College of Business and Economics

School of Commerce

Economics Program Unit

EFFECT OF ACCESS TO HEALTH SERVICES ON POVERTY IN ETHIOPIA

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June,2022

Addis Ababa, ETHIOPIA

EFFECT OF ACCESS TO HEALTH SERVICES ON POVERTY IN ETHIOPIA

A thesis submitted to the department of economics in partial

Fulfillment for the requirements of Master of Science in Developmental Economics

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June,2022

Addis Ababa, ETHIOPIA

DECLARATION

I, the undersigned, declare that this Master's thesis paper entitled "*TheEffect of Access to Health Care Service on Poverty in Ethiopia*" is my original work prepared under the guidance of BerhanuDenu (PhD). All sources of materials used for this thesis preparation have been duly acknowledged. I also declared that this paper has not been submitted either in part or in full to any other higher learning Institution for earning degree.

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MSc in Development Economics

Effect of Access to health service on poverty In Ethiopia

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ACKNOWLEDGEMENTS

I am very grateful and thankful to God for according me good state of health and energy during the entire MSC study period. I am grateful for invaluable comments and guidance received from my adviser Dr. BerhanuDenu. Lastly, I also appreciate my parents and brothers for the support and encouragement during my study.

ABBREVIATION AND ACRONYMS

CBHI	COMMUNITY-BASED HEALTH INSURANCE
CPR	CONTRACEPTIVE PREVALENCE RATE
CSA	CENTRAL STATISTICAL AGENCY
EDHS	ETHIOPIAN DEMOGRAPHIC AND HEALTH SURVEY
MDG	MILLENNIUM DEVELOPMENT GOAL
NGOS	NON-GOVERNMENTAL ORGANIZATION
NHA	NATIONAL HEALTH CARE ASSOCIATION
SHI	SOCIAL HEALTH INSURANCE
VNP	VOLUNTARY NATIONAL REVIEW

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ABSTRACT

The importance of good health cannot be under estimated. However, presence of high poverty rate can lead to lack of health care service and vice versa, thus ,poverty reduction and improvement of health care access are important in ensuring enjoyment of good health . Despite Ethiopian commitment to reduce poverty and improve health status of her citizen, poverty remained high over 22 million people are living below national poverty line. Ethiopian health indicators have also not been impressive. Infant mortality rate for instance 29.5 death per 1,000 live birth, maternal mortality rate remained high at 401 death per 100,000 live birth. This poor performance in the health indicates that the country need to address the health challenge otherwise it will miss on the developmental goal by 2030 .this study , therefor , was too investigate the relationship between access to health care and poverty in Ethiopian . The study employed non-experimental pooled cross-sectional research design. The study used Ethiopian demographic and health survey (EDHS) data collected 2005, 2011 and 2016. To achieve the main objective , the study used simultaneous regression model, the specific objective was addressed usingdescriptive analysis method .study finding showed that there was relationship between access to health care service and poverty ,increase in the access to health care service , which implies reduction in poverty , due to increased wealth , individual are able to afford health care and hence they easily access health service more and motivate individual to seek health care service from provider who give quality service lead to improved health status and make productive. Thus although Ethiopia missed some health related development Goal , if access to health service is addressed, the country can do better in its efforts to achieving the sustainable development goal and the country's development plan ,Ethiopian vision 2030 .

KEYWORDS; Access to Health Service, Poverty, Simultaneous Equation Model

Chapter 1

1. Introduction

1.1 Background of the Study

Health is fundamental human right, a valued asset and a prerequisite for improved productivity. Attaining the highest possible level of health is, therefore, one of the most important social goals worldwide. Health status of an individual household or population refers to all form of the individual household wellbeing or population health (Awliti, 2014). The main indicators of general health status at individual household level includes self-reported general health status, infant and child mortality,adult and maternal health, illness and normal activity. Other includes nutrition of children and adult hemoglobin levels and whether one is suffering an acute or chronic disease(Mwabu, 2008; Strauss& Thomas,2007).

People in poor countries tend to have less access to health services than those in better-off countries, and within countries, the poor have less access to health services. Although a lack of financial resources or information can create barriers to accessing services, the causal relationship between access to health services and poverty also runs in the other direction. When health care is needed but is delayed or not obtained, people's health worsens, which in turn leads to lost income and higher health care costs, both of which contribute to poverty. Deprivations that lead to ill health are common in developing countries, and the poor in developing countries are particularly at risk. The relationship between poverty and access to health care can be seen as part of a larger cycle, where povertyleads to ill health and ill health maintains poverty.(Riegle, A. L., & Stewart, S. D. (2013).

The relationship between poverty and health care is a common subject of research and policy, often usingdifferent definitions of poverty and health care access.Poverty is recognized as extending beyond the concept of deprivationof income or material assets. It also can be understood as the lack of freedom to lead the life people have reason to value, with people and communitiesempowered to lead healthy lives seen as both a means to overcoming poverty and an end in itself. In this context, public health and clinical health services, along with food, water, sanitation and other human assets, such as knowledge and education, can be considered necessarymaterial conditions for good health.Empowerment at the individual level affects

individual choices over healthy lifestyles and choice of health services, whereas at the community level, empowermentinvolves the securing of resources for health and health services(Mark R. Montgomery 2019).

