its effect on labour supply and food production of the households. Foster (1993) noted that when a house head is affected with HIV, they depend on female labour for important agricultural duties such as cultivation, fertilizing and weeding, the resultant effect is decline in agricultural production as women take time in caring for sick members. Ching'ambo (1995) survey on selected agricultural organizations reveals that

HIV/AIDS increases the number of absenteeism and deaths among management teams. Contributing to the discussion, Kwaramba (1997) study in Zimbabwe - a nation with adult prevalence rate of above 25 per cent shows that about 50 per cent of agricultural productions of farmers have been on the decline in affected HIV/AIDS household.

Tibaijuka (1997) carried out a study of 220 affected HIV/AIDS households in Kagabiro village, Muleba in Tanzania. The descriptive statistics outcome revealed that the epidemic has an adverse effect on household and community welfares, as considerable output are foregone when labour input is reallocated to care and mourn for the death. Similarly, the affected household faces diminishing farm productivities as working capital and asset are sold to foot medical bills. To bring the illness under control, the study suggested that, there should be careful research into community based strategies which help foster new social ethnics in the society (Tibaijuka, 1997). Also, Mutangadura *et al.* (1999) noted that, there will be less crops and land cultivated, fewer cattle and other domestic animals among farm households affected with HIV/AIDS in Namibia.

Ncube (1999) did an interesting study on the impact of HIV/AIDS on agricultural production in Zimbabwe. He noted that the death of an income earner can cause decrease in inputs purchases and selling of power machine and other farm implements so as to cover medical expenses and funeral costs. The author noted that if these adjustments prove inadequate, the affected households will cut crop cultivation, particularly in outlying fields. The studies of Kabir, Rahman, Salway, and Pryer (2000), Nkurunziza and Rakodi (2005) show that HIV/AIDS is one of the most common shocks that struck impoverished setting households. These authors pointed out that the infected person, experience productivity loss resulting from depression, stress and eventually death initiated by the AIDS illness. They pointed out too that the household faces further loss of human capital as labour is expended for caregiving activities of the infected household

member/s (Nkurunziza and Rakodi, 2005).

Again, the findings of Yamano *et al.* (2002) in Kenya, suggest that affected households headed by female experience outsized decline in area of land cultivated, while death of adult male member of the households adversely affect cash crop production. In the light of the above, Beegle (2003) stressed that there is little that is known about the impacts of adult mortality among African households. The study utilized panel data on the Tanzania economy to investigate how adult deaths impinge on time allotment of surviving members of HIV/AIDS households and the portfolio of farming behavior of household. In contrary to other findings, the study shows that the chore hours and farm activities across different groups have little and insignificant impact on labour supply of persons in different households experiencing adult mortality.

As pointed out by Katahoire (2004), HIV/AIDS adversely impact on workers' performance through leave of absence, poor teaching performance, and loss of skilled workers. To support this view, Katahoire study in Moi University in Kenya and Jomo Kenyatta University indicate that infected staff members are temperamental, withdraw themselves from peers groups, involved in heavy drinking and demonstrated poor health condition. This in turn results into increase in absenteeism and decline in productivity of the staff. While other staff bore the burden of covering for ill or deceased colleagues, in most instances, some find themselves in areas that are less qualified, experienced or suitably for (Katahoire, 2004). Wyss *et al.* (2004) studies in Chad show that productivity loss due to HIV/AIDS illness constitute approximately 28 per cent of total costs incurred by the affected households.

By and large, Kessy *et al.* (2004) noted that affected households experience decline in labour supply and productivity when other non-affected members spend time visiting and attending to the sick person, take time to attend mourning and funeral ceremonies of

AIDS death members. These activities reduce the time each active member spends in participating in farming activities of the households. Another interesting survey was carried out by Fox *et al.* (2004). The researchers utilized longitudinal regression to estimate the effect of HIV/AIDS on individual labour productivity of 54 workers in Western Kenya. They found out that HIV/AIDS employees harvested less tea within the last eighteen months preceding HIV/AIDS termination period and take more leave within the three years prior to termination. Further, they opined that, increase in absentee and output decline can jeopardize the chances of sick workers who often lose their jobs and eventually impose financial encumbers on their employers. Similarly, Muwanga (2004) and Whiteside *et al.* (2006) studies in Swaziland advanced that absenteeism due to HIV/AIDS illness accounts for 118.32 man-hour loss per employees annually in the manufacturing sector, 56.64 man-hour loss in transport sector, 59.04 man-hour loss in service sector and 87.84 man-hours loss in private small farms. The authors agreed that the man-hours loss negatively influence productivity and profitability of businesses and farms in the country.

Consistent with other studies, Daudu, Okwu, and Shaibu (2006) carried out a study of HIV/AIDS impact on farm families in Benue State, using 100 respondents comprising 50 affected households and 50 unaffected households. The Chi-Square result shows that, HIV/AIDS has adverse impact on farmer's productivity, income and standard of living of the affected families. The authors suggested that educating the rural households should be undertaken by all concerns bodies in order to prevent and minimise the danger of HIV/AIDS spread among the populace. Similarly, evidence abound that, in Kenya, there is decline in time spent in agricultural activities in household where there is HIV/AIDS sick members compared to non-affected households (NACC, 2006). The report identified the implications of the scourge on households to be neglect of farm lands and decline in

general planted areas (NACC, 2006).

Bekele's (2007) carried out a survey of 745 respondents in three Weredas areas in Ethiopia and the outcome indicates that HIV/AIDS adversely affects the active work force and agricultural production of farmers. The author pointed out that the traditional family ties may force many to provide for the needs of diseased families and in turn decrease their own financial resources. The author proposed that poverty reduction strategies as embarked by the government should incorporate issues of HIV/AIDS-related cases. In line with other works, Bukusuba, *et al* (2007) cross sectional data of 177 HIV affected household in Ugandan shows that HIV morbidity and AIDS mortality leads to continuous decline in productivity of the affected household. Alemu and Bezabih (2008) also noted that the HIV/AIDS illness leads to mortality of age group 15-54 years and in turn shortage of manpower supply to different key sectors of the society.

Considering it from the angle of migration, HIV/AIDS and food security in Southern and Eastern Africa (SEA), Crush, Grant, and Frayne (2007) findings suggest that the scourge is bringing about new dimensions of migration, as migrants with HIV/AIDS returned to rural areas while children migrate for greener pasture. Thus, migrant-effect does not only lead to fall in remittances, but increases the cost burden of rural households. In turn, food production in rural areas meant for urban household members is adversely affected as more rural farmers and producers get infected with HIV. On the other hand, Mason *et al* (2007) utilized longitudinal data of 7000 small and medium scale farm households to investigate the impact of HIV/AIDS on rural livelihoods in Zambia. The regression result suggests that HIV/AIDS illness has little or no effect on rural farm production of household. The study suggests that government, NGOs and donors should continue to invest in HIV/AIDS mitigation strategies and rural development program in order to boost resilient household livelihood strategies.

The work of Kuyponiyi (2008) on 192 PLWHAs in Osun state confirmed that there is loss of manpower, psychological depression and death of household members due to HIV/AIDS illness. He therefore recommended that governmental bodies, agricultural extension agents and Non-governmental Organizations (NGOs) should invest massively in public education in order to either reduce the spreads of the epidemic or eliminate it totally. Also, Nguthi and Niehof (2008) explore the effect of HIV/AIDS illness on livelihoods of 254 households (179 non affected and 75 HIV/AIDS affected) in Maragua district in Central Kenya. The study found out that most affected HIV/AIDS households are headed by female who have significantly higher dependency ratio. Similarly, it finds that the household experience labour dearth in spite of their large household size. A greater number of the households with HIV/AIDS have stopped growing labour intensive cash crops and have shifted to cultivating food crops. In the same vein, management in cash crop farming has reduced among the survey households (Nguthi & Niehof, 2008).

A survey of 482 infected HIV/AIDS persons and a random control group of 6400 persons was carried out by Mahal, Canning, Odumosu and Okonkwo's (2008) in Oyo and Plateau States of Nigeria. The findings revealed that the HIV/AIDS illness is associated with considerably loss of work time, rising morbidity rate, increase utilization of public health facilities as well as loss of time for care giving by household members. The findings suggested that, government and non-governmental establishments should assist in the area of increasing household access to income generating activity, especially for infected individuals.

Adeoti and Adeoti (2008) applied the Cobb Douglas production function to analyse the impact of HIV/AIDS on cropping patterns and technical efficiency of 155 farmers in two LGAs in Benue state, Nigeria. The outcomes revealed that there is decline in farm size and variety of crops cultivated by HIV farm household. However, increasing the years of

schooling among households with and without HIV/AIDS diminishes the technical inefficiencies among the subgroup. Similarly, Masuku and Sithole (2009) reported that households that experience HIV morbidity and AIDS mortality are faced with labour shortage and decline in crop and food production.

Ugwu (2009) employed descriptive statistic to study the impact of HIV/AIDS on 120 women farmers (60 infected and 60 not infected with HIV/AIDS) in Enugu state, Nigeria. The results show that agricultural output was significantly reduced due to HIV/AIDS infection of feminine labour. The author recommended that there is the need for a gender based paradigm for agricultural development and rural growth in Nigeria. Ulimwengu (2009) investigated the nexus between farmers' health status and agricultural production using 1500 households in rural Ethiopia. Drawing from household's production model and regression analysis, the result confirms adverse effects of ill-health on agricultural efficiency, production and health of farmers. It was also observed that affected households tend to allocate less time to input application. The author recommended that government should embark on policies that will not only increase farmer's health status but agricultural productivities and poverty reduction.

Ghailan *et al.* (2010) survey on 297 patients on the economic cost of HIV/AIDS from the household's perspective in Malaysia showed that productivity loss as a result of inability to work and absenteeism by respondents were stated to be RM10, 800 and RM900 respectively. They recommended that there should be adequate resource allocation to control and manage HIV/AIDS. To them, there should also be more investments made on home-care training in order to help households support themselves without endangering their wellbeing and the future of other members. Employing the Maximum Likelihood Estimates (MLE) technique, Oyekale and Adeoti (2010), surveyed 515 farmers in five states (Cross River, Ogun, Oyo, Lagos and Ebonyi) in Nigeria. The result shows that the

average economic efficiency for farmers from household with HIV was lower than that of farmers from household without the disease. Also, the number of household member contributing to home income reduces drastically due to HIV morbidity and AIDS mortality. The authors proposed the need for Nigerian government, corporate organisation, NGO and international bodies to provide aids in form of financial assistance for household suffering for the HIV/AIDS illness.

In Cameroon, the National AIDS Control Committee report (2010) states that there is significant loss of skilled health workers, teachers, technical and professional workers, while greater absenteeism exist among teachers and more increases in the demand for qualified health professionals due to HIV/AIDS-related illness. The report stated that the illness is associated with increased production cost among enterprises as employers tend to provide treatment and care for their sick employees (NACC, 2010). In southeast Nigeria, Iheke, Okezie, and Onyekanma (2011) worked on HIV/AIDS impact on farm productivity of 120 households in six LGAs of Abia state. The findings using descriptive statistics and stochastic frontier revealed that farm households regardless of their HIV/AIDS status were grossly inefficient. With respect to farm production, the chow test established that HIV/AIDS negatively impact on affected household than households without infected individual. The study advocated for adequate facilities and equipment for local health centers so as to increase access to ART centres and reduce time spend in caregiving activities by other non-infected household member(s).

A study on the impact of HIV/AIDS on farm productivity of 110 Households with and without HIV/AIDS in Abia state of Nigeria was carried out by Okezie *et al.* (2011). Adopting Cobb Douglas production function, vulnerability index and ordinary least square regression technique, the authors demonstrated that education of household head, labour and farm size significantly and positively impact on agricultural productivity of

both households. However, access to credit facilities has positive effect on the productivity of household with HIV but negative impact on household without HIV/AIDS. The policy suggestion is that, government should provide the basic infrastructural facilities and equipments to Primary Health Care Centre's (PHC) for proper functioning as well as review agricultural extension policy to make it more useful to changing rural environment. Likewise, Simwaka (2011), using panel data of 2431 household with and without HIV/AIDS investigated the economic impact of adult morbidity and mortality on farm households in Malawi. The multinomial logistic result suggests that the average efficiency levels for households with and without HIV/AIDS are not statistically different.

Supporting other studies, Tham-Agyekum *et al.* (2011) employed 25 respondents to investigate the perceived effects of HIV/AIDS illness on fishing-related livelihoods in three fishing communities in Accra region of Ghana. The descriptive statistics and Chi-Square results show that HIV morbidity and AIDS mortality lead to labour loss, decline in time allocated for productive activities, reduction in production, and rise in food insecurity among respondents. The study suggested that HIV/AIDS awareness and education programmes should be intensified. Likewise people should be faithful to their spouse and abstain from sexual relationship with non-regular partners. Throwing more light on the debate, Dorward and Mwale (2011) employed farm household model using Stone Geary utility function with a linear expenditure system to estimate the impact of HIV/AIDS morbidity and mortality in Malawi economy using 153 affected household. The result revealed that, households directly affected by HIV/AIDS will experience labour shortages, decline in farm incomes as well experience increases in cash constraints. In turn, these further depressed labour productivity and foster the increase in the demand for non-tradable goods in rural communities that face high HIV/AIDS

incidence.

The study carried out in South Africa by Levinsohn, Shisana, McLaren, and Zuma (2011) using control function theory and logit regression technique, revealed that being HIV-positive is associated with a six to seven per cent - point increase in the likelihood of being unemployed. Also, the findings suggested that South Africans with less than high school education are ten to eleven per cent more likely to be unemployed if they are HIV positive. Again, Saliu, Adejoh, and Orisagbemi (2010) examined HIV/AIDS and farmers perception using a sample size of 160 respondents in Dekina Local Government of Kogi state, Nigeria. Using regression techniques, the result suggests that the illness adversely affects farmer's health and productivity in the locality. Similarly, the report indicate that about twenty per cent of the extension workers asserted that infected farmers adversely affect their work delivery service in some ways. The study recommended that government should provide every village with a comprehensive health care centre that will provide free HIV/AIDS treatment and drugs to patients. Similarly, there is the need for capacity building for agricultural extension workers; this will assist in disseminating information on HIV/AIDS illness to farmers (Saliu *et al.*, 2010).

Alemayehu and Aregay (2012) survey of 307 PLWHAs in Ethiopia shows that the HIV/AIDS is having adverse impact on labour force participation rate as most participants are government employees, petty traders, daily labourers, housewife, farmers and those employed in the private sectors. According to Iya *et al.* (2012), household affected with HIV/AIDS experiences man hour loss and food production decline emanating from infected adult member(s) and care giver activities of other active household's member/s. Fox (2012) added that considerable loss of productive labour and investments are recorded in organisations due to HIV/AIDS. In the study of HIV/AIDS and food security programmes in South Africa, the author recall that AIDS has led to

drain of manpower resources and expertise in organisations (Fox, 2012).

Manyumwa, Baars, and Kingma (2012) explore the impact of HIV/AIDS on welfare and food production of 16 households affected with HIV/AIDS in Zvishavane District, Zimbabwe. The finding shows that there was decline in crop production among the sampled households. The result also reveals that there is a direct correlation between crop production, quantities harvested, and female head of households. Similarly, there were higher quantities of crops harvested in affected households headed by females with no death records but caring for orphans than in affected households headed by males with AIDS death record cases. The study called for support for crop production, especially one in which affected households is familiar with and to strengthen community initiative of switching with selected crops to meet up with their food requests.

Following the foregoing discussion, Musinguzi's (2012) work on HIV/AIDS impact on food production in Bushanyi district, Uganda shows that people who die through AIDS are mostly between ages 15-65. The mortality of young productive household members reduces household labour supply and productive capacity. It is suggested that government should enact policies that will help household manage HIV/AIDS illness in the long term. In South Africa, Ngepah (2012) employed the basic production function and exploratory analysis to estimate the nexus between health and production. The outcome reveals that there is a negative and significant interaction between HIV incidence and productivity of the respondents. In fact, a per cent increase in HIV incidence decreases the effect of life expectancy on productivity by a certain percentage. Similarly, gender comparisons offer that HIV incidence decreases the effect of female life expectancy on productivity than the male. This finding, however, suggested that females are more susceptible to die of AIDS-related illness than males. As part of policy recommendation, Ngepah called for joint macroeconomic decision on improving health and growth related parameters.

Wafula, Kaseje, Ochieng, and Were (2013) employed 200 HIV respondents to assess the economic impact of HIV/AIDS on rural households in Suba region, Kenya. The result shows that affected household experiences labour shortage due to drop out from work by sick member, especially when the illness progress to more severe phases. Supporting the above view, Kerina, Babill, and Muller (2013) explained that approximately 23 per cent of the agricultural sector total labour force has been lost to the AIDS epidemic in Zimbabwe. As a result, scarcity of farm inputs, low capitalisation level and poor irrigation system have made the agricultural sector to witness negative growth rate of about 8 per cent over the past decades.

From the point of view of farm input support programme, Ng'ambi, Baars, and Kingma (2013) did a qualitative study of 20 households (10 with HIV/AIDS chronically sick members and 10 with AIDS related mortality) in Kaputa District, Zambia. The finding indicates that farmer input support programme has no effect on farm production of affected households in Kaputa District. For this reason, the study identified several factors responsible for the ineffectiveness and inaccessibility of the programme. These include: increasing health care cost relating to HIV morbidity and AIDS mortality, stigmatization, decline in labour supply due to loss of productive adult members and increased workloads of women who work in the farm and act as caregiver of ill members. As part of policy recommendation, the strengthening of local seeds systems and providing alternative low price soil fertility machineries for affected households is highly crucial.

Following the work of Ulimwengu (2010), Iheke and Ukaegbu (2015) examined the effect of ill-health on total factor productivity of 72 farmers in two Local Government Areas in Abia state, Nigeria. The OLS regression results indicate that capital, days of ill-health, experience, age, farm size, sex, and extension visits have significant impact on

total factor productivity of farmers. The study therefore called for policies that will encourage and assist in training of farmers in area of reducing risk and curbing infections. In a related study carried out in Swaziland, Masuku, Kibirige, and Singh (2015) explained that rising cost of financing funerals, medical care and other health-related bills tend to diminish investment in agricultural inputs and other related agricultural activities. This has led to decline in farm productivity and rise in food insecurity. This study called for support for susceptible households, especially in areas of easy access to agricultural inputs at reasonable prices and the need for home-based care particularly for chronically sick HIV/AIDS persons.

Mbaeh, Wafula, Munyi, and Njoroge (2015) explore the impacts of HIV/AIDS on productivity of 43 employees' drawn from fifteen hotels in Kenya's North Coast. The descriptive statistics result showed that 9 employees have been lost to AIDS death, 23 (77%) have been absent from work due to HIV/AIDS illness, while 6 (20%) of the respondents admitted that they experienced turnover decline due to the scourge. The authors advocated that management should develop strategies that will motivate employees to raise their esteem so as to increase productivity.

3.4.5. Impact of HIV/AIDS on Households Savings

When HIV/AIDS affect household's man hour labour and income, there is the propensity that the savings of households tend to decline so as to augment the purchase of health-related drugs for sick member. This view is buttressed by Menon *et al.* (1998) on the economic impact of adult mortality on households in Rakai District in Uganda. The findings advance that households experiencing HIV/AIDS –related death losses savings and were prompt to dispose their properties in order to generate income to pay for health care cost and funeral expenses. Similarly, a survey of 68 households in Benin was

conducted by UNDP (1998). The report shows that there is 84 per cent fall in savings for families who have one of their member engaged in the formal sector and has died of HIV/AIDS (Bollinger, Stover, & Martin-Correa, 1999).

Foster and Williamson (2000) and Oni *et al.* (2001) posited that HIV/AIDS-related morbidity and mortality stand to increase household borrowings and reduce household savings in the face of declining household income and high health expenditures. As well, several studies of affected households in Cambodia and Thailand show that on the average 57 per cent of the respondents in latter utilized their personal savings for medical care of infected members, while in the former, on the average, 29 per cent of the respondents uses their savings for the same purpose (Bonnard, 2002; Donahue *et al.*, 2001; Yamano & Jayne, 2002).

Cohen's (2002) study in SSA countries shows that the HIV/AIDS illness is eroding household saving- capacity through its direct impacts on the income flows and expenditure levels of the affected households. Hilhorst *et al.* (2004) argued that about one fifth of household affected with the HIV/AIDS illness are reducing their investment in farming related activities and this is inimical to future earnings and production capacity of the households. The authors noted that diversion of investments and savings into upkeep and funerals ceremony have adverse effect on economic progress of households, communities and the state.

Arrehag, Durevall, Sjöblom and De Vylder (2006) noted that there are numerous ways that HIV/AIDS illness can impact on capital accumulation. One effect is tied to increased adult mortality which reduces the probability of survival and the expected pay-off from saving and investment. Another effect is from families exposed to HIV/AIDS who have to run down their savings as income decreases and expenses rise. Furthermore, there is the private sector effect, where the illness reduces investment by increasing the cost of

production. This in turn diminishes current and expected profits, likewise the public sector, where it negatively affects the available resources for public investment (Arrehag *et al.*, 2006).

Masanjala (2006) carried out a study relating to the nexus between HIV/AIDS and poverty level in Africa. The author argued that AIDS epidemic undermines household's capacity to survive by stripping off the household of its livelihood assets. This is done through dissaving or disinvestment, thereby pushing a household into portfolios with less variety, smaller returns and higher probability of livelihood collapse. Collins and Leibbrandt (2007) noted that HIV/AIDS effect is so enormous that, it dictates household savings and insurance policies of affected families in South Africa. Faisal (2008) reported that HIV/AIDS illness reduces the capacity to save in affected households. Following this, Ugwu (2009) noted that the illness depleted savings of household, especially female headed family. Lastly, one report admitted that the scourge has an adverse effect on savings of affected household in Nigeria (Iya *et al.*, 2012).

3.4.6. Impact of HIV/AIDS on Children Welfare

The category of people that face the burden of HIV/AIDS most especially when the household head is affected or any adult member of the family is the children. According to Stover and Bollinger (1999), children in affected household tend to stop schooling due to financial constraint or loss of their parent. According to this study, 56 children (26 per cent) out of a total of 215 children are forced to drop out of school in a survey of 49 HIV/AIDS affected household (Stover & Bollinger, 1999). Likewise, Harvey (1991) study shows that 42 per cent of children from 116 HIV/AIDS affected household in Zambia have stopped going to school. Similarly, children whose parents are affected with HIV/AIDS related illnesses are prone to become caregivers, thereby leaving schools due

to poor attendance or drop out. One consequence of this is the malnourishment of the children from the affected household (Baggaley & Needham, 1997).

Foster and Williamson (2000) argued that one of the noticeable economic effects of HIV/AIDS is the rise in the number of children labour, especially those as young as five years. The authors opined that child labour occurs when parent become sick and too weak to work. It also occurs when children become orphan. In this way, the work load on orphans might be more when compared with non-orphans in the same household size. Thus, for adolescents to generate income, they may leave their orphan home to seek for work. In this process, some girls become commercial sex workers, while others get married at an early age so as to meet the needs of their siblings (Foster & Williamson, 2000).

The study by Mutangadura (2000) on 215 households in Zimbabwe shows that 27 respondents (13 per cent) admitted that their children could not attend school after the AIDS resultant death of the adult female. From the analysis, it was observed that lack of money was the major cause of children absenteeism and dropout of school. Furthermore, related foster parents and grandparents become household head in home where child/children drop out of school after the mortality of the mother (Mutangadura, 2000). In addition, Namposya (2000) survey of 223 urban and 101 rural households in Zambia revealed that the death of adult member of the households forces the household member to withdraw older children from school in order to help maintain the current level of food production.

Cohen (2002) and Gaigbe-Togbe and Weinberger (2004) argued that children whose one or both parent are ill are withdrawn from school to care for sick parents or for financial purposes. Similarly, the authors added that grandparents act as surrogate parents to help

in caregiving activities of their grandchildren. Also, ILO report (2003) in India indicates that nearly 17 per cent of children in affected households are involved in some forms of petty jobs in order to fulfil the increasingly financial demand of the households. The study noted that this act might increase child or underage labour in India and other worst hit countries in the globe.

In a related development, Richter (2004), Nkurunziza and Rakodi (2005) explained that there is decrease in school attendance of children in HIV/AIDS affected household as children labour is needed for subsistence activities, when household income fall and health care cost increases. Thus, the money reserved for school payments is utilized for basic necessities such as food stuff, health services and medications. Also, the authors admit that the phenomenon of stigmatisation tend to prompt children from affected household to stay away from school, instead of enduring exclusion or being ridicule by peers and teachers. A survey in Zambia, for instance, indicates that 68 per cent of orphaned children in urban areas were not enrolled in school, compared to 75 per cent of children from non-orphaned homes (Richter, 2004).

Taking their study from the nutritional status of children, Kikafunda and Namusoke (2006) compared HIV/AIDS orphaned (below 10 years) residing with elderly relatives (100 respondents) with non-orphaned children dwelling with both parents (50 respondents) in Rakai district, Uganda. The findings suggest that there is high level of malnutrition that exist among AIDS orphaned children, as about 47 per cent of them were found to be underweight. The level of underweight as depicted by the result was significantly higher ($p < 0.05$) than the value (28%) recorded among children with both parents. The authors advised for more increase in the support and care for orphaned children as well as their elderly relatives.

In line with extant studies, the UNAIDS report (2006) stated that children from affected

HIV/AIDS household may be forced to abandon their education. Even in some cases, young women may be forced to turn to commercial sex workers. The negative effect is higher risk of HIV transmission, which further exacerbates the initiate situation. To buttress these views, Kaschula (2008) added that, in some cases child labour was utilized to augment adult labour shortages in order to generate income for the household.

Contrary to other findings, Markus *et al.* (2009) study using longitudinal data from Kenya national Bureau of Statistics points out that weekly hour of children attending school was raised by twenty per cent within six month after the initial treatment of the adult person of the households. The study also observed a weak result regarding young children that experience short-term nutritional status which later improves. The authors therefore called for more measures and policies that will help improve the health status of adult members in the districts. Similarly, Ugwu (2009) opined that reduction in family income among women in the agricultural sector will cause withdrawal of children especially girls from schools.

Apata *et al.* (2010) study on 320 households in Benue state, Nigeria, noted that about 21.82 per cent of children between the age of fourteen and below have assumes the role of parent since they have lost either of their parent or both parents to HIV/AIDS. Contributing to the debate, Tibaijuka (1997) and Tham-Agyekum *et al.* (2011) noted that the epidemic has increased the number of dependency ratio in affected households. According to UNICEF report (2011), one in every 4 children in Zimbabwe has lost either one or both parents to HIV/AIDS or other related causes. As a follow up, Kerina *et al.* (2013) noted that about 20 per cent of children in Zimbabwe have lost one or both parent to the epidemic. The study also indicated that the illness has brought about a new form of social costs in the form of orphaning for the household and the state, a condition where grandparent manage to care for the orphans left behinds by their parents.

Furthermore, Wafula *et al.* (2013) study in Kenya observed that school absenteeism was high among affected families with AIDS members than in HIV households. Conclusively, Gubwe *et al.* (2015) survey of 270 pupils from Dikwindi primary school in Zimbabwe shows that HIVAIDS illness is the major source of child-headed households in the country.

3.4.7 Coping Strategies of Affected Households

The impact of HIV/AIDS illness on households has driven several families to adopt diverse survival coping strategies. The works of Tibaijuka (1997) in Kagabiro Tanzania and Rugalema (1998) in Buhaya, Tanzania, show that affected households facing insufficient income to buy foodstuffs, pay medical bills, foot educational costs and funeral expenses often respond to the crises by selling assets. Mutangadura (2000) conducted a survey of 215 households to investigate household welfare and adult female mortality in Manicaland province of Zimbabwe. The result suggests that 24 per cent of the surveyed household reported that they have sold an asset in order to cope with the mortality of an adult female. The most frequently sold items are televisions, wardrobe, cattle, furniture, goats, clothes and poultry. On the contrary, 19 per cent of the surveyed households admitted that they have gained asset due to the death of an adult female. The foremost reasons for gaining asset were attributed to inheritance by the surviving offspring. Answer is through forceful marriage, a scenario where the husband is forced to pay the bride price of the spouse which he has not initially done.

Mutangadura (2000) also opined that the dominant coping response in household includes receiving remittances from relatives, agriculture activities, subletting, and migration to other regions in search of job opportunities, cross border trade, child labour and informal business activities. In their review, Desmond, Michael and Gow (2000) identified several forms of coping strategies which are common among HIV/AIDS

households in Africa. These include: receiving assistance or remittance from relatives and friends, altering the household composition, selling of assets and withdrawing of savings. However, they added that these surviving strategies are more likely to bring about unanticipated medium and long-term economic shocks to the households.

According to Oni *et al.* (2001), the coping strategies adopted by household to augment income include: petty trading especially in agricultural products, selling of second-hand made dress and clothes, borrowing, buying of food from relative and friends, withdrawing children from schools so that they can assist in caregiving activities of sick member, reducing farm size and activities, joining religious support groups and selling of assets. One report reveals that affected household in India cope with the impact of the scourge by selling assets and borrowing from relatives and friends. This phenomenon increases the debt burden of an average family to the tune of Rs.4,818 (ILO, 2003).

Booyesen *et al.* (2004) and Russel (2004) asserted that household tends to reallocate tasks of the sick member to other members to cope with the HIV/AIDS impact on household. Similarly, the authors noted that households borrowed money to pay for medical expenditures or to replace lost earning / income. To support this assertion, Kessy, *et al.* (2004), Casale (2005) and Ganyaza-Twalo and Seager (2005) noted that expenditures on the illness and funeral rites force households to sell some of their productive assets. This results in decline in investment in agricultural production, and leads to drop in food availability. Slater and Wiggins (2005) identified financial resources and savings as the first asset to be depleted by the AIDS illness. Thereafter, non-productive assets such as clothes, fridge, furniture, cooking utensils follow. The final asset to be sold includes productive assets such as land, draught animals and tools.

Quite a number of studies carried out in Malawi by Mather *et al.* (2004) and Arrehag *et al.* (2006) indicate that assets sale by households is a short-term effects of reducing adult

AIDS death and other shocks. However, in the medium and long-term, the use of asset depletion (such as sale of productive assets) as coping strategy might lead to adverse consequences. The negative effects of asset sales includes; increasing households' susceptibility to income shocks or decreasing households' utilization of cash input in crop farming (Arrehag *et al.*, 2006).

In the light of the above, Jayne, Villarreal, Pingali, and Hemrich (2005) report that AIDS will increasingly de-capitalized highly affected rural areas, by means of loss of household's assets and savings. Therefore, the authors pointed out that the most effective means for agricultural policy to respond to HIV/AIDS will entail stepping up support for technological development and crop market development in order to improve the agricultural sector's potential to raise living standards in highly affected rural communities. The study carried out in Kenya by NACC (2006) indicates that the most common coping strategies employed by affected households includes intra-family labour substitution, assets sales, withdrawing children from schools, borrowing money from relatives and friends, use of past savings and sending children to reside with relatives. Similarly, in southwest Nigeria, Adeyemi (2007) examines HIV/AIDS and family support systems using 188 PLWHAs in Lagos state. The finding revealed that infected individuals sell assets or borrow to cope with the impact of the illness. The study recommended that the PLWHAs should be empowered economically with adequate medical drugs and kits so as to reduce the burden of the illness on their households

As stated by Alemu and Bezabih (2008) and Iya *et al.* (2012), most households sell assets to reduce the burden of HIV/AIDS illness on their welfare. Nguthi and Niehof (2008) argued that affected households do not sell their land asset to meet medical cost and school fees. They rather use savings or sell livestock for such purposes. Wayne and Lori's (2009) empirical study shows that 13 per cent of the 290 families surveyed were

engaged in three forms of food shortage as coping strategies. These include: asking for food from neighbours, consume food they do not enjoyed and skipped meals per day. Ugwu (2009) opined that the death of female head of household in agricultural community gives rise to malnutrition, food insecurity and poverty. This further prompted the remaining surviving members to resort to selling of family assets.

In support of the above, Apata *et al.* (2010) noted that one of the coping strategies adopted by affected household is to sell asset and properties to support shortfalls of farm income. To buttress this view, Agatha *et al.* (2010) assert that affected HIV/AIDS households sell assets to settle medical bill, school fees, funeral expenses and food purchase. Simwaka (2011) survey of households in Malawi shows that the leading coping strategies adopted by affected and non-affected households include purchasing food from the market followed by using casual labour, eating of unripe crop before harvest, getting food from friends and relatives, and involving in irrigation farming.

In a related study of financial and other material aids allocated to affected households, Baidoo *et al.* (2012) descriptive results obtained from 47 HIV/AIDS affected respondents in Accra and Kumasi metropolis, shows that 59.1 per cent of the participants received supports such as finance, foods, medications, cloths and shelter from close relatives, friends, NGOs and philanthropists. However, about 40.9 per cent of the respondents stated that they depend on their own efforts to finance health care costs. Also, Ofonime (2012) finding shows that about 80.8 per cent support received by PLWHAs comes from family members. Similarly to cope with the illness, respondents (60.7 %) sell assets and borrow money from relatives and friends. Furthermore, the outcome suggests that there is a significant relationship between borrowing/selling of assets and the number of children the respondents have. Particularly, borrowing is observed to be high among those with five to six children and least among those without children (Ofonime, 2012).

As a following up, Manyumwa *et al.* (2012), Ng'ambi *et al.* (2013) and Laar *et al.* (2014) studies in Zimbabwe, Zambia and Ghana identified several coping strategies adopted by affected households to mitigate HIV/AIDS impact. These include: reduction in households basic essential items, decline in purchase of farm inputs, receiving remittances from relatives, withdrawal of children from school to assist in wage labour and care giving activities, sale of physical and productive assets, taking of loans from corporative societies, labour reallocation, eat low quality and less nutritious food, reducing the number of meals taken per day, consumption of wild vegetables, reducing the hectares of land cultivated for farm production and shifting from farming activities to non-farming activities.

Accordingly, Wafula *et al.* (2013), Natalia *et al.* (2014) and Shyamala (2015) assert that affected households tend to sell assets to foot medical and other related expenses. This exposes the households to unplanned poverty. Kissi-Abrokwah *et al* (2015) study in Ghana identify the following coping strategies adopted by PLWHAs to include: receiving financial support from friends, relatives, NGO and religious bodies. Also, counselling, acceptance and empathy from health and NGO personnel, relative and friends help the respondents to cope with the stigmatization and discrimination problems.

Thus far, this section has addressed some pertinent issues relating to the impact of HIV/AIDS on household income, food expenditure, labour productivities, production, children welfare and coping strategies both at the local and global levels. The next section presents a summary of selected studies in a tabular form.

Table 3.1: Summary of Selected Literatures done in Nigeria

Authors & Countries	Studies Objective	Theories, data utilized & Estimation Technique	Dependent Variables utilized	Independent Variables employed in the model	Findings	Literature Gaps
Adeoti & Adeoti (2008). Two LGs in Benue state (Nigeria)	To analyse the impact of HIV/AIDS on cropping patterns & technical efficiency of farmers	Cobb Douglas production function. Primary data of 155 farm Hh. Descriptive statistics, analysis of Variance.	Farm outputs of farmers	Farm size, family labour, hired labour, fertilizers, other costs, age, educational levels, years of farming.	There is decline in both farm size and variety of crops cultivated by HIV farm Hh.	Qualitative in nature. Focus on HIV/AIDS impact on agricultural production only. Restricted to two LGAs. Location: North Central region of Nigeria. Estimation technique: Analysis of variance (ANOVA)
Ugwu, (2009). Enugu state, Nigeria.	To examine and determine the impact of HIV/AIDS on farm women	Primary data. 120 farm workers. Descriptive statistics	NA	NA	HIV/AIDS leads to loss of feminine labour supply, decline in income and agricultural production similarly loss of assets	Qualitative in nature. Restricted to female labour supply and productivities. Location: Rural area in Enugu state, South East Region. Estimation technique: Descriptive statistics
Odoemelam (2011). Abia state, Nigeria.	To investigate the effect of HIV/AIDS on productivity and welfare of women farmers.	150 Respondents. Descriptive and inferential statistics (T-Statistics)	NA	NA	Married women are more infected (92.7%). Respondents are facing the problem of stigmatization. Family face decline in income.	Qualitative in nature. Restricted to agricultural productivity of women in rural area. Location : Abia state, South East Region. Estimation technique: Descriptive statistics & inferential statistics
Okezie <i>et al.</i> (2011). Six LGAs in Abia state of Nigeria	Examine the impact of HIV /AIDS on the productivity of farm Hh.	110 Hh. Cobb Douglas production function. Primary data of Hh. Descriptive statistics & OLS regression analysis	Agricultural productivity measure by dividing total value of crops produced by the cost of production.	Farm size, Sex, Total market loss to illness, Farming experience in year, Access to credit, Hh size, Member of corporative society, Cost of fertilizer, Education level of Hh head & labour/capita	Access to credit facilities has positive effect on the productivity of Hh with HIV. Also, Hh lost 50% in productivity due to inefficient usage of resources.	Examine HIV/AIDS within the contexts of household farm productivities. Restricted to six LGAs in Abia state, South East Region. Estimation technique: Descriptive statistics & OLS
Iya <i>et al.</i> (2012). Six LGs of Adamawa state in Nigeria	Assess the impact of HIV/AIDS on Hh production & income	Primary data. 120 Respondents. Descriptive statistics and logistic regression analysis.	Income level of households	Sex of Hh head, Hh size, Sales of assets & total spending on health care and drugs.	HIV/AIDS illness leads to decline in Hh income and farm production	Study restricted to HIV/AIDS impact on farm output & income in rural area. Location: North East Region. Few variables in the model. Absence of theoretical underpinning and framework

Source: Author computation. NB: Households (Hh). NA= Not Available.

