

**DETERMINANTS OF OUT OF POCKET EXPENDITURE FOR PEOPLE
LIVING WITH HIV: A CASE OF MALAWI**

MASTER OF ARTS (ECONOMICS) THESIS

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**UNIVERSITY OF MALAWI
CHANCELLOR COLLEGE**

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MASTER OF ARTS (ECONOMICS) THESIS

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November, 2017

DECLARATION

I, the undersigned hereby declare that this dissertation is my own original work which has not been submitted to any other institution for any degree award. Where other people's work has been used acknowledgements have been made.

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Full Legal Name

Signature

Date

CERTIFICATE OF APPROVAL

I, the undersigned, certify that this thesis represents the student's own work and effort. Where he has used other sources of information, it has been duly acknowledged. This thesis has been submitted with my approval.

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Supervisor

DEDICATION

I dedicate this work primarily to Lord God Almighty who has been with me through thick and thin. He knew me even before I was born. You have done it repeatedly Lord and I know “You will do it again”. I forever remain strong because of You Lord. Secondly, the work is dedicated to my dear parents “Dickson and Chrissie Mainjeni “for being there for me always.

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ABSTRACT

The Government of Malawi (GoM) is promoting expanded and improved quality and equity in access to health care including for those that are infected with Human Immune Virus (HIV). As one way of ensuring such equity in access, the GoM has a policy that supports people living with HIV to be accessing free antiretroviral therapy (ART) from different ART clinics across the country. However, despite a free HIV healthcare service policy, there are systematic reported and unreported cases of out of pocket healthcare expenditure incurred by People living with HIV (PLWHIV) that are retrogressive and may lead to catastrophic conditions. There is need therefore to understand the determinants of Out of Pocket healthcare expenditure for people living with HIV in Malawi. The study has estimated a Double Hurdle model using the Survey data on People Living with HIV and AIDS collected by the Ministry of Health in Malawi in 2011. The empirical analysis is underpinned by a basic theoretical framework of demand for health and a further analysis of health as a durable commodity that depreciates over time and requires investment to replenish. The study shows that an expenditure decision of an individual has two levels namely the participation stage and the expenditure stage each of which having a vector of variables. The study revealed that individual characteristics like Age, Education level and being a Household head significantly determine the participation decision to spend through out of pocket by the PLWHIV. On the other hand the study revealed that both geographic and individual level factors statistically determine the magnitude (how much one spends) of Out of Pocket expenditure for PLWHIV. The results of the study offer reinforcement to the targeting policies and interventions for PLWHIV to minimize their chances of graduating from poor to ultra-poor as a result of episode of illness. The study concludes that there may be many more variables that are potential determinants for OOP for PLWHIV but were not pursued in this study due to data limitations. This study focused on two components namely individual level and geographic characteristics as determinants of OOP for PLWHIV.

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LIST OF ACRONYMS AND ABBREVIATIONS

AIDS	ACQUIRED IMMUNE DEFICIENCY SYNDROME
ART	ANTIRETROVIRAL THERAPY
CHAM	CHRISTIAN HEALTH ASSOCIATION OF MALAWI
DMHT	DISTRICT HEALTH MANAGEMENT TEAM
DHO	DISTRICT HEALTH OFFICER
GOM	GOVERNMENT OF MALAWI
HIV	HUMAN IMMUNO VIRUS
HTC	HIV TESTING AND COUNSELLING
MDHS	MALAWI DEMOGRAPHIC HEALTH SURVEY
MGDS	MALAWI GROWTH AND DEVELOPMENT STRATEGY
NAC	NATIONAL AIDS COMMISSION
NGOs	NON GOVERNMENTAL ORGANISATIONS
NCD	NON COMMUNICABLE DISEASES
NSP	NATIONAL STRATEGIC PLAN
OOP	OUT OF POCKET PAYMENT
OPC	OFFICE OF PRESIDENT AND CABINET
PLWHA	PEOPLE LIVING WITH HIV AND AIDS
PMTCT	PREVENTION OF MOTHER TO CHILD TRANSMISSION
SSA	SUB-SAHARAN AFRICA
STI	SEXUALLY TRANSMITTED INFECTIONS
VCT	VOLUNTARY COUNSELLING AND TESTING
WHO	WORLD HEALTH ORGANISATION

CHAPTER 1

INTRODUCTION

1.1 Background

Health is a fundamental dimension of well-being and a key component of human capital and development (Alkire 2002). The World Health Organization, a United Nations agency concerned with global health matters defined health as, “a state of complete physical, mental and social well-being and not merely the absence of disease and infirmity” (WHO, 1946). Poor health and inability to cope with episodes of illness can be considered important dimensions of deprivation (Lindelow, 2003). A wide range of factors pertaining to individual, social and environmental context, affect health outcomes. In addition, preventive and curative health services are direct inputs that affect an individual’s health status and the ability to cope with ill health.

In Africa the disease burden of both communicable and non-communicable diseases (NCD) is rising considerably. However, Sub Saharan Africa (SSA) has disproportionate burden of both infectious and chronic diseases compared with other world regions (Dalal S, et al., 2011). According to the 2010 World Bank Global burden of Disease study, disease estimates for Sub Saharan Africa indicate that increases in non-communicable diseases are caused by demographic and epidemiological transitions. The study results further show that cardiovascular and respiratory diseases, mental and behavioral disorders and diabetes are the common NCDs in Sub Saharan Africa. Additionally, the Sub Saharan Africa experienced more than 2 million deaths in 2010 due to Non-Communicable diseases indicating a 46% increase from 1990 findings. Furthermore the total burden of NCDs in terms of disability adjusted life years showed a 45% increase compared to results in 1990. Likewise, the burden of communicable diseases is also high in Sub Saharan Africa. The major communicable diseases include malaria, tuberculosis and HIV and AIDS (Worldbank, 2010). The SSA region is the hardest hit by these diseases and it accounts for 90% of all malaria deaths. It also has nearly 70% of all people living

with HIV and 28% of all TB cases in the world (Worldbank, 2010). Recent World Health Organization projections estimate that about 40 million people are currently infected with HIV in Africa, of whom 25.8 million (64 percent) live in Sub-Saharan Africa (WHO and UNAIDS, 2010).

Considering the poverty levels in most African countries, most people fail to cope with episodes of HIV and AIDS related illnesses at both national and household levels. For instance in Malawi, although the government receive significant donor funds towards HIV/ Aids interventions the financing gap towards HIV/AIDS service provision still exist (Ministry of Health, 2014). Similarly, the gaps exist at household and individual level as other indirect costs related to care such as transportation and food that are not provided by either donors and governments leave individuals to fend for themselves and hence incur out of pocket expenditure in the process. This act as a financial barrier for health access in countries that are resource constrained like Malawi (Tran BX, et al., 2013).

The burden of HIV and AIDS is felt at many levels of the society from institutional level all the way to the community level. In 2011, approximately one million people were living with the HIV virus in Malawi alone and 48,000 people died of HIV related illnesses in the same year. Malawi's HIV prevalence is one of the highest in the world, with 10.3% of the population living with the virus (World Health Organization, 2012). Furthermore the Malawian HIV epidemic plays a critical role in the country's low life expectancy of just 54.8 years (UNDP, 2013). The major economic setbacks of the HIV pandemic in Malawi are that it reduces the labor supply and increases costs at both household and national level. On the reduction of labor supply it is evident that the loss of young adults in their most productive years affect overall economic output of the country (Bollinger, 2000). Furthermore if AIDS is more prevalent among the economic elite, then the impact may be much larger than absolute number of AIDS deaths indicates. According to a study by Bollinger in 2000, the direct costs of AIDS include expenditures for medical care, drugs and funeral expenses. Indirect costs include lost time due to illness, recruitment and training costs to replace workers and care of orphans. If costs are financed out of savings, then the reduction in investment could lead to a significant reduction in economic growth (Bollinger, 2000).

The household impacts begin as soon as a member of the household starts to suffer from HIV related illnesses; Loss of income of the patient (who is frequently the bread winner), household expenditures for medical expenses may increase substantially, other members of the household, usually daughters and wives may miss school or work less in order to care for the sick persons.

When it comes to health care, the Government of Malawi has a policy that all adults that have tested positive for HIV and have a CD4 count of less than 500cells/mm³ are supposed to receive free Antiretroviral Therapy (ART) drugs to boost their immunity and prolong their lives (Government of Malawi, 2014). This is as a result of policy change from the initial WHO (2010) guidelines that required individuals whose CD4 count of less than 350 cells/mm³ to be eligible for treatment. As a result of this change in policy the country has seen a number of people being eligible for treatment. This has undoubtedly improved the health status and survival of people living with HIV and AIDS (PLWHA) over the past few years. Furthermore as a result of expanded ART rollout more than 51% of PLWHA are now receiving life prolonging Antiretroviral drugs. This has resulted in a 51% reduction in AIDS related deaths over the past decade in Malawi (UNAIDS, 2013). However, since the introduction of highly active antiretroviral therapy in 2004, ART has become the main driver of total cost of caring for PLWHA. This presents challenges in low income countries such as Malawi. The price of HIV care can quickly become a considerable economic burden especially in settings where all drugs are not available free of charge, where they remain on charge by patients or where direct out of pocket payment (OOP) are required (Kouanda *et al*, 2010).

In Malawi, public health services including for HIV and AIDS are offered for free unless individuals go for private health services (Government of Malawi, 2011). However, incidences of individuals incurring direct out of pocket expenditures have been reported to be on the rise in public health facilities. The findings from Malawi household health expenditure survey conducted in 2011 indicate that government health facilities received 27% of total household funds through direct out of pocket payments. This finding implies that free public health care to a large extent is just rhetoric as in reality households pay for services in public health facilities. Considering that HIV and AIDS ailment is a long term condition, the financial burden

is impedingly higher. The financial burden of OOPs has disproportionately a higher effect on low income households as such households have to alter their budgets, reduce consumption of basic commodities and therefore modify financial and social family dynamics (Nguyen, 2014).

Furthermore OOP expenditure has an effect in that mostly those that need care do not have ready cash and may thus resort to borrowing from friends, relatives and other sources at possibly higher interest rates. Other clients may even resort to selling assets such as livestock, household items etcetera thereby jeopardizing the livelihood of the household (McIntyre et al., 2005). According to recent WHO estimate, every year more than 100 million people become impoverished and further 150 million people face severe financial hardship as a result of health care payments worldwide (WHO, 2005a). With the HIV and AIDS pandemic the situation may even be worse than projected. In Malawi, as is in many Sub Saharan African countries, there is a growing concern about potentially catastrophic health care payments particularly for people living with HIV.