Poverty, which manifests itself in various forms such as high mortality rate, lack of access to basic education, lack of safe drinking water, lack of main health facilities and shelter can lead to ill health (Nafula et al., 2005; Nkpoyen et al., 2014; Salihi et al, 2012). On one hand, poverty can create barriers to accessing and utilizing health services. This is because poverty may lead people not to utilize or underutilize health care. Non-utilization or underutilization of health care may in turn lead to poor health. On the other hand, poor health can lead to poverty due to higher health costs and inability or reduced ability to work hence losing income (Buddelmeyer&CAI, 2009; Gupta et al., 2007; Peters et al., 2008). Ill health can also lead to increased school absenteeism and reduced ability by children to learn when they do attend school. Reduced ability to learn and increased absenteeism by children May later in life, negatively impact their productivity levels. In turn, reduced productivity levels will affect children's health outcomes (Peters et al., 2008; Salihi et al., 2012). Thus, the vicious cycle of ill-health and poverty continues to propagate.This study therefore,explores the link between poverty and access to health services by considering the case of Ethiopia.

Access to Health Service and Poverty in Ethiopia.Over the past fifteen years, the headcount poverty rate declined by about 93 percent from 45.5 percent in 2000 to 23.5 percent in 2016. According to the Household Consumption Expenditure Survey report, between 2010/11 and 2015/16 about 5.3 million people were lifted out of poverty. Poverty gap and poverty severity indices have respectively declined from 10.1 percent and 3.9 percent in 2000 to 3.7 percent and 1.4 percent in 2016. Nonetheless poverty is still a challenge in Ethiopia as over 22 million people are living below the national poverty line. Poverty is predominantly rural phenomenon in Ethiopia. While urban headcount poverty declined from 36.9 percent in 2000 to 14.8 percent in 2016 rural poverty only declined from 45.4 percent to 25.6 percent in the same period (Mohammed S,2020).

Ethiopia's strong economic performance has been the Government's proactive and forceful role in shaping socio-economic policy. In pursuit of its goal of making Ethiopia a middle-income country by 2025, the Government has been investing heavily in economic and social

infrastructure, streamlining the public services, revamping the tax collection system, and supporting small and medium enterprises.

Ethiopia has created an enabling policy environment to effectively implement the SDGs at national and sub-national levels. Ethiopia was among the 44 voluntary countries to undertake Voluntary National Review (VNR) in 2017 and presented to the High Level Political Forum in New York in July 2017.

With wide ranging of policy intervention Ethiopia has made significant improvements in many health indicators. The country has reduced under-five mortality by two-thirds from the 1990 baseline, meeting the Millennium Development Goal (MDG) target three years ahead of the schedule; new HIV infections have gone down by more than 90%, and there has been no generalized malaria epidemic in more than 8 years. The number of malaria cases and death due to malaria has dropped by 67% and 48% respectively. Recent reports have also shown that Ethiopia has reduced maternal mortality by 72%, and the Contraceptive Prevalence Rate (CPR) increased from 29% in 2011 to 42% in 2014. These great successes are mainly due to well-coordinated, extensive efforts and intensive investment of the government, partners and the community at large to strengthen and expand the primary health care (Ethiopian Demographic health survey 2014).

According to the World Health Organization, Ethiopia's healthcare sector is financed by multiple sources including loans and donations from all over the world (46.8%), the Ethiopian Government (16.5%), out-of-pocket payments (35.8%), and others (0.9%). The country allocated $2.6 billion to health care in 2018 and of total health expenditure; approximately 15% goes to primary health care. The Ethiopian Government develops a Community-Based Health Insurance (CBHI) for the informal population since 2010 and has been trying to establish Social Health Insurance (SHI) for the formal sector as a way to achieve universal health coverage. CBHI covers near 20 million people, which makes it one of the largest health schemes in Africa.Although there is no mandate to have health insurance, the government does promote CBHI expansion. Members pay a 240 birr annual premium per household, with additional payment for adult children.The premium has a 25% subsidy from the federal government. Regional and district governments cover premiums for a small portion of households who are unable to pay.

Social Health Insurance (SHI) was planned to be fully implemented by 2014, however, the implementation has been postponed multiple times mostly due to strong resistance from public servants. Enrollment in SHI is compulsory and the proposed contribution is 3% of their salary.The insurance benefit package includes outpatient care, inpatient care, delivery services, surgical service, diagnostic tests and generic drugs. CBHI and SHI provide free-to-access care in public health facilities, reimbursed through a fee-for-service system. CBHI and SHI cover primary, secondary and tertiary care for patients following a referral system.