Table 3.2: Summary of selected Literatures done outside Nigeria

Authors & Countries	Studies Objective	Theories, Data utilized & Estimation tools	Dependent Variables	Independent Variables	Findings	Literature Gaps
Agbola <i>et al.</i> (2004). South Africa.	Explore the impact of HIV/AIDS on food demand.	Demand equation. Time series data from 1970-2000. Simulation analysis.	Quantities of food consumed	Price of items, Real Per Capita GDP and Time variable to capture trends in food consumption.	HIV/AIDS has a significant impact on food pattern of selected food items in South Africa	Qualitative study. Study restricted to selected agricultural products.
Kessy <i>et al.</i> (2004). Ludewa district, Tanzania.	To evaluate the impact of HIV/AIDS on food security of farmers in selected Hh.	Primary data of 312 respondents. Descriptive statistics and regression analysis	Yield / total agriculture output per Hh in the past one year (kg)	Expenditure on HIV/AIDS, Time spent visiting hospital; Care giving activities in a month, Hours spends attending funeral, Hh size, Hh income, Educational level of Hh head, Death in Hh, Orphans, Tap water, and Radio.	HIV adversely affects food security. There is decline in productivity due to loss of man-hour and physical labour in affected Hh	Examine HIV/AIDS from the angle of food security. Study restricted to two concepts of food security (food accessibility and availability). Rural based study.
Mano <i>et al.</i> (2006). Manicaland & Mashonaland East, Zimbabwe.	To develop policy on how to mitigate the impact of HIV/AIDS on agricultural growth	Cross section data of 350 agricultural households. Regression analysis.	Food security: Food self-sufficiency Maize productivity	Region variable, Gender, Family labour, number of cattle, number of crops growth, number of orphan, education, asset/wealth index. Weighted index of the sick, status of household. Family size and maize seed/ha.	Evident of HIV/AIDS negative impact on the performance of small farmers and particularly on food security prospect. There is loss of family labour, income and assets.	Qualitative in nature. Centred more on food security.
Faisal (2008). 65 districts of Uganda	To reveal the effects of HIV/AIDS on Hh investments and welfare	Consumer Utility function. National Hh survey (UNHS). Descriptive statistics and multinomial logistic regression	Households accumulation asset (earning, savings and investment)	AIDS status of Hh, poverty status, Hh size, educational level of Hh head, region and residential status	HIV/AIDS affect the capacity of the Hh to earn income, saves and invest in asset accumulation.	Study restricted to household investment, saving and income. Secondary data analysis
Alemu and Bezabih (2008). Rural, Ethiopia.	To explore the impact of HIV/AIDS on household foods and livelihood security	1245 Hh. Administering of questionnaire. Descriptive statistics and multivariate analysis	Reduced number of meals daily. Reduce the qty of food eaten daily. Skipping of meals a whole day without eating	Region, Marital, status, Age,, HIV/AIDS status of Hh, Sex of Hh head, Age of Hh, Deceased member, chronically sick member	HIV/AIDS lead to mortality of age group 15-54 years. Hh faced income fall and in turn sell assets to cope with the illness. Health costs do not affect food expenses	The subject matter is narrowed down to food security in rural areas only.

Source: Author computation. NB: Households (Hh)

Table 3.2: Summary of selected Literatures done outside Nigeria (Continuation)

Authors & Countries	Studies Objective	Theories, Data utilized & Estimation tools	Dependent Variables	Independent Variables	Findings	Literature Gaps
Ulimwengu (2009). Rural Ethiopia.	Examine the nexus between farmers' health status & agricultural production	Hh production model. 1500 Hh from Ethiopia Rural Hh survey. Descriptive analysis and Regression analysis).	Agricultural production Log of agricultural efficiency index Health status	Land, Labour, Gender, land slope, cultural seasons, Extension services, religion, fertilizer, probability of sickness. Food expenditure, main activity, farming assets, distance to public hospital and daily wage rate for adult male & access to public piped water	Affected Hh tends to allocate less time to inputs application. Results confirm adverse effects of ill health on agricultural efficiency of farmers	Focus on all aspect of illness shocks on farmers output. The study is restricted to rural area only.
Musinguzi (2012). Bushanyi district, Uganda	To examine the extent of HIV/AIDS effects on Hh food production.	613 Hh Interview and questionnaires Descriptive statistics and multinomial Logit regression analysis.	Food insufficiency	Age group, educational level of the Hh head, Religion, sale of commodities and wage	AIDS deaths mostly affect age groups 15-65 years. AIDS mortality reduces Hh labour, earnings and productive capacity.	Study narrowed down to household food production only.
Zhang <i>et al.</i> (2012). Three Provinces in China	To identify factors associated with Per capita Income of affected HIV/AIDS Hh	Primary data of 866 PLWHA. Descriptive and Linear Regression Analysis.	Log of Per capita income.	Genders, age, education level of respondent, marital statute, duration of HIV/AIDS, Hh size, the number of PLWHA in the Hh, the infection status of other family members and employment status of respondent.	There is decline in PCI of affected Hh with large member and higher PCI for HIV cases than AIDS cases	Qualitative in nature. Centred on individual & households Income only. Estimation technique: Multiple Regression analysis. Absent of theoretical underpinning and framework
Natalia <i>et al.</i> (2014). Tanzania	Assessing the implications of HIV/AIDS on Hh income	150 Respondents using questionnaires Descriptive Statistics.	NA	NA	HIV/AIDS illness has a negative impact on household income through expenditures on medications and transportation.	Study focused on Hh income only. Estimation tools; Descriptive Statistics. Absent of theoretical underpinning & framework. Restricted to one urban area
Laar <i>et al.</i> (2015). Rural and Urban Area of Ghana	To determine the negative coping strategies adopted by HIV-affected households	Primary data with 745 HIV-affected Hh. Descriptive Statistics	NA	NA	Affected Hh skips entire day's meal, reduce food portion, harvest immature crops as well as beg for livings.	Descriptive Statistics. Absence of theoretical underpinning and framework

Source: Author computation. **NB: Households (Hh).** Not Available: NA.

3.5 Theoretical Framework

In line with the objectives of this study, alongside the definition of health as noted by WHO (1948), two microeconomics theories are reviewed to guide the choice of model formulation in the next chapter. These include the household production theory which is derived from the theory of production. This is employed to derive the household income model. The next is the Grossman-Wagstaff health production theory which is employed to obtain the food expenditure model.

3.5.1 The Household Theory of Production (for the Household Income Model)

This study employs the simple Neoclassical growth theory which is an extension of the Classical theory of production. This is in order to conceptualize the various channels in which HIV and AIDS affect output at the macro level (Cuddington 1993a; Masha, 2004; Ojha & Pradhan, 2010).

Considering it from the micro level and using the household production theory, output is expressed as a function of the level of capital, labour and technological progress (Koutsoyiannis, 2006). Accordingly, Ironmonger (2001) noted that in household production analysis, capital and labour are the key factors of production for output growth. However, while labor involves the time and effort provided by household members, it also utilizes the human capital input which is the second factor of production. Following this revelation, the household capital input entails the use of physical or tangible non-human capital such as the services provided by land, dwellings, vehicles and equipment. In line with microeconomic analysis, this study describes the behaviour of households by means of a production function as:

$$Y = f(L, K, A) \dots \dots \dots 3.1$$

Where;

K = Household capital

L= Household labour

A = Technological progress

Y = Household output.

Following national income accounting, aggregate output is equal to aggregate income. Therefore, it is assume that the value of household output will be equal to income. Thus, household output (Y) is considered as household ‘i’ income at time ‘t’ (Y_{it}).

Incorporating the contribution of each factor input as noted by Cobb and Douglas (1928), such as; the contribution of capital: ‘ α ’, labour: ‘ ∞ ’ and total factor productivity: ‘ ϖ ’ will bring about;

$$Y_{it} = K_{it}^{\alpha}, L_{it}^{\infty}, A^{[1-\alpha-\infty-\varpi]} \dots\dots\dots 3.2$$

Clearly, in equation 3.2, both capital and labour are disaggregated respectively (See Knowle & Owen, 1995; Ojha & Pradhan, 2010 & Ngepah, 2012). The capital variable can be subdivided into human (E), natural, productive and physical capital. Therefore, it is assumed that natural, productive and physical capitals are asset holding of household, and as such can be treated as one (SA). Similarly the labour variable is segmented into healthy labour (efficiency of labour; hL) and unhealthy labour (labour efficiency, that is number of day’s respondent’s absence from work; uL).

The equation 3.2 can be rewritten as:

$$Y_{it} = f(SA_{it})^{\beta} (E_{it})^{\alpha} (uL_{it})^{\varpi} (hL_{it})^{\infty} (A_{it})^{[1-(\alpha-\beta-\infty-\varpi)]} \dots\dots\dots 3.3$$

Where; $\alpha + \beta + \infty + \varpi = 1$.

Let each of the predictors be summarized as: $\beta SA_{it} = SA_{it}$, $\alpha E_{it} = E_{it}$, $\infty hL_{it} = hL_{it}$, $uL_{it} = uL_{it}$, and $\varpi A_{it} = A_{it}$

Rewriting equation 3.3 into functional form of the expression will be;

$$Y_{it} = f(\alpha E_{it}, SA_{it}, \infty hL_{it}, uL_{it}, \varpi A_{it}) \dots\dots\dots 3.4$$

Following equation 3.4, the human capital (αE_{it}) captures knowledge, skills and ability of household workers when combined with health, enable people to pursue different livelihood objectives' (Jafry, 2000 & DFID, 2001). The HIV/AIDS illness adversely affects human capital through morbidity and mortality of prime age adults (Joyce *et al.*, 2008). The ill-health or death of adult members undermined knowledge transfer between generations and the coping strategy of withdrawing children from school may reduce their ability to acquire knowledge. The natural, productive and physical capitals include the basic infrastructures, tools, equipment and household goods needed to support livelihood. The major means by which the HIV/AIDS illness may impact on natural, physical and productive capital is through its possible sales of household assets.

The healthy labours capture the number of adult members of the household that are not infected with the HIV/AIDS disease. Following the ILO reports (2006, 2015) of classification of child labour from 17 years below, the healthy labour is defined as member of the household that are within the labour force age group between 18 - 65 years. Since, they are not directly infected with the HIV/AIDS illness; it is assumed that indirectly, the disease reduces the financial resources and man-hour labour of this core group. They spend time and resources caring for the sick member. Similarly, the unhealthy labours capture the loss of working man-days by an adult member(s) within the age group 18-65 years infected with HIV/AIDS (Kessy *et al.*, 2004). Infected individuals suffer from a series of opportunistic infections and may not be available for work and become less productive. These can affect the aggregate household income.

As noted earlier, let the value of total household output be equal to income. Therefore, the total income of the survey households (Y_{it}) is noted to be a function of educational attainment of the household head (E_{it}), asset holding of households (SA_{it}), labour efficiency of healthy adult member/s (hL_{it}), labour efficiency of infected adult member/s

(uL_{it}) and total factor productivity (work experience and skill of respondents; A).

This can be re-stated in equation form as:

$$Y_{it} = f(E_{kit}, SA_{it}, hL_{it}, uL_{it}, A) \dots\dots\dots 3.5$$

In general, equation 3.5, is the household-income demand equation.

3.5.2 The Grossman-Wagstaff Model (for Household Food Expenditure Model)

The household food expenditure equation is derived from the works of Wagstaff (1986) and Grossman (1972). Wagstaff adopting the Grossman theory of health production establish the relationship between income, health production and consumption. The basic tenets of Grossman and Wagstaff theoretical analysis is that household health care expenditure is the amount of other basic consumptions (expenditures) that must be foregone so as to purchase health care related drugs and therapy. In other words, the shadow price of financing HIV/AIDS drugs and therapy are the basic needs of the affected households that need to be foregone. Using the consumer behaviour theory in this analysis, it is assumed that every affected HIV/AIDS household ‘i’ maximises utility by directly purchasing two goods foods (Q_f) and health commodity (Q_h) at a specific period of time (t). This is written as:

$$U = U (Q_{fit}, Q_{hit}) \dots\dots\dots 3.6$$

The family problem is how to maximise utility subject to income (Y);

$$\text{Max } U (Q_f, Q_h) \dots\dots\dots 3.7$$

$$\text{The budget constraints is specified as: } P_1Q_f + P_2Q_h = Y \dots\dots\dots 3.8$$

Where ‘ P_1 ’ and ‘ P_2 ’ are the prices of food (Q_{fit}) and other goods (Q_{hit}) that will be bought.

From equation 3.5, the variable ‘ Y_{it} ’ is assumed to be the aggregate income of household.

This cuts across all selected HIV/AIDS affected households. Forming the Lagrangian

function will yield:

$$\Psi = U(Q_f, Q_h) + \lambda(Y - Q_f P_1 - Q_h P_2) \dots\dots\dots 3.9$$

The first order condition for constraint maximisation is derived as:

$$\frac{\partial \Psi}{\partial Q_f} = Q_h - \lambda P_1 = 0 \dots\dots\dots 3.10,$$

$$\frac{\partial \Psi}{\partial Q_h} = Q_f - \lambda P_2 = 0 \dots\dots\dots 3.11,$$

$$\frac{\partial \Psi}{\partial \lambda} = Y - Q_f P_1 - Q_h P_2 = 0 \dots\dots\dots 3.12$$

From equations 3.10 and 3.11 solve for ‘ λ ’:

$$Q_h = \lambda P_1 ;$$

$$\lambda = \frac{Q_h}{P_1} \dots\dots\dots 3.13,$$

$$\text{Let } Q_f = \lambda P_2 ;$$

$$\lambda = \frac{Q_f}{P_2} \dots\dots\dots 3.14,$$

$$\text{Let } \lambda = \lambda$$

$$\lambda = \frac{Q_h}{P_1} = \frac{Q_f}{P_2} \dots\dots\dots 3.15,$$

Cross multiply and divide by P_2 to obtain Q_h :

$$Q_h P_2 = Q_f P_1 ,$$

$$\text{Therefore: } \cancel{Q_h P_2} = \frac{Q_f P_1}{P_2} ; \quad Q_h = \frac{Q_f P_1}{P_2} \dots\dots\dots 3.16$$

Substituting equation (3.16) into (3.12) and cancel out:

$$Y = P_1 Q_f - \cancel{P_2} \left(\frac{Q_f P_1}{\cancel{P_2}} \right) = 0 \dots\dots\dots 3.17;$$

$$Y = 2P_1 Q_f \dots\dots\dots 3.18$$

$$Q_f = \frac{Y}{2P_1} \dots\dots\dots 3.19$$

Explicitly, equation 3.19 is the household food expenditure function (Q_f), which can be written as: $Q_f = Q(Y, P_1) \dots\dots 3.20$. The equation 3.20 expresses the household’s food expenditure as a function of household’s income and the price of food.

Following the works of Engel (1857), Galino and Vera-Hernandez (2008), and Donkoh *et al.* (2014), other household variables also determine household food expenditure.

Therefore, food expenditure is stated as a function of income, price and other socio-economic variables. In this regard, three basic factors influence individual household consumption choice or food expenditure that is: income level, prices (own and related products) and socioeconomic and demographic variables (DV). The last variable (DV) includes selected household socio-demographic characteristics which take into account the health status (medical care) of individuals as emphasized by Grossman (1972, 2000), Wagstaff (1986), Pitt and Rosenzweig (1986) and Galino, and Vera-Hernandez (2008). In the event of sudden shock, where the household's head or any productive member is infected with HIV/AIDS illness, contemporary consumption expenditures and other socioeconomics variables suffer. This postulation has been put to test by several scholars including: Balyamujura *et al.* (2001), Agbolaa *et al.* (2003), Mwakalobo, (2007), Faisal (2008), Masuku and Sithole, (2009) and Levinsohn *et al.* (2011).

From the aforementioned analysis, the household food expenditures equation can be written as: $Q_{fit} = F(Y_{it}, P_{it}, DVA_{it})$3.21

Let us assume the price of food to be silent in equation 3.21, due to the food expenditure variable on the right hand side of the equation and also data availability problem among the participants, the new equation is depicted as;

$$Q_{fit} = F(Y_{it}, DV_{it})$$
.....3.22

Let assume $Q_{fit} = Fex_{it}$

Therefore;

Fex_{it} = Food expenditure of household 'i' at time 't',

Y_{it} = Household 'i' income at time 't',

DV_{it} = Selected socioeconomic and demographic variables.

The equations 3.5 and 3.22 are the framework for the model specifications in the next section.

3.6 Literature Gaps

A cursory look at the literatures reviewed shows that most studies on the impact of HIV/AIDS on household income, food security and other means of livelihood focus on countries in Southern and Eastern Africa (Oni *et al.*, 2001; Agbola *et al.*, 2004; Kessy *et al.*, 2004; Reneth & Matshe, 2006; Faisal, 2007; Alemu & Bezabih, 2008; Duru & Mernan, 2011; Musinguzi, 2012; Baiyegunhi & Makwangudze, 2013; Natalia *et al.*, 2014). Noticeable too is that studies in West Africa nations, especially in Nigeria are few and mostly rural-based and centred on the Northern and Eastern province of the country (Adeoti & Adeoti, 2008; Ugwu, 2009; Odoemelam, 2011, Okezie *et al.*, 2011; Iya *et al.*, 2012). With the exception of Adeyemi (2007) that carried out a descriptive study of PLWHAs in Lagos state. These extant studies in Nigeria are mostly qualitative in nature and restricted to few LGAs and few numbers of people. The studies mainly focused on farmer's labour supplies and productivities. To make up for this scholarly gaps, this study intends to employ both qualitative and quantitative analysis to investigate the impact of HIV/AIDS on household income and food expenditure in Lagos state, Nigeria. Unlike prior studies, this work is unique as its covers ten LGAs randomly drawn from the state. Similarly, the study is not restricted to a particular occupation, but examines the impact of different age groups and occupational distributions of People living with HIV/AIDS (PLWHAs) on income of affected household across Lagos state.

Likewise, several empirical literatures on the impact of HIV/AIDS on household livelihood have come out with mixed results. For instance, the outcomes of Masuku and Sithole (2009) and Feulefack *et al.* (2013) using descriptive statistics, vulnerability index and OLS regression techniques show that selling of assets and free Antiretroviral Therapy (ART) increase household income of PLWHAs. In contrary, other studies such as; Kessy *et al.* (2004), Ugwu, (2009), Alemu and Bezabih, (2008) and Natalia *et al.* (2014)

employed descriptive statistics, OLS regression and multivariate analysis. The results show negative impact of HIV/AIDS on household income. Furthermore, the result of Zhang *et al.* (2012) revealed mixed effects (negative and positive effects) of HIV and AIDS on income of participants. However, the divergence or inconclusive results from these authors might be connected to the focus of the studies, techniques of data analysis, variables included in the statistical analysis and the absence or inadequate theoretical underpinning employed in such studies.

To ensure a more robust, more efficient and more consistent coefficient and to fully solve the problems associated with each predictors impact on the outcome variables that is yet to be satisfactorily addressed in previous studies of HIV/AIDS, – household income and food consumption and expenditure literatures, this study employs logistic regression analysis to estimate the odd that HIV/AIDS affect income and food expenditure of affected household. Particularly, only a few studies (Wayne & Lori, 2009; Iya, *et al.*, 2012; Hailemariam *et al.*, 2013) have employed this method despite its potential benefits over the traditional OLS technique. This technique supports more robust, more efficient and more consistent coefficients (Morgan & Teachman, 1988; Nwakeze, 2006; Yusuff *et al.*, 2012).

This study also pays strong attention to a state-level based analysis by considering the relationship between income and food expenditure on household affected by HIV/AIDS in Lagos state. To achieve this, the household's theory of production and the Engel law of food expenditure are deployed as the theoretical guide. Drawing from earlier views, no empirical studies have utilize both theories to analyse HIV/AIDS impact on household income and food expenditure in SSA countries, especially in Lagos State, Nigeria. It is this major gap that this work intends to fill (Table 3.1 & 3.2).

Chapter Four

Research Methodology

4.1 Preamble

This chapter contains a description of the research methodology of this study. The first section describes the method and procedure employed in collecting different data to be used for the study. It also reveals how data is analyzed to achieve the principal aim of the study. The section also explains the research procedure utilized to arrive at various conclusions in the study. This is done so that if any other research is undertaken on the same topic, similar results would be arrived at. Therefore, the research methodology aims at presenting the following: research design, population of the study, sample size determination and sampling technique, method of data collection, research instrument, validity and reliability analysis. The second section deals with the discussion of the model specifications and estimation techniques.

4.2 Research Design

Research design is said to be the arrangement of conditions for collection and analysis of data in a manner that aims to combine relevance to the research purpose with economy in procedure (Kumar, 2011). It is the conceptual structure within which research is conducted. The research design constitutes the blueprint for the collection, measurement and analysis of data. As noted by Kothari (2004), it stands for advance planning of the methods to be adopted for collecting the relevant data and the techniques to be used in the analysis, keeping in mind the objective of the research and the availability of staff, time and money. The research design adopted is the descriptive research survey. According to Burns and Grove (2003:201), descriptive research “is designed to provide a picture of a situation as it naturally happens”. It may be used to justify current practice, make judgment, and develop theories. Employing descriptive research survey implies selecting

part of the population of study, as sample for the study since the population itself may be too broad for convenient research. According to Driscoll (2011), the survey method may be personal interview, telephone interview, mail interview, or questionnaire. However, in this study, questionnaire is employed so as to obtain necessary information from PLWHAs on HIV/AIDS, household income and food expenditure levels of different households.

4.3 Population of the Study

The present study's population includes the entire People Living With HIV/AIDS (PLWHAs) receiving counselling and Antiretroviral (ART) drugs in the various medical and treatment centres in the 20 Local Government Areas (LGAs) of Lagos state, Nigeria. Because the population is too large, it is not easy to involve all the Centres and LGAs in the state. For this reason the research population is restricted to respondents (PLWHAs) in ten LGAs in the state. The respondents are within the age group (18 - 65 years) classified by the ILO reports (2006, 2015) as the economic active population of a country. The choice of this group is based on their adequate knowledge of the HIV/AIDS illness, household welfare and effect of the HIV/AIDS condition on them and member/s of their family.

4.4 Sample Techniques

The study employed multi-stage sampling technique to determine the number of site to be sampled. The first step involves adopting purposive sampling technique to select Lagos state from the South West States (Ekiti, Lagos, Ogun, Ondo, Osun & Oyo) of Nigeria. The choice of the state is based on the geographical distribution of high HIV/AIDS infection rate, population density, minimum language and communication barriers, availability of several treatment sites provided by the state government for

counselling and medical service as well as easy data accessibility.

The second stage involves utilizing simple random sampling technique to draw ten Local Government Areas (LGAs) from the twenty LGAs in the State. Each Local Government Area was written out on a piece of paper and selected through lucky dip. At the third stage, purposive sampling was employed to select one treatment centre and site (establishments and agencies that give support and aid to PLWHA) from each Local Government Area (LGA). Also, ten centres were selected from the 65 Antiretroviral Therapy (ART) facilities and Prevention of Mother-to-Child Transmission (PMTCT) facilities in the 10 LGAs. The choice of selecting ten LGAs and treatment centres is based on the limited financial capacity of the researcher and easy access to data from the Network of People Living With HIV/AIDS in Lagos state (NEPWHAL) (Table 4.1).

4.5 Sample Size Determination

Sample size is one of the four inter-related features of a study design that can influence the detection of significant differences, relationships or interactions (Peers, 1996). In determining the sample size, this study employed the Krejcie and Morgan (1970) and Bartlett, Kotrlik and Higgins (2001) tables for sample size determination for finite population. With 0.05 per cent margin of error and 95 per cent confidence level, these authors agreed that a sample size of 384 is appropriate for a population greater than 10,000. Alternatively, using the Yamane (1967) sample size equation as stated below;

$$n = \frac{N}{1 + \frac{N(e)^2}{2}} \dots\dots\dots \text{Equation 4.1}$$

Where ‘n’ is the sample size, N is the Lagos state HIV/AIDS population size as estimated in 2009 by the National Bureau of Statistic (2009/10) to be 223,425 people, and ‘e’ is the level of precision. With 95 per cent confidence level and 0.05 per cent margin of error, the equation 3.28 is obtained.

$$n = \frac{223425}{1 + 223425(0.05)}^2 \dots\dots\dots \text{Equation 4.2.}$$

The sample size (n) is given as 399.28, approximately 400.

From all indications, both sample size techniques (Table; 384 and the Yamane equation; 399) almost have the same outcomes. Following this tradition, the sample size of 384 - 399 are both accepted for this study though adjusted to 1500 in order to have a larger number of respondents and a robust empirical analysis.

Particularly, one hundred and fifty (150) questionnaires were administered to 150 respondents in each of the ten selected treatment centres, using convenient sampling technique. In sum, 1500 copies of the questionnaires were administered to 1500 respondents in ten centres/facilities in Lagos State, Nigeria (Table 4.1).

Table 4.1: Framework of Selected Sites and Sample Size Determination

Purposive sampling	20 Local Government Areas (LGAs)	Simple random Sampling (Ten LGAs)	No. of Counselling, ART & PMTCT	Purposive sampling technique	Convenient Sampling for administering questionnaires
Lagos state	Agege	Ajeromi/Ifelodun	5	Ajeromi General Hospital	150
	Ajeromi/Ifelodun	Alimosho	7	Alimosho General Hospital	150
	Alimosho	Eti-Osa	3	Police Hospital Falomo	150
	Amuwo-Odofin	Ikeja	11	Ikeja General Hospital	150
	Apapa, Eti-Osa	Ikorodu	3	Ikorodu General Hospital	150
	Epe, Ikeja	Lagos Island	10	General Hospital	150
	Ibeju-Lekki	Lagos Mainland	5	Military Hospital, Yaba	150
	Ikorodu, Badagry	Mushin	7	Good is Good Support Group, Lucina Hope Foundation	150
	Lagos Island	Ojo	5	Nigeria Navy Hospital	150
	Kosofe	Surulere	9	SWANN Support Group, Ojuelegba	150
Aggregate	Lagos Mainland Ifako Ijaiye Mushin, Ojo Oshodi/Isolo Shomolu and Surulere 20 LGAs	10 LGAs	65	10	1500

Source: Author computation. Antiretroviral Therapy (ART) and Prevention of Mother-to-Child Transmission (PMTCT)

4.6 Sampling Procedure

The work employed ethnography technique to obtain the names of Co-ordinators,

treatment centres and data from the participants. Prior to this, a letter of introduction was obtained from the Department of Economics, University of Lagos, to enable the researcher seek permission from Lagos State Health Service Commission and Lagos State AIDS Control Agency (LSACA) to conduct research on specific HIV/AIDS patients. The letter was accepted by the appropriate authorities. Thereafter, a letter of introduction was sent to the state co-ordinator of Network of People Living With HIV/AIDS (NEPWHANs) for familiarity purposes. The state co-ordinator introduced the researcher to other local government co-ordinators who were later employed as research assistants for the site survey. On ethical grounds, the co-ordinators stated the objectives of the survey to the respondents before seeking their consent. Subsequently, questionnaires were administered to those willing to participate in the survey in their respective counselling ART and PMTCT facilities.

4.7 Research Tool

The data was collected by means of structured questionnaires. Each household has two informants. These informants are people primarily infected with the disease or any adult person in full blown AIDS household with adequate knowledge of the household finances and livelihood. The instrument (Household Income Dietary Scale, HIDS) is adapted from the drafted questionnaires of FAO study (2008), United Nation World Food Programme report (2008), Nigeria Demographic and Health Survey (2008, 2013), Iya *et al.* (2012) and Zhang *et al.* (2012) works.

The HIDS tool was modified by the researcher to fit into the current study. The instrument was structured into six sections. Section 'A' comprised 15 items on demographic characteristics of the respondents. The 15 items comprise 13 closed-ended questions and two open ended questions. The items were designed to obtain information

on gender, age, marital status, educational level, religion, state of origin, ethnic group, Local Government Area (LGA) where respondents reside, occupations, number of years of working, respondent's position in the household, household size, head of household and educational level of head of household.

Section 'B' comprised 7 items on Assessment Of PLWHA (AOP) for the last 12 months. The 7 items are structured into 6 closed-ended questions and one open-ended questions. The 7 items are designed to assess the periods/range the respondents have been living with HIV/AIDS, other morbidity associated with the HIV illness, the duration of the illness (Open-ended question), household member(s) or respondents have suffered discrimination from job due to HIV/AIDS status, number of household member infected with the HIV illness, access to free drugs, therapy and the level of support received from the government.

Section 'C' comprised 10 items which cover the Income Level of the household (ILH). The items were structured in closed-ended question format. Similarly, the items are designed to derive data information on the three main sources of income to the household, aggregate monthly income before and after the HIV incidence, the forms of impact the illness has on household income, HIV/AIDS-related expenses (drugs, treatment, consultation, transportation, and other supporting drugs), non-household income (remittances) from relatives and friends as well as the price range of drugs taken daily.

Section 'D' comprised 10 items which deal with the Food Expenditure and consumption pattern of Household (FEH). The questions were organized in close-ended format. The items were designed to evaluate household food shortage, number of meal taken per day, expenditure on food before and after the HIV incidence, reduction of food spending for HIV/AIDS drugs, price of food bought daily, proportion of educational expenditure spent

on food consumption as well as food purchased on credit.

Section 'E' examines the Labour Supply of Household (LSH). This is made up of 13 items. All the items in this section were designed in closed-ended question format. The items were meant to capture the effect of HIV/AIDS on the number of economic active persons in the household, productivity loss due to absentee from work by the respondent, number of adult member/s affected with the illness, number of adult member/s not infected with the illness, under-age and aged workers in the labour market, hours spent in care giving activities, death due to HIV/AIDS, position of the deceased person and expenditure on mourning/funeral ceremonies.

Section 'F' assesses the Coping Strategies of Household (CSH). This consists of 7 items (5 closed-ended questionnaires and two open-ended questions). The items were designed to examine sale of assets, type of asset sold, and impact of the illness on savings, borrowing by households and the opinions of the respondents regarding the impact of the HIV/AIDS illness on their household not captured in the HIDS tool.

The closed-ended questionnaire was mostly adopted for the study because it provides an opportunity for the study to cover a wide range of geographical area. And to large extent eliminate interviewers' bias and for easy analyses. Since every answer can be given a number or value so that a statistical interpretation can be assessed, closed-ended questions are suitable for a study of this nature.

4.8 Validity and Reliability of the HIDS Instrument

Validity refers to the degree to which a study accurately reflects or accesses the specific concepts that the researcher is attempting to measure. It refers to the ability of the questionnaires to measure the intended constructs (William, 2008). Therefore, to minimise the element of bias that could emerge from this study, a structured

questionnaire consisting of mainly closed-ended questions were carefully constructed. Before the final version of the questionnaire was sent out, it was pilot-tested to determine the appropriateness and relevance of the questions in the instrument. This draft was circulated to some Lecturers in the Department of Economics, Educational Foundation of the University of Lagos, as well as the coordinators/counsellors of HIV/AIDS programme in LSACA and NEPWHAN. This is done in order to scrutinize the content of the instrument. Based on the feedback, several questions relating to mode of contacting the illness, spouse HIV/AIDS status, just to mention a few, were considered sensitive issues and were removed from the list of items in the HIDS instrument. To validate the stability of the instrument, the HIDS was subjected to Test-Retest reliability analysis.

On the other hand, reliability refers to the extent to which any measuring procedures yield the same results on repeated trials. The more consistent the results achieved by the same participants in the same repeated measurements, the higher the reliability of the measuring procedures; conversely, the less consistent the results, the lower the reliability. However, without the agreement of the independent observers to replicate research procedures, or the ability to use research tools and procedures which yield consistent measurement, researchers would be unable to satisfactorily draw conclusions, formulate theories or make claims about the generalisability of their research (Uwuigbe, 2011). To this end, this study therefore adopted the Cronbach Alpha Reliability method or test-retest method of reliability to establish the stability of the HIDS tools (See Table 3.4).

4.9 Pilot Study

A pilot study was carried out by the researcher before the main study in Nigeria Institute of Medical Research (NIMR), Yaba, Lagos state. It was used as a try-out to determine the psychometric properties. In other words, it was used in the validity and reliability coefficients of the research instruments. The instruments were administered on forty nine

(49) People Living With HIV/AIDS (PLWHAs) who usually meet once in a month at NIMR. At the end of the pilot test the researcher found that there were two questions which were not adequately responded to. The two questions were reframed for clarity and simplicity. The draft of the questionnaire was given to experts in the field of research in Social Sciences, educations, public health, mathematic and statistics for correction. The draft was adjusted according to the corrections of the experts.

Following the word of Armstrong and Foley (2003), the authors suggest that, the closer Cronbach's Alpha is to 100, the more reliable the scale. Similarly, Nunnally and Bernstein (1994) state that a value for Cronbach's Alpha coefficient greater than 0.60 is considered acceptable. As shown in Table 4.2, the reliability coefficients of 0.634 for AOP, 0.682 for ILH, 0.781 for FEH, 0.842 for LSH and 0.772 for CSH exceeded the minimum acceptable level of 0.60 as suggested by Nunnally and Bernstein (1994) and Armstrong and Foley (2003). Therefore, each of the five categories of the items is considered reliable for the study.

Table 4.2: Test – Retest Reliability Coefficient of Instruments for Pilot Study.

Instruments	No. of Items	Variables	N	Test Position	r_n
AOP	7	Year of infection	49	1 st	0.634
				2 nd	
ILH	10	Income	49	1 st	0.682
				2 nd	
CEH	10	Food demand	49	1 st	0.781
				2 nd	
LSH	13	Labour supply	49	1 st	0.842
				2 nd	
CSH	7	Sale of Assets	49	1 st	0.772
				2 nd	
Pooled; 5	47		49	10	$r_n = 0.7422$

Source: Author computation (Field Survey, 2014-2015)

The pooled test- retest coefficient value for the HIDS tool is given as $r_n = 0.7422$ (Table 4.2). Based on the result, the constructs in this study fall within the acceptable range and as such accepted for further analysis.

4.10 Reliability Analysis for Internal Response Rate

The instrument was later subjected to reliability analysis of internal response rate of the 891 participants. The outcome of the reliability test of the tool is represented in Table 4.3. The test of reliability of the responses on Household Income Dietary Scale (HIDS), using standardized Cronbach's Alpha, indicates that the instrument is reliable since the Cronbach's Alpha Statistics obtained for the pooled results is 0.898 (89.8%) which is > 60 per cent threshold value. This result is supported by the coefficient of variation (CV) values: $0.33 < 0.50$ threshold value ((Nairy & Rao, 2003; Kelly, 2007), indicating homogeneity on how the respondents rated the items. Hence, there is an internal consistency of the answers from the respondents and the data. Therefore, there is no violation in the assumption of reliability test.