Providing ART drugs free of charge represents an important improvement in health service provision. However, other direct and indirect costs related to care such as transportation, loss of income etc. that are not sponsored, and instead are financed by patients through OOPs remain high and represent a financial barrier for health care access in low income countries (Nguyen, 2014). Subsequently, this may have an effect on access to treatment, diminishing patient's treatment compliance and can further lead to a greater need for complex and expensive second line ART drugs.

It is with this background that this study seeks to identify factors that influence out of pocket health expenditure for people living with HIV in Malawi. This will inform policy makers on the magnitude and sustainability of such payments and what they mean to the health system, individuals and households involved.

1.2 Problem Statement

Given that the HIV and AIDS pandemic affect all levels of the society, it requires a lot of resources for prevention, treatment and care as well as coping with psycho-social effects of illness or post illness. Despite the fact that in Malawi ART clients receives free ARVs, households incur costs that are complimentary to treatment through Out of Pocket payments. Out of Pocket health expenditure are those made by clients at the point of receiving health services and include cash payments reported in the survey. For instance, households need to travel long distances to ART clinics on monthly basis to get stock of antiretroviral drugs (Ntata, 2007). Monthly visits may entail travel for long distances to reach ART clinics and require Out of Pocket expenses on travel, food and sometimes loss of wages. Often times these costs may be more than the cost of drugs provided to the patients. Households may also spend their incomes on drugs in cases where hospitals have run out of drug stocks. Furthermore such costs like outpatient and inpatient hospitalization costs are incurred by households as complimentary spending outside institutionalized HIV and AIDS care needs. These costs may lead to irregular or delayed visits and thus may adversely affect drug adherence and risk of drug resistance. In the process of this happening households have been noted to be spending considerable proportions of their incomes to cope with episodes of AIDS related illnesses and hence graduating into catastrophic payments and eventually affecting overall household welfare. Catastrophic Spending on health occurs when a household reduce its basic expenses over a certain period of time in order to cope with health care expenses on one or more of its members. Health expenditure is defined as catastrophic if 5-40% of total household income is spent on healthcare (Xu et al. 2003).

Understanding the financial burden of HIV and AIDS is necessary to develop protective mechanisms and improve efficiency of health care systems. It is for this reason that the determinants for out of pocket healthcare expenditure for people living with HIV needs to be understood. So far no systematic expenditure analysis at individual and household level has been undertaken to show the size of the burden to households, the motives for spending and the types of spending. The expenditure estimates that exist have only concentrated on aggregating the magnitudes of overall household spending as a category for national health spending. This study seeks to undertake a detailed analysis on the determinants of out of pocket health expenditure

for People living with HIV in Malawi. The study will peer into individual choices regarding spending that is complimentary to what government and non-governmental institutions provide. Given that health services particularly for HIV and AIDS in Malawi are for free and yet ART clients still incur some expenses it will be interesting to explore how such OOP expenditure affect households in general and PLWHA specifically as this has a potential of driving the households into catastrophic expenditure and eventually ultra-poverty.

1.3 Study Objective

The main objective of the study was to assess the determinants of out of pocket health expenditure for people living with HIV when seeking healthcare services. In particular the study had the following specific objectives:

1. To investigate whether geographical location (urban and rural) affects Out of Pocket healthcare expenditure for PLWHIV.
2. To analyze if individual factors (education level, being household head, sickness condition and gender) affect the magnitude of OOP health care expenditure for PLWHIV.

1.4 Research hypothesis

Given the objectives above, the study seeks to test the following hypotheses;

- Geographical location does not affect OOP expenditure for people living with HIV.
- Individual factors do not affect OOP health care expenditure for people living with HIV.

1.5 Significance of the study

AIDS is a chronic condition requiring long term care and treatment hence the need to understand how households cope with health care payments. AIDS has also the potential to create severe economic impacts in many African countries. It is different from other diseases because it strikes people in the most productive age groups and very fatal. The study recognizes the effect that HIV and AIDs related illnesses and their cost may have on the economy. Specifically the study will help to draw socioeconomic and demographic determinants that need to be critically looked at

when formulating policies to do with HIV and AIDS, and ART clients specifically so that those stricken by poverty should not graduate to ultra-poverty due to incurring of HIV and AIDS related inpatient and outpatient costs. The results of the study will therefore provide valuable inputs in policies and programs that promote ART clients and their survival.

Furthermore economic support to patients is becoming an essential component of HIV and AIDS programs. It still represents a small proportion of the Global Fund grants to fight AIDS, Tuberculosis and Malaria (Richter, 2014). In addition, the study will contribute to literature on the dynamics of HIV and AIDS related health care costs and application of Zero inflated models of analysis in economics.

The study tackles a relevant subject matter of healthcare costs particularly in the era of HIV and AIDS pandemic. The study recognizes that AIDS is a long term condition that requires long term care and treatment and hence to achieve Sustainable Development Goal number 3 of ensuring healthy life and promoting wellbeing for all at all ages there is need to understand the determinants of Out of Pocket healthcare expenditure for people living with HIV. Furthermore the 90:90:90 objective of HIV can better be achieved through understanding the underlying variables that affect OOP for people living with HIV. This study is a first national study on healthcare expenditure in Malawi and hence it provides valuable insights on healthcare costs related to people living with HIV. The study recognizes that household health expenditure in low and middle income countries poses a great financial risk to the household and hence welfare problems (Xul et al., 2003). On the other hand the study quantifies costs and controls for the unobserved unlike previous studies that focused on the descriptive.

1.6 Organization of the Study

The rest of the paper is outlined as follows. Chapter 2 gives a brief overview of HIV and AIDS pandemic in Malawi. In Chapter 3, provides the theoretical and empirical literature that was reviewed while Chapter 4 outlines the methodology used in this study. Chapter 5 presents the results and discussion while the final chapter provides conclusion, policy implications and limitations of the study.

CHAPTER 2

HIV AND AIDS SERVICE DELIVERY SYSTEM IN MALAWI

2.1 Introduction

This chapter provides an overview of Malawi's health sector in general terms, its structure and delivery system including policies that govern implementation of HIV and AIDS programs. The chapter further highlights the gaps that exist in HIV/AIDS service provision and gaps that the system fail to address to minimize the burden. It also presents a section on financing mechanism for HIV and AIDS related activities.

2.2 Structure of Health Sector

In Malawi, health service providers are categorized into traditional (informal) and modern sectors (formal) sectors. The two sectors complement each other such that a large proportion uses them simultaneously. However, HIV and AIDS services are mainly provided in the formal sector. Within the modern health sector, three main categories of health service providers exist namely the public sector, nonprofit private sector and private for profit sector. The Ministry of Health and population services is the largest provider of public health services which are provided free apart from private wards at central and district hospitals, paying outpatient departments (OPDS) and hospital bypass fee.

The current health delivery system is district based and the MOH has 27 district offices each headed by a District Health Officer (DHO), which are responsible for the dissemination of national policies, overall coordination of health services and programs, and provision of public services at district level. The DHOs are responsible for managing and supervising both hospital and peripheral government facilities. In addition, the DHOs have the mandate to supervise all health facilities and services within the district through the District Health Management Team (DHMT) including the supervision of preventive and promotion activities throughout the district, and ensuring adherence to national policies by all health care providers.

The non-profit private sector comprises health facilities run by various mission churches. These are grouped under the Christian Health Association of Malawi (CHAM), which provide a large proportion of health services at variable charges. Firms be it agricultural, large companies and parastatals also provide health services to their employees and people in their catchment areas. Other healthcare providers include the Ministry of Local government and rural development, Ministry of Agriculture, Ministry of education, the Malawi Defense Force and Malawi police service, all these at a small scale. All the above health delivery units have special HIV and AIDs interventions.

The Government of Malawi is responsible for providing minimum set of services and for managing the health system of the nation. Delivery of health care is organized into three levels; primary secondary and tertiary. In theory patients are referred through this system in accordance with their need. At primary level, services are delivered through rural hospitals, health centers, health posts, outreach clinics and community initiatives such as drug revolving funds. Secondary level health services are provided by district hospitals and CHAM hospitals. The secondary level constitute the first level of referral and provides surgical back up services, general medical and pediatric inpatient care for acute conditions. Patients in need of more specialized care are referred to tertiary hospitals.

2.3 HIV/ AIDS Services in Malawi

2.3.1 HIV Testing and Counseling

HIV Testing and Counseling (HTC) is one of the essential interventions in HIV prevention and care. It both promotes the prevention of HIV infection and is an entry point to care and support including ART. According to the 2010 Malawi Demographic Health survey, 27 percent of women and 48 percent of men had never tested for HIV (MDHS, 2010) bringing the gap that this service ought to have served. The government of Malawi recognizes the importance of HIV testing and counseling and promotes it to enable all Malawians to know their HIV status and so to prevent HIV, to improve the quality of life and as needed, to obtain HIV treatment (Government of Malawi,2011). HTC services are provided in a specialized testing and counseling unit. However, testing and counseling may be provided in almost any setting, wherever a client or provider determines that the service is necessary. In this

scenario HTC centers are made available close to the citizenry for easy access but also to promote individuals to get tested and know their sero-status. Overall 80 percent of health facilities in Malawi have HIV testing system including 95 % of hospitals and health centers. Almost all CHAM facilities and 90% of government facilities have an HIV testing system (GoM, 2014). Only 40 percent of private health facilities have an HIV testing system (Table 1.).

2.3.2 HIV Care and Support Services

As a result of their suppressed immune system, people living with HIV are at risk of developing opportunistic infections such as TB. Furthermore if they contract malaria, PLWHA are likely to experience more severe forms of the disease. Thus, one of the important HIV/AIDS care and support strategies is the immediate treatment of opportunistic infections. Facilities that offer care and support services for HIV/AIDS clients are also able to offer services for TB, STIs and Malaria. Other HIV and AIDS care and support services commonly available in Malawi health system include provision of Condoms, family planning counseling or services and pediatric HIV care. In general hospitals offer the broadest range of services.

2.3.3 Antiretroviral Therapy (ART)

The Ministry of Health, together with partners has embarked on improvements to the quality of ART programmes in Malawi. The National ART programme guidelines call for prescription and provision of ART by trained health personnel who should regularly monitor the condition of their clients to ensure that an effective ART regimen is being implemented and that side effects are well managed. Antiretroviral drugs inhibit the replication of HIV and thus can substantially prolong and improve the quality of life of HIV positive people. It is estimated that in Malawi close to half a million people living with HIV are receiving ART. Still 25 percent of those eligible for ART are not yet receiving it (GoM, 2014). Overall two thirds of all health facilities offer ART services; 90 percent of hospitals and 95 percent of health centres offer ART services. Few dispensaries and Clinics and very few health posts offer ART services (Table 1 below). ART services are offered in 86 percent of government facilities and 88 percent of CHAM facilities.