The diversity of socio-economic environments, climates, and terrains among regions in Ethiopia greatly impacts health conditions and outcomes. Poor health coverage is of particular concern in rural Ethiopia, where access to any type of modern health institution is limited at best. Health systems and roads are underdeveloped, and transportation problems are severe, especially during the rainy season. Almost all births take place at home in Ethiopia (94 percent) with only six percent of women delivering in a clinic or hospital. Many of these women live in remote areas that are too far from a road, let alone a health facility where they can receive emergency obstetric care. The majority of these births (61 percent) are assisted by a relative or some other untrained person and five percent are delivered without any assistance. Less than 28 percent of all Ethiopian mothers receive prenatal care from a trained doctor, nurse or midwife. The quality and frequency of this care is variable; many women receive the care either too late in their pregnancy or too few times.

Over time, the Ethiopian government has implemented various policies and initiatives aimed at addressing the challenges of health care utilization. Ethiopian Household Health Expenditure and Utilization Surveys of 2011,2014 and 2015/16, the government examined how utilization of health care has changed overtime, by investigation the changes in the indicators of health. Demand for health care services by individuals and households depends on their perception on the need for a health care.

Ethiopian ministry of health report 2018/2019 indicate ,individual household health indicators in Ethiopia are self-reported general health status, infant and child health mortality, adult and maternal health, nutrition of child, adult hemoglobin level, life expectancy and suffering an acute or chronic disease. Ethiopian Ministry of health reported, infant mortality rate 29.5 death per

1,000 live birth, child mortality rate 44 per 1,000 live birth, maternal mortality 401 death per 100,000 live birth.

Accessibility and utilization of health care depends on the availability of the services, finances and distance to the nearest health facilities. In Ethiopia, delivery of health services is done through various health care providers. The providers include government, private-for-profit and voluntary agencies such as faith based organizations (FBOs), missions and NGOs (Gakii, 2013; Kosimbei, 2005). In 2014, the main providers of outpatient services were government health facilities (77 percent), followed by private health facilities (20 percent), traditional and religious healers (2 percent), and NGOs (1 percent). This finding is consistent with those of the previous NHA. Government health facilities were used by a larger proportion of individuals living in rural areas (78 percent) than by individuals residing in urban areas (59 percent). The most frequently used types of health facility for outpatient care were government health centers (35 percent) and government health posts (26 percent).

Ethiopian government pursuit of its goal of making Ethiopian a middle-income country by 2025 , by investing heavily on economic and social infrastructure, streamlining the public service, revamping tax collection system and supporting small and medium enterprises .

Ethiopian also signed between 44 voluntary countries about 17 sustainable development goal, building on the principle of “leaving no one behind” and transfer the world in to no poverty and good health and well-being.

1.2 Statement of the problem

Health is a highly valued asset, a fundamental human right and a prerequisite for improved productivity. This right and enjoyment of good health may not be realized in the presence of high incidences of poverty. To guarantee good health to her citizens the Ethiopian government has instituted various policies. The policies are aimed at increasing health care accessibilityand,utilization, improved welfare. Despite the operation of these policies, Ethiopian individual house hold health indicators have not been impressive. Under five mortality rate was 44 death per 1,000 live birth in 2020 compared to SDG target 25 per 1,000 live birth. Maternal mortality tare remained at 401 death per 100,000 live birth in SDG target of 70 death per 100,000 live birth .if the situation continued , it is unlikely the country will meet the SDG target of access to health service and healthy individual house hold by 2030. The delay in traction is likely to hinder achievement of Ethiopian vision 2030.

Compared with making Ethiopian a middle income country by 2025 and sustainable developmental goals target of eradication of poverty by 2030, poverty still remains high over 22 million people are living below national poverty line.

Low level of access to health service experienced in the country, could explain high poverty level in the country. Low health care access could be the reason why the country has been experiencing poor health outcomes as indicated by high maternal and under five mortality rates.

Despite the limitations, the studies showed that individual from wealthier families have better health and are more likely to access health care than those from poor families (kabubo-mariara.,2010; Mutunga, 2011). Further, the studies showed that access to health service reduces probability of poor (Awiti, 2014; Nyambura, 2016). However,the finding may not be representative of the country, and hence cannot be generalized. This study filled the gap by firstly, focusing on effects of access to health care on poverty in Ethiopia. This gave a better picture of how wealth level of household in the country is affected by access to health service. Therefore, it is relevant to continuously investigate the link between access to health service and poverty.

1.3 Basic Research Questions

With the above background this study wasseek to answer the following questions:

I. What is the status of access to health care services in Ethiopia?
II. What is the distribution of health care services in Ethiopia?
III. What are the causal relationship between access to health service and poverty in Ethiopia?

1.4 Objective of the Study

I. The General Objectiveof the Study

The general objective of this study is toinvestigate the relationship between poverty and health care serves in Ethiopia.

II. The Specific Objectives:

With the above broad objective investigating the link between poverty and health care services, this study wasaddress the following specific objectives:

i. Explore the status of access to health care service in Ethiopia.
ii. Analyze the spatial and income wise distribution of health service in Ethiopia.

1.5 Hypothesis of the Study

The following results are expected from the analysis with respect to the above specific objectives:

i. Access to health services in Ethiopia is expected to be lower with some improvement overtime.
ii. Bette access to health care services is expected among those who are living in urban areas and with better income than rural and the poor part of the society.
iii. With a theoretical foundation of bi causality between poverty and health care services, in this study it is also expected to have poverty depriving people from access to health services and vice versa.