Table 4.3 Reliability Analysis of Household Income Dietary Scale (HIDS)

Instruments	Scale Statistics					Reliability Statistics (Cronbach's Alpha)
Source	No. of Items	No. of samples	Mean	SD	CV	R _s
Assessment of PLWHAs for the last 12 months (AOP)	7	891	20.02	7.39	0.37	0.746
Assessing the household income level for the last 12 months (ILH)	10	891	15.76	6.69	0.43	0.776
Evaluating the food expenditure for the last 12 months (FEH)	10	891	12.08	4.16	0.34	0.759
Assessment on household labour supply for the last 12 months (LSH)	13	891	17.14	7.13	0.42	0.835
Coping strategies (last 12 months, CSH)	7	891	13.02	4.58	0.35	0.843
Pooled; 5	47	891	61.02	20.2	0.33	0.898

Source: Field Survey, 2014-2015. SD (Standard Deviation). CV (Coefficient of Variation).

4.11 Training of Research Assistants

Based on the sensitive nature of the study, the researcher recruited fifteen research assistants. Two undergraduates and one M.Sc. graduate from the Department of Psychology, University of Lagos, Akoka, Lagos. The other twelve assistants were counsellors from each of the treatment centres/support groups in the 10 sampled LGAs.

Involving counsellors from each centre/group were strictly adhered to in order to insure reliability of the data/tool. A brief lecture was held to sensitize the research assistants of the objectives of the study, the targeted population and how best the questionnaire can be filled. The lecture was held within a day at the Nigeria Institute of Medical Research (NIMR), Yaba and lasted for one hour. At the end of the meeting, the assistants were appreciated and remunerated for their efforts.

4.12 Administration of HIDS Instrument/Data Collection

After obtaining permission from the Lagos State Health Service Commission (LSHSC), Lagos State AIDS Control Agency (LSACA) and Network of People Living With HIV/AIDS (NEPWHANs) Lagos state branch, the researcher visited a week before the commencement of the main study. The aim of the researcher's first visit was to familiarise himself with some of the officials who are different from the co-ordinators (research assistants) that assisted in the field survey. The administration of the instruments lasted for twelve (12) weeks.

The administration of the HIDS tool lasted 12 weeks. The field work was in two phases:

Phase one (week one – two). The researcher first visited some of the treatment centres to sort out administrative bottle-neck issues relating to obtaining permission to administer the questionnaire to the PLWHAs in the treatment/medical centers. Similarly, the visits help the researcher to familiarise and establish rapport with some of the participants; informing them of the benefits of the programme and the need to cooperate and adhere to necessary instructions during the interacting session.

Phase two (week three – twelve). The main field work was carried out on 10 sites in 10 LGAs of Lagos state, Nigeria. Before the main fieldwork commenced, clearance was initially obtained from the Department of Economics, University of Lagos, Lagos State.

As noted earlier, this letter was presented to the appropriate authorities for easily data access. In November 2014 (week three) the main field work started and ended in the tenth week (January 2015). The selected 12 co-ordinators (counsellors) also PLWHAs as well executives of NEWPLHAs as appointed by the State Government, administered the HIDS tools to all respondents 18 years and above living with HIV/AIDS in their respective treatment and medical centres. The survey was carried out during the counselling and therapy periods which are every Tuesday and Thursday in a week or month. The respondent was also permitted to withdraw at any point during the interview. The length of completing each questionnaire was approximately 25 minutes. Between November 2014 and January 2015, ten centres were covered and 1242 questionnaires were retrieved from the respondents. These figures (1242) represent 82.8 per cent response rate. The field survey was supervised by the researcher and other assistants (Two undergraduates and one M.Sc. graduate) in each centre.

In January 2015 (week eleven – twelve), the researcher along side the assistants started data editing and coding. In this regard, each question in the HIDS tool is followed by options, for a ‘Yes’ and ‘No’ option, lettered A to B, is attached to such questions, while a greater percentage (72.3 %) of the questions have lettered A to E. During the coding process, the researcher ensured that one and zero is coded for questions with ‘Yes’ and ‘No’ options, while figure one (1) to five (5) is coded for letter/questions with ‘A’ to ‘E’ options. Thereafter, the data was punched into excel sheets and Statistical Package for Social Science Students (SPSS) for the empirical analysis. This activity comes to an end in the second week of January 2015.

4.13 Ethical Consideration

The study has put into consideration the under listed ethical issues in conducting the research.

i. Informed consent: All the respondents were informed and their consent sought before extracting information through questionnaires.

ii. Confidentiality: The respondents were assured that information provided shall be used only for the purpose for which it was sought.

iii. The right of privacy and dignity. It is a legal right of the respondents to maintain their privacy. Hence, the researcher has taken into consideration and ensured that the right to privacy and dignity of the respondents were not violated in writing the report.

4.14 Model Specification

In accordance with the research methodology, likewise the relevant literatures in the previous chapter (particularly Faisal, 2008; Iya *et al.*, 2012; Musinguzi, 2012; Zhang *et al.*, 2012) and the unified conceptual framework discussed in section 3.5, the models for this study are formulated. Two models are developed in this section. They are: the household income demand model and the food expenditure model.

4.14.1. Model One: Household Income Equation

The derived income equation (3.5) in the previous chapter, informed our household income model and this is adopted to achieve objective one and two of this study. Expanding the equation 3.5 and augment it with demographic variables (DV_{it}) as proposed by Mincer (1974), Tandon (2005), Masanjala (2006), Iya *et al.* (2012) and Zhang *et al.* (2012), will yield;

$$Y_{it} = \Omega_0 + \Omega_1 E_{it} + \Omega_2 SA_{Kit} + \Omega_3 A_{it} + \Omega_4 hL_{it} + \Omega_5 uL_{it} + \Omega_6 DV_{it} \dots\dots\dots 4.1$$

Following the reviewed extant studies (Table 2.1), “ DV_{it} ,” is decomposed into; sex of household head (SH_{it}), non-household income (NI_{it}), health expenditures (H_{bit}), access to

free medical drugs and services (FM_{sit}), age distribution of respondents (AGE_{it}), marital status (MS_{it}), occupation of respondents (OC_{it}) and productivity lost due to absence from work (PL_{it}).

The equation 4.1 is redefined as:

$$Y_{it} = \Omega_0 + \Omega_1 E_{it} + \Omega_2 SA_{it} + \Omega_3 A_{it} + \Omega_{4h} L_{it} + \Omega_{5u} L_{it} + \Omega_6 Sex_{it} + \Omega_7 NI_{it} + \Omega_8 H_{bit} + \Omega_9 FM_{sit} + \Omega_{10} AGE_{sit} + \Omega_{11} MS_{it} + \Omega_{12} OC_{it} + \varepsilon \dots \dots \dots 4.2$$

Note the subscript ‘i’ denotes household with HIV/AIDS at time ‘t’ period. The random term is ‘ ε ’.

The definitions of variables are depicted in Table 4.4. The variables source is obtained from extant literatures reviewed in the previous chapter.

Table 4.4: Descriptions of selected variables in Household (Hh) Income Model One

Variables	Definitions	Measurements	Apriori Signs	Data sources
Y_{it}	Aggregate Households (Hh) income	This measures the difference between aggregate household incomes before a member/s gets infected with the HIV/AIDS illness and the current HIV/AIDS status of the Hh. When the difference between the income values for the two periods (Current –Past) is negative, one (1) is assign to such variable. When it is positive a dummy variable that takes zero.		Iya <i>et al.</i> (2012) and Zhang <i>et al.</i> (2012).
	(Predicted variable)			
Predictor variables				
E_{it}	Education level	Education level of Hh head. This captures the educational attainment of the head of the Hh. This takes the value 1, if the Hh head has no formal education and otherwise 0.	$0< \Omega_1>0$	Adeoti & Adeoti (2008).
SA_{it}	Household (Hh) assets	This captures the asset that is sold due to HIV/AIDS cost on household member/s. This takes the value 1, if Hh sells assets and otherwise 0.	$0< \Omega_2>0$	Oni <i>et al.</i> (2001)
A_{it}	Work experience	This variable captures the current or previous years of work experience of the respondents. It takes the value 1, if the participant has no work experiences and 0 otherwise.	$0< \Omega_3>0$	Rosen <i>et al.</i> (2006) & Mbaeh <i>et al.</i> (2015)

Note: Household = Hh. The expenditure on HIV/AIDS therapy and other variables are measured per month during the last twelve months.

Table 4.4: Descriptions of variables in Household (Hh) Income Model One (Cont.)

Predictor variables				
Variables	Definitions	Measurement	A priori signs	Data Sources
hL_{it}	Healthy labour	This measures labour efficiency of adult household member without HIV/AIDS. It captures the number of hours/days spent by adult members for caregiving activities for the sick. It takes the value 1, if non-infected adult member spend productive time caring for ill member/s and otherwise 0.	$\Omega_4 > 0$	Oni <i>et al.</i> (2001); Hilhorst <i>et al.</i> (2004) & Mahal <i>et al.</i> (2008)
uL_{it}	Unhealthy labour	This captures labour productivity / man-day loss of the infected adult household member/s. It measures the number of days in a month that respondents are absent from work due to HIV/AIDS illness.	$\Omega_5 > 0$	Oni <i>et al.</i> (2001); Hilhorst <i>et al.</i> (2004) & Ghailan <i>et al.</i> (2010).
Sex_{it}	Sex of Hh head	The sex of household head is included in the model to show which sex experience greater income decline. If the household head is a female, this takes the value 1, otherwise 0 for male.	$0 < \Omega_6 > 0$	Iya <i>et al.</i> 2012
NI_{it}	Remittance	This is the monetary value of gifts and aids received from relatives and friends. It takes the value 0, if household receive remittance and 1 otherwise	$\Omega_7 < 0$	Naidu and Harris (2006) & Joyce <i>et al.</i> (2008)
H_{bit}	Health expenditures	Health care and therapy cost. This captures the aggregate amount spent on HIV/AIDS drugs, service fees, traditional medicine, transportation and other expenses. It takes the value 1, if household members incur any cost & 0 otherwise.	$\Omega_8 > 0$	Iya <i>et al.</i> (2012).
FM_{sit}	Free drugs & service	Free drugs and service are included in the model to capture government aids to PLWHAs. This is expected to reduce the burden of HIV/AIDS on household's income. When household member has access to free drugs & service, this takes the value 0 and otherwise 1	$\Omega_9 < 0$	Feulefack <i>et al.</i> (2013)
AGE_{sit}	Respondents age	This captures the age range of each respondent. The age categories give an insight to the age group that experiences income declines the most.	$\Omega_{10} > 0$	Adeoti & Adeoti (2008).
MS_{it}	Marital status	This captures the marital status of each respondent. It is important to know the subgroup that bore income fall among these categories.	$0 < \Omega_{11} > 0$	Zhang <i>et al.</i> (2012).
OC_{it}	Occupational distribution	This measures the occupation distribution of each respondent.	$0 < \Omega_{12} > 0$	Ojha and Pradhan (2010)

Note: Household = Hh. The expenditure on HIV/AIDS therapy and other variables are measures per month during the last twelve months.

4.14.2 Model Two: The effect of HIV/AIDS on Household Food Expenditure

In line with the food expenditure function (equation 3.22) in the preceding chapter, the equation 3.22 is modified to include selected demographic variables (*DVA*) as supported by studies of McCracken and Brandt (1987), Balyamujura *et al.* (2000), Agbola *et al.* (2004), Dunne and Edkins (2008), Galino and Vera-Hernandez (2008), Huffman (2010),

Ebru and Melek, (2012), Sekhampu (2012) and Donkoh *et al.* (2014). The incorporation of demographic and economic variables helps in reducing the effect of unexplained factors in the behaviour of household experiencing HIV/AIDS impact on the expenditures of food consumption. The model is re-specified as:

$$Q_f = \phi + \phi_1 Y + \phi_2 DVA \dots \dots \dots 4.3$$

The demographic variable (DVA) is decomposed into: household size (HSize), expenditure on medical care (H_{bi}), clinical stage of HIV/AIDS case (H_s), sex of household head (Sex), Non-household income (remittance from friends and relatives; NI), sales of household assets (SA), purchase foods on credit (PF_c), support from the government (SFG), number of HIV/AIDS person in the household (NH_p), employment status of respondent (EMT) and educational status of household head (E).

The econometric form of the model is represented as:

$$Fex_{it} = \phi_0 + \phi_1 Y_{it} + \phi_2 HSize_{it} + \phi_3 H_{bit} + \phi_4 H_{sit} + \phi_5 Sex_{it} + \phi_6 NI_{it} + \phi_7 SA_{it} + \phi_8 PF_{cit} + \phi_9 SFG_{it} + \phi_{10} NH_{it} + \phi_{11} EMT_{it} + \phi_{12} E_{it} + \epsilon_t \dots \dots \dots 4.4.$$

In line with equation 4.4, the description of variables is depicted in Table 4.5.

Table 4.5: Descriptions of selected variables in the Food Expenditure Model Two

Variable	Definitions	Measurements	A priori Signs	Data Source
Fex _{it}	Household (Hh) Food expenditure	This variable captures total Hh food expenditure. This measures the difference between total food expenditure of household before (a) member/s gets infected with the HIV/AIDS and the current HIV/AIDS status of the Hh. When the difference between the food expenditure values in the two periods (Current – Past) is negative, one (1) is assign to such variable. When it is positive a dummy variable that takes the value of zero.		Musinguzi (2012) & Donkoh <i>et al.</i> (2014)
	(Predicted variable)			
Estimated parameters				
Y _{it}	Household (Hh) income	This measures the aggregate income in Naira earned by the Hh per month. One is attributed to Hh that earns below ₦20,000 and zero to Hh that earns above ₦20,000.	ϕ ₁ <0	Ugwu (2009) , Ayele <i>et al.</i> (2012) CBN (2012); Baiyegunhi & Makwangudze, (2013)

Note: Household = Hh. The expenditure on HIV/AIDS therapy and other variables are measured per month during the last twelve months.

Table 4.5: Descriptions of variables in the Food Expenditure Model Two (Cont.)

Estimated parameters				
Variables	Definitions	Measurements	A priori signs	Data sources
HSize _{it}	Household (Hh) size	This captures the total number of people dwelling in the Hh. In Lagos state, an average Hh size is 4 persons. Therefore, small Hh size (1-4 persons) take the value 0 and large Hh size (5 and above) takes the value 1.	$0 < \phi_2 > 0$	(NBS, 2009/2010) & Mano <i>et al.</i> (2006).
H _{bit}	Health expenditures	Expenditure on health care and therapy. This measures the aggregate amount spent on HIV/AIDS drugs, service fees, traditional medicine, transportation and other expenses. It takes the value 1, if Hh members incur any cost & 0 otherwise.	$\phi_3 > 0$	Bukusuba et al. (2007), Natalia, <i>et al.</i> (2014), Nmadu & Nwawulu (2015).
H _{sit}	Clinical stage of the HIV/AIDS	This measures the number of years the respondent has been living with HIV or AIDS. One is assigned to respondents living with the illness for 7 years & above; and zero (0) for six years and below.	$\phi_4 > 0$	Zhang <i>et al.</i> (2012).
Sex _{it}	Sex of Hh head	The sex of the Hh head is included herein to captures the bread winner of the household. If the Hh head is a male, this takes the value 0, otherwise 1 for female	$0 < \phi_5 > 0$	Foster (1993) & Mano <i>et al.</i> (2006).
NI _{it}	Remittance	This is the monetary value of gifts and aids received from relatives and friends to reduce the burden of the infection on Hh members. It takes the value 0, if household receives remittance and 1 otherwise.	$\phi_6 < 0$	Baiyegunhi and Makwangudze, (2013)
SA _{it}	Sales of Hh assets	When the financial burden of HIV/AIDS is so great on household, they resort to sell their assets. This variable measures the asset sold by household due to HIV/AIDS cost on member/s. This takes the value 1, if household sells assets and otherwise 0.	$0 < \phi_7 > 0$	Agatha <i>et al.</i> (2010) & Musunguzi (2012)
PF _{cit}	Food purchases in credit	One of the coping strategies employed by household to reduce the burden of the illness on food members is buying food on credit. When household buys food on credit, this takes the value 0, otherwise 1.	$0 < \phi_8 > 0$	Okezie <i>et al.</i> (2011).
SFG	Support from the government.	This captures the various forms of support rendered by the government to affected HIV/AIDS persons and household to reduce the threat of the illness on their means of livelihood. If household receives supports in the form of cash, jobs and other aids from the government, this takes 0 and 1 otherwise.	$\phi_9 < 0$	Hatsu <i>et al.</i> (2014) & Shyamala (2015).
NH	Hh member/s with HIV	Household with more than one infected person tends to spend more on food and non-food expenditures. Hence, this variable captures the numbers of People Living with HIV/AIDS (PLWHA) in the household. One is attributed to; more than one person with HIV/AIDS and zero if only the respondent is affected with HIV/AIDS.	$\phi_{10} > 0$	Mano <i>et al.</i> (2006).

Note: Household = Hh. The expenditure on HIV/AIDS therapy and other variables are measured per month during the last twelve months.

Table 4.5: Descriptions of variables in the Food Expenditure Model Two (Cont.)

Estimated parameters				
Variables	Definitions	Measurements	A priori signs	Data sources
EMT	Employment status	This captures the employment status of the respondents. When the respondent is gainfully employed, this tends to reduce the burden of HIV/AIDS on household expenditures otherwise reverse is the case. This takes the value 1, if the participant is unemployed & 0 otherwise.	$0 < \phi_{11} > 0$	Zhang <i>et al.</i> (2012).
E	Educational level	This is utilized to captures the educational level of the household head. One is attributed to household head with no formal education and zero otherwise.	$0 < \phi_{12} > 0$	Ayele <i>et al.</i> (2012) & Musinguzi (2012).

Note: Household = Hhs. The expenditure on HIV/AIDS therapy and other variables are measures per month during the last twelve months.

4.15 Estimation Techniques

This study employed descriptive statistics (percentage and mean where applicable) to analyse the socio-economic and demographic characteristics of the respondents (Objectives one and two). It also uses econometric technique (Binary Logistic Regression Techniques, LRT) to achieve objective three, four and five. This is done by utilizing LRT to predict the odds that certain age group and occupational class will experience income decline in objective three. In objective four and five, selected socioeconomic, demographic and health variables were employed to predict the Odd/livelihoods of income and food expenditure decline among affected household in Lagos state.

Basically, LRT is a type of regression which is applied when the predicted variable is dichotomy (Binary) or is more than two classes (Multinomial), while the predictor variables are of any form (Hosmer & Lemeshow, 2000). In other words, the technique is employed to estimate the odds or livelihood of an event (value) occurring. The LRT usually applies the Maximum Likelihood Estimation (MLE) after the dependent variable is transform into logit variable (Roy & Guria, 2008). The term logit is defined as the natural log of the odd of the predicted variable equal to a certain figure or number (in

binary logistic regression, it usually take the value one while in multinomial, it takes the highest value). The logit (log odd) is regarded as the slope value in the regression equation. The slope can simply be said to be a change in the mean value of ‘Y’ as a result of a unit change of ‘X’. In LRT, the study estimates the change in the log odds of the predicted variable, not the change in the predicted value as it is done in Ordinary Least Square Technique. With regard to this study, with a dichotomous variable, the odds of being a member of the target group is equal to the probability of being a member of the target group divided by the probability of being a member of the other group. Given this, the dependent variable in logistic regression function usually takes the value of one (1) with a probability of success ψ or otherwise zero (0) with a probability of failure as $1 - \psi$. Using the income model in equation 4.2, the task of estimating the parameters is achieved by using log-odd ratio such that:

$$\text{Logit } (\psi_i) = \Omega_0 + \Omega_1 E_{it} + \Omega_2 SA_{it} + \Omega_3 A_{it} + \Omega_{4h} L_{it} + \Omega_{5u} L_{it} + \dots \Omega_6 Sex_{it} + \varepsilon \dots + .4.5$$

The logit transformation can be defined as the:

$$\text{Odds} = \frac{\psi_i}{1 - \psi_i} = \frac{\text{Aggregate household income will decline due to HIV/AIDS illness}}{\text{Aggregate household income will not fall due to HIV/AIDS illness}} \dots 4.6$$

Therefore, equations 4.5 and 4.6 can explicitly be specified as:

$$\text{Odds} = \frac{\psi_i}{1 - \psi_i} = \Omega_0 + \Omega_1 E_{it} + \Omega_2 SA_{it} + \Omega_3 A_{it} + \Omega_{4h} L_{it} + \Omega_{5u} L_{it} + \dots \Omega_6 Sex_{it} + \varepsilon \dots + .4.7$$

Explicitly, the computed value ‘ ψ_i ’ is the probability ranging from 0 to 1. Following equation 4.7, the study estimates the odd of experiencing income decline as against not experiencing income decline among HIV/AIDS affected households. All other variables have been previously defined.

The Logistic Regression Technique (LRT) is justified for the study based on the fact that it is very robust and proves to be an effective tool of estimating predicted variable from the probabilities of dichotomous and demographic variables. Also, the logistic function is

bounded by zero and one value which is good for modelling binary variables as coded in Table 4.1 and 4.2 of this study. Similarly, this technique has been tested to be useful clinically (Yussuff *et al.*, 2012), especially in this kind of study where the estimated outcome is the probability of occurrence of an event to the probability of it not occurring (William *et al.*, 1993). Unlike other estimated tools (OLS), the dependent variable of 'LRT' need not be normally distributed for our empirical analysis to be performed. Importantly, most estimation techniques (for instance, discriminant analysis, linear regression) examine variation in the outcome variables as explained by the predictors. However, LRT examines the effects of predictors on the probability (or log odd) of the outcome, not changes in the outcome itself.

4.16 Methodological limitation

This study encountered a lot of challenges among which are:

- i. Low response rate as respondents complained that the version of the HIDS instrument is quite lengthy. When the researcher examines the result report provided by research assistants, it was discovered that in addition to the number of respondents who completed the survey, many visited the site and/or took a portion of the survey and did not complete it. This suggests that there was a considerable amount of attrition due to the length of the survey. Also, some questionnaires given to some research assistants/co-ordinators were not returned at due date as promised.
- ii. Some respondents might give incorrect or incomplete information, especially as it relates to household income and food expenditures. Some informants may purposefully give misinformation due to fear of taxes on income or fear of being asked to pay for some essential drugs and services which are supplied for free in

the state. Other respondents due to ignorance or illiteracy, were not able to give detailed information about the full data of the impact of the illness on their households means of sustenance.

- iii. Lack of state-level household disaggregated data particularly on income level/categories, food expenditure, duration of living with the HIV/AIDS illness, average monthly expenditures on HIV/AIDS-related drugs and services, just to mention a few. The foregoing deficiencies limit the ability of the researcher to categorize households into different subgroup for the purpose of the empirical analysis.

In spite of these limitations, generally, the study gives adequate empirical support and findings to extant arguments of the impact of HIV/AIDS on income and food expenditures of affected households.

Chapter Five

Data Presentation and Analysis

5.1 Preamble

In an attempt to provide answers to the propositions highlighted in this research, this chapter presents the data outcomes obtained with the aid of questionnaires. The presentations of the results are structured into three parts. Firstly, the analysis of the outcome of the response rate on the questionnaire administered. Secondly, it presents socioeconomic characteristics of the respondents from the ten sampled sites. Thirdly, it provides the empirical analysis (correlation and logistic tests) utilized to proffer answers to the research questions initially postulated.

Out of the 1500 copies of the HIDS questionnaires distributed a total of 1242 copies were retrieved from the respondents. This represents 82.8 per cent of the aggregate questionnaire sent out. The reason a sizeable number of the HIDS was retrieved is based on the fact that this is a site-based study where respondents are expected to fill the HIDS tools during and after their consultation and treatment hours, and submit to their respective coordinators (Research assistants). Of the 1242 copies of the questionnaire retrieved, 891 copies were deemed usable and therefore fit for the study. This represents 59.4 per cent response rate. Some questionnaires were rejected at the analytical stage because of poor responses. This is a common problem in HIV/AIDS related research since people in many societies associate the disease with stigma. Therefore, some respondents are reluctant to give out certain vital information about their household means of livelihoods (Table 5.1).

Table 5.1: Analysis of Questionnaires

No. of distributed (A)	No. of retrieved (B)	No. of usable (C)	% of 'B' to 'A'	% of 'C' to 'B'
150	142	118	94.6	78.6
150	123	70	82.0	46.6
150	96	66	64.0	44.4
150	146	133	97.3	88.7
150	102	48	68.0	32
150	138	104	92.0	69.3
150	124	97	82.6	64.6
150	109	63	72.6	42
150	117	80	78.0	53.3
150	145	112	96.6	74.6
1500	1242	891	82.8	59.4

Source: Author's computation 2014/15.

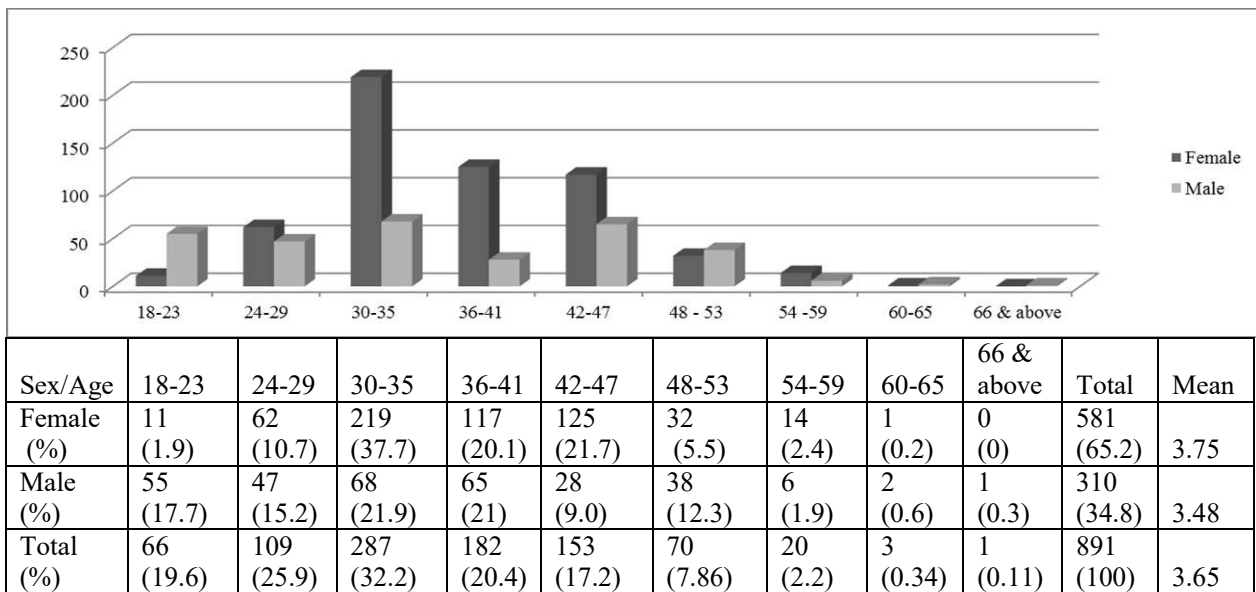
Thus, the demographic and socioeconomic analyses of the respondents are based on response rate as presented in Table 5.1.

5.2 Demographic Characteristics of PLWHAs

This section examines the socio-demographic profiles of the respondents as noted in the HIDS tool. As well, it is meant to proffers answer to objective one and research question one of the study.

5.2.1 HIV/AIDS by Sex and Age Group

Out of the 891 copies of the edited questionnaires, it is observed that female respondents were more in the surveyed centres. They are made up of 65 per cent of the aggregate respondents while the remaining were males (35 %). Generally, the age-group survey shows that participants within the ages of 30-35 years have the highest number of PLWHA. This is followed by the age group 36-41years with 20 per cent. The respondents within age group 18-23 years, 48-53 years, 54-59 years, 60-65 years, 66 years and above constitute the least group infected with HIV/AIDS scourge.



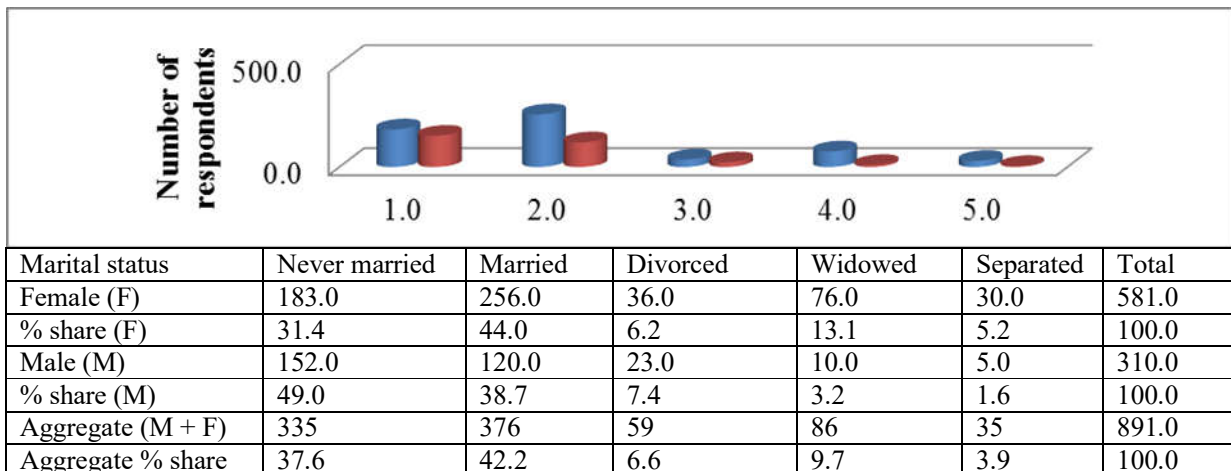
Source: Author's computation 2014/15

Figure 5.1: HIV/AIDS by Sex and Age Group

The mean score of 3.7 per cent (female) and 3.4 per cent (male) shows that age 30 - 35 are most likely to be at risk of HIV/AIDS infection in Lagos state. This statistics is buttressed by the aggregate mean score of 3.65 per cent, indicating high incidence rate among this core group (Figure 5.1).

5.2.2 HIV/AIDS Incidence by Sex and Marital Status

The field survey on marital status reveals that HIV/AIDS incidence is more common among female married respondents (44 %) and single unmarried male (49%).



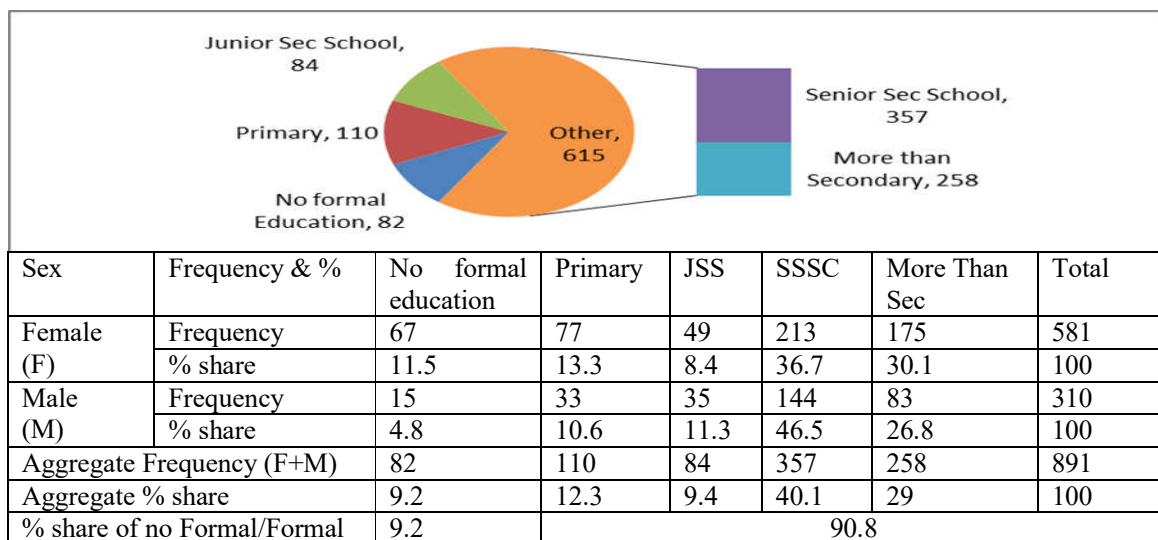
Source: Author's computation 2014/15.

Figure 5.2: HIV/AIDS by Marital Status

The number of divorced respondents is given as 6.2 percent for female respondents and 7.4 for male respondents. Additionally, individuals who are married but not living together (Separated) constituted 13.1 and 3.2 percent of the respondents. The result so far shows that the least group that attends ART and PMTCT facilities are respondents who are separated, while the highest group are married individuals.

5.2.3 HIV/AIDS by Educational Status

The response rate by educational attainment showed that 9.2 per cent of the respondents had no formal education, while 12.3 per cent are primary education holders. Approximately 9.4 per cent of the respondents hold a Junior Secondary School certificate (JSS), refer to Figure 5.3.



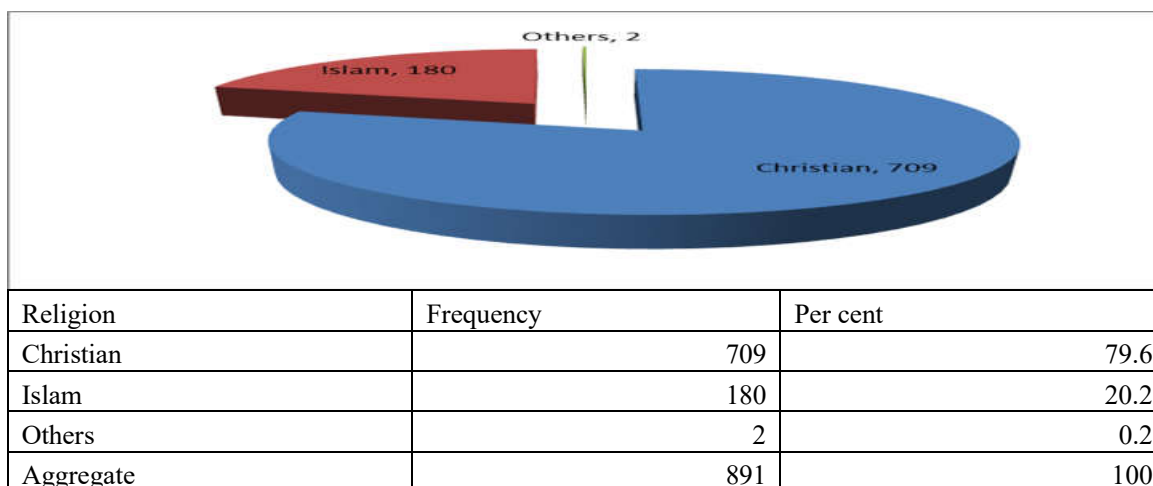
Source: Author's computation 2014/15.

Figure 5.3: Educational Status of participants

Respondents with Senior Secondary School Certificate (SSSC) and those with more than Secondary School certificate accounted for the highest PLWHAs with 40.1 and 29 per cent respectively. In the same vein, a high proportion (90.8%) of the participants had one form of education or another (Figure 5.3).

5.2.4 Religion Affiliation of Respondents

The finding in Figure 5.4 shows that 709 participants who represent about 79.6 per cent of the respondents are Christian. Also, the respondents who practised Islam were 180 which constitute 20.2 per cent of the participants



Source: Field survey 2014/15 (Author's computation 2015/2016)

Figure 5.4: Religion Affiliations of Respondents

A few number of the respondents (2) which represent 0.2 per cent noted that they practised other religion.

5.2.5 Participants State of Origin

The HIV/AIDS incidence (%) by state shows that Ogun state has more respondents in our study (12.1 %). This is followed by Lagos (10.4 %) and Imo states (8.9 %).