2.3.4 Services for Sexually Transmitted Infections

Sexually transmitted infections (STIs) including reproductive tract infections (RTIs) cause major health problems worldwide. STI and RTIs remain among the leading causes of disease burden in Malawi. The presence of STIs increases the risk of HIV infection as such the government of Malawi place a lot of emphasis and effort to reduce and prevent STIs. Sexual contact is the most common route of HIV transmission hence preventive measures for STIs are equally relevant to the control of HIV. Treating common STIs may also reduce transmission of HIV in a population. The government of Malawi and its partners has embarked on health programmes to revitalize STI/RTI programmes at all service provision level to complement efforts to fight against HIV and AIDS.

Table 1: HIV/AIDS Services by Facility Type and Managing Authority

Service Provider	Number of Facilities	No. of facilities offering ART	% of facilities offering ART	No. of facilities offering HTC	% of facilities offering HTC
Managing Authority					
Government	472	406	86	424	90
CHAM	163	144	88	158	97
Private	214	44	21	85	39
NGO	58	21	36	49	84
Company	69	40	58	44	64
Facility Type					
Hospital	113	102	90	107	95
Health Centre	466	441	95	444	95
Dispensary	48	20	41	31	65
Clinic	327	93	28	171	52
Health post	23	1	5	7	28

Source: Malawi service Provision Assessment 2013-2014, GoM

2.4 The Institutional and Policy Framework for HIV and AIDS in Malawi

The Malawi Growth and Development strategy (MGDS 2011-2016) provides the overall framework for socio-economic development agenda in Malawi. HIV is one of the key priority areas within the wider theme of social development. The MGDS also identifies key strategic interventions which should be implemented in order to manage the HIV epidemic. In 2001, the National AIDS Commission was established in Malawi to replace the National AIDS Control Programme. Subsequently the National HIV and AIDS Policy was launched in 2003 in Malawi (OPC, 2004). This policy was developed through consultative process that involved civil society organizations, the public and private sectors, the media and persons living with HIV. The national HIV and AIDS policy now provides guiding principles for all programs and interventions in Malawi. In addition, the National HIV and AIDS policy (Revised 2012) offers specific policy guidance to the national HIV and AIDS response. In Malawi, National HIV and AIDS Strategic Plans (NSP) are developed at intervals to translate the National HIV and AIDS policy into action. Currently the country is implementing the NSP for 2015-2020 which replaced the 2011-2016 NSP. . The goal of the National HIV and AIDS Strategic Plan (NSP) for the period 2011-2016, was to prevent the further spread of HIV infection, promote access to treatment for People Living with HIV and AIDS, and mitigate the health, social-economic and psychosocial impact of HIV and AIDS on individuals, families, communities and the nation. However, factors such as the scale of the epidemic and the shortage of human resources and financial resources available have hindered progress. Implementation of NSP aims at implementing HIV and AIDS interventions in line with the UNAIDS 90-90-90 targets. This means 90% of PLWHIV will know their status, 90% of people diagnosed will be on ART and 90% on ART will be virally suppressed. The 2015 -2020 NSP emphasizes on the following;

- Intensifying the identification of previously undiagnosed HIV infected children and adults by refocusing the provision of high quality provider initiated HIV testing and counseling services.
- Expanding access to ART by continuing roll out ART services to peripheral health facilities and increasing the number of HIV positive children and adults eligible for ART in line with 2013 WHO ART guidelines.

- Maintaining high level of adherence to ART regimens and retention treated HIV positive individuals in ART programme through intensified public education and engagement and use of community based support groups.

Besides the HIV specific policies and strategies, Malawi has several pieces of legislation which directly and indirectly impact the prevention and management of HIV and AIDS. They include the Constitution of Malawi, The public health Act, Gender Equality Act, Health and welfare Act, Employment Act and many more. In 2008, the Malawi law commission started the process of developing a bill which is aimed at consolidating HIV related provisions spread across pieces of legislation and strengthening the legal framework for implementing HIV and AIDS interventions. The bill is now at cabinet level ready to be tabled in parliament.

Malawi is also a signatory to a number of international conventions and declarations. These include the 2000 UN millennium declaration, the 1948 declaration for Human rights, the 2001 Declaration for commitment for HIV and AIDS and the 2011 Political declaration on HIV and AIDS. These international declarations and convention continues to provide important guiding framework for national laws, policies, plans and regulations relating to HIV and AIDS.

The country's response to the epidemic has evolved over the years from a health sector led response to a multi-sectoral one coordinated by one national authority, one strategic framework and one monitoring and evaluation framework. The responsibility of coordinating national response against HIVAIDS epidemic rests with National AIDS Commission (NAC). NAC coordinates development of an integrated annual work plan which outlines activities to be carried out by different stakeholders and their budgets (Government of Malawi, 2015).

Among other programmatic areas of focus for national response to HIV and AIDS in Malawi include delivery of Option B+. This is a program which Malawi started implementing in July 2011. In this approach all pregnant women who are found HIV + are put on ART for the rest of their lives regardless of the clinical staging or CD 4 count.

Related to Option B+ is a free ART programme which is supported by global fund and other partners. Malawi started implementing free ART programme in 2004 using a public health approach. At that time there were about 3,000 people on ART, however with free ART by 2014 more than half a million people were on ART in Malawi representing 67% coverage (UNAIDS,2015).

2.5 HIV AND AIDS Financing Mechanism

The main financing schemes for health sector in Malawi include development partners contributing 65%, government funding 21%, households 10% and private sector 4% (Government of Malawi, 2014). This shows that Malawi has a weak domestic health financing due to low per capita incomes and expenditure. Specifically for HIV and AIDS, the development partners have been a major category of institutional units serving as a source of HIV and AIDS funds for many years. The main Development partners providing financial resources for the implementation of national response to the HIV and AIDS pandemic include; The global fund, PEPFAR, World Bank, DFID, Centre for Disease Control and UN agencies. The development partner's contribution accounted for 76% of total HIV and AIDS health expenditure in the period between 2009 and 2012 (Government of Malawi, 2014). The government accounted for the second largest percentage (16.6%) while households were the third largest institutional units spending on HIV and AIDS contributing 7.1%. As with general health spending, the HIV and AIDS subaccounts findings of 2011 attest that Malawi HIV and AIDS sector is one of the most donor dependent. In the event of sudden withdrawal of funding from donors and international organizations, HIV and AIDS programs would be negatively affected.

From the funding source, HIV and AIDS funds are channeled to financing agents in Malawi who manage the financial resources and have programmatic control over use of these funds in Malawi. The National AIDS Commission (NAC) is the largest financing agent for HIV and AIDS in Malawi controlling on average 30.4% of total HIV and AIDS resources in the country. It is followed by Ministry of Health which manages 17%, International Non-governmental organizations who have increased their share from 2.9% to 14% in recent years, local governments (10%) and households 6.9%. The increase in share of international NGOs as financing agents from 2.9% in 2009 to 14% in 2012 reflects a shift in donor preferences towards

channeling their funds through international agents other than local government and local NGOs (GoM, 2014).

The HIV and AIDS funds are lastly channeled to implementing agents and HIV and AIDS health care providers. HIV and AIDS health care providers use HIV and AIDS funds received from financing agents to deliver goods and services to the population. The providers include hospitals, health centers, public health programs such as voluntary counseling and testing (VCT), prevention of mother to child transmission (PMTCT), Information, education and communication (IEC) and services to prevent sexually transmitted infections and providers of non-health HIV and AIDS services. The non-health HIV and AIDS services include PLWHA support, orphan and vulnerable children support and policy advocacy expenditures.

As can be seen, the Global Fund and other development partners meet a significant proportion of HIV and AIDS expenditure, however despite the huge injection of financial resources and interventions there are still pockets of unmet needs particularly for PLWHIV. These unmet needs become subject of household own spending. For instance travel costs to VCT centers and ART clinics are borne by patients and households. Furthermore some inpatient costs like costs for supplement food and other related costs are borne by households. Now considering that a good fraction of Malawi population live below the poverty line, it is a cause for concern as these episodes of HIV and AIDS related illnesses bring severe financial shocks to households.

2.6 Socio Economic Indicators and HIV and AIDS Epidemiological Profile

Malawi is one of the countries most severely affected by HIV/AIDS in Sub-Saharan Africa. Actually, it is one of the poorest countries in the world with more than 50% of its population living below the poverty line. The country's health financing structure relies on general tax revenue and external donor funds as is seen above. The first case of AIDS in Malawi was identified in 1985. The Joint United Nations Programme on HIV/AIDS in its 2010 global reports stated that there were 920,000 adults and children living with HIV in Malawi in 2009 (UNAIDS 2010). Major factors in the transmission of HIV in Malawi are poverty, low literacy levels, high rates of casual and unprotected sex in the general population particularly among the youth between

ages of 15-24, cultural & religions factors and stigma and discrimination (UNAIDS, 2010).

HIV and AIDS increasingly contribute to the disease burden shouldered by households. According to Malawi demographic health survey of 2010, 11 % of the population was living with HIV and AIDS. Urban and rural prevalence were 17.4% and 8.9% respectively. However, in terms of absolute numbers more rural than urban people were infected with HIV because 85% of Malawi's population lives in rural areas. Women generally exhibited higher prevalence (13% in 2010) up to age 40; while men between ages of 30 and 39 had higher infection rates (8 % 2010). HIV rates also differed across ethnic groups, educational level, employment and wealth status and regions of residence.

2.7 Conclusion

This chapter has provided a brief description of health sector in Malawi with a bias on HIV and AIDS health service delivery system. It has also looked at the institutional and policy framework for HIV interventions in Malawi including key programmatic areas and HIV and AIDS financing mechanisms. The chapter has further revealed how the existing system has failed to cope with the pandemic burdens at household or individual level. The paper will next look at literature, both theoretical and empirical on the choice of health care and its related costs by households for PLWHIV.

CHAPTER 3

LITERATURE REVIEW

3.1 Introduction

This chapter aims at reviewing the literature in the field of demand for health care and its determinants for out of pocket healthcare payments. Primarily the chapter looks at theoretical literature on health care demand which forms the theoretical framework upon which out of pocket expenditure studies are based. Section 3.3 presents the empirical literature, concentrating on the various studies that have been conducted regarding determinants for out of pocket health care expenditure.