1.6 Significance of the Study

The findings of this study will benefit key government ministries, departments, and agencies both at the national and country governments, and other health sector stakeholders involved in promotion and improvement of health and fight against poverty. The findings will inform them of the causal relationship between access to health service and poverty, status and distribution of health care service. This information is intended to inform policy and planning in the health sector with an aim of ensuring better health for all Ethiopians. The study will alsocontribute to the existing knowledge on the relationship between access to health service and poverty, status and distribution of health care service in Ethiopia.

1.7 Scope of the Study

The study sought to investigate the access to health service and poverty in Ethiopia using Ethiopian Demographic and Health Survey (EDHS) data. EDHS survey was conducted in 2005, 2011 and 2016 conducted under the aegis of the Federal Ministry of Health and implemented by the Central Statistical Agency (CSA). The data in this study are nationally representative. The sample data include 14,500(2005), 16,702(2011) and 16,650(2016) households.

1.8Limitation of the study

The empirical result reported herein should be considered in the light of some limitations. Such as, Lack of previous research studies on the topic, lack of currentData.

1.9 Organization of the study

The study is organized as follows: chapter one present the background of the study,research questions, the objectives and the significance of the study. Chapter two provide a review of theoretical and empirical literatures relevant to the study chapter three presents the research design, theoretical framework, empirical models that were estimated, and data analyses estimation procedures. Chapter four presents the finding of the study with respective discussion while chapter five presents conclusion and policy implication.

Chapter 2

2. LITERATURE REVIEW

2.1 Theoretical Literature Review

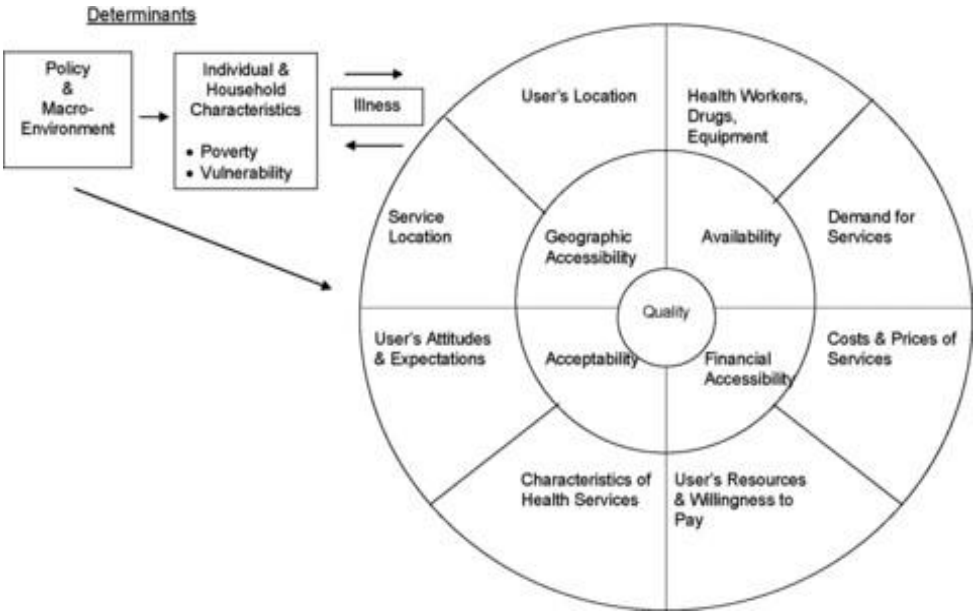
2.1.1 Conceptual definition of access to health care service

This study focused on access to health care service to some extent as result the readers should have clear understanding about the concept of access to health care service. Facilitating access is concerned with helping people to command appropriate health care resources in order to preserve or improve their health. Access is a complex concept and at least four aspects require evaluation. If services are available and there is an adequate supply of services, then the opportunity to obtain health care exists, and a population may 'have access' to services. The extent to which a population 'gains access' also depends on financial, organizational and social or cultural barriers that limit the utilization of services. Thus access measured in terms of utilizations is dependent on the affordability, physical accessibility and acceptability of services and not merely adequacy of supply. Services available must be relevant and effective if the population is to 'gain access to satisfactory health outcomes'. The availability of services, and barriers to access, have to be considered in the context of the differing perspectives, health needs and material and cultural settings of diverse groups in society. Equity of access may be measured in terms of the availability, utilization or outcomes of services. Both horizontal and vertical dimensions of equity require consideration (martin G 2002).

2.1.2 Conceptual definition of poverty (WEALTH INDEX)

The wealth index is **a composite measure of a household's cumulative living standard**. The wealth index is calculated using easy-to-collect data on a household's ownership of selected assets, such as televisions and bicycles; materials used for housing construction; and types of water access and sanitation facilities. Demographic health survey wealth index categorizes households in to five wealth quintiles, allowing to see how health differs between the poor and wealth. Wealth index is a composite measures of household's cumulative living standard. The wealth index is calculated using easy to collect data on households ownership of selected assets, such as source of drinking water, type 0f toilet facility ,type of cooking fuel, television , bicycles and materials used for housing construction . Then the wealth index calculated using principal

component analyses and the household clustered together in to lowest, second, middle fourth and higher wealth index according to the asset level of the household (EDHS 2005,2011,2016).