Table 5.2: State of Origin of Respondents

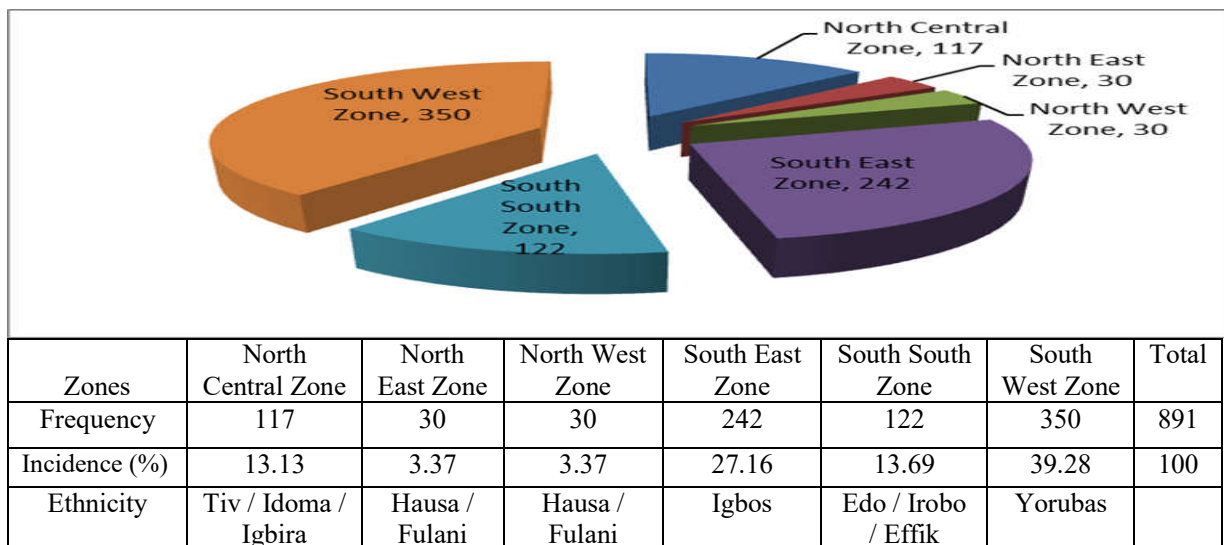
States	Freq	(%)	State	Freq	(%)	State	Freq	(%)	State	Freq	(%)
Abia	57	6.4*	Delta	36	4.0*	Kano	12	1.3	Ogun	108	12.1*
Adamawa	17	1.9	Ebonyi	12	1.3	Katsina	2	0.2	Ondo	38	4.3*
Akwa Ibom	22	2.5	Edo	35	3.9*	Kebbi	1	0.1	Osun	39	4.4*
Anambra	48	5.4*	Ekiti	22	2.5	Kogi	26	2.9*	Oyo	50	5.6*
Bauchi	2	0.2	Enugu	45	5.1*	Kwara	48	5.4*	Plateau	10	1.1
Bayelsa	2	0.2	Gombe	4	0.4	Lagos	93	10.4*	River	6	0.7
Benue	25	2.8*	Imo	80	8.9*	Nasarawa	5	0.6	Sokoto	4	0.4
Borno	4	0.4	Jigawa	2	0.2	Niger	3	0.3	Taraba	3	0.3
Cross River	22	2.5	Kaduna	8	0.9						
Aggregate respondents; 443. Mean Scores: 2.64						Aggregate respondents; 448. Mean score: 2.64					

Source: Field survey 2014/15 (Author's computation 2015/16)

The states with the least respondents are: Kebbi (0.1%), Bauchi (0.2%), Bayelsa (0.1), Jigawa (0.2) and Katsina (0.2). The figures asterisked indicate states with values above the mean threshold and indicating high incidence of HIV/AIDS among the indigenes from these states.

5.2.6 Geo-Political Zones / Ethnic Groups of Participants

The survey on ethnicity via zones was sought from the respondents and the outcome suggested that more respondents are from the South West Zone (Yoruba: 39.28 %) and South East Zone (Igbo: 27.16 %).



Source: Field survey 2014/15 (Author's computation 2015/16)

Figure 5.5: HIV/AIDS Prevalence by Zone and Ethnicity

The zones and ethnic groups with the lowest participants are from North East (Hausa/ Fulani) and North West (Hausa/ Fulani) Zone with 3.37 per cent incidence rate (Figure 5.5).

5.2.7 Local Government Area where Respondents Dwell in Lagos State

The respondents were asked to indicate the Local Government Areas (LGAs) where they reside in Lagos State. Quite shocking, about 60 per cent of the participants receive treatment outside the Local Government Areas (LGAs) of their residence (Appendix 1.2).

After disaggregation of data into different Local Government Areas (LGAs) and

senatorial districts, it was observed that Alimosho LGA (11.4 %) in Lagos West senatorial district (484 PLWHAs) has more people receiving consultation, medication and treatment outside the LGAs of their dwelling.

Table 5.3: HIV/AIDS by Local Government of Residence

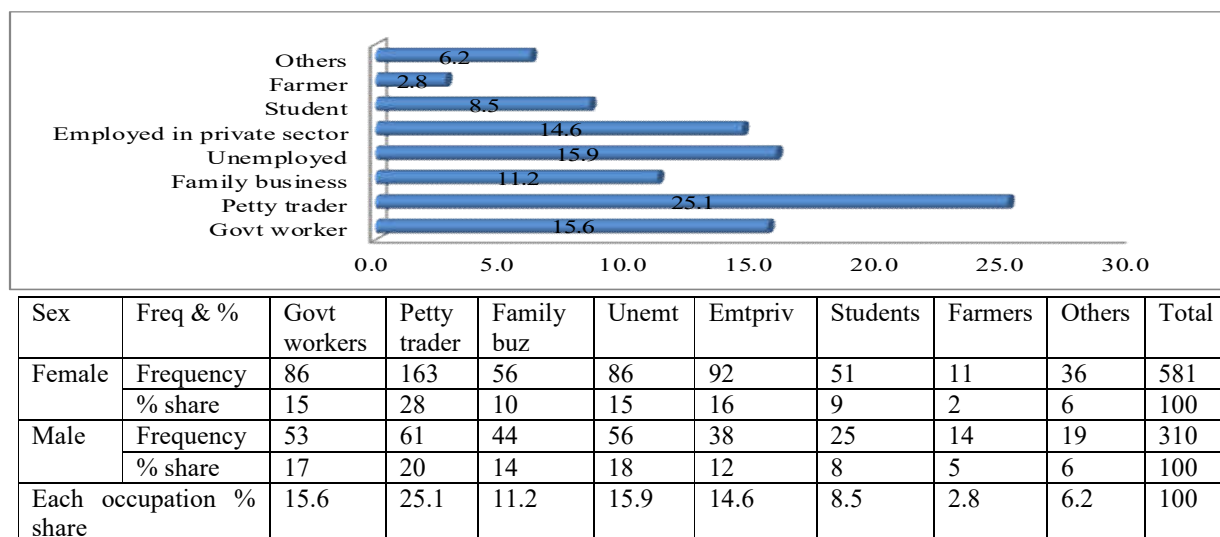
Lagos Central	Freq	(%)	Lagos East	Freq	(%)	Lagos West	Freq	(%)	Lagos West	Freq	(%)
Apapa	23	2.6	Epe	19	2.1	Agege	23	2.6	Ifako	28	1.8
Eti-Osa	34	3.8	Ibeju Lekki	16	1.8	Ajeromi	62	7*	Ikeja	36	4
Lagos Island	55	6.2*	Ikorodu	67	7.5*	Alimosho	102	11.4*	Mushin	62	7*
Lagos Mainland	68	7.6*	Kosofe	39	4.4	Amuwo-Odofin	20	2.2	Ojo	75	8.4*
Surulere	53	5.9*	Shomolu	33	3.7	Badagry	32	3.6	Oshodi-Isolo	44	4.9*
Total	233		Total	174		Total respondents: 484.				Mean; 4.9	

Source: Field survey 2014/15 (Author's computation, 2015/16). NB: Frequency = Freq.

The lowest participants were from Ibeju Lekki LGA (1.8%) in Lagos East senatorial district. The Figures asterisked are LGAs with statistics above the mean threshold of 4.9 per cent.

5.2.8 HIV/AIDS by Occupations

The participants were asked to indicate their current occupations 25.1 per cent revealed that they are petty traders (Figure 5.6).



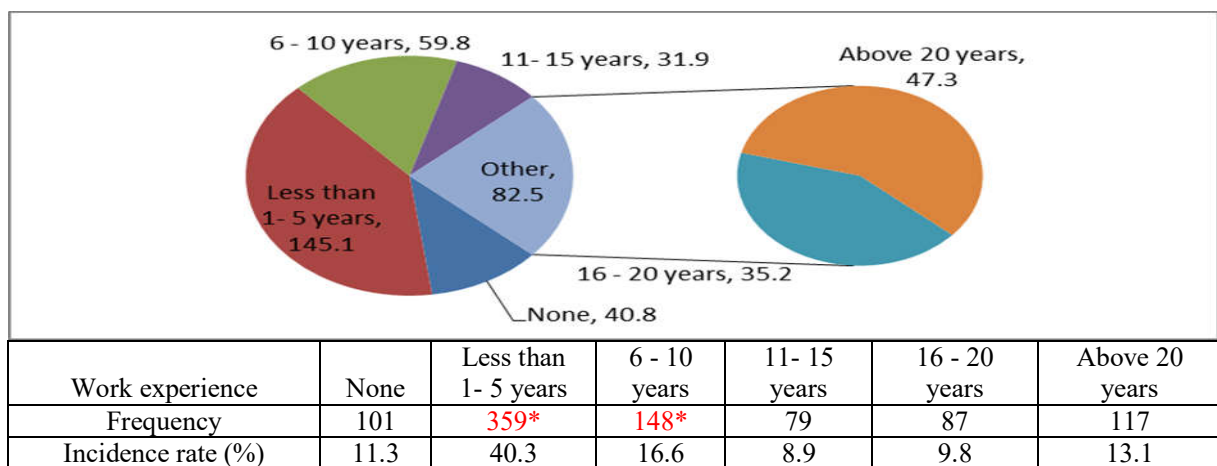
Source: Field survey 2014/15 (Author's computation 2015/16)

Figure 5.6: Present Occupations of Respondents (Values in percentage)

The unemployed (Unemt) and Government workers constitute 15.9 and 15.6 per cent of the participants respectively. Those employed in the private sector (Emtpriv) account for 14.6 per cent, while individuals managing family businesses constitute 11.2 per cent of the participants. However, the percentage share of students (8.5%), farmers (2.8%) and others (6.2%) account for the lowest number of PLWHAs. Going by the result, the researcher deduced that petty traders, mostly female, are more likely to be at risk of HIV/AIDS vulnerability in Lagos State.

5.2.9 Work Experience of Respondents

The work experience profile of the PLWHAs shows that majority of the participants fall within less than 1–5 years group (40.3 %). In other words, most of the respondents have work experience of five years and below.



Source: Field survey 2014/15 (Author's computation 2015/16)

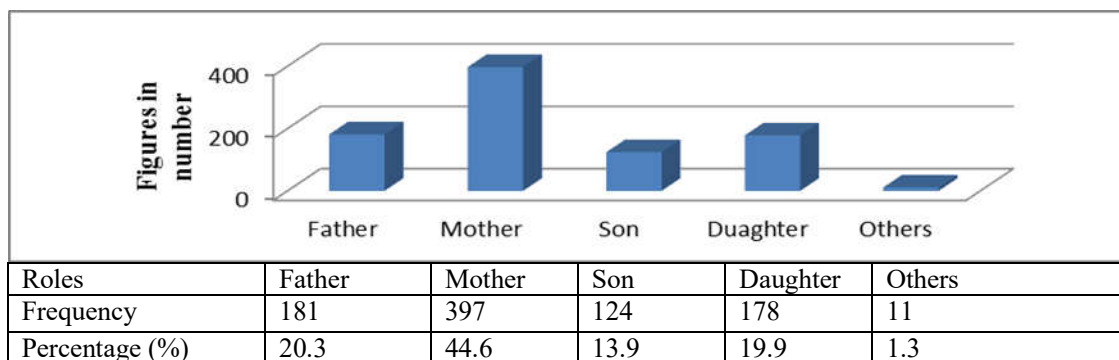
Figure 5.7: Work Experience of Participants

The group that has the least participants are those who have work experience of between 11– 15 years. High participation rate in treatment and medical facilities is mostly observed among respondents with < 1-5 years and 6-10 year of work experience.

5.2.10 Respondent Role in the households

The field survey suggested that child bearing mothers (44.6 %) are mostly found in the

entire centre where the study was carried out. This is followed by father (20.3 %).



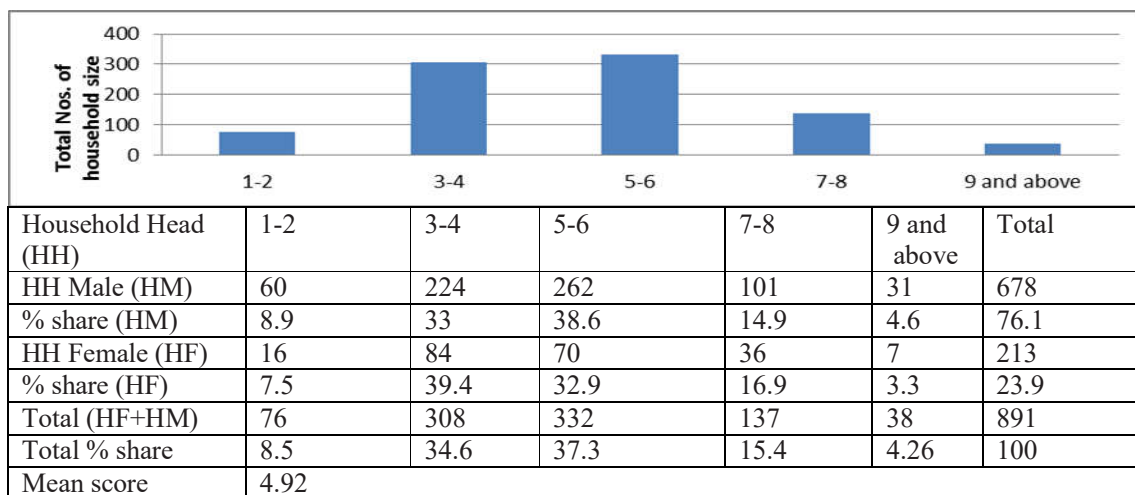
Source: Field survey 2014/15 (Author's computation 2015/16)

Figure 5.8: Respondents position in the home

To some extent, the researcher deduced that mothers, fathers and daughters are more found receiving medication in most HIV/AIDS facilities and centres in Lagos state.

5.2.11 Household size and Head of Household in PLWHAs Dwelling

The household size was cross tab with the head of household in order to investigate whether small or large household sizes are headed by male or female. The finding shows that most household are headed by male (76.1%). Only 23.9 (24) per cent of the households are headed by female.



Source: Field survey 2014/15 (Author's computation 2015/16)

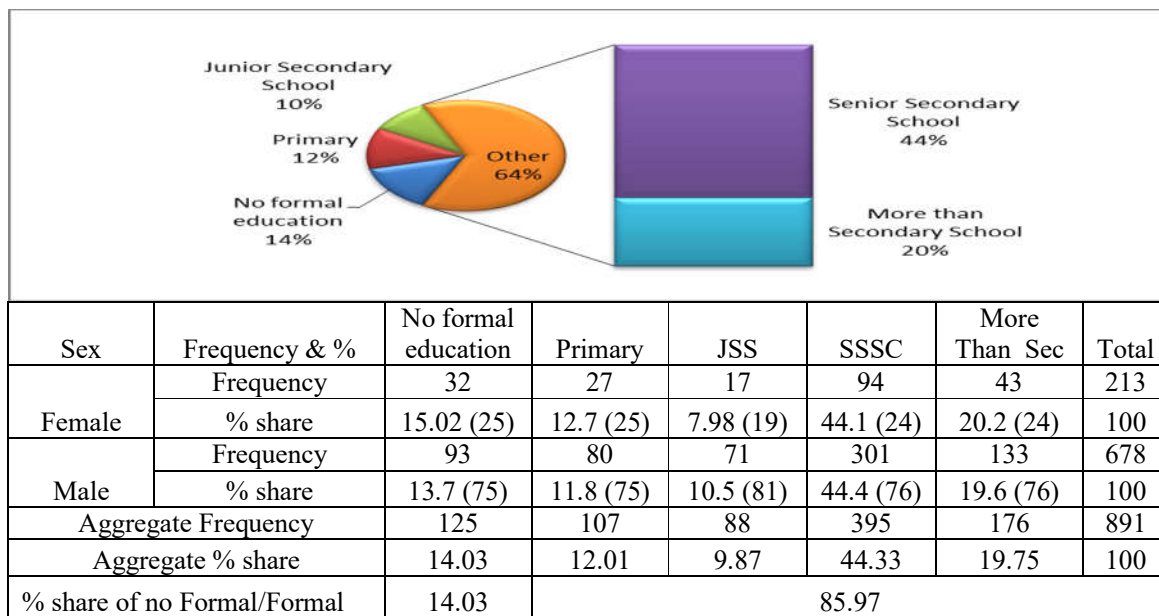
Figure 5.9: Household Size by Head of Household

A sizeable number of the respondents dwelled in a household of 5 – 6 persons headed by

a male (38.6%). However, in female headed households, the highest household size is given as 3-4 persons. Going by the data coding, it can be inferred that the mean or average household size in our study is 6–7 persons in the home of people living with HIV/AIDS in Lagos state. Interestingly, fewer respondents were found to be residing in larger households of nine (9) persons and above in Lagos state (4.26 %).

5.2.12 Educational status of Head of Household

The Figure 5.10 presents the data on educational status of both male and female head of household in our survey.



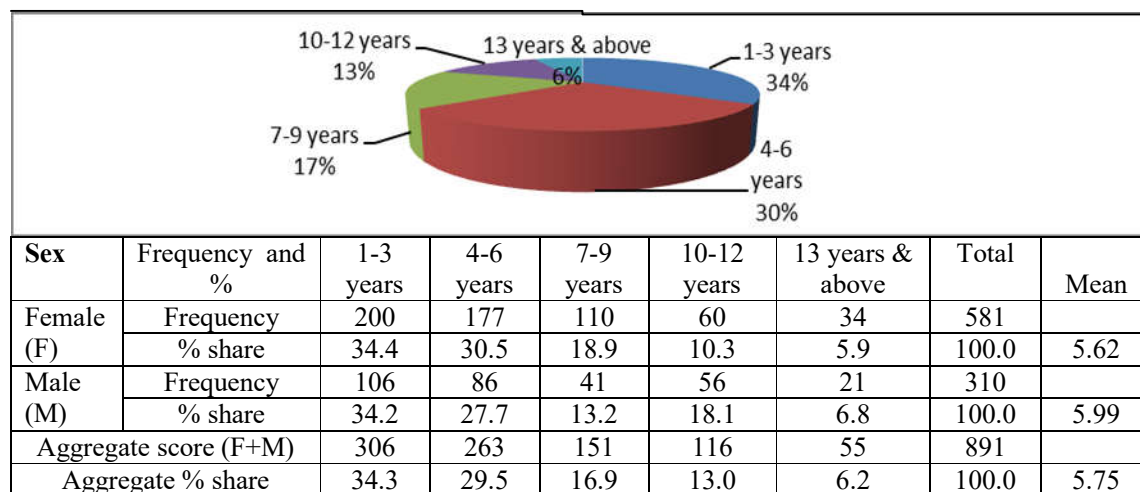
Source: Field survey 2014/15 (Author's computation 2015/16) (Figures in brackets are used for comparison in between sex)

Figure 5.10: Educational Status of Household Head

From the result, it can be deduced that more respondents dwell in households where the head had attained senior secondary school certificate. The least group are those whose household head attained junior secondary school certificate (9.87%). So far, the outcome revealed that there are more males (75%) with no formal education than females (25). Also, shown is that household heads with formal education (85.97%) is higher than household head without formal education.

5.2.13 Duration of Living With HIV/AIDS

For both sex (male and female respondents), approximately 80.7 per cent of the respondents admitted that they have been living with the disease from 1-to-9 years. This implies that new infection rate is still high as more PLWHAs are within the brackets of 1-to-3 years and 4 – to- 6 years.



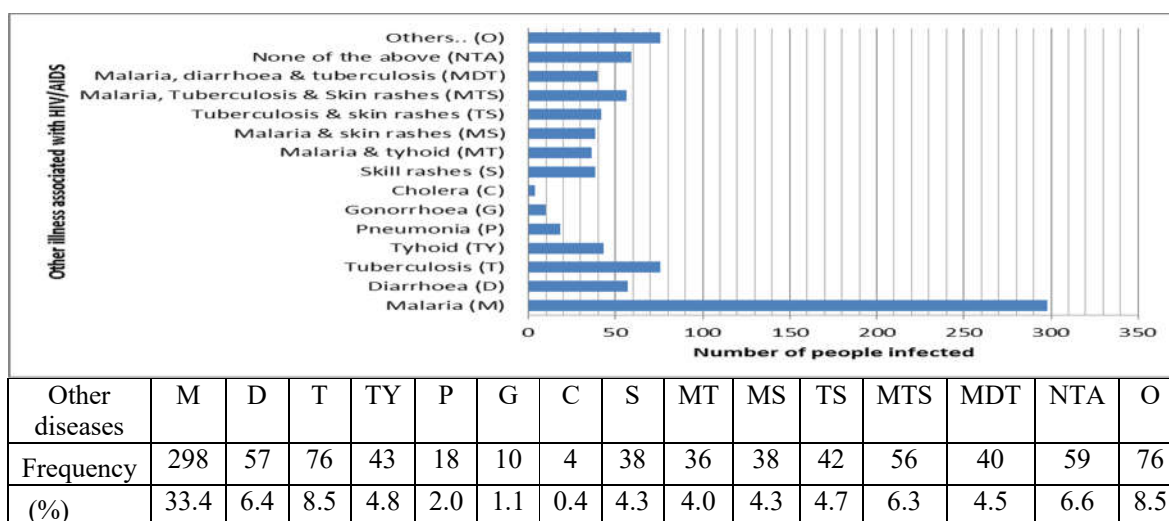
Source: Field survey 2014/15 (Author's computation 2015/16)

Figure 5.11: Duration / Years of Living With HIV/AIDS

However, there is decline in the number of PLWHAs for the period of over 13 years (6.2 per cent). The study might attribute the decline in the number of this subgroup (PLWAs) to AIDS - mortality that is common among people who are in AIDS stage.

5.2.14 Other Illness Associated With HIV/AIDS

The number of illnesses associated with HIV/AIDS were sought from the participants. The result in Figure 5.12 indicates that 24 per cent of the participants have experienced more than one disease (23.8%). About 33.4 per cent of the participants noted that malaria is associated with the HIV/AIDS illness. Approximately, 6.4 per cent and 8.5 per cent disclosed that they experienced diarrhoea and tuberculosis respectively. Those who suffered from typhoid, pneumonia, gonorrhoea, cholera and skin rashes stood at 4.8, 2.0, 1.1, 0.4 and 4.3 per cent.



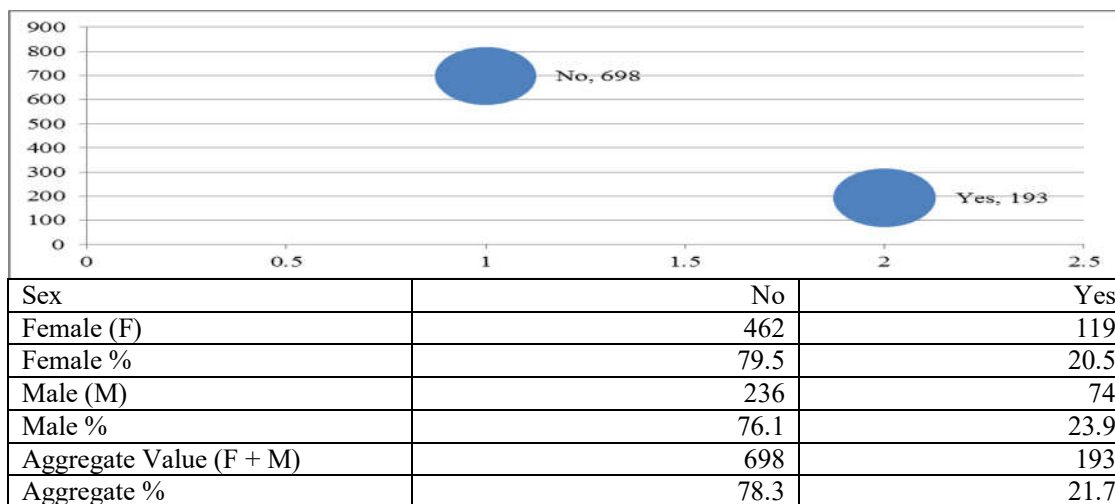
Source: Field survey 2014/15 (Author's computation 2015/16)

Figure 5.12: Number of other diseases affecting PLWHAs

The most common illness among PLWHAS include: malaria, diarrhoea, tuberculosis and typhoid. However, 8.5 per cent of the participants admitted not to have experienced any form of illness (Figure 5.12).

5.2.15 Discriminations and Stigmatization (SAD) from Job Opportunities

Besides, the participants were asked if they or any member of their household have suffered from discrimination or being stigmatized with regard to job placement. So far, a greater number of the respondents (78.3%) responded that they have not encountered any form of discrimination and stigmatization when securing a job.



Source: Field survey 2014/15 (Author's computation 2015/16)

Figure 5.13: Discrimination and Stigmatization from Employment Opportunities

However, a lesser percentage (21.7) of the respondents agreed that they have experienced one form of discrimination and stigmatization from job opportunities due to their HIV/AIDS status. In between sex, female respondents have encountered more discrimination and stigmatization than their male counterpart.

5.2.16 Other Household Member/s Infected with HIV/AIDS

The finding from Table 5.4 shows that 60.7 per cent of PLWHA admitted that no other member of their household is suffering from HIV-related infection.

Table 5.4: HIV/AIDS Status of Other Member/s by Household Size and Head

Household sizes of PLWHAs	Number of other Hh members infected with HIV/AIDS			
	None	One	Two & above	Aggregate
Small household of 1 - 4 persons (S)	238	83	63	384
Percentage (%) of 'S'	62 (43.9)	21.6 (44.6)	16.4 (38.4)	100
Large household of 5 persons & above (L)	303	103	101	507
Percentage (%) of 'L'	59.8 (56)	20.3 (55.4)	19.9 (61.6)	100
Aggregate (S + L)	541	186	164	891
Percentage (%)	60.7 (100)	20.9 (100)	18.4 (100)	100
Head of household (Hh)				
Male head of Hh	405	139	134	678
Percentage (%) of 'M' Hh member infected	59.7 (74.8)	20.5 (74.7)	19.8 (81.7)	100
Female head of Hh	136	47	30	213
Percentage (%) of 'F' Hh member infected	63.8 (25.2)	22.1 (25.3)	14.1 (18.3)	100
Total Hh member infected (M + F)	541	186	164	891
Percentage (%)	60.7 (100)	20.9 (100)	18.4 (100)	100

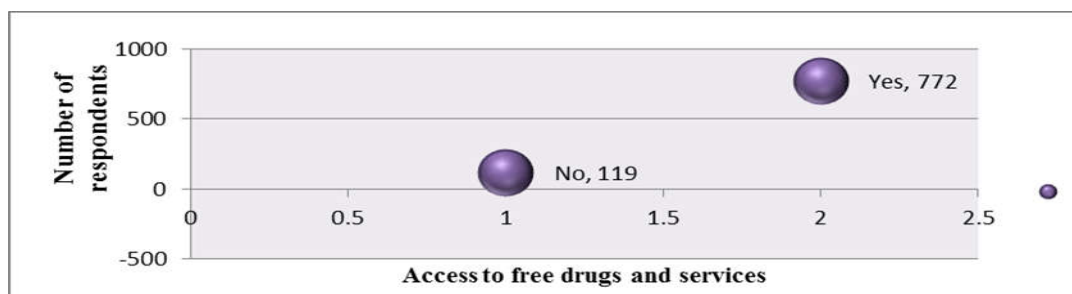
Source: Field survey 2014/15 (Author's computation 2015/16). Values in brackets are for comparison in between sex.

Conversely, 20.9 per cent and 18.4 per cent of the participants noted that, one or two of the household member/s is/are infected with HIV/AIDS. With regard to household size, there are more people living with HIV/AIDS in large households (55.4% & 61.6%) than in smaller households (44.6% & 38.4%). Similarly, it is observed that HIV/AIDS incidence (rate) among other household member/s (excluding the respondent) is higher in male-headed households (74.7% & 81.7%) than in female-headed households (25.3% & 18.3 %) as indicated in Table 5.4.

5.2.17 Access to Free Drugs and Services

As indicated in Figure 5.14, 772 respondents (87%) agreed that they have access to free

health-care drugs and consulting services from the medical/treatment centres where they enrolled.



Source: Field survey 2014/15 (Author's computation 2015/16)

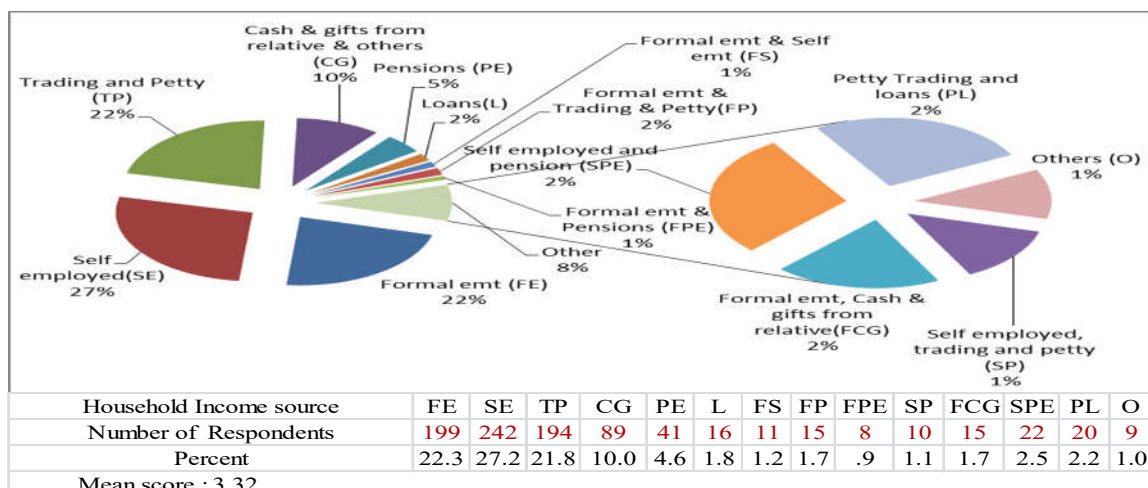
Figure 5.14: Access to Free Drugs and Services by PLWHAs

However, a smaller fraction of the respondents (13 %) decline receiving such aids from their consulting and treatment centres.

5.3 Socio-Economic Profile of PLWHAs by Income, Expenditures and Coping Strategies (Objective Two).

5.3.1 Sources of Household Income

The participants were asked to state three main sources of income to their household. Majority of the respondents noted that they are self-employed (SE: 27.2 %). Those involved in petty trading constitute (TP) 21.8 per cent, while participants receiving cash and gifts from relatives and friends (CG) were 10 per cent.



Source: Field survey 2014/15 (Author's computation 2015/16)

Figure 5.15: Household Major Sources of Income

A good number of the participants are employed in the formal sector (FM: 22.3 %). Pensioners were made up 4.6 per cent of the respondents, while those who rely on loans were 1.8 per cent. Participants whose households are involved in formal employment and self-employment (FS) were 1.2 per cent, while those in formal employment and petty trade were 2 per cent.

5.3.2 Aggregate Household Income

Table 5.5 presents the household income level before and after the HIV/AIDS infection. Findings from the study suggest that the average household income bracket before the HIV/AIDS incidence is given as ₦20, 000 – ₦50, 000. Similarly, household income after the HIV/AIDS incidence is below ₦20, 000.

Table 5.5: Household Income Level

Household Income before the HIV/AIDS infection						
Head of Household	Below ₦20,000	₦20, 000 – ₦50,000	₦50,001- ₦100,000	₦100,001- ₦150,000	₦150,001 & above	Total
Male (M)	238	238	129	58	15	678
Percentage	35.1 (75.3)	35.10 (81.5)	19.03 (71)	8.55 (82.8)	2.21 (48.4)	100
Female (F)	78	54	53	12	16	213
Percentage	36.62 (24.7)	25.4 (18.5)	24.9 (29)	5.63 (17.2)	7.51 (51.6)	100
Total (M+F)	316	292	182	70	31	891
Percentage (M+F)	35.46	32.77	20.43	7.86	3.48	100
Mean value =2.11, that is household income ranges from ₦20,000– ₦50,000.						
Household Income after the HIV/AIDS infection						
Head of Household	Below N20,000	N20, 000- N50,000	N50,001- N100,000	N100,001- N150,000	N150,001 & above	Total
Male (M)	93	347	100	77	61	678
Percentage	13.72 (65.96)	51.2 (76.09)	14.75 (77.51)	11.4 (92.8)	8.9 (74.4)	100
Female (F)	48	109	29	6	21	213
Percentage	22.54 (44.04)	51.2 (23.91)	13.62 (22.49)	2.82 (7.23)	9.86 (25.6)	100
Total (M+F)	141	456	129	83	82	891
Percentage (M+F)	15.8	51.2	14.5	9.32	9.2	100
Mean value = 1.41, that is household income ranges from ₦20, 000 and below.						
If the household have experienced income decline due to HIV/AIDS						
Respondent/Option	No	Yes	Aggregate			
Male (M)	130 (33.6)	180 (35.7)	310			
Female (F)	257 (66.4)	324 (64.3)	581			
Total (M+F)	387	504	891			
Percentage (M+F)	43.4	56.6	100			

Source: Field survey 2014/15 (Author's computation 2015/16). Figures in brackets are in-between sex ratios.

In between sex, households headed by males tend to earn more than those headed by female. This is apart from the scenario of, ‘before’ the HIV/AIDS incidence where the income percentage share of female (Head of household), who earned more ₦150,000 were 51.6 and male 48.4 per cent. The Table 5.5 also suggested that a greater percentage of the respondents (56.6 %) agreed that they have experienced income decline from HIV/AIDS-related illness. However, about 43.4 per cent of the participants indicated that HIV/AIDS does not have any adverse effect on their household income.

5.3.3 Household aggregate food expenditure in Naira

Prior to the HIV illness, the finding on food expenditures suggested that the average amount spent by household is below ₦1,000.

Table 5.6 Aggregate Expenditure on Food Consumption

Household food expenditures in Naira (Before the HIV/AIDS infection) by household head						
Head of Household	None	Below ₦1,000	₦1,000 - ₦1,999	₦2,000- ₦2,999	₦3000 & above	Total
Male (M)	175	279	81	83	60	678
Percentage	25.8 (71.2)	41.2 (75)	11.9 (78.6)	12.2 (91.2)	8.8 (75)	100
Female (F)	70	93	22	8	20	213
Percentage	32.9 (28.8)	43.7 (0.25)	10.3 (21.4)	3.8 (8.8)	9.4 (25)	100
Total (M+F)	245	372	103	91	80	891
Percentage (M+F)	27.5 (100)	41.8 (100)	11.6 (100)	10.2 (100)	8.98 (100)	100
Mean value =1.31, Indicating that household food expenditure per day is below ₦1,000 .						
Household food expenditures in Naira (After the HIV/AIDS infection) by household head						
Head of Household	None	Below ₦1,000	₦1,000 - ₦1,999	₦2,000- ₦2,999	₦3000 & above	Total
Male (M)	75	141	217	151	94	678
Percentage	11.1 (72.8)	20.8 (72.3)	32 (79.8)	22.3 (76.6)	13.9 (75.8)	100
Female (F)	28	54	55	46	30	213
Percentage	13.1 (27.2)	25.4 (27.7)	25.8 (20.2)	21.6 (23.4)	14.1 (24.2)	100
Total (M+F)	103	195	272	197	124	891
Percentage (M+F)	11.6 (100)	21.89 (100)	30.53 (100)	22.11 (100)	14 (100)	100
Mean value =2.05, Household food expenditure per day is below ₦1,000 - ₦1,999.						
Household experienced food expenditure decline due to HIV/AIDS						
Respondent/Option	No	Yes		Aggregate		
Male (M)	136 (33.8)	174 (35.6)		310		
Female (F)	266 (66.2)	315 (64.4)		581		
Total (M+F)	402	489		891		
Percentage (M+F)	45.1	54.9		100		

Source: Field survey 2014/15 (Author's computation 2015/16). Figures in brackets are in-between sex ratios.

However, after the HIV/AIDS incidence, the average food expenditure was within the range of ₦1,000 - ₦1,999. This statistics shows that food expenditure has increased during the period of the illness (Table 5.6). Similarly, households headed by males spent more on food consumption than those of females. The foregoing may be attributed to the economic advantage given to males over females in job-related activities and environment (Table 5.6).