3.2 Theoretical framework

The economic theory of demand for healthcare by Grossman 1972 provides a framework for the analysis of households as consumers and producers of health care. According to Grossman theory of demand for health care (1972), health is determined by many factors of which medical care is one of them. The central proposition in the Grossman model is that health is a durable commodity. Individuals are said to inherit an initial stock of health that depreciates over time and can be augmented by investment. Death is said to occur when the stock falls below a certain level and one novel feature of the model is that individuals “choose” their length of life and therefore a given consumer selects the optimal amount of health in any period of his life. The theory is concerned with how individuals allocate resources to produce health. The model goes beyond the traditional demand analysis and has been extremely influential in health economics. Grossman model argues that what individuals demand when they purchase health care is not health care per se but good health. The model emphasize that individuals are not passive consumers of health but active producers who spend time and money on the production of health. Health is therefore seen as lasting over time periods. It depreciates (perhaps at a non-constant rate) and can therefore be analyzed as a capital good.

Demand for health care is derived from a demand for health. Demand for health is derived from the demand for utility e.g. health days in which to participate in leisure and work. Grossman first constructed a model for demand for health and derived the demand for healthcare from the demand for good health. He argued that health demand consists of two elements;

- (a) Consumption effect: where health is perceived as a commodity good and it directly enters the preference function as such health yields direct utility. This shows that you feel better when you are healthier and sick days are a source of disutility.
- (b) Investment effect: As an investment commodity, it determines the total amount of time available for market and non-market activities. An individual combines health care with other inputs and produces good health and good health enters the utility function.

Let the inter temporal utility function of a typical consumer be;

$$U = U(\delta_0 H_0, \dots, \delta_n H_n, Z_0, \dots, Z_n)$$

Where H_0 is the inherited stock of health, H_i is the stock of health in the i th time period, δ_1 is the service flow per unit stock, $h_1 = \delta_1 H_1$ is total consumption of “health services” and Z_1 is total consumption of another commodity in the i th period.

In particular death occurs when $H_i = H_{Min}$. Therefore, length of life depends on quantities of H_i that maximize utility subject to certain production and resource constraints.

By definition, net investment in the stock of health equals gross investment minus depreciation.

$$H_{i+1} - H_i = I_i - \delta_i H_i$$

Where I_i is gross investment and δ_i is the rate of depreciation during i th period. The rates of depreciation are assumed to be exogenous, but they may vary with age of the individual.

Consumers produce gross investments in health and other commodities in the utility function according to a set of household production functions;

$$I_i = I_i(M_i, TH_i; E_i)$$

$$Z_i = Z_i(X_i, T_i; E_i)$$

In these equations M_i is medical care, X_i is the goods input in the production of commodity. Z_i , T_i and TH_i are time inputs and E_i is stock of human capital. It is assumed that a shift in human capital changes the efficiency of production process in the non-market sector of the economy, just as a shift in technology changes the efficiency of production process in the market sector. It is also assumed that all production functions are homogenous of degree one in the goods and time inputs. Therefore, the gross investment production can be written as;

$$I_i = M_i g(T_i, E_i)$$

This implies that an investment in healthcare is inevitable given that health is a consumed good. Since health is a good that is consumed then an element of choice and opportunity cost also comes into play hence choices made by patients as to whether they need to spend through out of pocket expenditure or utilize subsidies where they are present.

In trying to reinforce Grossman model mainly on the premise that individuals are active producers of health by spending time and money to produce good health, Acton 1975 argued that if out of pocket payment falls due to insurance or subsidized government health care, the non-monetary factor like time price becomes more influential in determining the demand for health care. In other words, the theory states that the demand for free health care should be more sensitive to changes in time prices than demand for non-free health care since time constitutes a greater proportion of the total price when healthcare is free compared to a situation when it is priced. The time costs tend to be higher in case where the distance between the individual and facility is high. According to Acton distance matters to an individual because of three reasons;

- (a) Higher distance increases transport cost
- (b) Higher distance implies higher time cost

Acton derived demand from maximization of individual's utility function which depends on the consumption of medical service and other consumption goods subject to time and budget constraint. The Acton Model has the following form:

$$\text{Max } U = U(m, x) \quad \text{subject to: } (P + wt)m + (q+ws)x \leq Y = y + wT$$

Where:

P – Money price per unit of medical service

m – Medical service

x – Composite goods

q - Money price per unit of other goods

t – Time price per unit of medical service

s - Time price per unit of other goods

w – Wage rate per hour

Y – Full income (earned, unearned and opportunity cost of home production)

y – Unearned income

T – Total time available for market work and own production

The advantage of the Acton's model is that of its simplicity where as its disadvantage lies in its ignoring role of health need and demographic variables. In addition to this, the inclusion of time is not logical since it is not in accordance with household production theory where time enters the budget constraint since the household is viewed as a production unit. However, in Acton's model where the individual derives pleasure directly from the consumption of medical services, consumption has to be leisure activity and thus time should have no cost.

Furthermore Acton hypothesizes that demand for treatment in response to a particular episode of illness or injury can be modeled in terms of the provider choice between opting for different kinds of care. For example the choice can be among public, private or no care and may even extend as to whether to pay for the service or not pay for the service. Primarily such an analysis is more relevant for the case of curative care. Empirical specification for such a model starts from behavioral model of utility maximization where utility depends on health and the consumption of other goods

besides medical care. On experiencing an illness an individual is hypothesized to choose among various treatment alternatives so as to maximize total utility subject to his/her constraint.

Furthermore the economic theory of choice provides a framework for the analysis of healthcare choice. And how much one is willing to part to cover for the healthcare cost. According to this theory, economists characterize rational consumer behavior using a basic set of postulates or axioms, which are completeness, transitivity and continuity (Nicholson, 2008). These properties make it possible to show formally that people are able to rank in order all possible situations from least desirable to the most. Such ranking is referred to as Utility (Nicholson, 2008). A basic theoretical framework of utility maximization and household production of health underpins the empirical analysis of most health care demand studies (Gertler et al, 1987, Lindelow, 2002). In this framework, an individual is assumed to derive utility from consumption on health (h) and non-health goods (C). In particular individuals are assumed to have the following utility conditional on using health care provider j.

$$U_j = U (C_j, H_j)$$

The individual is assumed to maximize this utility subject to two constraints. One is the budget constraint

$$I = C_j + P_j$$

Where P_j is the total cost for using provider j and I is the share of the individual in the household budget. The other is the health production function

$$H_j = H_0 + Q_j$$

Where H_0 is the health status without professional health care and Q_j measures the incremental health benefits from using health care provider j. So for a home or no care option, it is assumed that $Q_j = 0$ or equivalently $H_j = H_0$

The consumer theory is used in this study to understand the decision made by PLWHIV on whether they would be willing to incur out of pocket expenditure to acquire healthcare services in relation to their utility.

The healthcare utilization is another model that can theoretically help to analyze the determinants for out of pocket expenditure for PLWHA. The model which is also called socio-behavioral or Andersen model (Andersen & Newman, 1973) groups into logic sequence three clusters or categories of factors (predisposing, enabling and need factors) which can influence health seeking behavior. The model was specifically developed to investigate the use of biomedical health services.

- a. Predisposing factors: the model suggests that use of health services is a function of predisposition factors which include demographic characteristics such as age, sex, race, education, marital status, general attitudes towards health and knowledge about the illness etc.
- b. Enabling factors: They entail an individual's ability to secure services. Enabling factors include income, health insurance, social support and availability of services etc.
- c. Need factors: they include illness level, disease severity, disease duration or total number of days in bed, psychological distress overall quality of life.

The model is very important in assessing the determinants of out of pocket healthcare expenditure as predisposing factors, enabling factors and need factors as outlined by Andersen may have an influence on PLWHA to incur out of pocket expenditure.

In the study PLWHIV are aware that AIDS is an incurable disease and that it deteriorates their health and therefore there is need to reinvest good health in order to prolong their life. In the study households without full health insurance are left with a choice as to whether they should face a risk of incurring large medical care expenses through out of pocket expenditure should a household member fall ill or remain with their current consumption budget. The rationale is that spending a large fraction of the household budget on health care must be at an expense of consumption of other goods and services. This opportunity cost may be incurred in the short term by cutting back on current consumption or in the long run if it is financed through savings, sale of assets or credit.

The study has borrowed a number of theoretical applications from Grossman, Acton and Consumer choice and health utilization Model. The study suggests that PLWHIV will replenish health stock by reinvesting through seeking good healthcare and therefore they will use whatever available resources to ensure good health is attained. Failure to invest in good health may result in deterioration of the health and hence where health insurance coverage is not available households will sacrifice a fraction of their household budget to pay for healthcare expenses through out of pocket expenditure. On the other hand the households are left with a choice to either pay for consumption goods or health care with the available budget. The choice depends on which one of the two provides maximum utility.

The models discussed above have helped in the choice of variables of the study for determinants of out of pocket healthcare expenditure for people living with HIV. Furthermore the theoretical models have helped to frame the study by providing a comprehensive understanding of demand for health and its intrinsic considerations.

3.3 Empirical Literature

Micro economic models of health care utilization have extensively been used to analyze demand for health care services and determinants for related costs including out of pocket expenditures. Econometric models for health care costs have also been used in many areas of health economics and policy evaluation. Two areas where they are frequently used are risk adjustment and cost effectiveness analysis. It should be pointed out that health costs pose particular challenges for econometric modeling. Individual data on medical expenditure or costs of treatment typically have a large mass point at zero (with costs truncated at Zero). This results in a highly skewed distribution with a heavy right hand tail. This non-normality stems from that a small minority of patients which are responsible for a high proportion of health care costs and mean costs are well above median costs (Matsaganis and Mitrako, 2008). The presence of substantial zeros in the data has typically been handled by using a two part model (2PM) which distinguishes between binary indicator, used to model the probability of any costs and conditional regression model for positive costs. Other studies have used alternative approaches by using sample selection or generalized Tobit models to deal with zeros. However, the dominant approach in modeling health care costs in literature has been the use of generalized linear models (Manning et al.

2005, Buntin and Zaslavsky, 2004). In our study, our dependent variable Out of Pocket expenditure is characterized by substantial zeros and hence fits well to use a two part model in regression analysis. In Africa there are limited relevant studies on individual level out of pocket health care expenditure. A lot of literature however focuses on a household as a unit of healthcare expenditure.

A study by You and Kobayashi (2011) investigated the determinants of individual out of pocket healthcare expenditure using health and nutrition survey data of 2004 in China. The study focused on individuals aged 18years and above. The study findings showed that perceived severity of illness and self-reported health status were the most important factors when determining out of pocket healthcare expenditure. The study further noted that age, place of residence (urban or rural) and level of education of the patient mainly those with chronic diseases affected healthcare costs that individuals paid through out of pocket. The study reported that older individuals of over 65years were noted to incur higher OOP healthcare expenditure compared to their counterparts. Furthermore, individuals who resided in urban areas and those with higher education levels paid more for healthcare through OOP. The study further revealed that out of pocket healthcare expenditure was directly related to severity of the illness. The study used the Heckman selection model to analyze individual's health expenditure decision which is based on a sample that excludes individuals who do not report paying for healthcare.