FIGER 1 *.Conceptual framework for assessing access to health services* (Peters, D. H. (2014)

In FIGURE 1, quality of care is at the center of thecircle of all four dimensions of access to health services,because it is an important component of each dimension and is ultimately related to the technical ability of health services to affect people's health. To the left of the circle are sets of more distal determinants of health service access, shown at the policy or macroenvironmental level, aswell as the individual and household levels. Poverty can be examined as a determinant of illness or health needs, aswell as by looking at disparities within the different dimensions of healthcare access.

A number of theories explain the relation between poverty and access to health care services. These include Neo-materialist Hypothesis, Behavioral model of health care utilization, Grossman's model of human capital, and Acton's utility maximization model of health care utilization.

I. Neo-materialist Hypothesis

The Neo-materialist hypothesis was advanced by Lynch, Smith, Kaplan, and House (2000). The hypothesis contends that differences in health among nations, regions, cities and individuals are

as a result of the level and distribution of material resources within the population (Lynch *et al*., 2000). The proponents of the hypothesis argued that how a society decides to distribute resources among its citizens is an important contributor to the quality of various social determinants of health. The neo-materialist hypothesis suggests that the effect of income inequality on health is a combination of negative exposures and lack of resources held by individuals together with under-investment in human, physical, health and social infrastructure. This argument avers that bad health could be due to increased income inequalities that reduces state spending on health care, goods and services for the poor (Drabo, 2011).

The hypothesis brings out an understanding on how income and resource distribution may affect health of individuals. It shows the importance of the government in the provision of social services such as health care and how government's actions may affect health of her citizens. This is an important policy issue, which can be of much help to policy makers in deciding on how to allocate resources if they need to influence health status of the population. However, the hypothesis does not inform the amount of resources that can influence health positively. It also ignores other channels through which income may influence health such as environmental quality (Drabo, 2011). Therefore, though distribution of material resources and society decisions to distribute resources, negative exposures and reduced government spending could be important determinants of health and health care utilization, this study did not incorporate them in the modeling framework. This is because their inclusion was beyond the scope of this study and there was possibility of data limitations especially on the negative exposures and the society's decisions on how to distribute resources among individuals.

II. Behavioral Model of Health Care Utilization

The behavioral model of health care utilization was formulated by Andersen (1968). The model aimed at demonstrating the factors that lead to the use of health services. It was developed to assist in understanding why families use health services; to define and measure equitable access to health care; and to assist in developing policies to promote equitable access to health care services (Awiti, 2014; Kimalu 2013; Kimani, 2014). The model considers an individual's use of health services to be a function of three types of factors; predisposing characteristics, enabling and need factors (Andersen, 1995). The predisposing factors are those conditions that influence people to use or not to use health services even though the conditions are not directly responsible

for use. The predisposing factors include the socio-cultural characteristics of individuals that exist prior to their illness (Andersen & Newman, 1995; 2005). The factors are based on the argument that a family's propensity to utilize health services can be predicted from a set of individual characteristics such as demographic factors, social structure, and health beliefs, which predate illness (Andersen, 1995). Demographic factors such as sex, past illness and gender represent biological imperatives suggesting the probability that individuals will need health services. Social structure is a representative of a range of factors that determine an individual's status in the society, his/her ability to deal with challenges and the resources he/she commands to deal with the challenges. Social structure includes marital status, education, religion, household size, occupation, culture, ethnicity, social networks and social interactions (Awiti, 2014; Babitsch et al., 2012; Andersen, 2005).

Health beliefs are values concerning health and illness, attitudes towards health services and knowledge that people have about disease or illness and health services (Andersen, 1995). The health beliefs might influence individual's subsequent perceptions of need and use of health services (Andersen, 1995, Kimani, 2014; Rebhan, 2011). Individuals who believe on the importance of health services are more likely to use them. Enabling factors are those conditions that facilitate or impede use of health services. The factors are based on the argument that even if individuals have a predisposition to use health services, certain resources must be in place to enable them access health services (Andersen & Newman, 2005; Andersen, 1995). Enabling factors include poverty status of an individual/household, illness level, availability of health facilities, access to health care, health insurance, health policies and other individual, family and community resources (Awiti, 2014; Kimani, 2014).

Need factors draw from a premise that for individuals to utilize health services there must be felt need from the individuals to use those services (Andersen, 1995). Need can be classified in two categories namely, perceived need and evaluated need for health services (Andersen, 1995; Kimani, 2014). Perceived need relate to how individuals perceive their general health. It includes whether or not people judge their problems to be of sufficient magnitude to warrant professional help. Evaluated need represents professional assessment and objective measurement of patient's health status and need for medical attention (Andersen, 1995; Andersen & Newman, 2005; Rebhan, 2011).