5.3.4 Aggregate Expenditures on HIV/AIDS Health Related Activities

It is of interest to note that 23.2 per cent of our sampled participants do not incur cost on consultation and health-related activities, while approximately 72.8 per cent do.

Table 5.7: Expenditures on HIV/AIDS related drugs and services by household size

Expenditures on HIV/AIDS related drugs and services per months							
Household size	None	Less than ₦1000	₦1001 - ₦5,000	₦5001 - ₦10,000	₦10,001 & above	Total	Average
1 - 4 persons	90	125	107	45	17	384	₦1,000
Per cent	23.4 (43.5)	32.6 (44.8)	27.9 (43.1)	11.7 (39.8)	4.4 (38.6)	100	
5 persons & above	117	154	141	68	27	507	
Per cent	23.1 (56.5)	30.4 (55.2)	27.8 (56.9)	13.4 (60.2)	5.3 (61.4)	100	₦1436.59K
Aggregate	207	279	248	113	44	891	₦2436.50K
Per cent	23.2	31.3	27.8	12.7	4.94	100	

Source: Field survey 2014/15 (Author's computation 2015/16). Figures in brackets are for comparison between household.

As shown in Table 5.7, a household of 1-4 persons spends on the average ₦1,000 on health care while household of 5 persons and above spends about ₦1436.50k on medical care per month. In aggregate, we can deduce that households accommodating PLWHAs in Lagos state spend about ₦2436.50k per month on HIV/AIDS health care drugs and medications.

5.3.5 Productivities Loss, Caregiver Times & Underage Labour by Head of Household

Of the 891 respondents that were interviewed, 507 noted that they do not absent themselves from job-related activities. This outcome is not surprising, as Figure 4.6

shows that most respondents are petty trade who determine the time to begin and end work. About 17.3 per cent which translated to 153 respondents stated that they were absent in work related duties for a day in a month. While 26.8 per cent (231) respondents agreed that they left job-related activities for more than one day due to consultation and treatments services. In between sex, there are more persons that have left work-related activities for medications and other activities.

Table 5.8 Productivities Loss, Caregiver Times & Underage Labour by Household Head

Variables	Productivity loss / Man-day loss due to HIV/AIDS illness			Time spend in caregiving activities			Underage Labour	
	No day loss	One day loss	More than one day loss	None	One hour	More than one hour	Yes	No
Sex of Household head								
Male (M)	386	121	171	392	127	159	261	417
Percentage	57 (76)	17.8 (79)	25.2 (74)	57.8 (78)	18.7 (75)	23.5 (72)	39(73)	62 (78)
Female (F)	121	32	60	109	42	62	97	116
Percentage	57 (24)	15 (21)	28.2(26)	51.2 (22)	19.7 (25)	29.1 (28)	46(27)	55 (22)
Total (M+F)	507	153	231	501	169	221	358	533
% (M+F)	56.9	17.3	26.8	56	18.9	17.8	40.2	59.8

Source: Field survey 2014/15 (Author's computation 2015/16). Figures in brackets are for comparison between household.

From Table 5.8, it can be inferred that caregiving activities among respondents are low. About 58 per cent of the participants noted that the activities are not functional in their dwelling. In the same vein, about 36.7 respondents advanced that there are caregiving activities in their households. Taking the per cent change, the outcome suggests that caregiving activities are more noticeable in households headed by females. Also, the activities of underage labour are not common in-between sex. Only 40.2 per cent of the respondents agreed that child labour activities occur in their households.

5.3.6 AIDS Mortality by Head of Household

The AIDS mortality data as depicted in Table 5.9 shows that 258 (29 %) households have lost member/s to the illness, while 633 (71 %) have not experienced any death incidence. Nevertheless, most AIDS death cases have been experienced in households headed by males (68.6 %) than in those headed by females (31.4 %).

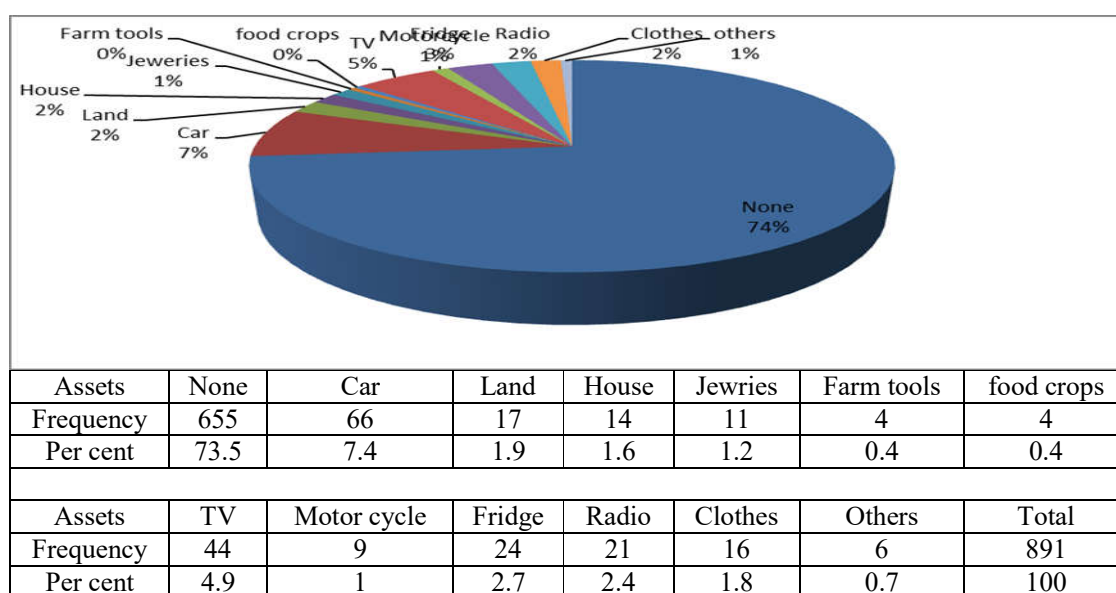
Table 5.9: Death due to AIDS Related Illness

Head of Household/Responses	Yes	No	Total
Male (M)	177	501	678
Percentage	26.1 (68.6)	73.9 (79.1)	100
Female (F)	81	132	213
Percentage	38 (31.4)	62 (20.9)	100
Total (M+F)	258	633	891
Percentage (M+F)	29 (100)	71 (100)	100

Source: Field survey 2014/15 (Author's computation 2015/16). Figures in brackets are for comparison between sexes of household head.

5.3.7 Coping Strategies Adopted by Household with PLWHAs

One of the key strategies adopted by households to reduce HIV/AIDS vulnerability is selling of household belongings. Figure 5.16 depicts the items sold by households.



Source: Field survey 2014/15 (Author's computation 2015/16).

Figure 5.16: Household asset and non-asset sale

Interestingly, a greater percentage of the respondents (74 %) stated that their households have not sold any family asset during the studied period. In sum, 26 per cent of our respondents have disposed one asset or another. The next section will discuss other coping strategies adopted by household accommodating HIV/AIDS member/s

5.3.8 Coping strategies adopted by household with PLWHAs (II).

The various coping strategies utilized by affected household as indicated by the

respondents are depicted in Table 5.10. Particularly, there are more people skipping meals, buying food on credits, substitute food expenditure for health cost, selling of assets and stopping child/children from schooling due to school fees – in households headed by males than in those of females. Similarly, more respondents in households headed by males than those headed by females received remittances from relatives and friends, involved in caregiving activities, employed underage labour, borrow money due to the HIV/AIDS illness and used savings for health care-related costs.

Table 5.10: Coping strategies by head of household

Household coping strategies	Female Head of household		Male Head of household	
Coping strategies	Yes (%)	No (%)	Yes (%)	No (%)
Skipping of meals due to HIV/AIDS illness	113 (53.1)	100 (46.9)	265 (39.1)	413 (60.9)
Household buy food on credit	110 (51.6)	103 (48.4)	321 (47.3)	357 (52.7)
Substitute food expenditures for health care cost	163 (76.5)	50 (23.5)	499 (73.6)	179 (26.4)
Substitute Educational expenditures for food cost	166 (77.9)	47 (22.1)	467 (68.9)	211 (31.1)
Child stop school due to school fee	157 (73.7)	56 (26.3)	472 (69.6)	206 (30.4)
Sale of household assets	66 (31)	147 (69)	170 (25.1)	508 (74.9)
Received remittances from relatives & friends	106 (49.8)	107 (50.2)	312 (46)	366 (54)
Caregiving activities by household member/s	104 (48.8)	109 (51.2)	286 (42.2)	392 (57.8)
Household member below 18 years working	97 (45.5)	116 (54.5)	261 (38.5)	417 (61.5)
Household borrow money due to the illness	89 (41.8)	124 (58.2)	231 (34.1)	447 (65.9)
Household spend savings	181 (84.9)	32 (15.1)	485 (71.5)	193 (28.5)

Source: Field survey 2014/15 (Author's computation 2015/16). Figures in brackets are for comparison between sexes of household head.

However, in between sex, the percentage change outcome suggested that more household headed by female are most likely to skip meals (53.1 %), buy food on credit (51.6 %), substitute food expenditures for health care cost (76.5 %), substitute educational expenditures for food cost (77.9 %), stop child/children from schooling due to school fee (73.7 %), sell assets (31 %), received remittances from relatives and friends (49.8 %), involve in caregiving activities (48.8), be employed as underage labour (45.5 %), borrow money due to the illness (41.8 %), and spend savings (84.9%).

5.4 Presentation of Empirical results

This section presents both the correlation and Logistics regression results of the study.

The results are obtained from the data derived and coded from the field survey.

5.4.1 Correlation Analysis of Selected Demographic and Socio-Economic Profiles of PLWHAs

The Table 5.11 presents the correlation matrix of the aforementioned variables. The equations 4.2 and 4.4 inform the result in Table 5.11. From the outcome, it is observed that the Pearson Product Moment Correlation Coefficients of the variables are significant at 1 per cent and 5 per cent confidence level. Though, the result suggests that there is a negative significant correlation between the household income variable (Yt) and health care (Hbi) parameter. This inverse relationship meet up with the expected a priori sign as well gives an initial signal that expenditures on health/medical care can increase the livelihood of income decline among households affected with HIV/AIDS.

It is also observed that a direct correlation exists between expenditure on health care (Hbi) and food expenditure of household. This relationship is quite absurd as one expects a negative nexus between both variables.

Table 5.11: Correlation Result of Variables in Equations 4.2 and 4.4 (Pages 112-114)

Variables	E	SA	A	HL	UL	Sex	Ni	Hbi	FMs	MS	OC	Hsize	Yt	Hsit	PFCR	SFG	NH	EMT	HMB	Fex
E	1																			
SA	-0.05	1																		
A	0.049	-0.03	1																	
HL	-.102*	.342**	-.158**	1																
UL	-.077*	.279**	-.082*	.397**	1															
Sex	0.016	0.057	-0.018	0.057	0.001	1														
Ni	0.017	-.241**	.074*	-.358**	-.140**	-0.032	1													
Hbi	-0.02	.282**	-.128**	.374**	.304**	0.054	-.319**	1												
FMs	0.055	-0.023	0.031	-.076*	-0.038	-0.014	0.058	0.015	1											
Ms	0.032	0.059	.145**	-0.024	0.016	0.064	-0.012	.075*	-0.04	1										
OC	0.02	-0.002	.221**	-0.061	-0.023	-.076*	0.001	-0.005	-0.01	.130**	1									
Hsize	0.032	-0.022	-0.003	0.01	.066*	-0.044	0.04	.070*	0.009	0.065	.066*	1								
Yt	-0.03	-0.03	.107**	-0.048	-.092**	.103**	.130**	-.090**	-0.04	-0.056	-0.012	-.070*	1							
Hsit	-0.02	.147**	-.120**	.225**	.180**	-0.039	-.147**	.127**	0.028	0.008	-0.03	0.016	-0.03	1						
PFC	0.035	-.284**	0.041	-.364**	-.237**	-0.037	.319**	-.247**	0.055	0.034	0.025	0.019	0.038	-.167**	1					
SFG	-0.05	-0.053	-0.053	-0.034	-.102**	0.039	0.046	-0.037	0.057	-0.013	-.079*	0.031	0.058	-0.038	-0.01	1				
NH	-0.04	.240**	-.083*	.330**	.337**	-0.053	-.186**	.251**	0.014	-.086*	0.01	0.036	-0.06	.165**	-.136**	-0.04	1			
EMT	0.003	0.006	.457**	-0.044	-0.061	0.02	-0.029	-0.011	-0.06	.072*	.266**	-0.05	.200**	-0.045	-.072*	0.004	-.088**	1		
HMB	-0.03	.333**	-.178**	.597**	.378**	0.061	-.395**	.332**	-0.06	-0.017	-0.025	-0.01	-0.03	.269**	-.421**	-0.03	.273**	-.073*	1	
Fex	-0.02	.207**	-0.003	.154**	.247**	0.043	-.260**	.219**	-0.04	0.061	.069*	-0.04	-0.05	0.052	-.228**	-.078*	.132**	0.064	.219**	1

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

Source: Field survey 2014/15 (Author's computation 2015/16)

Another outcome that is quite surprising is the nexus between food expenditure (Fex) and household income (Yt) which is negative. This outcome does not conform with the expected a priori sign. The result suggests that a rise in household income leads to decline in food expenditure (Table 5.11). This finding is opposed to extant literatures by García, and Grande (2010), Hopper (2011) and Donkoh *et al.* (2014) that observed positive nexus between food expenditures and household income in their respective studies. Based on this outcome, the logistic regression analyses for objectives three to five are performed.

5.4.2 Logistic Regression Results of Selected Demographic and Socio-Economic Profiles of PLWHAs at the Senatorial Districts and State Levels

The logistic regression analysis for this study is carried out with the aid of the coded data in Table 4.1, 4.2 and 5.10. As a follow up, the household income demand model as well as food expenditure model (Equations 4.2 and 4.4, in the preceding chapter) informs the empirical analysis in this section. The variables (Socio-economic and demographic profiles) included in the models are obtained from extant studies review in the literatures. Particularly, the socio-demographic profiles of affected household are significant variables to consider when focusing on household income in a population. This is because they constitute factors that may directly or indirectly influence household income when the HIV/AIDS illness strikes an adult member/s of the households. For instance, the age group, occupational status and sex of household head parameters, will aid policy makers and concerned bodies to know which age group, occupation and sex is experiencing income decline the most for policies recommendations and more awareness campaign among these groups in Lagos State in particular and in Nigeria in general.

The logistic regression analyses examine the relationship between household income (i.e. decline in household income), socioeconomic and demographic variables on one hand and household food expenditure (i.e. decline food expenditure) and selected

socioeconomic and demographic variables on the other. (See the preceding chapter for a full description of the variables employed). The results in this section are presented in two phases. While the first is at the senatorial districts level, the second is at the state level. In carrying out the logistic test, several tests are performed to ascertain the suitability of the specified models and data for the study. These tests are discussed in the next section.

5.4.3 Parameters and Model Fitting Analysis for Household Income Model

Prior to the logistic test, the following tests: sample size ratio, Omnibus Chi-Square (X^2), Hosmer and Lemeshow, Cox and Snell R^2 and Nagelkerke R^2 are observed. The sample size ratio measures the minimum ratio of valid cases to independent variables. This is stipulated as ten (10) to one (1) for logistic regression to be undertaken. However, the preferred ratio criterion is given as twenty (20) to one (1). The ratio of cases to the predictors in our outcome is 99. This satisfies the minimum requirement criteria (10 to 1) and the preferred ratio of 20 to 1 criteria.

The Omnibus Chi-Square (X^2) test reveals the existence of a relationship between the dependent variable and predictors. This is based on the statistical significance of the model chi-square at step one (Reed & Wu, 2012). The Omnibus Chi-Square (X^2) tests in Table 5.12, have probabilities values lesser than 0.05 per cent. Thus, the null hypothesis is rejected, while the alternative hypothesis which states that there is a significance relationship between the outcomes and the predictors is accepted.

The Hosmer and Lemeshow test is employed to indicate how adequate the model fits the data. It is expected that the probability value of the estimated parameters should be greater than 0.05. The outcome suggests that the Hosmer and Lemeshow statistics is greater than 0.05 per cent, by implication; the model adequately fits the data. .

Table 5.12: Test Statistics of Model Coefficients for Household Income Model.

Tests Statistics	Lagos State (LS)
Sample size ratio	111.4
Log Likelihood: Beginning Block	1068.917
End Block 1	918.054
Step 1. Model	150.863
Omnibus (X^2) test of model coefficients	(DF =45; PV: 0.000 < 0.05)
Hosmer and Lemeshow X^2 Test	4.310 (DF =8; PV: 0.828 > 0.05)
Cox & Snell R Square	0.156
Nagelkerke R Square	0.209

Source: Field survey 2014/15 (Author's computation 2015/2016)

Furthermore, the Cox and Snell R^2 , and Nagelkerke R^2 explain the variation in the predicted variable being explained by the predictor variables. The Cox and Snell R^2 are given as 0.156 per cent, and Nagelkerke R^2 as 0.209 per cent. The values are adequate since the Omnibus test of model coefficient is significant at probability value of $0.000 < 0.05$. The test statistics (Table 5.12) is a clear indication that our model passes the logistic model suitability criteria. Therefore, the socioeconomic and demographic indicators of households are useful predictors of income decline among HIV/AIDS household in Lagos State.

5.4.4 Discussion of Logistic Regression Result on Selected Socio-Demographic Characteristics of PLWHAs on household Income (Objectives Three).

Following the work of Peng *et al.* (2002) the 'b' coefficient, P- significance level and the Odd Ratio (Exp (b)) for each predictor are included in the result. Accordingly, Jennings (1986) and Jaccard (2001) suggest that only variables that are statistically significant at one and five per cent levels are included in the result.

As noted earlier, the multivariate logistic models of household income on selected socio-demographic characteristic of PLWHAs are meant to achieve objectives three of this study and are presented in Table 5.13. The dependent variable, declining household income is coded such that a code of one is given to household income decline and a code of zero to non-household income fall. The justification for dichotomizing household income is to ensure that income levels is reduced into two group, thereby simplify the

statistical analysis for easy interpretation and presentation of results. The independent variables, however, are categorical. They are therefore run as dummy variables such that each category is assigned a value indicating the presence or absence of a characteristic (Hair *et al.*, 2006; Ogunmefun, 2008). Two predictor variables are utilized to achieve objective three of this study. These includes: the age groups and occupational distributions of the respondents. These indicators are core household variables that enable the researcher to know the categories of respondents that are more burdens with the HIV/AIDS illness.

Each model in the result shows the odds ratio, the coefficient in parentheses, and an asterisk which represents the level of significance in the model. In the result, the coefficients are employed to interpret the direction of the relationship between the predicted variable and predictor variables. In the same way, the odds ratio are used to determine the magnitude of the relationship by reporting the odds ratio or the percentage change in the odds for a one unit change in the predictor variable.

The model one is a baseline model of household income decline and the variables for sex and age categories. The variables for the other independent variables are added in the progression of models two to seven. The final model shows all the variables in one model. At the 0.05 level of significance, a greater number of the predictor or independent variables have a significant relationship with household income decline.

In model one, the gender variable is not significant, however, there is a positive significant relationship between household income decline and the variables for age categories. The finding suggests that those who are within age groups 18-23, 24-29, 30-35, 36-41 and 42-53 are more likely to experience income decline than those of age 54 and above. Simply put, the odds of experiencing income decline is higher for age group 18 – 23 (than for 54 year and above) by a factor of 4.0, while for 24 – 29 years, the odds

is decreased by a factor of 2.5.

Similarly, the odd ratio or Exp (B) values of age groups 30-35, 36-41 and 42-53 implies that the odd of income decline increases the most (by a factor of 2.7, 1.8 and 1.5) if the respondents fall under ages 30-35, 36-41, 42-53 than age 54 years and above. Following this outcome, young people of ages 18 - 23 have 1.5, 2.0, 2.6 and 2.5 greater odds of experiencing income decline than ages 24-29, 30-35, 36-41 and 42-53. This implies that age group 18-23 years is most likely to experience income decline than other age categories in Lagos state (Table 5.13).

In model two, marital status variables are added and they increase the positive effect of the age categories (18-23, 24-29, 30-35, 36-41 and 42-53 years) on income decline. The variables, never married, divorced and widowed also have a positive relationship with household income decline. This shows that being single (never married), divorced and widowed increase the odds of income decline by factors of 2.1, 2.5 and 2.4 times than being separated. As a consequence, respondents who are divorced have 0.4 and 0.1 times of facing income fall than those who are single (never married), and widowed, even when controlling for age group. Noticeable as well is that the married variable was not significant in the model, therefore was not discussed herein.

The variables that relate to human capital (education attainment of the respondents) are added in model three. This increases the positive effect of age categories and decreases the significance of never married respondents (in marital status variable). The variables, no formal education and Junior Secondary School Certificate holders have significant positive relationship with household income decline, except for Senior Secondary School Certificate variable that has negative relationship with income decline though not significant.

Table 5.13: Odds Ratios for Logistic Regression of Household Income decline on Selected Socio-Demographic Profiles of PLWHAs for Objectives Three.

Response variable: Declining income takes the value one.

Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Gender. Ref : Male							
Sex_female (1)	(0.09) 1.09	(.12) 1.12	(-.09) .91	(-.08) .93	(-1.2) (.88)	(-.21) .81	(-.28) 0.76
Ref: Age 54 & above							
Age(1) 18 -23	(1.4)* 4.0	(1.9)* 6.4	(1.8)* 6.3	(1.8)* 6.3	(1.6)* 5.1	(1.8)* 6.3	(1.69)* 5.39
Age(2) 24-29	(.92)* 2.5	(1.3)* 3.8	(1.3)* 3.8	(1.4)* 3.9	(1.2)* 3.2	(1.4)* 3.94	(1.24)* 3.46
Age(3) 30-35	(.69)* 2.0	(.99)* 2.7	(.88)* 2.4	(.92)* 2.5	(.86)* 2.4	(1.0)* 2.77	(0.96)* 2.61
Age(4) 36-41	(.35)* 1.4	(.57)* 1.8	(.58)* 1.8	(.62)* 1.9	(.69)* 2.0	(.80)* 2.23	(0.84)* 2.31
Age(5) 42-53	(.41)* 1.5	(.49)* 1.6	(.50)* 1.7	(.56)* 1.7	(.71)* 2.0	(.73)* 2.08	(0.77)* 2.16
Ref: Separated							
Never married(1)		(.73)* 2.1	(.21) 1.2	(.37) 1.45	(.19) 1.21	(.15) 1.16	(0.21) 1.23
A3_Married(2)		(.49) 1.6	(.43) 1.54	(.54)* 1.7	(.28) 1.32	(.57) 1.77	(0.36) 1.44
A3_Divorced (3)		(.92)* 2.5	(.94)* 2.7	(.98)* 2.7	(.73)* 2.1	(.56)* 1.75	(0.78) 2.17
A3_widowed (4)		(.85)* 2.4	(.96)* 2.6	(1.0)* 2.8	(.80)* 2.2	(-.33)* .72	(0.77)* 2.15
Ref: Above Sec Sch							
A4_No formal edu			(.98)* 2.7	(.93)* 2.5	(.53)* 1.7	(.69)* 1.99	(0.53) 1.69
A4_Primary (2)			(.28) 1.3	(.20) 1.2	(-.07) .93	(-.03) .97	(0.15) 0.86
A4_Junior sec Sch (3)			(.44)* 1.6	(.39)* 1.5	(.38)* 1.46	(.48)* 1.6	(0.35) 1.41
A4_Senior sec sch (4)			(-.01) .99	(-.05) .96	(-.22) .801	(-.16) .856	(-0.27) 0.76
Ref: Other tribes							
A7_Yorubas (1)				(.53)* 1.7	(.28) 1.32	(.28) 1.32	(0.23) 1.25
A7_Igbos (2)				(-.06) .94	(-.21) .808	(-.28) .757	(-0.26) 0.77
A7_Hausas(3)				(.64)* 1.9	(.28) 1.32	(.27) 1.32	(0.25) 0.29
A10_Ref: Other occupations							
Govt workers (1)					(.29) 1.35	(.22) 1.24	(0.39) 1.48
Petty traders (2)					(-.20) .817	(-.25) .78	(-0.22) 0.80
Family business (3)					(-.67)* .51	(-.76)* .47	(-0.67)* 0.51
Unemployed (4)					(.72)* 2.1	(.68)* 1.97	(0.74)* 2.09
Employ Private (5)					(.52)* 1.7	(.47) 1.61	(0.62)* 1.86
Students (6)					(-.59)* .55	(-.67)* .51	(-0.61)* 0.54
Farmers (7)					(.04) 1.04	(-.01) .99	(0.39) 1.48
Ref: Head of household male							
A16_Female(1)						(.49)* 1.64	(0.51)* 1.65
Ref: Household Size (Hsize); 1- 4 persons							
Hhsize >4 persons (1)							(0.14)* 1.15
Constant	(.41) 1.5	(-.79) .45	(-1.04) .36	(-0.02) .98	(-1.2) .302	(-.829) .44	(-1.2) 301

Observations; 891. The reference category for each variable is in bold letter, P<.05*.

Source: Field survey 2014/15 (Author's computation 2015/16)

The result also indicates that the odd of experiencing income decline is higher for household with respondents holding Junior Secondary School Certificate (than household with respondents having above Secondary School Certificate) by a factor of 1.6. For those with no formal education; the odds are greater by a factor of 2.7. Therefore, affected household with people with no formal education have 1.1 greater odds of experiencing income fall than holders of Junior Secondary school certificate. This means that affected households with people without formal education are more likely to faced income fall than other educational core groups.

In the fourth model, the variable ethnicity is added. It has positive relationship with household income decline. This implies that irrespective of the respondents' tribes, income decline is not reduced in affected households. The inclusion of ethnicity variable increases the positive effect of marital status, age categories and reduces educational status impact on income decline. More importantly, the inclusion also brings about the significance of married variable in the marital categories. What this indicates is that ethnicity of respondents has a strong linked with their marital status, especially for married respondents. Model four also advances that respondents from the Hausa speaking region and Yorubas are more likely to experience income decline (by factors of 1.9 and 1.7) than any other ethnic groups. However, Hausas have 0.2 greater odds of decreasing income than Yorubas. Simply put, among the various ethnic groups in Lagos state, the odd of diminishing household's income is high among affected Hausa dwellers.

In model five, the variables that relate to occupational status are added. The presence of occupation status brought about the insignificance of the ethnicity variables. The occupational variables have both positive (unemployed and employed in private sector) and negative (Family business and students) effects on declining household income. The outcome suggests that respondents who are students and those engaged in family business

are less likely to experience income fall than those in other occupations. In other words, in households where respondents are students and family business owners, the probability of experiencing income decline is reduced than those in other occupations. One simple explanation for this outcome might be that students have access to multiple streams of income from relatives and friends. At the same time family business respondents have access to their enterprise finances which they can use to reduce the burden of illness on their aggregate income.

Furthermore, it is not surprising that the odd of income decline is greater by a factor of 0.4 times by being unemployed than employed in the private sector. This is somewhat explainable as those employed in private sector are more empowered financially and materially to meet their needs and as a result, more likely to be economically viable than the unemployed. In sum, respondents employed in the private sector and those unemployed have greater risk of income fall than those in other occupations.

In model six, gender of household heads are incorporated. They increase the positive effect of age categories and educational status (Primary and Junior Secondary School Certificate holders), and reduce marital status effect thereby making ethnicity variable statistically insignificant. The variable, female has a positive relationship with income decreased of affected household. This shows that being female head of household increases the odds of household income decline by a factor of 1.64 times than being a male head of household. This indicates that households headed by females tend to bear greater burden of income decline than their male counterparts.

In model seven, the variable of household size is added and both educational status and ethnicity variables are statistically insignificant. The household size variable has a direct effect on income decline of household. This suggests that household size increases the likelihood of income fall among affected household in Lagos state. As expected, the odd

of experiencing income decline is increased by a factor of 1.15 times for respondents in large household size (more than five persons) than respondents in small household size (four persons and below).

In essence, the models (in Table 5.13) have demonstrated that age category, marital status, occupation distribution, household head and household size variables have significant positive relationship with household income. This suggests that these five predictors have stronger influences on household income decline than education status and ethnicity variables.

Inferring from this result, one can deduce that households with young people (ages 18-23 years) will face greater catastrophic effect of income decline than other subgroups. It also identified respondents with no formal education, unemployed individuals, private employees, to mention a few, are more likely to face income decline in Lagos state (Table 5.13). With regard to objectives three of this study, it is clear that age group and occupation status of respondents significantly predict income decline of households accommodating PLWHAs in Lagos state. Therefore, the null hypotheses which implies that, age groups and occupational distribution do not have any significant impact on declining household income is rejected, while the alternative is accepted.

5.4.5.1 Presentation of Logistic Regression Result of Declining Household Income on Selected Socio-Economic Prolifes of PLWHAs (At the Senatorial Districts Level), for Objective Four.

The theoretical framework (equation 3.5), the income model (equation 4.2) and results from the descriptive statistics suggest that some other characteristics such as educational status of household head (Eit), asset sale (SA), work experience (A), caregiving activities (CA), productivities/man-hour loss (uL), non-household income/remittances (NI), health expenditures (Hbi), free drugs and services (FMS), underage labour (Hmb) and AIDS

mortality (AIDD) are likely to define income decline among HIV/AIDS households.

In order to further confirm the nexus between these socio-economic characteristics and income decline of affected household, equation 4.2 and data from Table 5.3 is employed to disaggregate the respondents into three Senatorial districts in Lagos state, Nigeria. Thereafter, the logistic regression analyses was employed to achieve objective four and to test hypothesis two, where the health expenditures variable (key indicator) and other variables are likely to have a strong relationship with declining household income.

The multivariate logistic models of declining income on socio-economic characteristics of household in the three senatorial districts and Lagos state are presented in Table 5.14 and 5.15. The finding suggested that eight variables pass the Wald statistics criterion at the district levels. For instance, the estimated results show that in Lagos Central (LC), six variables; asset sale (SA), work experience (A), productivities loss/man-hour loss (uL), non-household income / remittances (NI), health expenditures (Hbi) and free drugs and services (FMS) have probability - value < 0.05 per cent.

In Lagos East, four variables; caregiving activities (CA), man-hour loss (uL), health expenditures (Hbi), and underage labour (Hmb) meet up with the “Wald statistics” significant level of one and five per cent. Similarly four variables; asset sale (SA), productivities loss (uL), non-household income /remittances (NI) and health expenditures (Hbi) meet up with the a priori criteria in Lagos West.

As can be seen in Table 5.14, the result advance that asset sale (SA) is positively related to the predicted variable (household income), only in Lagos Central (LC) and Lagos West (LW). Simply put, income is reduced when households sell their belongings to cope with HIV/AIDS scourge on their member(s). The odd ratios suggest that households that sell asset in Lagos Central (LC) and Lagos West (LW) will experience income fall by factors of 6.13 (LC) and 2.65 times than households who do not sell asset.

Comparing between districts, households in Lagos Central (LC) have 3.48 greater odds of suffering from income decline than households in Lagos West (LW). One possible explanation for this divergent outcomes between the two senatorial districts might be the high living standard and cost faced by respondents in Lagos Central (LC) as against the average lifestyle among dweller in Lagos West (LW). However, this finding does conform with economic literature since asset sale is one form of coping strategies adopted by household when there is loss of income and other options to generate earning are out of reach (Adeyemi, 2007; Alemu & Bezabih, 2008; Iya *et al.*, 2012).

The variable work experience (A) of PLWHAs is statistically significant in Lagos Central only (LC: -2.33) and negatively related with declining household income. This implies that work experience reduce the odd of declining income among household in Lagos Central. The odd ratios or exp (B) of 0.098 predict that the odd of experiencing income decline is reduced by 0.098 times for respondents with work experience as against respondents without work experience. By and large, respondents with work experience and skill tend to bear lesser catastrophic effect of income decline than the inexperienced and unskilled workers. The finding is buttressed with the studies of Rosen *et al.* (2006) and Mbaeh *et al.* (2015) who noted that unskilled labour and casual staff are mostly affected with the HIV/AIDS illness.

It is also observed that the caregiving parameter (Cga) relates negatively with falling income of household in Lagos East (LE). This implies that caregiving activities do not typically reduce income of household in the district. The odd ratio of 0.24 suggests that the probability of experiencing income decline relatively to income not falling is reduced by a factor of 0.24 times for households with caregivers compare to the base category. This result does not conform with economic literature, as caregiving activities usually consume time and resources of affected household (Musinguzi, 2012; Natalia *et al.*,

2014). Therefore, the reversal effect should be on household practicing caregiving activities not the other way round.

Table 5.14: Odds Ratios for Logistic Regression of Declining Household Income on Selected Socio-Economic Profile of PLWHAs in the three Senatorial Districts of Lagos State.

Senatorial Districts	Lagos Central		Lagos East		Lagos West	
Variables	B	Exp (B) / Odd ratios	B	Exp (B) / Odd ratios	B	Exp (B) / Odd ratios
Household asset (SA_{it})						
Ref: No asset sale (SA _{it})						
Asset sale	1.81*	6.113	0.927	2.528	0.98*	2.654
Work experience (A_{it})						
Ref: Without Work experience (A _{it})						
With work experience	-2.33*	0.098	0.247	1.28	-0.2	0.817
Caregiving activities (hL)						
Ref: Caregiving activities is not present (hL)						
Caregiving activities is present	0.34	1.409	-1.4**	0.24	0.125	1.134
Productivities loss (uL)						
Ref: No productivities loss (uL)						
Productivities loss	1.19*	3.315	2.192*	8.953	1.44*	4.237
Non-household income / remittances from relatives & friends (NI)						
Ref: Received remittances						
No remittances (NI)	1.29*	3.664	0.216	1.242	0.93*	2.548
Health care and medical service costs (Hb_i)						
Ref: Absent of health care & medical service costs (Hb _i)						
Present of health care medical service costs (Hb _i)	2.33*	10.25	2.989*	19.84	1.66*	5.277
Free drug & service (FMS)						
Ref: No access to FMS						
Have access to FMS	-1.15*	0.317	0.216	1.241	-0.09	0.991
Underage labour (Hmb)						
Ref: No Hmb						
Present of Hmb	-0.48	0.613	2.918*	18.51	0.747	2.112
Constant	-3.63	0.027	-2.57	0.076	-1.61	0.201
Observations	233		174		484	

Note: *Indicate "Wald Statistics" significant at 1 and 5 per cent level

Source: Author's computation 2015/16

The estimated parameters for productivity loss (PL) are positively related with income decline in the three senatorial districts of the state. This suggests that households where respondents absent themselves from work or economics activities are more likely to experience income reduction when compared with the reference category. Comparing between districts, respondents in Lagos East have 7.76 greater odds of experiencing income fall than respondents in Lagos West (LW). Also, respondents in Lagos West have 0.922 per cent odds of facing income reduction than their counterparts in Lagos West. In sum, this finding support the works of Naidu and Harris (2006) and Iya *et al.* (2012), who noted that prolonged HIV/AIDS illness results into workers' absenteeism from productive activities. The resultant effect is income decline of the affected household.

In the same way, the financial capital variable (non-household income) simply called remittance (NI) variable is found to be significant in two districts (Lagos Central and Lagos West). Though the coefficients do not depicted the expected negative signs, as they assumed positive signs. The finding advances that non-household income increases the odd of income decline among affected HIV/AIDS households. In other words, affected households who do not receive remittance from relatives and friends are more likely to face income reduction by a factor of 3.66 (Lagos Central) and 2.5 (Lagos West), when compared with their counterparts who received such assistance. At the districts level, the result advances that households in Lagos Central have 1.11 per cent odds of experiencing income fall than households in Lagos West (Table 5.14).

Particularly of key interest is the health expenditures (Hbi) variable which exerts positively on income fall across the district. As revealed in Table 5.13, an increase in health expenditures by one per cent will reduce household income by 2.33 (Lagos Central), 2.98 (Lagos East), and 1.66 per cent in Lagos West. The result also demonstrated that the odds of declining income are higher for households who incurred

health care expenditures (than those who do not incur) by a factor of 10.25 in Lagos Central district. For households who incurred health care expenditures in Lagos East district, the odds are higher by a factor of 19.84. Similarly, in Lagos West, the odds of income decline are increased by a factor of 5.27 for household who incurred health care expenditures than those who do not.