A study by Chang and Hague (2014) analyzed the major socio economic, geographic and environmental determinants of OOP healthcare expenditure and investigated the inequality in OOP healthcare spending and its variations in geographic location in Bangladesh. The study used the household income and expenditure survey for Bangladesh for 2010. Using the Double Hurdle (Cragg, 1971) model to analyze major determinants of OOP healthcare expenditure, the study results showed that contrary to common perception that decision of whether to spend on healthcare services and how much to spend depend primarily on an individual's health and illness, the analysis showed that illness is but one of the many factors involved in demand for healthcare. Other influences such as individual characteristics, education level, location and wealth variable significantly influenced level of health care expenditure. The study concluded that more rural households are likely to suffer catastrophic expenditure

than urban residence. In a related study by Oyinyere (2014) in Nigeria, concluded that geographical region (that is state of residence rural or urban), age of household head and family size determines whether a person who falls sick and seeks health services will spend out of pocket for healthcare. However in a hospital based study conducted at two ART centres in Uttar Pradesh in India by Shukla et al. (2015) it was found that place of residence (Urban or Rural) and educational level were insignificant factors to determine catastrophic OOP healthcare expenditure for people living with HIV.

A study by Ruger and Kim (2007) in Korea found that household out of pocket healthcare expenditure is the main source of personal healthcare financing in the developing countries and that the poor and the chronically ill pay more. This is in line with our priori expectation of this study in which we assume that individuals are likely to incur OOP healthcare expenditure based on their health status or severity of illness. Okunade et al. (2010) using double hurdle model and constructing wealth index as a distinct covariate, found out of pocket health care expenditure as a technical necessity across income quartiles and household sizes. In the study Okunade noted that the chronically ill pay significant out of pocket healthcare expenditure to mitigate a further deterioration of their health. They therefore found level of illness to be a determining factor for out of pocket healthcare expenditure for the chronically ill. Education is a factor that serves as a production factor of health and as such, determines healthcare expenditure. As far back as 1972, Grossman stated that influential factors on demand for health care are health status, income and of course education. The effect of formal schooling on OOP healthcare expenditure was studied by Parker and Wong in their paper on household income and expenditure in Mexico. They found positive statistical significance between formal schooling and individual healthcare expenditure.

In another study by Ichoku and Leibrandt, (2003), an individual's area of residence was studied to see if it has effect on OOP. The study expected a person's area of residence to affect his decision to seek care and hence affect his out of pocket payments in the process. The study results showed that area of residence (rural or Urban) had a statistical significance to influence an individual's decision to participate in Out of pocket healthcare expenditure. In a similar study conducted in

Tanzania by Berruti (2012) on out of pocket payments by PLWHIV from ten sites, the study wanted to find the factors that determine PLWHIV to incur out of pocket healthcare expenditure despite receiving the government funded treatment. The study found that 70% of out of pocket expenditure for PLWHIV in Tanzania related to travel expenses then food and accommodation at 12%. The study found that patients living in rural areas pay on average 90% more per year than those living in urban areas.

In a study conducted in Kenya by Olowolabi (2014) investigated the factors that influence out of pocket healthcare expenditure at household level using 2004/05 Household income and expenditure survey. The study results using the multiple regression analysis found that among other factors education level and area of settlement (rural and urban) have a significant influence for household healthcare out of pocket healthcare expenditure.

In a study by Wang et al (2015) using a two part model to determine factors that influence OOP payments on Chronic non-communicable diseases in Malawi found that a patient being a household head was positively associated with the amount of OOP expenditure that he or she can incur. Berruti (2012) found that urban males spent 97% more on HIV related costs through out of pocket expenditure than their female counterparts.

To crown it all a study by Hoang van Minh et al (2013) investigated the financial burden of out of pocket expenditure in Vietnam using the national living standards surveys of 2002,2004,2006,2008 and 2010. The study used the logistic method and it noted that in all the 5 surveyed years the means of the OOP were higher among households who belonged to higher expenditure quartiles, households from urban areas and those who had no insurance enrollees. This is in line with earlier studies discussed above.

3.4 Conclusion

This chapter looked at the theoretical literature on demand for health care and related costs. The theories motivated the choice of variables for the study. Particularly demand for health, health seeking behavior and consumer choice has been discussed in trying to explain the determinants for out of pocket expenditure. The section on empirical literature has outlined similar studies in the area of health care expenditure at both individual and household level. The studies reviewed here have used the double hurdle model, binary and multinomial logit specifications to analyze determinants of healthcare expenditure particularly out of pocket healthcare payments. The double hurdle model has been incorporated in our study because of it suits well in zero inflated studies as used in modeling similar studies.

The studies analyzed have identified the importance of individual's social and economic characteristics like age, income, education level, household location, individual's health status and illness on the individuals' decision to spend on health care through out of pocket payments. Both our empirical and theoretical literature reviewed have mentioned particular variables which we are also using in our study and hence they have been central in our choice of variables for the study.

CHAPTER 4

METHODOLOGY

4.1 Introduction

This chapter outlines the methodology that is used in the study. Section 4.2 presents a snap review of the double hurdle model and how it is derived. Section 4.3 looks at the specification of the model by considering the factors that are assumed to determine out of pocket healthcare expenditure and which are used as explanatory variables in the study.

4.2 The Double Hurdle Model

Econometric models where the dependent variable of interest has zero observations use a latent variable representation of the dependent, that is each household or individual has unobserved or latent expenditure which for some individuals is known and given by the actual expenditures and for some individuals is unknown and is denoted by zero. Econometric models where the dependent variable is incompletely observed are known as censored models (Woodridge, 2009). The Tobit model developed by James Tobin (1956) was the original model developed to analyze censored dependent variables. In the Tobit model censoring is assumed to represent a standard corner solution. This in itself is a restrictive assumption especially for household or individual expenditure items like medical care. A further limitation of the Tobit model is that it assumes that the same variables affect the probability of non-zero observation (the participation decision) as well as the level of a positive observation (expenditure decision) and moreover with the same sign. It may therefore be reasonable to allow the size and nature of the factors that affect the decisions to be different (Woodridge, 2009)

As a result of these short comings, a number of generalizations of the Tobit model have been developed. One generalization which is popular in the literature is the double hurdle model, originally formulated by Cragg (1971). The model postulates

that individuals must pass two separate hurdles before they are observed with a positive level of expenditure. The first hurdle corresponds to factors affecting participation in the market for the good and the second to the level of expenditure on the good. A different latent variable is used to model each decision process, with a probit determining the participation and Tobit determining the expenditure level.

The double hurdle model can be specified as follows;

$$y_{1i}^* = w_i \alpha + u_i \quad \text{Participation decision}$$

$$y_{2i}^* = X_i \beta + V_i \quad \text{Expenditure decision}$$

$$y_i = X_i \beta + V_i \quad \text{If } y_{1i}^* > 0 \text{ and } y_{2i}^* > 0$$

$$y_i = 0 \text{ otherwise}$$

Where y_{1i}^* is the latent endogenous variable representing an individual or households expenditure decision, y_{2i}^* is the latent endogenous variable representing an individual expenditure decision. y_i is the observed dependent variable (Out of pocket healthcare expenditure), w_i is a set of individual characteristics explaining the participation decision, X_i is variable explaining the expenditure decision and u_i and V_i are independent, homoscedastic normally distributed error terms.

The double hurdle model is estimated using maximum likelihood techniques with the log likelihood given as follows,

$$LL_{Double \text{ hurdle}} = \sum_{n=1}^{\infty} \ln \left[1 - \Phi(w_i \alpha) \Phi \left(\frac{X_i \beta}{\delta_i} \right) \right] + \sum_{n=1}^{\infty} \ln \left[\Phi(w_i \alpha) \left(1 - \Phi(w_i \alpha) \frac{1}{\delta_i} \Phi \left(\frac{y_i - X_i \beta}{\delta_i} \right) \right) \right]$$

The double hurdle model has been used in this study because it accommodates the zero inflated modeling. Our dependent variable Out of Pocket Expenditure is a zero inflated variable which would work better in models like double hurdle and hence the choice.

4.3 Model Specification

Following previous studies analyzed above and from theory, the empirical model to be estimated is as follows;

$$OOP = \beta_0 + \beta_1 Sex + \beta_2 Age + \beta_3 HHHead + \beta_4 HHLocatn + \beta_5 Educ2 + \beta_6 Educ3 + \beta_7 Educ4 + \beta_8 Clinicalstag2 + \beta_9 Clinicalstag3 + \beta_{10} Clinicalstag4 + \beta_{11} Married + \beta_{12} Married2 + \beta_{13} Wealth\ index + V_1$$

4.3.1 Variables and their measurement

The dependent Variable: Out of pocket Health expenditure

The dependent variable in the analysis is the most preferred health care out of pocket expenditure that an individual i selects. Individuals who reported to have tested HIV positive and were on Anti-Retroviral Therapy (ART) were asked about the outpatient and inpatient illness episode related costs that they incurred in the preceding four weeks. The expenditures included medical supplies like drugs, prescriptions, condoms, transport related costs and other paid for inpatient and outpatient medical services at public and private facilities.

The dependent variable was a continuous variable that would take any aggregated discrete number based on the costs incurred in illness episodes the last four weeks. This was measured in Malawi Kwacha.

Independent variables

Sex is a dummy variable for gender where Sex equals 1 if male and 0 otherwise. Sex also affects the capital depreciation and several studies have shown that demand for health differs according to sex.

HH Head is a dummy variable that shows whether the individual patient is household head or not. The dummy equals 1 if the individual is a household head or 0 if any other member of the household. We expect the care seeking decision and related magnitude costs to differ depending on whether one is household head or not.

HH location is a dummy variable for place of residence and equals 1 if urban and 0 if rural. Based on earlier studies we expect a person's area of residence to have an effect on his decision to seek care and hence affect magnitude of his out of pocket healthcare payments for an illness episode.

Educ refers to the level of education of the individual. Education level may affect the preferences and characteristics that PLWHIV may display as to whether they should incur healthcare costs through out of pocket healthcare expenditure or not. The effect of education will be captured through three dummy variables Primary education (Educ2), Secondary education (Educ3) and Tertiary education (Educ4) with no education as a base category.