The behavioral model gives a conceptual basis for understanding human behavior especially in regard to health care utilization. The model incorporates concepts and constructs that are representative of individual behavior as well as public health and health care such as resources as discussed under enabling factors. Thus, the model gives a basis for studying relationship between poverty and health care utilization since it captures well the issues of individual behavior and resource availability (Riegle& Stewart, 2013). The model also allows the unit of analysis to be either at family or individual level. However, the model ignores an important environmental channel through, which income may affect health. Even though the model could either explain or predict use of health service, predisposing factors might be exogenous and enabling factors may be necessary but not sufficient. Therefore, assuming the presence of predisposing factors and enabling conditions, individuals must perceive sickness as a need for utilization of health services. This study sought to examine the effect of poverty on health care utilization and also on health status in Kenya. The study incorporated aspects of the behavioral model for health care utilization such as enabling factors like poverty status, and predisposing factors in order to understand how poverty affects health care utilization.

III. Grossman's Model of Human Capital

Much of the economic theory of health analysis is based on the Grossman's human capital model (Grossman, 1972; 2000; 2004). The model explains individual's health status using the human capital theory. In the Grossman's model, individuals are assumed to maximize utility through consumption of health and non-health related goods subject to given income and wealth levels. Grossman also held that individuals produce and consume their own health. In his approach, the individual chooses his level of health and, therefore, his life span.

Grossman (1972) showed that every individual inherits an initial stock of health, which depreciates with age. However, the health stock can be replenished by investments like health care, diet, and exercise. Thus, health care services are demanded in order to improve health status (Grossman, 1972; 2000). Other inputs individuals use to produce their own health include education, nutrition and lifestyle choices such as physical exercises, smoking and consumption of alcohol (Mwabu, 2007; Kimani, 2014; Namubiru, 2014). Therefore, the level of health is not treated as exogenous but depends on the amount of resources the individual allocates to the production of health. Grossman (1972; 2000) argued that health care demand differs from other

goods and services because it is a derived demand. Thus demand for health services is derived from demand for good health. Good health increases individual's productivity and the total amount of time allocated on market and non-market activities. Therefore, health demanded is a consumption good, which enters directly into the individual's utility function. It is also an investment good, which increases the number of healthy days. The increased number of healthy days allows an individual to participate in both market and non-market activities, which in turn increase their earnings.

In the theory of consumer behavior each individual has a utility function by, which various combinations of goods and services that can be purchased are ranked. The theory assumes that individuals are rational. Therefore, individuals will choose a most preferred bundle of goods and services from the feasible set of consumption bundle allowed by their budget. Thus, individuals will buy goods 50 and services that will generally increase their utility level (Grossman, 1972). The theory of human capital explains the motives for an individual to invest in human capital to raise productivity in both market and non-market sectors. The theory, therefore, highlights the role of human capital in producing earnings and commodities, which in turn feeds into the individual's utility function (Becker, 1962, Grossman, 1972, 2000). Grossman (2000) also incorporated a household production function to explain the gap between health outcomes as an output and health care as an input. Grossman stressed that some output of household production function enters directly into the utility function. Further, Grossman (2000) distinguished goods and services from commodities, by presenting commodities as a function of goods and services, and consumer time. Grossman (2000), indicated that individuals buy health services and other goods to produce health, which is a commodity. Health enters the utility function directly rather than health care being an input that enters directly into the utility function.

Despite the great theoretical and intuitive insights of the Grossman (1972) model in understanding demand for health and health care utilization it has been criticized by several researchers. For instance, the model is said to be deterministic, since it does not take into account random occurrences of illness or stochastic shocks (Hren, 2012). The model also assumes that health deterioration is due to age only. However, empirical research has shown that other factors such as lifestyle influences the deterioration of health. In the model, an individual is also assumed to have complete and perfect information about their health capital, marginal benefits of

current and future investment into health, current and future depreciation rate and interest rate, and complete insight into the health production process (Hren, 2012). The assumption of perfect knowledge is an abstraction in reality as it evades uncertainty linked to the stochastic nature of disease occurrence and the unpredictability of future health care expenses.

Further, the model simplifies the complexity of individual's health status into a binary state, which assumes the individual is either sick or healthy (Galama et al., 2012). However, as argued by Liljas (1998), a more realistic approximation can be introduced by a continuum of health states. Although the model has received some criticism since its inception, it is unique in its approach within the context of health economics to both theoretically and empirically conceptualize a complex demand for health. Also, theoretical extensions and competing models are relatively low and so, the Grossman (1972) model has remained influential in understanding demand for health and health care services.