Drawing from the above discussion, households in Lagos East are most likely to have greater decline in income of about 9.59 per cent than households in Lagos Central, whereas households in Lagos East are less likely to experience income fall of 4.98 per cent than households in Lagos Central. This means household in Lagos East will face greater burden of income decline followed by household in Lagos central and Lagos East. On the whole, this finding substantiates earlier studies by Mano *et al.* (2006), Keitha *et al.* (2008) and Musinguzi (2012) that HIV/AIDS is associated with prolonged illness and increase in spending on health cares which adversely affect household income.

While controlling for other variables, household income is negatively related with social capital variable (free drugs and medical services; FMS) in Lagos Central district only. The following imply that household income is not significantly reduced by free drugs and medical services (FMS). In other words, a decrease in free drugs and medical service reduces household income by 1.16 per cent. Thus, the income effect of FMS is positive. In line with extant studies, access to free drugs and medical service helps to reduce the burden of HIV/AIDS on household welfare (Cohen, 2007; Habyarimana, Bekezela & Cristian, 2010).

Similarly, there is a direct nexus between the underage labour coefficients (Hmb) and the predicted outcome in Lagos East district. In simple terms, the household where underage labour exists, the tendency of income decline is unavoidable. The singular argument holds that child labour exposes children to negative coping activities such as: begging,

street selling, stealing and prostitution (Bangura, 1994 & 2001; Vogli & Birbeck, 2005). These activities might expose the household to further ill-health hazard and the welfare effect will impact on household income negatively.

Based on the results in Table 5.14, it can be deduced that only two variables: productivity loss (PL) and expenditures on health care (Hbi) are statistically significant in predicting the livelihood of income decline among households in the three districts of Lagos state. In essence, this is the first signal that the alternative hypothesis which relates to objective four of this study should be accepted.

5.4.5.2 Presentation of Logistic Result For Declining Household Income on Selected Socio-Economic Prolifes of PLWHAs (At the State Level), for Objective Four.

As a follow up from the outcomes of the district studies, the state level analysis is undertaken. Each model in this section exhibits the odds ratio (Exp (B)), the coefficient (B) in parentheses, and an asterisk which represents the level of significance in the model. For valid interpretation, a categorical variable is sometimes changed into a dummy variable. Particularly, the dependent variable, household income, is coded such that, a code of one is given to declining household income and a code of zero to household income not reducing. The socio-economic variables are categorical; therefore they are run as dummy variables such that each category of variable is assigned the values of 1 or 0.

In model one, which is the baseline model, five variables derived from the theoretical framework (Equation 4.2) are added herein. These include: education status (Eit), asset sale (SA), work experience (A), caregiving activities (CA) and productivities or man-hour loss (uL). The outcomes (Table 5.15) suggest that only three variables; asset sale (SA), caregiving activities (CA), and productivities loss (uL) exert positive impact on declining income of households. This implies that the odds of experiencing income

declined are higher in household where asset is sold. It is also higher where activities of caregivers are present and infected member/s absent themselves from work related activities than in households where these activities do not take place.

From the result in table 5.15, the Exp (B) values of the predictors (SA, hL & uL) advance that there is greater burden of income reduction by factors of 3.7, 2.4 and 2.7 times in households where assets are sold, caregivers activities are present and household member (workers) absence themselves from works than the reference categories. This study is supported by the works of Bollinger and Stover (1999), Oni *et al.*, (2001), Mather *et al.* (2004), Slater and Wiggins (2005), Arrehag *et al.* (2006) and Natalia *et al.* (2014). These authors in their studies noted that HIV/AIDS depleted household's financial resources through sale of assets, man-hour loss of the sick person/s. Additionally, the considerable working time loss that is spent on caring for the sick member/s by children and other adult members of the households displace productive time and deplete financial resources.

In model two, the financial capital variable (non- household income); a remittance (Ni) variable is included. They increase the positive effect of the productivity loss variable (2.7 to 2.86) and reduce the effect of asset sale (3.7 to 2.69) and caregiving activities (2.4 to 1.69) variables. The variable, no remittance, also has a positive relationship with declining household income. This shows that the odd of income decrease are increased by a factor of 4.49 for households who do not receive remittances as against household who received. Obviously, this finding is contrary to extant studies, as non-household income is expected to augment and exert positively on household income (Mutangadura, 2000; Desmond *et al.*, 2000).

Table 5.15: Odds Ratios for Logistic Regression of Household Income Decline on Selected Socio-Economic Profiles of PLWHAs (At the State Level)

Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Education (E_{it}):	'B' Exp (B)	'B' Exp (B)	'B' Exp (B)	'B' Exp (B)	'B' Exp (B)	'B' Exp (B)
Ref: Household head with formal education (E_{it})						
No formal education	(-.13) .88	(-.059) .943	(-.127) .881	(-.095) .909	(-.120) .887	(-.43)* .69
Household asset (SA_{it})						
Ref: No asset sale (SA_{it})						
Asset sale	(1.3)* 3.7	(.988)* 2.69	(.770)* 2.16	(.952)* 2.59	(.911)* 2.45	(.95)* 2.58
Work experience (A_{it})						
Ref: With Work experience (A_{it})						
Without work experience	(.21) 1.23	(.247) 1.28	(.470)* 1.60	(.241) 1.27	(.311) 1.37	(.402)* 1.49
Caregiving activities (hL)						
Ref: Caregiving activities is absence (hL)						
Caregiving activities is active	(.88)* 2.4	(.522)* 1.69	(.196) 1.216	(.489)* 1.63	(.222) 1.25	(-1.29) .879
Productivities loss (uL)						
Ref: Absence of productivities loss (uL)						
Productivities loss	(1.0)* 2.7	(1.05)* 2.86	(.868)* .38	(.902)* 2.45	(.830)* 2.29	(.903)* 2.47
Non-household income / remittances from relatives & friends (NI)						
Ref: Received remittances						
No remittances (NI)		(1.5)* 4.49	(1.32) 3.73	(1.40)* 4.06	(1.29)* 3.64	(-.73)* .480
Health care and medical service costs (Hb_i)						
Ref: Absence of health care & medical service costs (Hb_i)						
Health cost (Hb_i ; < N1, 000)			(1.76)* 5.79	(.302) 1.35	(.255) .255	(.211)* 8.23
Health cost (N1,001- N5000)			(1.87)* 6.52	(1.09)* 3.00	(1.03)* 2.80	(1.78)* 5.93
Health cost(N5,001-N10,000)			(1.91)* 6.76	(1.21)* 3.36	(1.18)* 3.27	(1.77)* 5.87
Health care cost (> N10, 000)			(1.72)* 5.56	(.871)* 2.39	(.795)* .795	(1.84)* 6.30
Free drug & service (FMS)						
Ref: Have to FMS						
No access to FMS				(-.170) .843	(-.172) .842	(-.121) .889
Underage labour (Hmb)						
Ref: No Hmb						
Present of Hmb					(.685)* 1.98	(.924)* 2.51
Death due to AIDS (DAID)						
Ref: No DAID						
Presence of DAID						(.297) 1.35
Constant	(-.78) .457	(-1.09) .334	(-1.78) .168	(-1.72) .179	(-1.72) .180	(-1.69) .184

Source: Field survey 2014/15 (Author's computation 2015/16)

In model three, the variables of health expenditures (Hbi) are added. Following the outcomes at the senatorial districts, similar outcome; positive relationships between health expenditures and declining household income are observed. This indicates that HIV/AIDS in the form of health expenditures increases the odd of income decline among affected household in Lagos state. In a similarly manner, the health expenditures result also indicates that households that incurred health care cost are most likely to face income reduction by factors of 5.79, 6.52, 6.76 and 5.56 times than the reference category. However, the deadweight of income decline rest more on households who spend between ₦5, 000 - ₦10, 000, as the result proposed 0.24 per cent income fall than the second highest spenders (those who spend between ₦1, 000 to ₦5, 000). This implies that households who spend ₦5, 000 to ₦10, 000 (monthly) on HIV/AIDS health related activities are most likely to experience income decline than other household's categories in Lagos state. All in all, this finding support the reports of Mano *et al.* (2006) Pitayanon *et al.* (1994), Whiteside *et al.* (2006) and Smit (2007), who asserted that the long duration of HIV/AIDS illness and health cost lead to decline or loss of household income and the catastrophic effect in turn deepen household poverty. Going by these results, the alternative hypothesis which indicates that HIV/AIDS have significant impact on household income is accepted, hence objective four is achieved.

In model four, the social capital variable (Access to free drugs and services; FMS) is added. However, the 'FMS' variable was insignificant in predicting household income.

In model five, the underage labour variable (Hmb) which relates to child labour is added. The variable (Hmb) has a significant positive relationship with household income decline. It does reduce the positive effect of asset sale, productivities loss, remittances and health expenditures on household income. Also, the odd ratios suggest that income reduction is increase by 1.98 times in households where underage labour is allowed as

against households where it is prohibited. Following the outcomes and explanations of underage labour at the senatorial level, it is noted that child labour exposed children to negative coping strategies which further expose the households to other health hazard and income fall in the long run (Foster & Williamson, 2000; Mutangadura, 2000; Bangura, 2001; Kaschula, 2008).

In the last model, model six, the variable, death due to AIDS (DAID) are added. And as expected, AIDS related death of member/s has a positive relationship with household income decline though not significant to predict the dependent variable. Nonetheless, the inclusion of the DAID variable increases the positive and significant effect of educational attainment of household head, asset sales, work experience, productivities loss, remittances and health expenditures of households. This gives a signal that death is a key factor that influences other socioeconomics and demographic variables in our model, though not significant to predict household income in Lagos state. More importantly, three key variables (Assets sales, productivities loss and health expenditures) are consistent in our results, both at the senatorial district and state levels, thus are noted to have significantly impacted on household income in Lagos state, Nigeria.

5.4.6 Presentation of Logistic Result for Declining Household Food Expenditure on Selected Socio-Economic Prolifes of PLWHAs in Lagos State (Objective Five).

This section is structured into two phases, one deal with result presentation at the senatorial district levels, while the other phase is at the state level. Both outcomes are employed to achieve the objective four of this study. The equation 4.4 and Table 4.5 in the preceding chapter inform the empirical results in this section. In view of the logistic result, the parameters and model fitting tests are carried out to validate the suitability of our data and model.

5.4.6.1: Parameters and Model Fitting Tests for Food Expenditure Model

As indicate in Table 5.16, the outcome of the sample size ratio satisfies the minimum requirement criteria (10 to 1), and the preferred ratio of 20 to 1 criteria for logistic regression to be carried out.

Table 5.16: Test Statistics of Model Coefficients for Household Food Expenditure.

Tests Statistics	Lagos State (LS)
Sample size ratio	74.1
Log Likelihood: Beginning Block End Block 1	929.9 629
Step 1. Model Omnibus (X^2) test of model coefficients	323.888 (DF =12; PV: 0.000 < 0.05)
Hosmer and Lemeshow X^2 Test	12.2 (DF =8; PV: 0.187>0.05)
Cox & Snell R Square	0.305
Nagelkerke R Square	0.407

Source: Field survey 2014/15 (Author's computation 2015/16)

The value of the Omnibus Chi-Square tests (X^2 ; PV: 0.000<0.05) indicates that there is a significant relationship between the outcomes and the predictors. The Hosmer and Lemeshow statistics show that the model adequately fits the data. The Cox and Snell R^2 (0.156%) and Nagelkerke R^2 (0.209 %) are adequate since the Omnibus test of model coefficient is significant at probability value of 0.000 < 0.05. Going by the test statistics as reported in Table 5.16, the selected variables are adequate to carry out logistic regression as well predict food expenditure decline in Lagos state.

5.4.6.2 Presentation of Logistic Regression on Food Expenditure and Selected Socio-Economic Profiles of PLWHAs at the Senatorial District Levels.

The logistic results of food expenditure and selected households variables are presented in Table 5.17. The significant of each variable at this level serves as a first signal on what is expected at the state level. Unlike the income results at the district levels, more variables were found to be significant in the food expenditure outcome. The dependent variable (household food expenditure) is coded, such that a code of one is given to food

expenditure decline and a code of zero to non-food expenditure decline.

The independent variables are categorical; they are therefore run as dummy variables such that each category of a variable is assigned the values of 1 or 0, indicating the presence or absence of a characteristic (Hair *et al.*, 2006; Ogunmefun, 2008). Recall, the independent variables include: household income (Yt), household size (Hsize), health care expenditures (Hbi), clinical stage (duration of living with HIV/AIDS; H_{sit}), sex of household head (Sex), non-household income (Remittances; NI), asset sale (SA), food bought on credit (Pfc), support from the government (SFG), number of household member infected with the HIV/AIDS illness (NH), employment status of the respondents (EMT) and education attainment of the household head (E).

In the foreground, the food expenditure outcome (Table 5.17) suggests that six variables (Hbi, Ni, SA, Pfc & E) were statistically significant in Lagos Central district and a greater number (nine variables; Hsize, Hbi, Hsit, Sex, Ni, SA, Pfc, SFG & EMT) were found to be statistically significant in Lagos east district. In Lagos west, eight variables (Hsize, Hbi, Sex, Ni, SA, Pfc, SFG & E) met up with Wald significant level criteria. By and large, ten variables passed the Wald statistical significant test across the districts. However, only four variables (health care expenditures, Hbi; Remittances, NI; asset sale, SA & food bought on credit, Pfc) were significant at all levels in each districts.

From the finding (Table 5.17), it can be deduced that household's income is not relevant in predicting food expenditure decline across the three districts in Lagos state. However, household size does. Household size (Hsize) is positively related to food expenditure decline in Lagos east (1.64) and Lagos West (0.011). This simply means that respondents from large household size (more than five persons) are more likely to experience food expenditure decline than respondents in small household size (four persons and below). As expected, the odd of experiencing income decline is greater by a factor of 1.3 times

for respondents in large household size than the reference category in Lagos west, while for Lagos east, the odds are greater by a factor of 5.2. In between districts, large household size has 3.9 greater odds of experiencing food expenditure decline in Lagos east than in Lagos west. This implies that large households size in Lagos east is most likely to face food expenditure burden in the state.

Across the three districts, the parameter estimate (health expenditure; H_{bi}) is found to be positive related with declining food expenditure in Lagos Central (LC) and inversely related with the predicted outcome in Lagos east and Lagos west. In other words, there is substitution or displacement effect between health expenditure and food expenditure among PLWHAs in Lagos central. In Lagos east and Lagos west, the likelihood of food expenditure decline is reduced by health expenditures. Simply put, there is no displacement effect between household's health expenditure and food expenditure in Lagos east and west senatorial districts.

In the same way, the odd ratios of the parameter estimate (health expenditures) advances that households that incurred health care cost are more likely to face food expenditure decline by a factor of 1.9 times than the reference category (Lagos central). The reverse is the case in Lagos east and west, as the outcomes suggest that the odds of experiencing food expenditure decline is reduced by 85.5 per cent (Lagos east) and 57 per cent (Lagos west) for households that incurred health-related expenses. However, in between districts, households in Lagos west will experience 0.285 greater reductions in food expenditure decline than household in Lagos east. The mixed results might be as a result of locational difference of the respondents.

The clinical stage or duration of the illness (H_{sit}) is significant in Lagos east only. Likewise, its outcome is negatively related to food expenditure decline. This implies that the duration respondents have lived with HIV/AIDS does not reduce the food expenditure

of the households. The Exp (B) value of .137 advances that respondent who have been living with the illness for more than seven years will experience lesser food expenditure decline of 86 per cent than the reference categories. Simply put, the burden of food expenditure decline will be faced the most by respondents who contacted the illness within the last six year than those infected seven years and above. This finding does not conform with the a priori expectation, as those who have been infected for a longer periods are expected to experience greater food expenditure fall than their counterpart.

In addition, the head of household (Sex) variable have negative impact on food expenditure decline in two districts (Lagos east and west). This means that the presence of household head reduces the likelihoods of food expenditure decline in the home. The odd ratio implies that male head of household will face lesser decline in food expenditure than their counterpart (female household heads). This result is not surprising, as studies have shown that in affected household, male heads are more empowered economically to cater for their households than female household heads (Mutangadura, 2000; Shyamala, 2015).

The non-household income (remittances; NI) variable which captures financial and material aids from relatives and friends is found to be negatively signed across the senatorial districts (Lagos central; -1.64; Lagos east; -0.939 & Lagos west, 0.700). The negative nexus between remittances and the outcome variables imply reduction in the burden of HIV/AIDS on food spending. This finding construes that material and financial aids from relatives and friends reduce the burden of HIV/AIDS on food expenditure of PLWHAs in the three districts. Nonetheless, the burden of food experience decline is more likely to fall on households who received remittances than households who do not. At the district levels, participants dwelling in Lagos west are less likely to experience food expenditure decline than those in Lagos central and east.

The asset sales (SA) variables appear to be positively related with declining food expenditure in Lagos central (1.81) and negatively related with the predicted variable in Lagos east and west. In other words, asset sale increases the odd of food expenditure decline in Lagos central and reduce it in Lagos east and west. Following the above result, household that sell asset in Lagos central will suffer food expenditure decline by a factor of 6.07, than the reference category. Contrarily, asset sale in Lagos east and west, reduce food expenditure decline by a factor of .138 and .429, in household where asset is sold than in household where it is not. The district level effect shows that household in Lagos central tend to face greater odd of food expenditure decline than households in Lagos east and west. Just like the health expenditure outcome, there is mixed result regarding the nexus between the predictor and the predicted variable (Table 5.17).

Another significant variable in the food expenditure model (result) is the food purchase on credit variable (Pfc), which is significant at all district levels. It, however, shows adverse nexus with falling food expenditure in Lagos central and east, and direct relationship with the predicted variable in Lagos west. The outcome suggests that food bought on credit reduces the burden on food expenditure among households in Lagos central and east and increases the burden on households in Lagos west. The odd ratios propose that households who purchase food on credit are less likely to experience food expenditure decline (than their counterparts) in Lagos central and east, while the reverse effect is observed in Lagos west.

Table 5.17: Odds Ratios for Logistic Regression of Household Food Expenditure Decline on Selected Socio-economic Profiles of PLWHAs at the District Levels (For Objective Five).

Senatorial Districts	Lagos Central		Lagos East		Lagos West	
Variables	B	Exp (B) / Odd ratios	B	Exp (B) / Odd ratios	B	Exp (B) / Odd ratios
Household Income (Yt)						
Ref: Income < N20, 000						
(Yt) > N20,000	(-.188)	0.828	(-.150)	.861	(.224)	1.25
Household size (Hsize);						
Ref: 4 persons & below						
Hsize ≥ 5 persons)	(.152)	1.16	(1.64)*	5.167	(.011)*	1.01
Health care cost (Hb_i)						
Ref: No health cost						
Present of health care expenditures (Hbi _i)	(.654)*	1.92	(-1.93)*	.145	(-.844)*	.430
Clinical stage HIV(H_{sit})						
Ref: ≤ Six years						
Seven years & above	(-.331)	.719	(-1.988)*	.137	(-.444)	.642
Household head (Sex)						
Ref: Female (1)						
Male	(-.156)	.856	(-1.213)*	.325	(-.520)*	.94
Remittances (NI) from relatives & friends						
Ref: Received NI						
No remittances (NI)	(-1.68)*	.186	(-.939)*	.392	(-.700)*	.497
Asset sale (SA_{it})						
Ref: No sale of asset						
Asset sale	(1.807)*	6.09	(-1.981)*	.138	(-.847)*	.429
Food on credit (Pf_c)						
Ref: Household do not purchase food on credit						
Purchase food on credit	(-1.39)*	.247	(-1.48)*	.228	(1.073)*	2.76
Support from Govt (SFG)						
Ref: Receive support						
No support	(-.579)	.561	(1.396)*	4.40	(0.917)*	2.50
Infected member (NH)						
Ref: One person						
More than one persons	(.512)	1.668	(.086)	1.090	(-.107)	.898
Employment (E_{mt})						
Ref: Employed						
Unemployed	(.441)	1.554	(-1.436)*	5.178	(-.073)	.930
Education (E)						
Ref: No formal edu.						
Formal education	(-.52)*	.593	(-.002)	.998	(.481)*	1.618
Constant	(1.465)	4.328	(3.731)	41.735	(-.594)	.552

Observations; 891. The reference category for each variable is written after the bold letter, ref. The P < .05*.

Source: Field survey 2014/15 (Author's computation 2015/16)

Quite shocking is the Support from Government variable (SFG) which depicts positive relationship with food expenditure decline and is significant in two districts (Lagos east and west). Government support in this context is measured as the degree of empowerment (employment opportunities, food aids, materials aids etc) and financial support received by households at the districts and state levels. The outcome (Beta coefficients: LE, 1.396 and LW, 0.917) can be interpreted as government support does not reduce food expenditure decline among affected households at the district levels. The Exp (B) coefficients of 4.4 (LE) and 2.5 (LW) indicates that the odds of experiencing food expenditure reduction is greater for households who do not receive government support (than those who received) by a factor of 2.50 in Lagos west, while for households in Lagos east, the odd is greater by a factor of 4.40. In between district effect, households in Lagos east have 1.9 greater odds of facing food expenditure decline than households in Lagos west.

In the same vein, the employment status of the respondents (EMT) exhibits direct effect on declining food spending in Lagos east district only. In other words, the result suggests that irrespective of the respondent's occupational status, there is the odd of food expenditure reduction among PLWHAs in Lagos east senatorial district. The odd ratios support greater food expenditure decline for those who are unemployed than employed respondents by a factor of -0.78. This finding supports the views that respondents who are gainfully employed are better empowered with resources to take care of themselves than those who are unemployed.

Finally, the educational variable appears to be negatively related with declining food expenditure in Lagos central (-0.52) and positively related with the predicted variable (declining food expenditure) in Lagos east. This implies that educational status of the household heads reduces the burden of HIV/AIDS on food expenditure in Lagos central

and increases the burden in Lagos west. The result shows that the odd ratios support lesser burden of about 41 per cent for household head with formal education, against those without formal education in Lagos central. However, in Lagos west, households with formal education are more likely to experience food expenditure decline by a factor of 1.62 than the reference category. In between district effect, the outcome suggests that there is mixed effect of education status on food expenditure at the district levels.

In the light of the above findings, the state level impact of selected household variables on food expenditure decline is examined.

5.4.6.3 Presentation of Logistic Regression Result on Food Expenditure and Selected Socio-Economic Profiles of PLWHAs at the State Level (For Objective Five).

The multivariate logistic models of household food expenditure decline on socio-economics variables are presented in Table 5.18. Model one is a baseline model of household food expenditure decline and variables for household income. The variables for the other independent variables are added in the progression of models two to seven. The final model shows all the variables in one model. All the variables (asterisk) of the socio-economic characteristics have a significant relationship with food expenditures decline in Lagos state.

The baseline model, model one, shows that the variables for household income (Yt) have a significant negative relationship with food expenditure decline. This is quite absurd, as household income was not statistically significant at levels in the districts outcome. However, the results advance that household income reduces the burden of HIV/AIDS on food expenditure. The odd ratio suggests that food expenditure decline is reduced by a factor of 0.808 for household earning above N20, 000 than household earning less than N20, 000. This outcome is expected as households that earn more, are better equipped financially to satisfy the urgent needs of their member/s than those that earn less.

Table 5.18: Odds Ratios for Logistic Regression of Food Expenditure decline on Selected Socio-Economic and Demographic Profile of PLWHAs at State Level.

Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Household Income (Yt)							
Ref: Income < N20, 000							
(Yt) > N20,000	(-.39)*.68	(-.398)*.67	(-.267) .77	(-.33)* .72	(-.21) .815	(-.21) .818	(-.45)* .64
Household size (Hsize);							
Ref: 4 persons & below							
Hsize ≥ 5 persons)		(-.10) .90	(-.22)* .80	(-.216) .81	(-.12) .888	(-.09) .927	(-.078) .93
Health care cost (Hb_i)							
Ref: No health cost							
Present of health care expenditures (Hbi _i)			(-1.5)* .23	(-1.4)* .24	(-.97)* .38	(-.89)* .41	(-.87)* .42
Clinical stage HIV(H_{sit})							
Ref: ≤ Six years							
Seven years & above				(.79)* 2.23	(.57)* 1.77	(.43)* 1.5	(.46)* 1.58
Household head (Sex)							
Ref: Female (1)							
Male				(.54)*1.71	(.49)*1.64	(.51)* 1.6	(.55)* 1.7
Remittances (NI) from relatives & friends							
Ref: Received remittances (NI)							
No remittances (NI)					(-1.1)*.33	(-.92)* .40	(-.89)* .41
Asset sale (SA_{it})							
Ref: No sale of asset							
Asset sale					(1.33)*3.7	(1.2)* 3.2	(1.1)* 3.03
Food on credit (Pf_c)							
Ref: Household do not purchase food on credit							
Purchase food on credit						(1.1)* .33	(-1.1)* .34
Support from the Government (SFG)							
Ref: Receive support							
No support						(-1.1)*.326	(1.16)* 31
Infected member (NH)							
Ref: One person							
More than one persons							(.314)* 1.4
Employment (E_{mt})							
Ref: Employed							
Unemployed							(.73)* 2.08
Education (E)							
Ref: No formal edu.							
Formal education							(-.24) 0.79
Constant	(.20)1.23	(-.26) 1.30	(.93) 2.53	(.64) 1.898	(.74) 2.09	(7.2) 3.61	(.91) 2.48

Observations; 891. The reference category for each variable is written after the bold letter, ref. The P < .05*.

Source: Field survey 2014/15 (Author computation)

In model two, household size (Hsize) variables are added. They reduce the negative effect of household income variable (Yt) on food expenditure decline. The household size variables also have a negative relationship with food expenditure decline. This shows that household size reduces the odd of food expenditure decline among the sampled household. For a small household's size, the odd of experiencing food expenditure decline is reduced by a factor of 0.90 than a large household size. This means small household size will experience about 10 per cent increase in food expenditure than the reference category. This outcome is buttressed with the fact that small household's size has less people to feed and provide for when compared with large households size.

The variable that relates to health care is added in model three. The variable, health expenditures (Hbi), has a significant negative relationship with household food expenditure decline. The negative nexus between health expenditures and food expenditure suggests that there is no substitution effect between the predictor and the predicted outcome. As a matter of fact, the result propose that health expenditures do not increases the odd of food expenditure decline among affected household in Lagos state. This is contrary to extant literatures that reported negative impact of health expenditures on food expenditure of affected households, thereby impoverish income meant for other basic needs and pushes poor household below the poverty level (Mano *et al.* 2006; Kaschula, 2008; Laar *et al.*, 2015).

In model four, the duration of living with the illness (Hsit) and gender of house head (Sex) variables are added. They increase the positive effect of the variables of household income (Yt) and health expenditure (Hbi) and cause household size variable to be insignificant. The variables, male and being living with HIV/AIDS for more than seven years (Hsit and Sex) have positive relationship with household food expenditure decline. Meaning the odd of experiencing food expenditure reduction is increased by a factor of

2.23 for respondents who contracted the illness for more than seven years than respondent, who contracted the illness within the last six years of the survey period. Alongside, the finding also shows that being male increases the odds of household food expenditure decline by 1.71 per cent. In other words, a male household head is more likely to experience food expenditure decline than a female household head even when controlling for other variables. This outcome in all ramifications differs from the districts level results, as there is negative nexus between gender of household head and food expenditure decline at all district levels.

The two variables that relate to non-household income (Remittance; Ni) and coping strategies of HIV/AIDS household (Sale of assets; SA) are added in model five. The first effect is that both household income and size become irrelevant in the model. The second effect points to the fact that the significant level of both health expenditure and clinical stage slightly fluctuated. The variable, no remittances, has a significant negative relationship with food expenditure decline whereas asset sales have positive impact on the predicted variable. In simple terms, remittance from relative and friends reduces the odd of food expenditure decline, while asset sale increased it.

Accordingly, another variable that relate to coping strategies of household's (food purchase in credit: Pf_c) and support from government (SFG) are added in model six. However, the variables for household income (Y_t) and size (Hsize) remain insignificant. The variable, food purchase in credit, has a significant positive relationship with food expenditure decline, while support from government (SFG) is negatively related with declining food expenditure in the model. In a nutshell, the positive sign in the result simply means that food bought on credit increases the odds of food expenditure decline in affected household in Lagos state (Table 5.18). In contrast, government material and financial support (FMS) reduce the livelihoods of food expenditure decline among the

sampled household. The odd ratio advances that households that purchase food on credit will experience greater food expenditure decline by a factor of .33 than the reference category. However, the odd ratio for government aids suggests that households that do not receive supports from the government are more likely to experience lesser food expenditure decline than the reference category.

In model seven, the variables; numbers of household member/s infected with HIV/AIDS (NH), employment status (Emt) and educational status (E) were added. However, only education status was not statistically significant in the result. The inclusion of several variables in model seven increases the predictability power of some variables in the previous model (6), except for household size that remains insignificant in the last three models analysed. As expected, household with more than one members living with HIV/AIDS were found to be more likely to experience food expenditure decline when compared with the reference category (household with only one person infected). The odd ratios propose that, household with more than one members infected with HIV/AIDS will experience food expenditure decline by a factor of 1.4, than household with only one member infected. This result support existing studies that confirmed high financial and material demand in household where more people are infected with HIV/AIDS than in household where only a person is infected with the illness (Bukusuba *et al.*, 2007; Crush *et al.*, 2007; Zhang *et al.*, 2012).

As a follow up from the above, the unemployment result indicates that being unemployed increases the predicted odds of experiencing food expenditure decline by a factor of 2.08. The positive relationship between unemployment (Emt; 0.73) and food expenditure suggests that those who are unemployed are more likely to face food expenditure decline than those employed. This finding is not surprising as the employed may be in possession of resources that, they can use to meet their own needs and those who co-reside with

them. As a result, their households are more equip to face the shock that comes with HIV/AIDS illness.

Lastly, one can notice from the empirical results that our predictor variables influence household income and food expenditure differently both at the district and state levels. Some variables were not statistically significant at the district levels (household income, duration of living with HIV/AIDS among others), but found to be significant at the state level. All in all, five variables were found to be significant in the income and food expenditure models. These include: asset sale, health expenditures, productivities losses, remittances and food purchases in credit. The outcomes of these variables would make up the discussion of findings in the next chapter.

5.5 Discussion of Findings

The main purpose of this study is to investigate the impact of HIV/AIDS on household income and food expenditure. The finding so far has shed more light on the overarching aim of this study. In view of the descriptive result (Objective one and two), it is observed that 60 per cent of the participants received drugs and consultation service outside the Local Government Areas (LGAs) of their residence. This act, if not urgently checked, might lead to erroneous computation of HIV/AIDS prevalence rate among LGAs. Similarly, it may bring about the allocation of resources to locality that needs less of such aids.

Based on the results of the demographic profile of PLWHAs; objective one (Figure 5.1 and 5.2), two categories of people were found to dominate our sampled respondents. They include: women and people of age group 30 – 35 years. This finding substantiates previous studies by Sangosanya and Siyanbola (2005), Reneth and Matshe (2006), Ijaiya *et al.* (2009) and Ghailan *et al.* (2010) that women are more vulnerable to the HIV/AIDS

infection and are most likely found receiving treatment in ART centres than their male counterparts. Contrarily to this finding, Samuels *et al.* (2012), study, found age group 15-24 years as the ‘Most-At-Risk-Age-Group’ (MARAG) in Lagos State. However, this study is supported on the ground that the NACA recent report (2014) revealed that the incidence rate is high among ages 30 – 45 years.

Another core group of people that were observed in the treatment centres were married women and petty traders. Extant studies have shown that unfaithfulness might not be the leading factor for married women high incidence rate, but discordance in marriage, power-imbalance between men and women, women biological features, use of untreated tools during cosmetic services, antenatal care via visiting of Traditional Birth Attendants (TBA) and unfaithful male partners might be contributing factors (Adelaja, 2006; Aborisade, 2015; Sidibé, 2015). Equally, most of the respondents interviewed noted that, they got infected within the period of one - three years. This, as this study points out, is an indication of rising HIV incidence in the state.

The finding also shows that most respondents are from large household size headed by male (76.1 %). This is a signal that large household’s size headed by male might be more vulnerable to the infection than smaller households headed by male.

With regard to objective two (Socio-Economic profile of PLWHAs) of the study, it was observed that household headed by males earn more income than those headed by females, before and after the HIV/AIDS incidence. In like manner, before a member was infected with the illness, the estimated household income is within the range of ₦20, 000 – ₦50, 000, and after the HIV incidence, household income was estimated to be below ₦20,000. This is a strong indication that household income is falling and the catastrophic effects of financing HIV/AIDS treatments from household hard earned income will be observed in the impoverished lifestyle that the affected household tend to adopt or live.

Thus, this call for policy option that will empower affected household in order for member/s to avoid the adoption of negative coping strategies.

Similarly, respondents from both (male and female) head of households admitted that the illness has negative impact on their household income. However, the catastrophic effect of financing HIV/AIDS medical care is more observed in female head of household than male. In a nutshell, this finding supports the works of Natalia *et al.* (2014) and Shyamala (2015) that HIV illness adversely impact on aggregate income of male and female heads of households. Alongside, the descriptive outcomes of food expenditure suggest that on the average a household spends below ₦1000K per day before the HIV incidence. But when a member of the household got infected, food expenditure rises to the range of ₦1,001 - ₦1,999 per day, which is approximately 33.3 per cent increase. Following the results in Table 5.5 and Table 5.6, it can be deduce that food expenditure of affected household is greater than aggregate income of the households. The implication of this outcome is that households spend more than they earned in Lagos state.

Another conflicting outcome is the health expenditure effect. On the average, it is estimated that affected household spends about ₦1001 - ₦5,000 per month on HIV/AIDS relates health care activities (Table 5.7). This is an indication that a considerable amount of household income is spent on health care expenditure. Thus, the implication of this result is that there is an element of displacement effect between health expenditures and some basic needs of the affected household. In a similarly manner, the descriptive statistics result shows that productivity loss and care givers activities relatively affect the economic performance of the respondent and the household. This is a confirmation that HIVAIDS leads to loss of man-hour labour and productive capacity of affected household (Alemayehu & Aregay, 2012; Musinguzi, 2012; Wafula *et al.*, 2013). The loss of labour hours and productive capacity of households if not properly checked will push marginally

poor households below the poor line.

Furthermore, in a bid to address the HIV/AIDS burden, the descriptive result indicated that households adopt several forms of coping strategies. These includes: substitute educational expenditures for food cost, stop child/children from going to school, sell assets, received remittances from relatives and friends, involved in caregiving activities, used underage for labour, borrow money as well as spent savings (Table 5.10). This finding conform with the studies of Mutangadura, (2000), Ugwu (2009), Ng'ambi *et al.* (2013) and Shyamala (2015), that noted that households adopt various forms of coping strategies in order to reduce the burden of the HIV/AIDS on their welfare.

With regard to objectives three, it was observed that several socio-demographic variables relatively predict household income. These variables include: sex of respondents, age group, marital status, educational status, ethnic groups, occupations, head of households and household size. In all, the predictive powers of age group, occupational status and widowed variables were more statistically significant on household income decline. For instance, in model one to seven (Table 5.13), age group positively predict the odd of income decline among affected households. This simply means that, irrespective of the age of the respondent, the odd of household experiencing income decline is high. However, a greater burden of the impact is observed on age 18-23 years, as the finding shows that they are most likely to experience income fall than any other age categories. It is not surprising as this core group might be expected to be in school and not working to fend for themselves. This age group finding supports existing studies that HIV/AIDS is adversely affecting young productive people in the society as well as eroding the future manpower of the country (Oni *et al.*, 2001; Ghailan *et al.*, 2010 & Musinguzi, 2012).

Also, to achieve objective three, the occupational status of the respondents was regressed on household income decline. Also, the finding advances that unemployed respondents

and those employed in the private sector are more likely to experience income decline than other occupational groups. The likelihood of income decline is increased by 2.09 times by being unemployed than be employed (Table 5.13). This result support the finding of Ogunmefun (2008) and Levinsohn *et al.*, (2011), who noted that those infected with the illness are less likely to secure job opportunities. As a result, they are financially incapacitated to take care of themselves and their loved ones.