Clinical stage refers to the severity of the illness as per the World Health Organization clinical staging of HIV guidelines. HIV disease staging and classification system are critical tools for tracking and monitoring the HIV pandemic and providing clinicians and patients with important information about the disease stage and clinical management. The Stages are categorized as 1 through 4, progressing from primary HIV infection to advanced HIV/AIDS. These stages are defined by specific clinical conditions or symptoms and as one progresses the ladder is assumed to be very sick at stage 4. The effect of seriousness of the illness will be captured through three dummies; Clinicalstag2, Clinicalstag3 and Clinicalstag4 with a primary infection as a base category.

Age refers to the actual age of the respondent. Age has been noted to be a significant variable in most health expenditure studies. Studies have shown that as one advances in age health expenditure also increases.

Wealth Index: a variable wealth index was introduced in the study as a proxy for income. The wealth index was developed by assuming that respondents who owned at least one of the livestock like cattle, goats, pigs, or sheep were in better off than those who didn't own any livestock. Households or individuals who owned either motorcycle, oxcart, private car or maize mill were classified as better off than households who never had any of the above. Income or wealth is assumed to be a

direct determinant for health expenditure and hence the inclusion of the variable in the study.

Married: The variable married was introduced in the study to refer to the marital status of the respondent at the time of the interview if he/she was married. Marital status has an influence on the expenditure patterns of the households as noted in health expenditure studies.

Married 2: The variable refers to respondents who were divorced, separated or widowed at the time of the interview. This corresponds to the above observation that marital status of the person has an influence on his/her expenditure patterns.

Table 2: Expected Signs of the Independent Variables

Variable	Measurement	Expected Sign
Sex	Dummy equal to 1 if Male and 0 otherwise	Positive
Age	Continuous variable	Positive
HH Head	Dummy equal to 1 if the respondent is household head and 0 otherwise	Positive
HH Location	Dummy equal to 1 if Urban and 0 if rural	Positive
Married	Categorical but introduced as dummy. Married equal to 1 if respondent is married and 0 if not	
Educ	Categorical but introduced as dummy 2= Primary, 3= Secondary and 4= Tertiary	Positive
Wealth index	Dummy equal to 1 if household own specified assets and hence better off economically and 0 if household does not own specified assets and hence a sign of lacking or not better off.	Positive
Clinical Stage (Severity of illness)	Categorical but introduced as dummy 2= clinical stage2, 3= Clinical stage 3 and 4=Clinical stage 4 (Serious condition)	Positive

The double hurdle model is employed to determine factors that influence participation decision to incur Out of pocket health care expenditure for people living with HIV and the magnitude of the expenditure decision. Ideally, HIV and AIDS patients will have geographical and individual characteristics as listed above which would cause them to seek health care and be willing to part with more financial resources through Out of pocket payments to purchase a commodity “good health”.

The study hypothesizes that being household head, education level, gender of the ill individual, severity of the illness condition and area of residence influences an individual’s choice of health care and how much he is willing to pay for the healthcare. Being household head, the level of education and severity of the illness would allow individuals and households to allocate a larger proportion of their earnings to pay for healthcare services. Education level or years of schooling have been linked to greater concern for improved health.

4.4 Data Source and Analysis

The data source for this study is a survey on people living with HIV and AIDS conducted in 2011 by Ministry of Health in Malawi. The survey was complementary to integrated household survey of 2010 and as part of National health accounts for 2011. Primary data was collected from people above 15 years of age infected with HIV who had their sero status confirmed positive by testing. The data was collected using a questionnaire designed and pretested by Ministry of health planning section. A questionnaire that contained a series of questions pertaining to the health status of the interviewees was used and specifically, the questionnaire captured information on whether the interviewee suffered an illness episode the last four weeks preceding the survey and incurred some out of pocket expenditure in the process. Privacy and confidentiality of collected information was ensured throughout the process. Data was collected in such a way that makes it impossible or very hard to identify the respondent.

The objective of the data collection was to collect better information on the amount of money spent by people on general health care and HIV and AIDS related care in particular and essentially to improve the health care provision system in Malawi. The questionnaire was administered by ART health workers in 60 ART clinics across the

country. The ART Clinics were selected based on probability population size with fixed sample size of 20 clients per health facility. ART Clients were interviewed on assumption that flow of clients per facility is a random event. The ART clinics were purposively chosen in order to obtain data that represent facts about rural and urban areas as well as the four regions of the country namely northern, central, southern and eastern. The survey targeted clinics with high registered number of ART clients and covering a larger geographical area. Consent from all the respondents was being granted before they provided their information.

The analysis of this paper is in two parts. The first is statistical (descriptive) analysis where the various descriptive statistics of the variables are presented. The second part is econometric analysis where the econometric package Stata version 13.0 was employed to estimate the slope coefficients and the associated marginal effects of the variables on the probability and magnitude of incurring out of pocket healthcare expenditure.

4.5 Diagnostic Tests

Examining the robustness and reliability of the regression results is an important issue. In this study, diagnostic tests are used to check any possible problems that may make the analysis less meaningful. One important test is to examine how well the model fits the data i.e. the goodness of fit test. It tests the hypothesis that all coefficients in the model are equal to 0:

$$H_0: \beta_{1j} = \beta_{2j} = \dots = \beta_{Nj} = 0$$

$$H_0: \beta_{1j} = \beta_{2j} = \dots = \beta_{Nj} \neq 0$$

Three classical test statistics are used in maximum likelihood estimation and these are the likelihood ratio, La grange multiplier and Wald principles which are analogous to the F test from linear regression. All three have the same distribution asymptotically. In this study, we will use the likelihood ratio test, which is conceptually the simplest of the three.

The significance of the individual coefficients will be tested by the use Wald test. It is analogous to the t-test for testing the significance of the individual coefficients in

linear regression. The Wald test is used to test the null hypothesis that a coefficient is equal to zero, against the alternative that it is not:

$$H_0: \beta_i = 0$$

$$H_i: \beta_i \neq 0$$

The test statistic, a Z-statistic is given as

$$Z = \frac{\beta_i}{\text{Asymptotic SE}\beta_i}$$

Where SE is the standard error

To carry out a test for the null hypothesis that a coefficient is equal to some value K, the test statistic is a simple extension of the equation above.

$$Z = \frac{\beta_i - k}{\text{Asymptotic SE}\beta_i}$$

The Stata computer package used in the estimation of the empirical model reports p-values for individual coefficients which are the results of the Wald test.

4.6 Conclusion

The chapter has presented a methodology that was employed in the study. It has outlined a double hurdle model and how it was used in the study. The specification of the model as well as the variables used has also been outlined, including the diagnostic tests used in the study. The next section presents the results of the study.

CHAPTER FIVE

PRESENTATION AND INTERPRETATION OF RESULTS

5.1 Introduction

This chapter presents and interprets the results of the study. Section 5.2 presents the descriptive statistics while section 5.3 presents the results of the Double Hurdle model regression on the determinants of out of pocket health care expenditure for people living with HIV.

5.2 Descriptive Statistics

The study analyzed responses from 1,111 ART clients across the country. The respondents included Male and Female patients aged between 15 and 88 years (inclusive). The mean age of the participants was 38.29 years with a standard deviation of 10.17 years. The individuals who were interviewed were asked follow up questions if they incurred out of pocket expenditure related to the illness episode. In total 168 respondents indicated to have incurred either Inpatient or Outpatient out of pocket healthcare expenditure. From the results 7% (80 individuals) of the respondents indicated that they incurred out of pocket expenditure related to an outpatient illness in the past four weeks. A further 8% (88 people) responded that they incurred out of pocket expenditure related to inpatient hospitalization in the past 4 weeks. When further asked if they received any health insurance coverage for health expenses, 93.4 % (156 people) of the respondents with positive expenditure said they did not receive any insurance coverage. Only 6.6 % of the respondents indicated that they had an insurance cover for their health expenses.

The study OOP healthcare expenditure when disaggregated into medical bills, gifts to health staff , food and transport indicate that most OOP healthcare expenditure is spent on medical bills (71%) seconded by transport costs(21%), food (7%) and gifts to health personnel (1%) -(Fig1. below).

Costs making up the medical bills include all costs that the patient incurred related to purchase of registration card, purchase of drugs, consultation, lab tests and X-ray costs. On the other hand gifts to health personnel costs only include gifts in cash paid by the patient to health workers for him to access or after accessing a service.