IV. Acton's Utility Maximization Model of Health Care Demand

The theory was advanced by Acton (1975). The model extended the Grossman (1972) model by embracing the argument that time costs and other demographic factors are involved in the consumption of health care. Acton's model starts from a behavioral model of utility maximization, where utility depends on health care and the consumption of other goods. In the model, on experiencing an illness or an injury, an individual is assumed to choose among various treatment alternatives including no treatment so as to maximize utility subject to budget constraint. The individual is constrained by both monetary and non-monetary costs such as travelling and waiting time while seeking health care (Mwabu, 1993). The impact of these monetary and non-monetary costs in accessing health facilities are seen as defining the quality of a particular facility or a certain healthcare provider (Mwabu, 1993). The model concentrated on the role of monetary and non-monetary costs in determining demand for health care. The model explains that, demand for treatment in response to a particular episode of illness or injury can be modeled in terms of the provider choice. The choice of health care providers involves selecting among various available alternatives such as public, private or no care. Thus, Acton (1975) recognized the discrete nature of health care decisions in health care demand. Therefore, estimation of demand for health care calls for use of discrete choice models (Mugwila, 2005).

In the model, Acton (1975) assumed that individuals consider health care as a normal good. The implication of the assumption is that, the effect of unearned income has a positive effect on demand for health care. Further, the assumption implies that, the earned income has a negative impact on the demand for health care. This is because, in the case of unearned income, people with higher incomes buy more of normal goods. However, in the case of earned income, the increase in wages raise income and the opportunity cost of time, which increases the time cost component of consumption activities. Consequently, goods and services that require relatively large commitments of time for them to be consumed become more expensive and, therefore, substituted by other goods and services, which require less time. The major advantage of Acton‟s model is its simplicity in application and appreciation of other demographic variables in determining demand for health care. The model also gives a theoretical basis for analysis of discrete choice models. However, the model ignores the role of health need. It also fails to acknowledge that, health care has a derived demand for good health, which should enter the utility function directly. Further, the direct inclusion of time is not logical, since it violates the household production theory, where time enters the budget constraint. This is because, in the household production theory, a household is seen as a production unit, which combines its own time with market purchased goods to produce pleasure giving commodities such as health.

However, despite, the model's limitations, it gives the theoretical foundation for analyzing how individuals choose health care providers, which requires use of discrete choice models (Mugwila, 2005). The model, therefore, gives a starting point for this study. The current study did not include health care services directly into the utility function but through the health care production function. This is because, the study appreciates that health care has a derived demand for good health (Grossman, 2000). Thus, health care can only enter the utility function through the health demand function. This study also did not incorporate time used in production of health, although it is an important variable in production of health. This is because incorporation of time costs was beyond the scope of this study, and also data on time costs was not readily available.

2.1 Empirical Literature Review

Theempirical investigation regarding the link between health care access and poverty conducted in different countries .Study conducted in new York ,Urban poverty and health service in

developing country Unlike the wealthier residents of cities and towns, the urban poor live in health environments that are often little better than the environments of rural villages. Many of the poor live in slums, where they are subjected to a barrage of health threats, but other poor urbanites are dispersed across a variety of neighborhoods. Geographic targeting may be an effective health strategy for reaching slum dwellers, but other approaches will need to be devised to meet the needs of the poor who live outside slums. The health needs of small-city residents—who account for the vast majority of urban dwellers—cannot continue to be neglected. (Mark R. Montgomery .2009)

Sinnatburia study the nexus among poverty , economic growth , employment and dependency ration in developing country and conclude that age dependency ratio significantly affect the poverty and has positive association with poverty . Similarly, poverty as an independent variable has had significant and positive association with age dependent ration. The impact of poverty on age dependency ratio is also relatively very high (Sinnathurai, V 2013).