Contrary to the above, the family business and student's variables relate negatively with household income. This is quite absurd and contrary to the initial finding as students are supposed to be within age group 18 -23 years. In a nutshell, one possible explanation for this outcome might be that some of the respondents who are students are working or getting financial aids from relatives and friends.

In line with objective three and hypothesis one of the study, it is noted that age groups and occupational distributions of the respondents significantly affects household income in Lagos state.

Correspondingly, the empirical results in Table 5.14 and 5.15 were carried out to shows the impact of socio-economic profile of PLWHAs on declining household income in Lagos state. The outcome proffers answer to objective four of the study. Across the districts and state levels, four keys variables have strong predictive power and significant influence on household income. They include: health expenditures, productivity, asset sale and remittance from relatives and friends. In order to test hypothesis two of the study, health expenditures were regressed on declining household income. Therefore, the finding advanced that there is a positive relationship between both variables. In other words, spending on HIV/AIDS related activities negatively reduce income of affected household. This finding is consistent with other studies that show that the illness is associated with considerable health expenditures which eat deep on household income

and causes loss of propensity to earn income, especially when the sick person or head of household is not productively active (Pitayanon *et al.*, 1994; Baggaley & Needham, 1997; Bollinger & Stover 1999; Mutangadura *et al.*, 1999; Whiteside *et al.*, 2006; Smit, 2007; Tekola *et al.*, 2008; Ghailan *et al.*, 2010 ; Iya *et al.*, 2012; Ofonime 2012).

Still on the income model (Table 5.14 & 5.15), the productivity loss (Pl) variable, a key variable in the conceptual framework positively relates with declining income of household at the districts and state levels. This indicates that the number of days absent from economics activities by infected worker or member/s of the households typically reduces the household income level. In other words, there is a displacement effect of working time with time spent in receiving treatments which has a negative significant impact on the household income. This is also consistent with other related studies that have shown that HIV/AIDS reduce man-hour labour of the infected adult member (workers) which negatively reduce organisational investment as well as crop production of the household (Kongsin *et al.*, 2001; Kessy *et al.*, 2004; Tham-Agyekum *et al.*, 2011; Fox, 2012; Musinguzi, 2012; Iya *et al.*, 2012; Natalia *et al.*, 2014).

In line with the income result, the food expenditure outcome was analysed to proffer solution to objective five of the study. At the district level, household's income is not statistically significant in predicting food expenditure. Surprisingly, the reverse was the case at the state level. This suggests that the odd of food expenditure decline is reduced by the presence of household income. This outcome supports the Engel law that expressed household food expenditure as a function of household income.

The results (Table 5.17 & 5.18) also demonstrated that health expenditures (Hbi) adversely predict food expenditure decline at district and state levels. The negative effect of health expenditures on food expenditure decline is surprising, as it implies that health expenditures does not decrease food expenditure of affected HIV/AIDS households. This

is contrary to extant studies by Booysen and Bachmann (2003), Hilhorst *et al.* (2004), Mikael (2004), Bukusuba *et al.*, (2007), Masuku and Sithole, (2009) that found substitution effect of food expenditure for health care cost. However, the result from this study is buttressed with the finding of Alemu and Bezabih (2008), who noted that expenditures on medical and funeral ceremonies do not significantly reduce food and non-food expenditures of affected households. Other possible reasons for this unexpected result might be attributed to the autonomous component of consumption which emanated from remittance given by relatives/friends as well as government support variables in the food expenditure result, which have been significant both at district and state levels. That is, the role of extended families and government in supporting PLWHAs in Lagos state is noticeable.

Furthermore, the sale of asset variable was found to relate positively with household food expenditure at the state level. Still, household food expenditure did not respond inversely to expenditure on medical care. This might be attributed to the fact that other coping strategies are available to households to reduce the burden of the illness on food expenditure.

By and large, the findings of this study can be summarised using Figure 5.17. The woman in question is Lagos state and the children with her are PLWHAs in the three senatorial districts. Using Table 5.3 data, it was observed that about 60 per cent of the participants received treatment outside the Local Government Areas (LGAs) of their residence. This is an indication that the participants do not want neighbours to know their HIV/AIDS status or might be afraid of stigmatization or discrimination.

As well, the LGAs data (Table 5.3) was disaggregated into senatorial districts. It was noticed that Lagos west had more number of PLWHAs, followed by Lagos Central and Lagos east. Since, Lagos east has the lowest number of PLWHAs; she represents the

baby at the back of the mother, while Lagos west is at the left hand and Lagos central at the right hand side. Given the low income level among households in Lagos west alongside the rising HIV/AIDS incidence rate, the catastrophic effect of having more affected households falling below the poverty is unavoidable.

In like manner, the children behind the woman are those who got infected with HIV/AIDS within the last six years prior to the survey. They are calling mummy for help. In other words, they are calling on the Lagos State Government to come to their aid. Going by the number of people in this core group (New infection rate; figure 5.11) and the occupational status (unemployed status) of some of the respondents (Figure 5.6), there is the tendency of new incidence rate if this core groups decided to involve themselves in negative coping strategies such as prostitution, street selling, rape just to mention a few.



Source: Author's construct 2015/2016

Figure 5.17: Pictogram Analysis of HIV/AIDS nexus with Household Income and Food Expenditure

Following the descriptive results in Figure 5.6, more respondents were found to be petty traders, as depicted on the right hand side of the picture. The outcome suggests that, when this core group of people are affected, the odd of present and future tax revenue from this subsector to the government is threatened.

Furthermore, a critical examination of the picture shows that the babies are holding money in their right hands and food expenditure in their left hand, but the income is split into two while food expenditure is not. This indicates that the odds of income decline among affected households in Lagos state is increased by HIV/AIDS, while the odd of food expenditure decline is reduced by the illness. One lesson drawn from this analysis is that HIV/AIDS impact on the human resource/citizenry is noticeable, and, if not critically addressed soon, it will affect the revenue structure and economic progress of the state in future.

Chapter Six

Summary, Conclusion, Recommendations and Contributions to Knowledge

6.1 Preamble

This chapter is structured into six parts with each subsection briefly discussing the findings of previous chapters.

6.2 Summary of Findings

This study explores the impact of HIV/AIDS on households income and food expenditure in Lagos State, Nigeria. This work is structured into six parts. Chapter one of this study introduces the research process and consists of the background of the study, statement of the problem, research objectives, research questions, research hypothesis, significance of the study, scope and delimitation. Chapter two contains socio-economic and demographic profile of Lagos State. Also included in this chapter is the State annual HIV/AIDS prevalence rate as well as public policies to address HIV/AIDS spread. Chapter three takes a cursory look at conceptual issues, theoretical reviews, empirical reviews, conceptual framework and gaps in extant literatures. Chapter four consists of research settings; research design, description of study's population, sampling techniques, sample size determination, sampling procedures, research tools, test of reliability of research instruments, reliability analysis for internal response rate, ethical consideration, training of research assistants, administration of HIDS instrument, model specifications and estimation techniques. Similarly, chapter five focuses on the data presentation, interpretation, and discussion of results. The data obtained in the course of the study were analysed using both descriptive and logistic regression analysis. While means and frequencies were used to summarize and describe the data, logistic regressions were

employed for the empirical analysis. Some of the overarching findings from the tested hypotheses are discussed below.

i. There is a significant relationship between age group categories and income of affected households. However, this nexus is inverse (Table 5.13). The finding has demonstrated that regardless of the age group of the adult infected member/s, the odd of household income decline is certain. These outcomes support the study's alternative hypothesis one that age group has significant impact on declining income of households. Within the age group categories, the result also advance that there are greater income decline for ages 24-29 years (odd ratios: 3.46), ages 30-35 years (odd ratios: 2.61), and much more greater income decline for age group 18-23 years (odd ratios: 5.39). This result supports the assertion that HIV/AIDS is ravaging the economically active section of the population (Erickson, 1990; UNAIDS report, 2006). Significantly labour productivity and production are affected, resulting in loss of income, which is a reduction of the available financial resources for the household (Ashford, 2006; Farahani *et al.*, 2013; Laar *et al.*, 2014; Natalia *et al.*, 2014).

Another remarkable result is the significant impact of occupational distribution variable on income of affected households. From the empirical analysis (Table 5.13), it was deduced that, the unemployed (odd ratios: 2.09) and respondents in private establishments (odd ratio: 1.86) are more likely to face greater income decline than other sub-occupations. Contrary, the outcome for participants working in private establishments was unexpected, as it is believed that these core groups of respondents are working and are economically viable to take care of themselves and family. But, for the unemployed this meets up with the study a priori expectation. By and large, they are expected to have greater odd of income decline than other occupational categories. This is in line with extant literatures which claim that those without jobs are more likely to be

hard hit by the HIV/AIDS illness than those employed (Pradhan *et al.*, 2006; Ogunmefun, 2008). With regard to the occupation result in Table 5.13, the study deduces that, the null hypothesis which states that occupational distributions of respondents have no significant impact on household income is therefore rejected.

Regarding the objective four and hypothesis two which advances that HIV/AIDS (through health expenditures) does not have any significant impact on household income was tested. The finding in Table 5.14 and 5.15 indicates that there is a significant positive relationship between the predictors (expenditures on health care with beta coefficients: 2.11, 1.78, 1.77, 1.84 and odd ratios: 8.23, 5.93, 5.87 & 6.30) and the outcome variable (income decline). This can be interpreted as; HIV/AIDS illness has negative impact on household income. The finding also corroborates previous studies that HIV/AIDS in the form of health care costs have negative impact on income of affected households (Kambou *et al.*, 1992; Tekola *et al.*, 2008; Ghailan *et al.*, 2010; Taraphdar *et al.*, 2011; Iya *et al.*, 2012). Following this finding, the null hypothesis is rejected, while the alternative hypothesis is accepted.

In the final result, the food expenditure model suggests that, the odd of food expenditure decline is not reduced by health care cost (Beta coefficient, -.078 & odd ratios: .93). This implies that health expenditures do not reduce food expenditure in HIV/AIDS affected households. This finding does not conform with existing studies (Masuku & Sithole, 2009; Ayele *et al.*, 2012; Laar *et al.*, 2015), as these authors propose negative impact of HIV/AIDS on food expenditure of affected household. The positive nexus between food expenditure and health expenditure are buttressed with the finding of Alemu and Bezabih (2008), Baiyegunhi and Makwangudze, (2013) that noted that increase in income and remittance to household tend to increase purchasing power of households to buy food, thus ensuring that the household is food secured. Following the above argument, the null

hypothesis is accepted which posit that HIV/AIDS illness does not have any impact on household food expenditure.

Lastly, three hypotheses were formulated and tested to examine the impact of HIV/AIDS on household income and food expenditure in Lagos state. On the basis of empirical evidence two were accepted while one was rejected. As part of policy implications of the study, a pictographic analysis of HIV/AIDS impact on household income and food expenditure was depicted to explain present and future impact of the illness on the human resource and revenue base of Lagos State. Lastly, chapter six presents the summary of findings, conclusion, recommendations, contributions to knowledge and suggestions for further studies.

6.3 Conclusion

It is evident from the findings of this study that age group, occupational category, man-hour loss, remittance, asset holding and health expenditures significantly impact on household income and food expenditure of affected households in Lagos state. These identified variables are very germane to the survival of many households, especially in Lagos state, Nigeria, where population growth, unemployment, poverty and HIV/AIDS incidence are high. This work also provides evidence to support the general assertion that HIV/AIDS affects household production, income and other means of livelihood of affected household in Nigeria and other SSA nations. The changing trends in the infected age group, marital status and duration of infection necessitate the need for governments to reconsider their interventionist policies to address the problems of unemployment, poverty, demographics and purchasing power changes.

Furthermore, the empirical results demonstrated that there is likely to be burden on the Lagos State Government in the area of providing and increasing antiretroviral

drugs/therapy, financial and materials aids whose demand are expected to increase in future. By and large, it may be safe to conclude that urgent steps should be taken so as to prevent new incidence rate, reduce AIDS mortality and support home-based care activities. This is possible with some recommendations provided overleaf.

6.4 Recommendations

Based on the existing public policies on HIV/AIDS as enacted by Lagos State Government and the findings of this study, the following recommendations are made:

- i. Policy interventions that will assist affected households to maintain regular income such as; skills empowerment and cash transfer programmes which can provide financial protection for affected HIV/AIDS household will serve as a welcome development. This programme should not be restricted to selected few as previous policies and programme but open to register PLWHAs (18 years and above) in the various treatment centres of the State.
- ii. There is the need for policy makers to pursue sound, effective and efficient social protection scheme for the poor in order to prevent negative coping strategies (child labour, prostitutions etc) as well as high HIV/AIDS incidence rate among young and unemployed people. As policy suggestion, the free health care service as provided by Lagos State AIDS Control Agency (LSACA), alongside financial support which this current study is proposing for the poor, should follow multi-dimensional selection criteria in order to reach the poorest group of household's accommodating PLWHAs. Also, it is important to identify and re-develop new methods and strategies to increase coverage for these vulnerable individuals and groups.

- iii. Following the descriptive result, it is observed that 60 per cent of the participants received drugs and therapies outside the Local Government Areas (LGAs) where they reside. This act if not urgently checked, might lead to erroneous computation of HIV/AIDS prevalence rate among LGAs and similarly bring about allocation of resources to locality that needs less of such aids. There is the need to review existing and current HIV/AIDS survey tools, particularly at the LGA levels in order to achieve accurate HIV/AIDS statistics in each of them in particular and states in general.
- iv. The Federal government in collaboration with state governments, corporate organisations, local and international bodies should ensure that genuine condom, microbicide and post exposure prophylaxis are made available at little or no cost for female users. Similarly, more treatment sites should be located in rural areas in order to serve the rural populaces within such areas. Likewise, young unmarried men are advised to abstain from indiscriminate and unprotected sex.
- v. This study observed that more respondents contracted the HIV/AIDS illness in the last three years (2012-2015). The import of this is that new infection rate might increase among Nigerians. This study, thus, advocates that more HIV/AIDS awareness and campaign programmes that goes beyond Family Life and Health Education curriculum (FLHE) should be carried out by the government and her agency in every sector / sphere of the nation.
- vi. Akin to these, the government in collaboration with other social partners should improve their financial and material aids to the support group (Network of People Living With HIV/AIDS in Nigeria; NEWPHA) as this has been a veritable avenue for PLWHAs to acquire new skills and employment opportunities.

- vii. It is also acknowledged that, if urgent solutions are not proffered presently, the effort by the State and National government to reduce HIV/AIDS spreads and impact on household income and sustenance may not yield the required result. Therefore, this study called for collective efforts of the government, NGO, private sector participation, community based-schemes and household support strategies to address the impact of HIV/AIDS illness at the micro-level of the society.

6.5 Implications of the Findings for Practice

The findings and recommendations of this study when carefully utilized will help reduce the burden of HIV/AIDS illness on household means of livelihood. Since a clear relationship was established between declining household income and age group, occupation status, health care expenditures and productivity loss. Therefore, households (both affected and non-HIV/AIDS affected) should therefore strive more than ever to ensure that young people (under 41 years of age), are equipped with appropriate and adequate knowledge of the burden of HIV/AIDS impact on household income. Same should also be done for other means of livelihoods. These revelations will put some caution in them and help to avoid indiscriminate sex. Consequently, this will help to control the incidence rate among age group 18 – 41 years in Lagos state.

The Lagos State Government on her part should not only create HIV/AIDS awareness campaign. She should also endeavour to educate households and families about the danger of losing their means of livelihoods to the HIV/AIDS scourge. This programme should be communicated to individuals in different languages especially in English, Yorubas, Igbo and Hausa. Likewise, special preference should be given to areas such as Alimosho, Ajeromi, Ikorodu, Lagos Island, Lagos Mainland, Mushin and Ojo. These areas were found to be plagued with high HIV/AIDS incidence in this study.

Considerably, poverty has been identified as a key factor that increases HIV/AIDS incidence among individuals. Therefore, the need to address the issues of unemployment and poverty in Lagos state, especially in this era of economic recession (2016) – is significant in reducing household's vulnerability to HIV/AIDS scourge both at state and Federal levels.

6.6 Contributions to Knowledge

From the findings of this study, the following are the contributions to knowledge

- i. The study identified demographic variables that determine the effects of HIV/AIDS on households' income and food expenditure.
- ii. The research identified variation by locality (senatorial district), as well the socio-economic variables that affect the income and food expenditure of households with PLWHAs.
- iii. This work revealed that HIV/AIDS – health related expenditures do not have any adverse impact on food expenditure of affected households.
- iv. The study identified household variables that affect the income and expenditure of households accommodating PLWHA.
- v. This thesis developed conceptual and theoretical frameworks for analysing the impact of HIV/AIDS on household income and food expenditure

6.7 Suggestions for Further Studies

The study's setting is Lagos state because of its strategic importance to the Nigerian economy. This is also alongside the increasing number of people reported as living with HIV/AIDS. In any way, this does not suggest that people living with HIV/AIDS in other

states or regions of the country do not have their own peculiar challenges. The scope of the study was also narrowed down to the impact of HIV/AIDS on household income and food expenditure in ten Local Government Areas (randomly selected) in the state.

Hence, the study setting is limited in scope and delimitations. It is therefore suggested that other interested researchers can embark on a study that will consider the impact of HIV/AIDS and other diseases on household income and food expenditures in Lagos state by considering more LGAs. The study area can also be extended to other parts of Nigeria such as Osun and Ogun (South West), River and Akwa Ibom (South South), Benue and Nasarawa (North Central), and Anambra and Enugu (South East).

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Appendix One

Topic: Household Income Dietary Scale (HIDS) Questionnaires

Department of Economics,
Faculty of Social Sciences,
University of Lagos,
Akoka,
Lagos State.

Dear Sir/Ma,

LETTER OF INTRODUCTION

I am a Postgraduate Student in the Department of Economics, from the above Institution.

I am currently pursuing my Doctoral study on the topic: The impact of HIV/AIDS on Households' Income and Food Expenditure in Lagos State, Nigeria. I hereby solicit your assistance in filling the spaces or ticking the appropriate options (as the case maybe) in the questionnaire attached hereto. All your responses shall be treated with utmost confidence. Kindly respond appropriately and accurately as possible. Please your timely response to the questionnaire will determine the success of the study.

Thank you.

Osobase, Anthony.

A. DEMOGRAPHIC CHARACTERISTICS OF RESPONDENTS

- (1) **Sex:** (a) Male ☐ (b) Female ☐
- (2) **Age:** (a) 18-23 ☐ (b) 24 -29 ☐ (c) 30-35 ☐ (d) 36-41 ☐ (e) 42– 47 ☐
(f) 48-53 ☐ (g) 54-59 ☐ (h) 60-65 ☐ (b) 66 & above ☐
- (3) **Marital status:** (a) Never married ☐ (b) Married ☐ (c) Divorced ☐
(d) Widowed ☐ (e) Separated ☐
- (4) **Educational status?** (a) No formal education ☐ (b) Primary ☐ (c) Junior Secondary school ☐ (d) Senior Secondary school ☐ (e) More than Secondary ☐
- (5) **Your Religious?** (a) Christian ☐ (b) Islam ☐ (c) Others (specify)
- (6) **State of origin? (Please specify):**.....
- (7) **Your ethnic group?** (a) Yoruba ☐ (b) Igbo ☐ (c) Hausa ☐ (d) Others (Specify):...
- (8) **Local Government Area where you live in Lagos state?**
- (9) **Are you working?** (a) Yes ☐ (b) No ☐
- (10) **Your current occupation?** (a) Government worker ☐ (b) Petty trader ☐
(c) Self-employment (e.g., Carpenter, Bricklayer, Vulcanizer, Electrician etc.) ☐
(d) Family business ☐ (e) Unemployed ☐ (f) Employed in private sector ☐
(g) Student ☐ (h) Farmer ☐ (i) NGO worker ☐ (i) Other (specify).....
- (11) **How long have you been working:** (a) Less than 1-5 years ☐ (b) 6-10 years ☐.
(c) 11-15 years ☐ (d) 16 - 20 years ☐ (e) Above 20 years ☐ (f) None ☐
- (12) **Your position in the family/household:** (a) Father ☐ (b) Mother ☐ (c) Son ☐
(d) Daughter ☐ (e) Others
- (13) **Please indicate the range that best define the total number of people that live in your family/household** (a) 1-2 ☐ (b) 3- 4 ☐ (c) 5-6 ☐ (d) 7-8 ☐ (e) 9 &above ☐
- (14) **The head of your household?** (a) Father ☐ (b) Mother ☐ (c) Uncle ☐
(d) Aunt ☐ (e) Others.....
- (15) **Educational level of the head of your household?** (a) No formal education ☐ (b) Primary ☐ (c) Junior Secondary school ☐ (d) Senior Secondary school ☐ (e) More than Secondary ☐

B. ASSESSMENT OF INDIVIDUAL LIVING WITH HIV/AIDS FOR THE LAST 12 MONTHS

- (1) How long have you been infected with HIV: (a) 1-3 years ☐ (b) 4-6 years ☐
(c) 7-9 years ☐ (d) 10-12 years ☐ (e) 13 years & above ☐
- (2) Which other diseases is associated with HIV? Please multiple answers are allowed:
(a) Malaria ☐ (b) Diarrhoea ☐ (c) Tuberculosis ☐ (d) Typhoid ☐ (e) Pneumonia
(f) Gonorrhoea ☐ (g) Cholera ☐ (h) Skin rashes ☐ (i) All of the above ☐ (j) None of the above ☐ (k) Other please specify:.....
- (3) Precisely, how many years have you been living with HIV: (Please specify).....
.....
- (4) Have you or any member of your household been rejected from any job opportunity due to your HIV status..... (a) Yes ☐ (b) No ☐
- (5) Apart from you, how many member/s of your household is/are living with HIV?
(a) 1 ☐ (b) 2 ☐ (c) 3 ☐ (d) 4 & above ☐ (e) None of them ☐
- (6) Do you receive free medical drugs and services from treatment centre?
(a) Yes ☐ (b) No ☐
- (7) Do you receive any support from the government in the form of..... (Multiple answers are allowed) (a) Free antiretroviral drugs ☐ (b) Subsidize antiretroviral drugs ☐
(c) Free counselling and treatment ☐ (d) Employment opportunities ☐
(e) cash and gifts ☐ (f) None of them ☐ (g) Others (specify).....

C. ASSESSING THE HOUSEHOLD INCOME LEVEL FOR THE LAST 12 MONTHS

(1) What are the **three main sources** of income (money) to your household for the past one year (Multiple answers are allowed) (a) Formal employment ☐ (b) Self-employment ☐ (c) Trading and Petty ☐ (d) Cash & gifts from relative & others ☐ (e) Pensions ☐ (f) Loan ☐ (g) Others specify.....

(2) Please indicate the range that best describes your **household total monthly income before** the HIV/AIDS incidence? (a) Less than ₦20,000 ☐ (b) ~~₦20,000~~ - ₦50,000 ☐ (c) ~~₦50,001~~ - ₦100,000 ☐ (d) ₦100,001 & above ☐ (e) None ☐

(3) Please indicate the range that best describes your **household total monthly income after** you notice the HIV/AIDS infection? (a) Less than 20,000 ☐ (b) ~~₦20,001~~ - ₦50,000 ☐ (c) ~~₦50,001~~ - ₦100,000 ☐ (d) ₦100,001 & above ☐ (e) None ☐

(4) Does your household total monthly income reduce due to HIV infection?
(a) Yes ☐ (b) No ☐

(5) With regard to question 4, in what way has the HIV/AIDS illness reduce your household income? (a) Illness of member ☐ (b) Death of household member ☐ (c) Expenditure on medical drugs & services ☐ (d) None of these ☐ (e) Others (Specified).....

(6) How much does your household spend on HIV drugs in a month? (a) Less than ₦1,000 ☐ (b) ₦1,001-~~₦5000~~ ☐ (c) ₦5,001-~~₦10,000~~ ☐ (d) ₦10,001 & above ☐ (e) None ☐

(7) In a month, how much does your household spend on other drugs to support the HIV drugs? (a) Less than ₦1,000 ☐ (b) ₦1,001-~~₦5,000~~ ☐ (c) ₦5,001-~~₦10,000~~ ☐ (d) ₦10,001 & above ☐ (e) None ☐

(8) Altogether, how much does your household spend on HIV/AIDS related expenses (Drugs, medication, consultation and transportation) in a month? (a) Less than ₦1,000 ☐ (b) ₦1,001-~~₦5,000~~ ☐ (c) ₦5,001-~~₦10,000~~ ☐ (d) ₦10,001 & above ☐ (e) None ☐

(9) Approximately how much does your household receive as help in the forms of cash or gift from relatives and friends in a month? (a) Less than 5,000 ☐ (b) ₦5,001- ₦10,000 ☐ (c) ₦10,001- ₦15,000 ☐ (d) ₦15,001- ₦20,000 ☐ (e) None ☐

(10) What is the price range of the total drugs your household takes daily? (a) Less than N1000 ☐ (b) N1001- N1999 ☐ (c) N2000-N2999 ☐ (d) N3000 & above ☐ (e) None ☐

D. HOUSEHOLD FOOD CONSUMPTION/EXPENDITURE LEVEL OVER THE LAST 12 MONTHS

(1) Does the HIV/AIDS infection causes any food shortage in your household?

(a) Yes ☐ (b) No ☐

(2) Does the HIV/AIDS condition affect the number of meals taken by your household in a day? (a) Yes ☐ (b) No ☐

(3) Please indicate the range that best describes your household **total amount of money spent on food consumption per day before** the HIV/AIDS incidence? (a) Less than N1000 ☐ (b) N1001- N1999 ☐ (c) N2000-N2999 ☐ (d) N3000 & above ☐ (e) None

(4) Please indicate the range that best describes your household **total amount of money spend on food consumption per day after** you notice the HIV/AIDS infection? (a) Less than N1000 ☐ (b) N1001- N1999 ☐ (c) N2000-N2999 ☐ (d) N3000 & above ☐.
(e) None ☐

(5) Does the HIV/AIDS condition reduce the amount of money spend on food consumption by your household in a day? (a) Yes ☐ (b) No ☐

(6) What proportion of your household feeding expenditure is spend on health care services in a day (a) Less than ₦500 ☐ (b) ₦501 – ₦1,000 ☐ (c) ₦1,001 – ₦2,000 ☐ (d) ₦2,001 & above ☐ (e) None ☐

(7) What is the price range of foods your household buy daily? (a) Less than ₦500 (b) ₦501 – ₦1,000 ☐ (c) ₦1,001 – ₦2,000 ☐ (d) ₦2,001 and above ☐ (e) None ☐.

(8) Approximately, what is the naira worth of credit on food your household received per day ... (a) Less than ₦500 ☐ (b) ₦501 – ₦1,000 ☐ (c) ₦1,001 – ₦2,000 ☐.
(d) ₦2,001 & above ☐ (e) None ☐.

(9) What proportion of your household educational expenditure is spent on food stuff in a month? (a) Less than 5,000 ☐ (b) ₦5,001- ₦10,000 ☐ (c) ₦10,001- ₦15,000 ☐.
(d) ₦15,001 and above ☐ (e) None ☐

(10) Do your household have to stop child/children from going to school due to non-payment of school fee?
(a) Yes ☐ (b) No ☐.

E. HOUSEHOLD LABOUR SUPPLY FOR THE LAST 12 MONTHS

- (1) Does the HIV/AIDS infection causes decrease in the numbers of family member (age group 18-65 years) working to generate income for the household? (a) Yes ☐ (b) No ☐.
- (2) Does the HIV/AIDS affect the time any of your household member/s spend working in any occupational activities? (a) Yes ☐ (b) No ☐
- (3) Has the HIV condition prevented you from participating in any occupational activities to generate income for yourself/household for the last 12 months? (a) Yes ☐ (b) No ☐.
- (4) How many days in a week were you absent from work due to HIV/AIDS infection? (a) 1 ☐ (b) 2 ☐ (c) 3 ☐ (d) 4 & above ☐ (e) None ☐
- (5). How many member/s of your household within the ages of 18- 65 years are involved in any paid jobs activities? (a) 1 ☐ (b) 2 ☐ (c) 3 ☐ (d) 4 and above ☐ (e) None ☐.
- (6) How many member/s of your household within the ages of 18-65 years have HIV/AIDS? (a) 1 ☐ (b) 2 ☐ (c) 3 ☐ (d) 4 & above ☐ (e) None ☐
- (7) How many member/s of your household within the ages of 18-65 years does not have HIV/AIDS? (a) 1 ☐ (b) 2 ☐ (c) 3 ☐ (d) 4 & above ☐ (e) None ☐
- (8) How many hours in a day, do a working household member/s (age group 18- 65 years) spend taking care of member/s Living with HIV/AIDS? (a) 1 ☐ (b) 2 ☐ (c) 3 ☐ (d) 4 & above ☐ (e) None ☐
- (9) As a result of HIV/AIDS condition, how many member/s of your household below the ages of 18 years are involved in any paid jobs activities? (a) 1 ☐ (b) 2 ☐ (c) 3 ☐ (d) 4 & above ☐ (e) None ☐
- (10) As a result of HIV/AIDS condition, how many member/s of your household above the ages of 65 years are involved in any paid jobs activities? (a) 1 ☐ (b) 2 ☐ (c) 3 ☐ (d) 4 & above ☐ (e) None ☐
- (11) How many adult member/s of your household has died as a result of AIDS? (a) 1 ☐ (b) 2 ☐ (c) 3 ☐ (d) 4 & above ☐ (e) None ☐
- (12) What is the position of the death person? (a) Father ☐ (b) Mother ☐ (c) Son ☐ (d) Daughter ☐ (e) Others.....
- (13) Approximately, how much has your household spends on mourning and funeral ceremony due to AIDS death of member? (a) Less than ₦10, 000 ☐ (b) ₦10,001 – ₦20,000 ☐ (c) ₦20001 – ₦30,000 ☐ (d) ₦30001 & above ☐ (e) None ☐.

F. COPING STRATEGIES FOR THE LAST 12 MONTHS

(1) Due to the HIV condition, did your household sell any assets in the past 12 months to buy food or drugs for you or any member living with HIV/AIDS? (a) Yes ☐ (b) No ☐

(2) If yes, what was the type of assets or properties (Please specify)

.....

(3) Approximately, what was the naira worth of the asset, when it was sold? (a) Less than ₦10000 ☐ (b) ₦10001 – ₦19,999 ☐ (c) ₦20,000 – ₦29,999 ☐ (d) ₦30,000 & above ☐ (e) None ☐

(4) Has your household spend savings due to the HIV/AIDS condition?

(a) Yes ☐ (b) No ☐

(5) Have you had to borrow more money in the last year because of the HIV condition?

(a) Yes ☐ (b) No ☐

(6) If you have borrowed more money in the last year, do you still owe?

(a) Yes ☐ (b) No ☐

(7) Do you have any contributions to make, as regards to HIV/AIDS condition, your household income and food expenditure not stated above? (Please briefly discuss).....

.....

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I am indeed grateful.

Appendix One



DEPARTMENT OF ECONOMICS
FACULTY OF SOCIAL SCIENCES
UNIVERSITY OF LAGOS
Akoka, Yaba, Lagos - Nigeria

DATE: 23-4-2014

TO WHOM IT MAY CONCERN

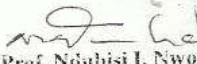
POSTGRADUATE DEGREE THESIS

The bearer, OSOBASE, Anthony Onogiese is a postgraduate student in the Department of Economics, School of Postgraduate Studies, University of Lagos. He is collecting data for his thesis done in partial fulfillment of the requirements for the award of M.Phil / Ph.D Degree in Economics.

We would appreciate your kind consideration in assisting the student to obtain the required information or data in your establishment, to carry out his thesis.

The researcher is fully aware that the information or data so obtained shall be treated with utmost confidentiality.

Thank you for your co-operation.


Prof. Ndubisi I. Nwokoma
Head of Department



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website: <http://www.unilag.edu.ng>

Appendix One



LAGOS STATE GOVERNMENT HEALTH SERVICE COMMISSION

1, Ganiu Smith Street
Lagos Island
Lagos.

Telephone: 2637140, 8923056
Fax No. 01-2637140

E-mail:.....
Website:.....

Ref: SHSC/634/224.....

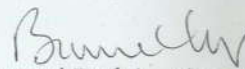
Date:..... 22nd July, 2014.....

Mr. Osobase Anthony Onogiese,
Department of Economics,
Faculty of Social Science,
University of Lagos,
Akoka- Yaba.

RE: PERMISSION TO ADMINISTER QUESTIONNAIRES

Sequel to your letter dated 15th July, 2014 on the above subject matter, I am directed to advise you to forward your request to Lagos State AID Control Agency for necessary approval.

2. Thank you.


Bunmi Badejo-Ekpo (Mrs.)
For: Permanent Secretary

MISSION STATEMENT

To Ensure Provision of Highly Skilled and Motivated Workforce with the Right Attitude Towards the Delivery of Qualitative Healthcare Service.

LAGOS STATE AIDS CONTROL AGENCY

Governor's Office



Secretariat:
General Hospital Lagos
Opposite Western House
Broad Street,
Lagos - Island
Tel: +234-1-738 7995
info@lsaca-nigeria.org
www.lsaca-nigeria.org



LSACA/POL.2034/7

22/7/2014

Mr. Osobase Anthony Onogiese
Department of Economics,
University of Lagos
Akoka, Yaba
Lagos.

RE:- PERMISSION TO ADMINISTER QUESTIONNAIRES

I am directed to acknowledge the receipt of your letter dated 9th July, 2014 on the above subject matter and to direct you to one of our partners, the Network of people living with HIV/AIDS (NEPHWAN) in Nigeria, Lagos State Chapter at Surulere. They are capable of handing your request appropriately.

Mr. Osobase Anthony Onogiese

2. However the Agency wishes you the best in your research work.
3. Thank you.

Oguntola J.O.
For: SSA-HE/CEO

MISSION STATEMENT:

To reduce incidence of HIV/AIDS in Lagos State and to mitigate its effects on those infected and affected



NETWORK OF PEOPLE LIVING WITH HIV/AIDS IN NIGERIA

Lagos State Chapter (NEPWHAN-Lagos)

55, Western Avenue (Funso Williams Avenue) Ojuelegba, Surulere, Lagos
Tel: 08061365769 E-mail: nepwhanlagos@yahoo.com
lagosnepwhan@yahoo.com

Mr. Osobase Anthony Onogiese,
Department of Economics,
Faculty of Social Sciences,
University of Lagos,
Akoka -Yaba.

RE: PERMISSION TO ADMINISTER QUESTIONNAIRES

With reference to your letter received from the Lagos State AIDS Control Agency (LSACA) on the 22nd July, 2014 on the above subject matter, we want to inform you that your request has been granted based on utmost confidentiality of the data collected and for academic purpose.

We wish you success in your academic pursuit.

Thank you.