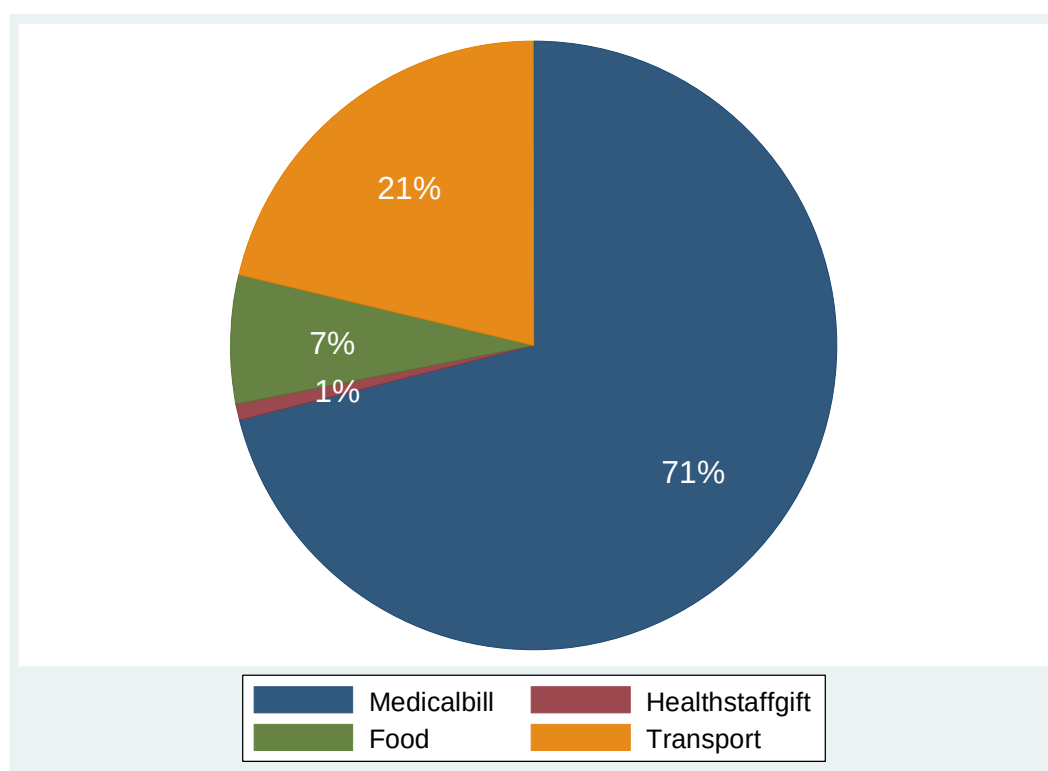


Figure 1: Out of Pocket Healthcare Expenditure by Category

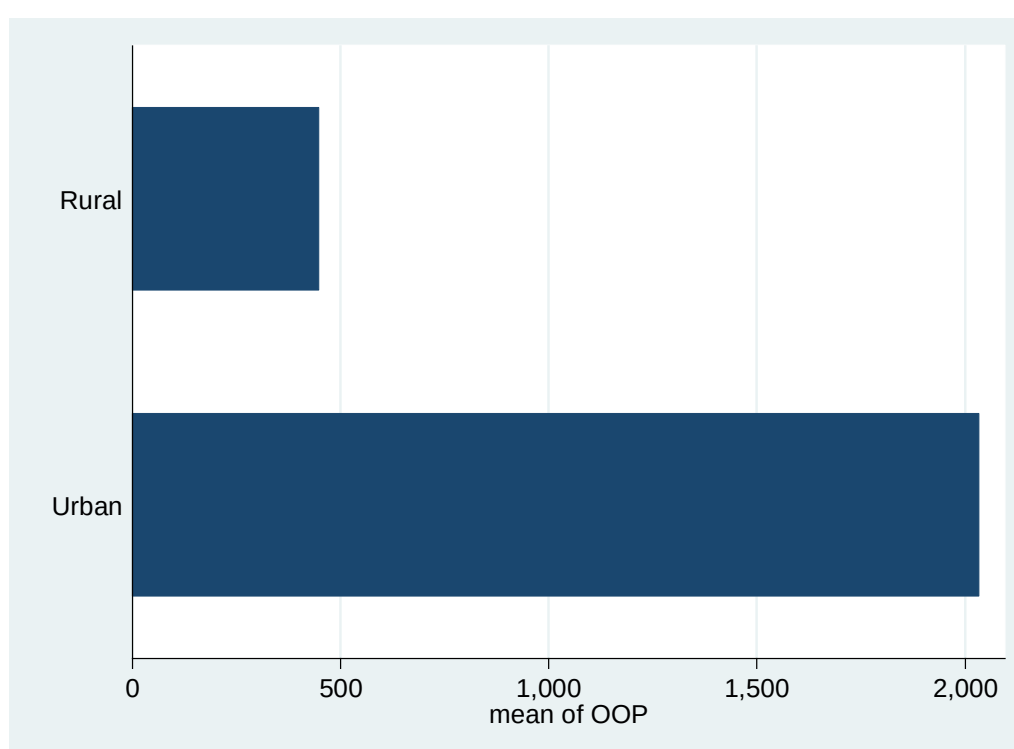
Table 3: Mean Out of Pocket Expenditure by Sex

Sex	Number of observations	Percentage	Mean Expenditure (MK)
Female	656	59.05	839.4954
Male	455	40.95	1032.286
Total	1111	100	918.4509

Table 3 shows the frequency and average out of pocket expenditure by sex. As seen from the table males incurred on average more OOP than females although in terms of absolute numbers there were more females (59%) than males in the sample.

Table 4: Out of Pocket Expenditure by location

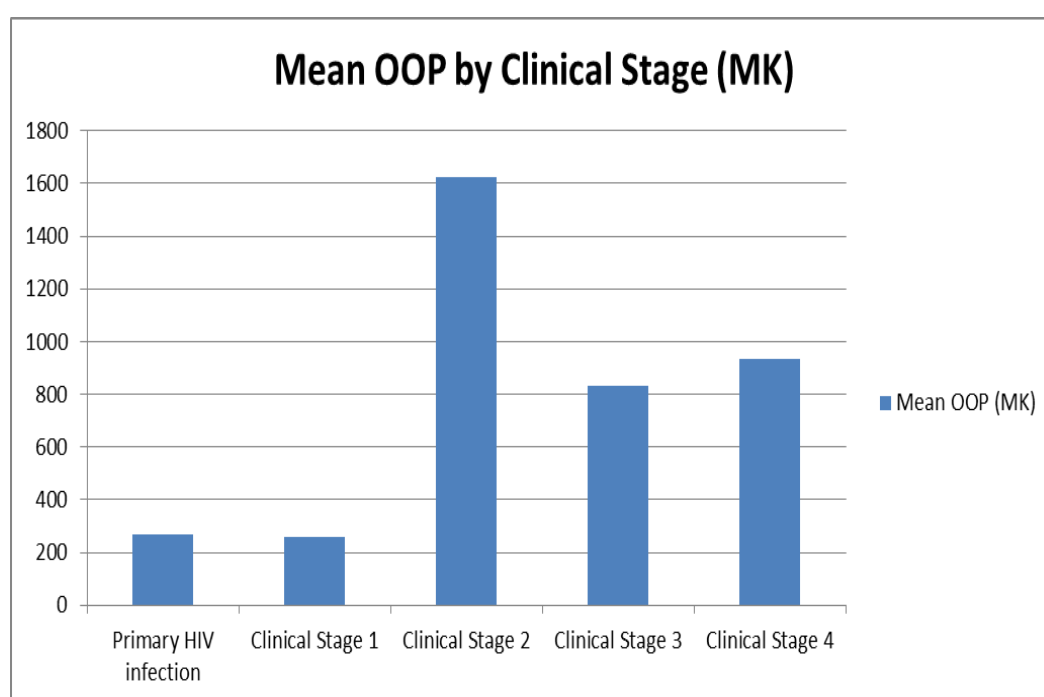
Household Location	Number of observations	Percentage	Mean Expenditure in MK (Std Deviation)
Rural	782	70.4	448.8043 (1995.795)
Urban	329	29.6	2034.754 (13180.15)
Total	1111	100	918.4509 (7393.223)

**Figure 2: Mean Out of Pocket Expenditure by location**

From Table 4, 70% of the respondents came from rural area and approximately 30% were from the urban area with the mean OOP for urban being higher at K2034.75 having a standard deviation of K13, 180.15, than that of rural which approximately K448.80 with a standard deviation of K1995.79 was. There were also regional variations reported in terms of average OOP mean expenditures. The central region recorded a higher OOP than the southern and northern regions of the country.

Table 5: Out of Pocket Healthcare Expenditure by WHO Clinical stage

Education Level	Number of observations	Mean Expenditure (MK)
Primary HIV infection	54	270.1111
Clinical Stage 1	142	260.9859
Clinical Stage 2	247	1624.105
Clinical Stage 3	559	833.4007
Clinical Stage 4	109	933.2844
Total	1111	918.4509

**Figure 3: Mean Out of Pocket Healthcare Expenditure by level of illness**

The bar chart above (Fig.4) indicates Out of pocket healthcare expenditure by clinical staging. From the fig OOP is mainly significant for PLWHA when they are in stage two of the illness. It is in this stage that a patient starts to show signs of the infection and hence incur a lot of OOP for him to mitigate the further health deterioration. From second stage to third stage there is a sharp decrease in the mean OOP and this basically may be due to high OOP that the person may have incurred at stage 2 of the illness. At stage four OOP starts to increase again and this is as a result of severity of the illness to save life.

Table 6: Mean Out of Pocket Expenditure by Education Level

Education Level	Number of observations	Percentage	Mean Expenditure (MK)
Not Educated	173	15.57	844.0462
Primary	573	51.57	454.6126
Secondary	292	26.28	1321.589
Tertiary	73	6.57	3123.041
Total	1111	100	918.4509

Figure 5.6 shows OOP by level of education one attained. Those who did not have any education represented 15.6 percent of the sample, while those with primary education were 573 representing 51.6 percent. From the sample, individuals who attained secondary education and beyond represented 26.2 percent and 6.6 percent respectively. The results show that there was a discrepancy in expenditure pattern for those who attained primary education and those who never attended any formal education. Those who never attended formal education had a higher mean OOP compared to those that attained primary education. However as one progressed through the education levels the mean OOP also increased the highest average being that of tertiary education at K3,123.04.

5.2 Double Hurdle Regression Results: The Marginal Effects

For reasons given earlier with regard to non-linearity of the model, this section presents and interprets the estimated double hurdle model marginal effects. An out of pocket expenditure was considered in this study as a continuous dependent variable with a number of independent variables examined if they influence OOP expenditure. Based on the likelihood ratio statistic, the model passes the goodness of fit test. This implies that for the model, there is at least one variable coefficient that is not equal to zero, so that the dependent variable is explained by at least some of the independent variables. The individual parameters are also tested for whether they are significantly different from zero. Here use is made of the Z statistics, presented alongside the estimated coefficients. Some parameters passed the test while some did not.

Using the double hurdle model the results had to pass through two stages. The first stage was to do with probability of participation decision whether one has to incur an out of pocket health expenditure or not (decision to participate). The second hurdle is to do with factors that determine the amount or magnitude of money the patient incur through out of pocket.

5.2.1 Participation decision

Table 7: Double Hurdle Estimation Results (Marginal Effects of Participation Decision)

	dy/dx	Std. Err.	P>z
Sex	0.0122	0.1268	0.923
Age	-0.0088*	0.0053	0.098
HHLocatn	0.1059	0.1087	0.330
Educ 2	-0.3911***	0.1152	0.001
Educ 3	-0.2716**	0.1324	0.040
HHHead	0.2860**	0.1220	0.019
Clinicalstage2	-0.1655	0.1863	0.374
Clinicalstage3	0.1190	0.1553	0.443
Clinicalstage4	0.0112	0.1387	0.936
Married	-0.0679	0.2194	0.757
Married2	-0.0662	0.2465	0.788
Wealth_index	-0.0494	0.1071	0.644
_Const	-0.5629	0.2917	0.054

***Significance at 1%,** significance at 5% , * significance at 10%

Number of Observ =1111

LR Chi2(12) =24.87, Prob>Chi2 =0.0155, Pseudo R2=0.0265, Log like
lihood= -456.06611

The marginal effects results of the double hurdle estimation above indicate that some individual level characteristics significantly influence the decision of the person living with HIV to participate in out of pocket healthcare expenditure.

Age: Age has been noted to be a statistically significant factor at 10% to influence a participation decision to spend through out of Pocket health expenditure. However as people advance in age their probability to spend through out of pocket expenditure reduces as indicated by the coefficient sign in the output above. This is an interesting result as it resonates with earlier studies that found that age has an effect on health care expenditure. It is believed that as people advance in age they are likely to give up on life easily than when they are young. So true is also the case when the individual is HIV positive and he is advancing in age. The person's probability to spend on healthcare using out of Pocket expenditure reduces by approximately 1% particularly when that individual is living with HIV.

HH Head: Being a household head is a statistically significant factor at 5% level of significance to determine participation decision to incur healthcare expenditure through out of pocket for PLWHIV. The Output coefficient indicates that being a household head increases the probability of one to spend through out of pocket by 28 percent than when that person is just any other member of the household. This also agrees to our prior expectation that being a household head may have a positive influence on OOP expenditure.

Educ.: Education level was also noted in the output to be a significant factor to determine participation decision in out of pocket healthcare expenditure. Attaining primary, secondary and tertiary education was observed to be less likely to increase probability of participating in OOP to access free healthcare. A person who has attained at least primary education may be somebody who can question some costs being charged on him because they are for free however for those that are not educated may find it difficult to seek clarification on extra payments they are being demanded to pay to access healthcare services because they feel inferior and shy to ask. As a result the probability of them paying more for free services is higher than those people that attended formal education. Furthermore this may be due to the level of understanding. The level of understanding may have a bearing as to whether the ailment requires physician attention or not and therefore have an effect on participation to incur OOP decision. The level of knowledge may affect frequency of meeting doctors and hence have an effect on participation decision to incur OOP.

5.2.2 Expenditure decision

Table 8: Double Hurdle Estimation results (Marginal Effects for Expenditure Decision)

Tobit regression	Number of Obs.	1111
	LR Chi2 (12)	31.69
	Prob >Chi2	0.0015
Log likelihood=-2148.9876	Pseudo R2	0.0073

OOP	dy/dx	Std. Err.	P>z
Sex	1050.531	2771.168	0.705
Age	-224.0564*	118.5962	0.059
HHLocatn	4986.725**	2358.797	0.035
Educ 2	-8487.804***	2560.226	0.001
Educ 3	-5216.146*	2894.601	0.072
HHHead	5440.345**	2676.034	0.042
Clinicalstage2	-4256.531	4172.255	0.308
Clinicalstage3	3789.009	3405.809	0.266
Clinicalstage4	526.1701	3065.019	0.864
Married	1012.823	4871.029	0.835
Married2	2937.025	5448.119	0.59
Wealth_index	-64.20874	2375.669	0.978
_Const	-18410.91	6561.951	0.005

*** Significance at 1%,	**Significance at 5%,	* Significance at 10%,
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Obs. Summary	945 Left censored observation at OOP<=0
	166 uncensored observations

Results from the double hurdle Stata output above indicate that the variables Age, HH Head, HH location Educ2 and Educ3 are significant variables that influence magnitude of OOP healthcare expenditure at 1 percent, 5 percent and 10 percent. The rest of the independent variables were found to be statistically insignificant.

Age: The marginal effects for healthcare expenditure through out of pocket show that age of an individual is a statistically significant factor to influence both the decision to spend through OOP and also the magnitude of healthcare OOP expenditure that an individual living with HIV can incur. Age is a statistically significant factor at 10% significance level. As an individual progresses in age he is likely to give up on the

OOP expenditure because he has given up on life and hence the reduction in OOP expenditure. The results from earlier studies show that as one progresses in age the OOP expenditure increases, however in our study results indicate that age has a disproportionate reduction in both the probability to incur OOP healthcare and magnitude of OOP expenditure by K224.05. This to an extent differs with the results in the study by Rous & Hotchkiss (2003) in which age was reported to be a positive predictor of OOP payments at all age groups except for those in age group 1-14 years.

HH Location: The location where one resides has a significant influence on the magnitude of Out of Pocket healthcare expenditure that a person living with HIV can incur. This is evident at 5 percent level of significance. This means for a person living in rural areas a discrete change from rural to urban area is likely to increase his out of pocket healthcare expenditure by K4986.73 compared to continue residing in the rural area. In view of this it means that for PLWHIV the household location has a significant influence on them incurring out of pocket expenditure. This means that for HIV patients who live in urban areas have a greater probability burden of incurring OOP than those in rural areas in absolute terms. This is agreement to findings by Rous & Hotchkiss (2003) where urban households incurred higher OOP expenditure than their rural counterparts. However, considering that the majority of the population in Malawi lives in the rural areas, in relative terms rural people may be the ones that incur proportionately a larger proportion of their incomes. This is a cause for concern since the HIV and AIDS illness is a long term condition and may graduate the poor rural patients from poverty to ultra-poverty and hence a catastrophic expenditure.

HH Head: Decision as to participate in OOP healthcare expenditure is influenced by status of being household head. Furthermore the amount of money that one spends on OOP increase by K5,440.35 when one is household head as compared to being any other member of the household. The output results show that at 5 percent level of significance being a household head has a significant influence on the amount of money that a person living with HIV can spend through out of pocket healthcare. This may infer that since most household heads are financial decision makers at household level, in the event of illness episode they prioritise their wellbeing. However, the HIV epidemic is a condition that affects people of all ages and irrespective of whether they

are household heads or not and hence this may put individuals who are not household heads at a disadvantage.

Educ: Education level of an individual was noted to have a statistical significant influence for PLWHIV to participate in out of pocket healthcare expenditure. Furthermore having attended primary school and secondary school reduces the amount that an individual living with HIV spend through OOP by K8,487.80 and K5,216.15 respectively as compared to if the individual had not attended any education at all.

5.3 Conclusion

The major objective of the present study was to establish empirically the determinants of out of pocket expenditure for PLWHIV. The study specifically wanted to establish if geographical location and individual level characteristics affect Out of Pocket healthcare expenditure for PLWHIV. There were twelve variables that were used in the model, however it has been found that only four determinants significantly affect participation decision in OOP for PLWHIV in Malawi using PLWHIV 2011 dataset. On the other hand the study found that personal characteristic like Age, being a HH Head, level of education e.g. Primary education (Educ2) significantly affect expenditure decision for PLWHIV. Furthermore geographical characteristic as to whether one lives in urban or rural area has also a statistically significant effect on the out of pocket expenditure decision for people living with HIV. According to specific objectives of the study, it has been established that mostly it is Personal characteristics that affect probability of an individual decision whether to spend or not through OOP for PLWHIV. On the other hand both geographical location and individual level characteristics have a statistical bearing on the magnitude of OOP expenditure for PLWHIV.

CHAPTER SIX

CONCLUSION AND POLICY RECOMMENDATIONS

6.1 Introduction

This chapter presents the conclusions and policy recommendations made on the findings of this study. It first presents a brief summary of the results in Section 6.1 followed by policy recommendations in section 6.2. Section 6.3 outlines the limitations of the study and suggestions for areas of further study.

6.2 Conclusion

The major objective of the study was to empirically establish the determinants of Out of pocket healthcare expenditure for people living with HIV. This choice was made because despite government policy for HIV/AIDS patients to receive free ART they still incur expenditures related to the illness which are not covered by the government. This consequently has the potential to impoverish people.

The results of the study have shown that in Malawi there are several geographic as well as individual level factors that have a substantial effect on OOP for people living with HIV. These are; Age, being a household head, education level of the patient and household location (rural or urban). From the study results household location, education level and being household head are significant factors that determine how much a patient should spend through OOP. Although the study managed to explain the individual and geographic factors that determine magnitude of OOP healthcare expenditure, it showed that it is only the individual level factors that influences participation decision to incur OOP.

The findings of this study therefore mean that we reject most of the null hypothesis that this study sought to test. That is, geographical location (Urban or rural) does not affect OOP for PLWHIV and individual level characteristics do not affect OOP for PLWHIV. However, geographical location affects the magnitude of healthcare expenditure for PLWHIV. Similarly individual characteristics like age, household

location, being household head and attainment of primary level education level have significant effect on the magnitude of healthcare expenditure.

6.3 Policy recommendations

Based on the summary of findings, a number of policy options can be drawn since some individual and geographical variables have been found to be significantly affecting the magnitude of out of pocket healthcare expenditure for people living with HIV.

Firstly, HH Location (area of residence being rural or urban) has significant effect on the OOP healthcare expenditure. This may suggest rural and urban disparities in the accessibility and availability of ART clinics. Although the results indicate that living in urban area increases OOP for PLWHIV but proportionately those that live in rural areas face more hurdles to access ART clinics and hence their OOP transport expenditure is high. The government and other service providers (NGOs, religious institutions) may endeavor to improve on distribution of ART clinics, health facilities, human resources and necessary infrastructure among other things in order to facilitate easy access to medication and health services for PLWHIV especially for the rural women. The government and other stakeholders may also further consider integrating ART services into the main health services since high OOP healthcare expenditure in urban areas may be due to ART clients being shy to be seen to be frequenting ART clinics and hence opt for OOP expenditure than free services that are perceived to be discriminatory.

Secondly, HH Head was seen to be statistically significant to influence OOP healthcare expenditure. This may suggest that for households that are headed by women or children the burden may be huge since the national patterns in Malawi indicate that most women are disadvantage in terms of access to resources. The government and other policy makers may thus consider introducing safety nets to child headed families and women headed families where the household head is infected with the virus.

Lastly, Educ2 and Educ3 are significant factors at 5% and 10% significant levels respectively. Level of education that an ART client has may have an effect on utilization of ART services. The government should ensure that civic education on utilization of health services particularly HIV services are provided to all levels of education to make sure compliance of medication. As seen in the study results individuals with lower education levels had reduced OOP expenditure compared to those with higher education levels.

6.4 Limitations of the study and suggestions for future research

Although it is hoped that the study will help inform policy regarding the ways in which access and equity to health care for people living with HIV can be improved, it is important to keep in mind a number of weaknesses pertaining to the data and methodology when the results in this paper are considered.

Firstly, the main limitation of the study is that OOP payments as reported by respondents were subjected to memory bias and self-reporting. Some respondents may have under or overestimated the costs they incurred for an illness episode and hence making it difficult to verify actual costs in the absence of medical bills and patients medical records.

Secondly, the study would have made more sense if we included a patient's income or expenditure variable so that issues to do with income level relationship to OOP could be established. This would have even helped to evaluate if OOP payments made by PLWHIV could lead to catastrophic payments. However, due to limitations of the dataset we were unable to isolate variables that are proxy to or are direct to either individual or household income.

The other limitation is that the data was collected from PLWHIV during their visits to ART clinics; thus the sample might exclude patient groups who did not have access to healthcare services, for example those who were severely ill and stayed at home or those that did not have resources to travel to ART clinics to access treatment.

In the light of the above shortcomings, a more comprehensive study would be required that would investigate the determinants of OOP for PLWHIV by estimating further on the possibility of such payments being catastrophic in nature. Notwithstanding the above limitations, the study contributes to the understanding of the economic impact of HIV and AIDS, and supports the development of HIV and AIDS policies in Malawi.

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