Yours Faithfully

For: NEPWHAN-Lagos State chapter

Aminat Alli

Coordinator

...caring for infected and affected persons

Appendix Two
Distribution of questionnaires according to LGAs

Sources	Ajeromi	Alim- osho	Eti- Osa	Ikeja	Iko- Rodu	Lagos Island	Lagos Mainland	Mushin	Ojo	Suru- lere	Total
Agege	1	1	3	13	0	1	1	0	0	3	23
Ajeromi	46	1	1	0	0	6	3	0	0	5	62
Alimosho	3	42	4	41	0	2	5	0	3	2	102
Amuwo Odofin	2	2	0	0	0	5	2	0	6	3	20
Apapa	9	0	3	1	0	4	2	1	0	3	23
Badagry	2	5	2	0	0	0	3	0	19	1	32
Epe	0	0	9	0	2	5	0	0	0	3	19
Eti-Osa	0	0	13	0	0	17	2	0	0	2	34
Ibeju-Lekki	0	0	8	0	0	6	0	0	0	2	16
Ifako	3	2	1	13	0	3	3	0	1	2	28
Ikeja	0	0	4	30	0	2	0	0	0	0	36
Ikorodu	3	2	3	2	40	4	4	3	2	4	67
Kosofe	5	0	5	1	6	6	10	0	1	5	39
Lagos Island	2	0	4	5	0	31	2	0	1	10	55
Lagos Mainland	14	1	0	6	0	5	32	0	0	10	68
Mushin	4	0	1	0	0	2	2	45	0	8	62
Ojo	10	14	1	0	0	0	2	0	47	1	75
Oshodi-Isolo	4	0	2	16	0	2	6	4	0	10	44
Shomolu	4	0	2	4	0	2	9	6	0	6	33
Surulere	6	0	0	1	0	1	9	4	0	32	53
Aggregate	118	70	66	133	48	104	97	63	80	112	891
Response rate	78.6	46.6	44.4	88.7	32.0	69.3	64.6	42.0	53.3	74.6	59.4
% of PTOTLGA	61.0	40.0	80.3	77.4	16.7	70.2	67.0	28.6	41.3	71.4	60

NB: Participants that receive treatment outside their LGAs of residence (PTOTLGAs)

Appendix Two
Number of PLWHAs According to Senatorial District

Senatorial District	Lagos Central					Lagos East				
Data source (LGAs)	Apapa	Eti-Osa	Lagos Island	Lagos Mainland	Surulere	Epe	Ibeju-Lekki	Ikorodu	Kosofe	Shomolu
Ajeromi	9	0	2	14	6	0	0	3	5	4
Alimosho	0	0	0	1	0	0	0	2	0	0
Eti-Osa	3	13	4	0	0	9	8	3	5	2
Ikeja	1	0	5	6	1	0	0	2	1	4
Ikorodu	0	0	0	0	0	2	0	40	6	0
Lagos Island	4	17	31	5	1	5	6	4	6	2
Lagos Main	2	2	2	32	9	0	0	4	10	9
Mushin	1	0	0	0	4	0	0	3	0	6
Ojo	0	0	1	0	0	0	0	2	1	0
Surulere	3	2	10	10	32	3	2	4	5	6
Lagos total	23	34	55	68	53	19	16	67	39	33
District sum	233					174				
Percentage of Total	26.2					19.5				

Number of PLWHAs According to Senatorial District

Senatorial District	Lagos West										Lagos State
Data sources (LGAs)	Agege	Ajero-mi	Alimosho	Amuwo-Odofin	Bad-agry	Ifako-Ijaiye	Ikeja	Mushin	Ojo	Oshodi Isolo	Total
Ajeromi	1	46	3	2	2	3	0	4	10	4	118
Alimosho	1	1	42	2	5	2	0	0	14	0	70
Eti-Osa	3	1	4	0	2	1	4	1	1	2	66
Ikeja	13	0	41	0	0	13	30	0	0	16	133
Ikorodu	0	0	0	0	0	0	0	0	0	0	48
Lagos Island	1	6	2	5	0	3	2	2	0	2	104
Lagos Main	1	3	5	2	3	3	0	2	2	6	97
Mushin	0	0	0	0	0	0	0	45	0	4	63
Ojo	0	0	3	6	19	1	0	0	47	0	80
Surulere	3	5	2	3	1	2	0	8	1	10	112
Lagos total	23	62	102	20	32	28	36	62	75	44	891
District/State sum	484										891
Percentage of Total	54.3										100

Appendices Three
Categorical Variables Codings

		Parameters coding							
Variables		Frequency	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Present Occupation	Govt worker	139	1.000	.000	.000	.00	.00	.00	.00
	Petty trader	224	.000	1.000	.000	.00	.00	.00	.00
	Family buz	100	.000	.000	1.000	.00	.00	.00	.00
	Unemt	142	.000	.000	.000	1.00	.00	.00	.00
	Emtpriv	130	.000	.000	.000	.00	1.00	.00	.00
	Student	76	.000	.000	.000	.00	.00	1.00	.00
	Farmer	25	.000	.000	.000	.00	.00	.00	1.00
	Others	55	.000	.000	.000	.00	.00	.00	.00
Respondents age	18-23	66	1.000	.000	.000	.00	.00		
	24-29	109	.000	1.000	.000	.00	.00		
	30-35	287	.000	.000	1.000	.00	.00		
	36-41	182	.000	.000	.000	1.00	.00		
	42-53	223	.000	.000	.000	.00	1.00		
	54 and above	24	.000	.000	.000	.00	.00		
Educational level	1	82	1.000	.000	.000	.00			
	2	110	.000	1.000	.000	.00			
	3	84	.000	.000	1.000	.0			
	4	357	.000	.000	.000	1.00			
	5	258	.000	.000	.000	.00			
Marital status	1	335	1.000	.000	.000	.00			
	2	376	.000	1.000	.000	.00			
	3	59	.000	.000	1.000	.00			
	4	86	.000	.000	.000	1.00			
	5	35	.000	.000	.000	.00			
Ethnicity of PLWHA	Yorubas	350	1.000	.000	.000				
	Igbo	242	.00	1.00	.00				
	Hausa	171	.000	.000	1.000				
	Others	122	.000	.000	.000				
Sex of respondent	Male	310	.000						
	Female	581	1.000						
Head of household	Male	678	.000						
	Female	213	1.000						
Household size	Small houtholds (1-4persons)	384	.000						
	Large household (5 persons & above)	507	1.000						

Appendix Three
Categorical Variables Codings

		Frequency	Parameter coding			
			(1)	(2)	(3)	(4)
HH expenditure on Drugs and services	None	207	.000	.000	.000	.000
	Less than N1000	279	1.000	.000	.000	.000
	N1001 - N5,000	248	.000	1.000	.000	.000
	N5001 - N10,000	113	.000	.000	1.000	.000
	N10,001 & above	44	.000	.000	.000	1.000
Death due to aids	No death case	633	.000			
	Yes, member/s has died due to AIDS	258	1.000			
HH sell any assets	No	655	.000			
	Yes	236	1.000			
Work experience	With work experience	790	.000			
	No work experience	101	1.000			
Caregiving	No caregiver	501	.000			
	Present of Caregiver	390	1.000			
Absent from work	NO	507	.000			
	YES	384	1.000			
Remittances	Yes	418	.000			
	No	473	1.000			
Hhh mem below 18 years	NO	533	.000			
	YES	358	1.000			
Free drugs and services	Received free DS	592	.000			
	Donot received free drugs and services	299	1.000			
Educational level of Househead	With formal edu	766	.000			
	No formal edu	125	1.000			

Appendix Three

Classification Table ^{a,b}					
	Observed		Predicted		
			HH experience income decrease		Percentage Correct
			No	Yes	
Step 0	HH experience income decrease	No	0	387	.0
		Yes	0	504	100.0
	Overall Percentage				56.6
a. Constant is included in the model.					
b. The cut value is .500					

Classification Table ^a					
	Observed		Predicted		
			HH experience income decrease		Percentage Correct
			No	Yes	
Step 1	HH experience income decrease	No	211	176	54.5
		Yes	125	379	75.2
	Overall Percentage				66.2
a. The cut value is .500					

Logistic Results Variables in the Equation

MODEL ONE							
		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1 ^a	Ref Age 54 & above			23.275	5	.000	
	Age 18-23 (1)	1.396	.355	15.500	1	.000	4.040
	Age 24-29 (2)	.922	.290	10.109	1	.001	2.515
	Age 30-35 (3)	.695	.266	6.834	1	.009	2.004
	Age 36-41 (4)	.347	.239	2.109	1	.146	1.415
	Age 42-53 (5)	.411	.256	2.583	1	.108	1.508
	Constant	-.257	.208	1.524	1	.217	.774

a. Variable(s) entered on step 1: Age.

MODEL TWO							
Variables in the Equation							
		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1 ^a	Age						
	Ref: 54 & above			29.399	5	.000	
	18 – 23	1.863	.398	21.941	1	.000	6.440
	24 – 29	1.342	.330	16.571	1	.000	3.826
	30 – 35	.998	.288	11.980	1	.001	2.712
	36 – 41	.570	.253	5.063	1	.024	1.768
	42 -53	.489	.261	3.514	1	.061	1.630
	Marital Status						
	Separated			7.674	4	.104	
	Never Married	.729	.371	3.872	1	.049	2.074
	Married	.497	.366	1.843	1	.175	1.644
	Divorced	.918	.447	4.228	1	.040	2.505
	Widowed	.854	.416	4.212	1	.040	2.348
a. Variable(s) entered on step 1: Age, A3_Marital_status.							

Appendices Three
Variables in the Equation

MODEL THREE							
	Marital status	B	S.E.	Wald	df	Sig.	Exp(B)
Step 1 ^a	Ref: 54 years & above			25.363	5	.000	
	Age(1) 18-23	1.835	.412	19.837	1	.000	6.268
	Age(2) 24-29	1.343	.339	15.714	1	.000	3.831
	Age(3) 30-35	.879	.294	8.926	1	.003	2.408
	Age(4) 36-41	.584	.258	5.111	1	.024	1.794
	Age(5) 42-53	.500	.265	3.563	1	.059	1.648
	Marital Status						
	Ref: Separated			11.273	4	.024	
	A3_Never Married (1)	.208	.388	.289	1	.591	1.232
	A3_Married (2)	.429	.369	1.351	1	.245	1.535
	A3_Divorced (3)	.940	.448	4.396	1	.036	2.561
	A3_Widowed/Widower(4)	.963	.420	5.264	1	.022	2.619
	Education status						
	Ref: Above Secondary Sch			14.982	4	.005	
	A4_No formal education (1)	.983	.296	11.048	1	.001	2.671
	A4_Primary education (2)	.279	.236	1.399	1	.237	1.321
	A4_Junior Sec Sch.(3)	.439	.265	2.755	1	.097	1.551
	A4_Senmior Sec Sch (4)	-.002	.173	.000	1	.993	.998
	Constant	-1.035	.416	6.183	1	.013	.355

a. Variable(s) entered on step 1: Age, A3_Marital_status, A4_education.

Appendices Three
Variables in the Equation

MODEL FOUR						
	B	S.E.	Wald	df	Sig.	Exp(B)
Re_sex(1)	-.078	.163	.229	1	.632	.925
Age group						
Ref: 54 years & above			24.325	5	.000	
Age(1) 18-23	1.842	.418	19.395	1	.000	6.311
Age(2) 24-29	1.362	.345	15.551	1	.000	3.903
Age(3) 30-35	.920	.299	9.474	1	.002	2.510
Age(4) 36-41	.624	.262	5.658	1	.017	1.866
Age(5) 42-53	.557	.269	4.282	1	.039	1.746
Marital Status						
Ref: Separated			9.946	4	.041	
A3_Never Married (1)	.370	.393	.889	1	.346	1.448
A3_Married (2)	.543	.372	2.126	1	.145	1.721
A3_Divorced (3)	.984	.455	4.685	1	.030	2.675
A3_Widowed/Widower(4)	1.041	.423	6.067	1	.014	2.832
Education status						
Ref: Above Secondary Sch			13.584	4	.009	
A4_No formal education (1)	.929	.299	9.664	1	.002	2.533
A4_Primary education (2)	.202	.240	.708	1	.400	1.223
A4_Junior Sec Sch.(3)	.394	.267	2.173	1	.140	1.483
A4_Senior Sec Sch (4)	-.046	.175	.071	1	.791	.955
Ethnic Group						
A7_Other Tribes			18.633	3	.000	
A7_Yorubas (1)	.525	.239	4.825	1	.028	1.691
A7_Igbos (2)	-.058	.246	.055	1	.815	.944
A7_Hausas (3)	.635	.309	4.237	1	.040	1.888
Constant	-.024	.217	.012	1	.914	.977

a. Variable(s) entered on step 1: Age, A3_Marital_status, A4_education, A7_ethnic.

Appendices Three
Variables in the Equation

MODEL FIVE						
	B	S.E.	Wald	df	Sig.	Exp(B)
GENDER						
Ref: Male						
Re_sex Female (1)	-.119	.168	.499	1	.480	.888
Age group						
Ref: 54 years & above			15.162	5	0.010	
Age(1) 18-23	1.627	.449	13.110	1	.000	5.090
Age(2) 24-29	1.165	.371	9.863	1	.002	3.207
Age(3) 30-35	.864	.318	7.369	1	.007	2.372
Age(4) 36-41	.698	.278	6.297	1	.012	2.010
Age(5) 42-53	.710	.284	6.258	1	.012	2.034
Marital Status						
Ref: Separated			6.637	4	.156	
A3_Never Married (1)	.194	.407	.227	1	.634	1.214
A3_Married (2)	.280	.383	.533	1	.465	1.323
A3_Divorced (3)	.732	.473	2.399	1	.121	2.080
A3_Widowed/Widower(4)	.800	.437	3.361	1	.067	2.227
Education status						
Ref: Above Secondary School			9.314	4	.054	
A4_No formal education (1)	.532	.320	2.751	1	.097	1.702
A4_Primary education (2)	-.076	.262	.084	1	.772	.927
A4_Junior Sec Sch.(3)	.381	.289	1.736	1	.188	1.463
A4_Senior Sec Sch (4)	-.222	.191	1.352	1	.245	.801
Ethnic Group						
A7_Other Tribes			8.631	3	.035	
A7_Yorubas (1)	.280	.265	1.113	1	.291	1.322
A7_Igbos (2)	-.214	.271	.623	1	.430	.808
A7_Hausas (3)	.281	.339	.686	1	.408	1.324
Occupational Status						
Ref: Other Occupations			38.484	7	.000	
A10_Government Workers (1)	.297	.338	.775	1	.379	1.346
A10_Petty Traders (2)	-.202	.319	.399	1	.528	.817
A10_Family business(3)	-.668	.362	3.408	1	.065	.513
A10_Unemployed (4)	.721	.348	4.296	1	.038	2.056
A10_Employed in Private sector (5)	.518	.345	2.256	1	.133	1.679
A10_Students(6)	-.596	.381	2.451	1	.117	.551
A10_Farmers(7)	.041	.527	.006	1	.938	1.042
Constant	-1.196	.622	3.698	1	.054	.302

a. Variable(s) entered on step 1: Age, A3_Marital_status, A4_education, A7_ethnic, A8_LGA, A10_OC.

Appendices Three
Variables in the Equation

MODEL SIX						
	B	S.E.	Wald	df	Sig.	Exp(B)
GENDER						
Ref: Male						
Sex _Female (1)	-.205	.172	1.427	1	.232	.814
Age group						
Ref: 54 years & above			21.280	5	.001	
Age(1) 18-23	1.841	.435	17.880	1	.000	6.300
Age(2) 24-29	1.371	.359	14.543	1	.000	3.938
Age(3) 30-35	1.019	.318	10.250	1	.001	2.771
Age(4) 36-41	.803	.279	8.306	1	.004	2.232
Age(5) 42-53	.733	.280	6.842	1	.009	2.082
Marital Status						
Ref: Separated			7.132	4	.129	
A3_Never Married (1)	.147	.194	.571	1	.450	1.158
A3_Married (2)	.572	.343	2.780	1	.095	1.771
A3_Divorced (3)	.558	.315	3.148	1	.076	1.748
A3_Widowed/Widower(4)	-.328	.407	.652	1	.419	.720
Education status						
Ref: Above Secondary School			11.877	4	.018	
A4_No formal education (1)	.693	.312	4.932	1	.026	1.999
A4_Primary education (2)	-.027	.253	.012	1	.913	.973
A4_Junior Sec Sch.(3)	.478	.278	2.965	1	.085	1.614
A4_Senior Sec Sch (4)	-.156	.184	.712	1	.399	.856
Ethnic Group						
A7_Other Tribes			12.130	3	.007	
A7_Yorubas (1)	.280	.256	1.190	1	.275	1.322
A7_Igbos (2)	-.278	.263	1.118	1	.290	.757
A7_Hausas (3)	.274	.332	.685	1	.408	1.316
Occupational Status						
Ref: Other Occupations			39.737	7	.000	
A10_Government Workers (1)	.216	.340	.406	1	.524	1.242
A10_Petty Traders (2)	-.253	.321	.621	1	.431	.777
A10_Family business(3)	-.760	.365	4.329	1	.037	.468
A10_Unemployed (4)	.681	.349	3.799	1	.051	1.975
A10_Employed in Private Sector (5)	.474	.346	1.875	1	.171	1.607
A10_Students(6)	-.672	.383	3.076	1	.079	.511
A10_Farmers(7)	-.009	.528	.000	1	.987	.992
Sex of Household Head						
Ref: Male						
A16_Female (1)	.497	.191	6.793	1	.009	1.643
Constant	-.819	.451	3.297	1	.069	.441

a. Variable(s) entered on step 1: Re_sex, Age, MSTATUS, A4_education, A7_ethnic, A10_OC, A16_HH.

Appendix Three
Variables in the Equation

MODEL SEVEN						
	B	S.E.	Wald	df	Sig.	Exp(B)
Gender						
Reference (Ref): Male						
Sex_Female (1)	-.280	.178	2.477	1	.116	.756
Age group						
Ref: 54 years & above			16.322	5	.006	
Age(1) 18-23	1.685	.453	13.842	1	.000	5.393
Age(2) 24-29	1.240	.376	10.864	1	.001	3.456
Age(3) 30-35	.958	.331	8.389	1	.004	2.608
Age(4) 36-41	.836	.291	8.266	1	.004	2.308
Age(5) 42-53	.768	.289	7.049	1	.008	2.156
Marital Status						
Ref: Separated			5.794	4	.215	
A3_Never Married (1)	.209	.415	.252	1	.615	1.232
A3_Married (2)	.363	.392	.861	1	.354	1.438
A3_Divorced (3)	.775	.478	2.624	1	.105	2.170
A3_Widowed/Widower(4)	.766	.438	3.057	1	.080	2.151
Education status						
Ref: Above Secondary School			10.079	4	.039	
A4_No formal education (1)	.528	.325	2.645	1	.104	1.696
A4_Primary education (2)	-.150	.266	.317	1	.574	.861
A4_Junior Sec Sch.(3)	.345	.290	1.412	1	.235	1.412
A4_Senior Sec Sch (4)	-.266	.192	1.911	1	.167	.767
Ethnic Group						
Step 1 ^a A7_Other Tribes			8.274	3	.041	
A7_Yorubas (1)	.226	.267	.718	1	.397	1.253
A7_Igbos (2)	-.257	.272	.892	1	.345	.773
A7_Hausas (3)	.251	.342	.540	1	.463	1.286
Occupational Status						
Ref: Other Occupations			51.030	7	.000	
A10_Government Workers (1)	.394	.323	1.487	1	.223	1.483
A10_Petty Traders (2)	-.218	.302	.521	1	.470	.804
A10_Family business(3)	-.672	.340	3.899	1	.048	.511
A10_Unemployed (4)	.739	.333	4.920	1	.027	2.095
A10_Employed in Private Sector (5)	.618	.326	3.599	1	.058	1.856
A10_Students(6)	-.610	.358	2.896	1	.089	.543
A10_Farmers(7)	.393	.497	.626	1	.429	1.481
Sex of Household Head						
Ref: Male						
A16_Female (1)	.500	.196	6.492	1	.011	1.649
A13_Household Size						
Ref: 5 persons & above						
Hhsize_(1) 1- 4 persons	.143	.155	.860	1	.354	1.154
Constant	-1.200	.640	3.521	1	.061	.301

a. Variable(s) entered on step 1: Age, A3_Marital_status, A4_education, A7_ethnic, A8_LGA, A10_OC, Re_sex, A16_HH, Hhsize.

Appendix Three
Household Income Demand Result for Lagos Central District

Variables	B	SE	Wald	Df	Sig	Exp(B)/ Odd ratios
Household Asset (SA_{it})						
Ref: No sale of asset						
Sale of household (SA _{it})	1.810	0.647	7.828	1	0.005	6.113
Work Experience (A_{it})						
Ref: No work experience						
Work experience (A _{it})	-2.326	0.704	10.914	1	0.001	0.098
Caregiving activities						
Ref: Absence of caregivers						
Present of caregivers	0.343	0.503	0.465	1	0.495	1.409
Number of days absence from work						
Ref: No productivities loss						
Productivities loss	1.199	.278	18.65	1	.000	3.315
Non- Household Income / Remittances (Ni_{it})						
Ref: Received remittance						
No remittances received (Ni _{it})	1.299	0.469	7.659	1	0.006	3.664
Health care and medical services costs (Hb_{it})						
Ref: Absence of health care and medical services costs (Hb _{it})						
Presence of health care and medical services costs (Hb _{it})	2.327	0.476	23.888	1	0.000	10.246
Access to free drugs & services (FMS_{it})						
Ref: No access to FMS _{it}						
Have access to FMS _{it}	1.146	0.498	5.282	1	0.022	3.144
Underage Labour (Hmb_{it})						
Ref: No Hmb _{it}						
Presence of Hmb _{it}	-0.489	0.690	0.502	1	0.479	0.613
Constant	-3.625	1.472	6.066	1	0.014	0.027

Appendix Three
Household Income Demand Result for Lagos East District

Variables	B	SE	Wald	Df	Sig	Exp(B)/ Odd ratios
Household Asset (SA_{it})						
Ref: No sale of asset						
Sale of household (SA _{it})	0.927	0.599	2.399	1	0.121	2.528
Work Experience (A_{it})						
Ref: No work experience						
Work experience (A _{it})	0.247	0.830	0.088	1	0.766	1.280
Caregiving activities						
Ref: Absence of caregivers						
Present of caregivers	-1.429	0.657	4.725	1	0.030	0.240
Number of days absence from work						
Ref: No productivities loss						
Productivities loss	2.192	.358	37.53	1	.000	8.953
Non- Household Income / Remittances (Ni_{it})						
Ref: Received remittance						
No remittances received (Ni _{it})	0.216	0.587	0.136	1	0.712	1.242
Health care and medical services costs (Hb_{it})						
Ref: Absence of health care and medical services costs (Hb _{it})						
Presence of health care and medical services costs (Hb _{it})	2.988	0.550	29.495	1	0.000	19.840
Access to free drugs & services (FMS_{it})						
Ref: No access to FMS _{it}						
Have access to FMS _{it}	0.216	0.718	0.090	1	0.764	1.241
Underage Labour (Hmb_{it})						
Ref: No Hmb _{it}						
Presence of Hmb _{it}	2.918	0.760	14.750	1	0.000	18.513
Constant	-2.572	1.522	2.857	1	0.091	0.076

Appendix Three
Household Income Demand Result for Lagos West District

Variables	B	SE	Wald	Df	Sig	Exp(B)/ Odd ratios
Household Asset (SA_{it})						
Ref: No sale of asset						
Sale of household (SA_{it})	0.976	0.299	10.647	1	0.001	2.654
Work Experience (A_{it})						
Ref: No work experience						
Work experience (A_{it})	-0.202	0.334	0.366	1	0.545	0.817
Caregiving activities						
Ref: Absence of caregivers						
Present of caregivers	0.125	0.345	0.132	1	0.716	1.134
Number of days absence from work						
Ref: No productivities loss						
Productivities loss	1.444	.213	45.80	1	.000	4.237
Non- Household Income / Remittances (NI_{it})						
Ref: Received remittance						
No remittances received (NI_{it})	0.935	0.248	14.259	1	0.000	2.548
Health care and medical services costs (Hb_{it})						
Ref: Absence of health care and medical services costs (Hb_{it})						
Presence of health care and medical services costs (Hb_{it})	1.663	0.249	44.706	1	0.000	5.277
Access to free drugs & services (FMS_{it})						
Ref: No access to FMS_{it}						
Have access to FMS_{it}	-0.009	0.359	0.001	1	0.981	0.991
Underage Labour (Hmb_{it})						
Ref: No Hmb_{it}						
Presence of Hmb_{it}	0.747	0.413	3.281	1	0.070	2.112
Constant	-1.604	0.807	3.948	1	0.047	0.201

Appendix Three
Household Income Demand Result for Lagos State
Variables in the Equation

Step 1 ^a	Variables	B	SE	Wald	Df	Sig	Exp(B)/ Odd ratios
	Educational status of household head						
	Ref: Has formal education						
	No formal education	-.128	.217	.349	1	.554	.880
	Household Asset (SA_{it})						
	Ref: No sale of asset						
	Sale of household (SA _{it})	1.294	.206	39.33	1	.000	3.649
	Work Experience (A_{it})						
	Ref: No work experience						
	Work experience (A _{it})	.208	.235	.784	1	.376	1.232
	Caregiving activities						
	Ref: Absence of caregivers						
	Present of caregivers	.881	.168	27.62	1	.000	2.414
	Number of days absence from work						
	Ref: No productivities loss						
	Productivities loss	1.005	.165	37.34	1	.000	2.733
	Constant	-.782	.119	43.05	1	.000	.457

a. Variable(s) entered on step 1: F1_SA, WRKEXP, Eduhhead, E8_CGA1, UL.

Appendix Three
Household Income Demand Result for Lagos State

Variables in the Equation

	B	S.E.	Wald	df	Sig.	Exp(B)
Eduhhead(1)	-.433	.237	3.322	1	.068	.649
F1_SA(1)	.946	.230	16.916	1	.000	2.576
WRKEXP(1)	.402	.261	2.366	1	.124	1.495
E8_CGA1(1)	-.129	.219	.346	1	.556	.879
UL(1)	.903	.192	22.220	1	.000	2.467
C4_NI(1)	-.729	.186	15.343	1	.000	.482
C3_OSHIV			67.889	4	.000	
Step 1 ^a C3_OSHIV(1)	2.108	.263	64.229	1	.000	8.230
C3_OSHIV(2)	1.780	.265	45.138	1	.000	5.932
C3_OSHIV(3)	1.770	.330	28.739	1	.000	5.871
C3_OSHIV(4)	1.841	.457	16.220	1	.000	6.302
Freds(1)	-.118	.179	.433	1	.511	.889
E9_HMB2(1)	.924	.226	16.754	1	.000	2.519
MDAIDS(1)	.297	.227	1.712	1	.191	1.346
Constant	-1.690	.287	34.714	1	.000	.184

a. Variable(s) entered on step 1: Eduhhead, F1_SA, WRKEXP, E8_CGA1, UL, C4_NI, C3_OSHIV, Freds, E9_HMB2, MDAIDS.

Appendix Three
Household Income Demand Result for Lagos State

Step 1 ^a	Variables	B	SE	Wald	Df	Sig	Exp(B)
	Educational status of household head (E_{it})						
	Ref: Has formal education						
	No formal education	-.433	.237	3.322	1	.068	.649
	Household Asset (SA_{it})						
	Ref: No sale of asset						
	Sale of household (SA _{it})	.946	.230	16.92	1	.000	2.576
	Work Experience (A_{it})						
	Ref: No work experience						
	Work experience (A _{it})	.402	.261	2.366	1	.124	1.495
	Caregiving activities (hL)						
	Ref: Absence of caregivers						
	Present of caregivers	-.129	.219	.346	1	.556	.879
	Number of days absence from work (uL)						
	Ref: No productivities loss						
	Productivities loss	.903	.192	22.22	1	.000	2.467
	Non- Household Income / Remittances (Ni_{it})						
	Ref: Received remittance						
	No remittances received (Ni _{it})	-.729	.186	15.34	1	.000	.482
	Health care and medical services costs (Hb_{it})						
	Ref: Absence of health care and medical services costs (Hb _{it})			67.89	4	.000	
	Health care cost: Less than N1000	2.108	.263	64.23	1	.000	8.230
	Health care cost: N1001 - N5,000	1.780	.265	45.14	1	.000	5.932
	Health care cost: N5001 - N10,000	1.770	.330	28.74	1	.000	5.871
	Health care cost: N10,001 & above	1.841	.457	16.22	1	.000	6.302
	Access to free drugs & services (FMS_{it})						
	Ref: No access to FMS _{it}						
	Have access to FMS _{it}	-.118	.179	.433	1	.511	.889
	Underage Labour (Hmb_{it})						
	Ref: No Hmb _{it}						
	Presence of Hmb _{it}	.924	.226	16.75	1	.000	2.519
	Death due to AIDS illness (DAID)						
	Ref: No death recorded						
	Presence of AIDS death	.297	.227	1.712	1	.191	1.346
	Constant	-1.69	.287	34.71	1	.000	.184

a. Variable(s) entered on step 1: E, SA, A, hL, UL, NI, Hbl, FMS, HMB, DAID.

Appendix Three

Categorical Variables Codings in Food Expenditure Results

		Frequency	Parameter coding
			(1)
Educational level of Househead	With formal edu	766	.000
	No formal edu	125	1.000
Household size	Small houtholds (1-4persons)	384	.000
	Large household (5 persons & above)	507	1.000
Expenditures on drugs	No	364	1.000
	Yes	527	.000
Head of household	Male	678	.000
	Female	213	1.000
Years living with HIV/AIDS or stages	Six years and below	720	.000
	Seven years and above	171	1.000
Remittances	Yes	418	.000
	No	473	1.000
HH sell any assets	No	655	.000
	Yes	236	1.000
Employment Status of respondent	Employed	559	.000
	Unemployed	332	1.000
Government support to plwhas	Rgovtsup	857	.000
	Drgovtsup	34	1.000
Food purchase on credit by Hh	Received	431	.000
	Do not received	460	1.000
Household income	Hh income above N20,000.00k	750	.000
	Hh income below N20,000	141	1.000

Appendix Three
Household Food Expenditure Result at the Senatorial District Levels
Lagos Central District
Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1 ^a	Household income; Yt (1)	-.188	.461	.167	1	.683	.828
	Household size; Hsize (1)	.152	.421	.130	1	.718	1.164
	Health expenditures; Hbi (1)	.654	.377	3.011	1	.083	1.924
	Clinical stage or duration of living with HIV/AIDS; Hsit(1)	-.331	.457	.523	1	.470	.719
	Sex of Household head; Sex (1)	-.156	.870	.032	1	.858	.856
	Non-household income/Remittance; NI (1)	-1.680	.362	21.561	1	.000	.186
	Asset sale of household; SA (1)	1.807	.510	12.565	1	.000	6.090
	Food purchased on credit; Pfc(1)	-1.396	.363	14.773	1	.000	.247
	Support from Government; SFG(1)	-.579	1.176	.242	1	.623	.561
	Other members infected with HIV; NH(1)	.512	.359	2.035	1	.154	1.668
	Employment status of respondent; EMT(1)	.441	.421	1.095	1	.295	1.554
	Educational status of household head; E (1)	-.523	.824	.403	1	.526	.593
	Constant	1.465	.901	2.645	1	.104	4.328

a. Variable(s) entered on step 1: Yt, Hsize, Hbi, Hsit, Sex, NI, SA, Pfc, SFG, NH, EMT, E.

Lagos East District

Variables in the Equation		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1 ^a	Household income; Yt (1)	-.150	.819	.033	1	.855	.861
	Household size; Hsize (1)	1.642	.616	7.096	1	.008	5.167
	Health expenditures; Hbi (1)	-1.928	.525	13.475	1	.000	.145
	Clinical stage or duration of living with HIV/AIDS; Hsit(1)	-1.988	.623	10.202	1	.001	.137
	Sex of Household head; Sex (1)	-1.123	.580	3.753	1	.053	.325
	Non-household income/Remittance; NI (1)	-.936	.499	3.522	1	.061	.392
	Asset sale of household; SA (1)	-1.981	.615	10.371	1	.001	.138
	Food purchased on credit; Pfc(1)	-1.480	.458	10.454	1	.001	.228
	Support from Government; SFG(1)	1.396	.559	6.234	1	.013	4.040
	Other members infected with HIV; NH(1)	.086	.477	.033	1	.857	1.090
	Employment status of respondent; EMT(1)	-1.436	.631	5.178	1	.023	.238
	Educational status of household head; E (1)	-.002	.650	.000	1	.998	.998
	Constant	3.731	1.521	6.018	1	.014	41.735

a. Variable(s) entered on step 1: Yt, Hsize, Hbi, Hsit, Sex, NI, SA, Pfc, SFG, NH, EMT, E.

Appendix Three
Household Food Expenditure Result at the Senatorial District levels
Household Food Rxpnditure result for Lagos West District

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1 ^a	Household income; Yt (1)	.224	.278	.650	1	.420	1.252
	Household size; Hsize (1)	.011	.266	.002	1	.966	1.011
	Health expenditures; Hbi (1)	-.844	.225	14.088	1	.000	.430
	Clinical stage or duration of living with HIV/AIDS; Hsit(1)	-.520	.253	4.238	1	.040	.594
	Sex of Household head; Sex (1)	-.700	.221	10.056	1	.002	.497
	Non-household income/Remittance; NI (1)	-.847	.266	10.104	1	.001	.429
	Asset sale of household; SA (1)	1.017	.219	21.463	1	.000	2.764
	Food purchased on credit; Pfc(1)	-1.017	.219	21.463	1	.000	.362
	Support from Government; SFG(1)	.917	.495	3.432	1	.064	2.503
	Other members infected with HIV; NH(1)	-.107	.229	.220	1	.639	.898
	Employment status of respondent; EMT(1)	-.073	.245	.087	1	.768	.930
	Educational status of household head; E (1)	.481	.304	2.503	1	.114	1.618
	Constant	-.594	.718	.684	1	.408	.552
a. Variable(s) entered on step 1: Yt, HSize, Hbi, Sex, NI, SA, Pfc, SFG, NH, EMT, E.							

Household Food Expenditure Result at State Level
Lagos State

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1 ^a	Household income (1)	-.388	.184	4.434	1	.035	.678
	Constant	.203	.073	7.675	1	.006	1.226

a. Variable(s) entered on step 1: Hhincome.

Lagos state
Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1 ^a	Household income; Yt (1)	-.205	.217	.897	1	.344	.815
	Household size; Hsize (1)	-.119	.159	.558	1	.455	.888
	Health expenditures; Hbi (1)	-.967	.163	35.383	1	.000	.380
	Clinical stage or duration of living with HIV/AIDS; Hsit(1)	.569	.211	7.317	1	.007	1.767
	Sex of Household head; Sex (1)	.497	.187	7.076	1	.008	1.643
	Non-household income/Remittance; NI (1)	-1.116	.161	48.111	1	.000	.328
	Asset sale of household; SA (1)	1.328	.202	43.326	1	.000	3.773
	Constant	.735	.179	16.815	1	.000	2.086

a. Variable(s) entered on step 1: Hhincome, Hhsize, C2_Exp_Med, A16_HH, Hsit, C4_NI, F1_SA.

Appendix Three
Household Food Expenditure Result at State Level
Lagos State
Variables in the Equation

	B	S.E.	Wald	df	Sig.	Exp(B)
Step 1 ^a						
Household income; Yt (1)	-.214	.224	.914	1	.339	.808
Household size; Hsize (1)	-.086	.165	.274	1	.601	.917
Health expenditures; Hbi (1)	-.889	.168	28.020	1	.000	.411
Clinical stage or duration of living with HIV/AIDS; Hsit (1)	.430	.218	3.879	1	.049	1.537
Sex of Household head; Sex (1)	.514	.194	7.003	1	.008	1.672
Non-household income/Remittance; NI (1)	-.915	.168	29.534	1	.000	.400
Asset sale of household; SA (1)	1.152	.210	30.141	1	.000	3.164
Food purchased on credit; Pfc(1)	-1.111	.166	44.833	1	.000	.329
Support from Government; SFG(1)	-1.121	.453	6.132	1	.013	.326
Constant	1.284	.204	39.481	1	.000	3.609

a. Variable(s) entered on step 1: Hhincome;Yt, Hhsize, Hbi, Hsit, Sex, NI, SA, Pfc, SFG.

Household Food Expenditure Result at State Level
Lagos State (Final outcome)
Variables in the Equation

Variables	B	S.E.	Wald	df	Sig.	Exp(B)
Step 1 ^a						
Household income; Yt (1)	-.447	.233	3.696	1	.055	.639
Household size; Hsize (1)	-.078	.168	.218	1	.640	.925
Health expenditures; Hbi (1)	-.868	.173	25.170	1	.000	.420
Clinical stage or duration of living with HIV/AIDS; Hsit(1)	.460	.222	4.290	1	.038	1.583
Sex of Household head; Sex (1)	.548	.198	7.675	1	.006	1.730
Non-household income/Remittance; NI (1)	-.888	.171	26.964	1	.000	.411
Asset sale of household; SA (1)	1.110	.214	27.021	1	.000	3.034
Food purchased on credit; Pfc(1)	-1.071	.169	40.331	1	.000	.343
Support from Government; SFG(1)	-1.158	.456	6.460	1	.011	.314
Other members infected with HIV; NH(1)	.731	.176	17.282	1	.000	2.078
Employment status of respondent; EMT(1)	.314	.174	3.268	1	.071	1.369
Educational status of household head; E (1)	-.236	.231	1.044	1	.307	.789
Constant	.910	.232	15.414	1	.000	2.483

a. Variable(s) entered on step 1: Hhincome, Hhsize, C2_Exp_Med, A16_HH, Hsit, C4_NI, F1_SA, D8_FCR2, Govtsup, EMT_STA, Eduhhead, B5_MEMHIV.