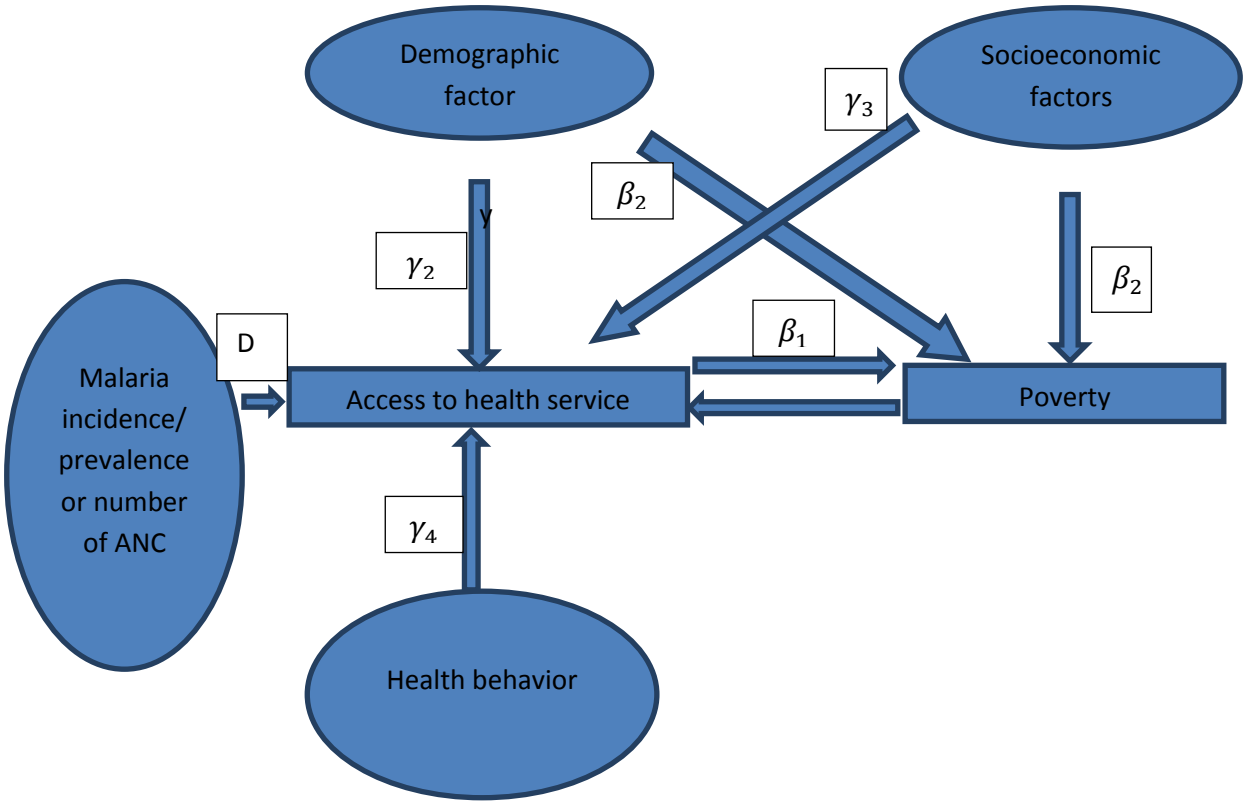
Japheth 2006 found the link between poverty and health care demand in Kenya that poverty has a negative effect on the demand for modern health care services, other factors held constant. In other words, poor individuals have a less likelihood of consulting modern health care providers when ill compared to their non–poor counterparts, holding other determinants of health care provider choice constant. (Awiti, J. O. (2014).

Study conducted 2010 in Nigeria the health of individual members of the family is the wealth of the nation asvirile and productive labor force will be available for sustainable development. Poverty has robbed the nation of this opportunity of maintaining a healthy population to create wealth because over 70% of the population of Nigeria cannot afford the luxury of health care services. Since poverty has an inverse relationship with health care, the two socio-economic phenomena must be vital in determining the well – being and survival of man in his environment. The health component in any development strategy is to improve the health status of the citizenry in order to maintain a virile labor force for efficient productivity. The strategy emphasizes the strengthening of preventive and curative primary health care services. The initiative should involve comprehensive health sector reform aimed largely at vitalizing the national health system and enhancing the delivery of effective, efficient, good quality and affordable health services to Nigerians.(Benedict. A 2010).

Studyconducted in Ethiopia in 2017 , this study examine the relationship between growth and poverty in Amhara national regional state of Ethiopia .the study estimate the fixed effect model using panel data from four household income, consumption and expenditure survey compiled between 1995/96 and 2010/11 by the central statistics authority (CSA) of Ethiopia. The result shows that there is a significant negative relationship between poverty and economic growth in ANRS, Ethiopia .the fixed effect estimation result shows that growth and change in inequality significantly affected the incidence of poverty in the region. The study has revealed growth contributes far more towards reducing poverty, keeping inequality constant, that the latter does to increasing poverty, holding the former constant. The study also investigated the net effect of growth on poverty. The absolute magnitude of the net elasticity of poverty to growth is smaller than that of the gross elasticity of poverty to growth, implying that some of growth effect on poverty is offset by the increase in inequality (kibrom K.2017).

Conceptual frame work

Figure. 2 Simultaneous Equation Model



Source; own creation

Chapter 3

3. RESEARCH METHODOLOGY

3.1 Research Design

The broad objective of this study was to investigate relationship between health care service and poverty with additional objectives of exploring the status of access to health care service and analyzing the distribution of health care service in Ethiopia. To achieve the objective, this study used non-experimental pooled cross-sectional research design.

3.2 Data Type and Source

In order to achieve objective of the study micro dataset obtained from the Ethiopian demographic and health survey (EDHS) pooled cross sectional data was used. Secondary source of data was used. EDHS data is a nationally representative cross-sectional data. The dataset was collected in 2005, 2011 and 2016, the survey target of women aged 15-49 and men aged 15-59 from randomly selected households. The survey covers the nine region and two administrative cities. Each region was stratified into urban and rural areas.

3.3 Data Analysis

The pooled cross sectional data once cleaned and organized to suit answering the research questions, both descriptive and inferential analysis was employed. Tables and graphs was generated to present the results. For the descriptive analysis frequency tables, central tendencies and dispersions, cross tabulations, correlation analysis, etc. were used. These methods was help to answer the two specific objectives: exploring the status of health care services and analyzing the spatial and income wise distribution of health care services in Ethiopia.

To answer the main objective of the research that was analyze the causal association between access to health services and poverty inferential analysis was used. Regression using simultaneous equation modeling was adopted. In analyzing the link between access to health services and poverty causality might run from access to poverty or vice versa. That is, low access to health services through affecting the human capital of household might result in poverty or

lower household income status. On the other hand, poverty might deprive household from access to health services.

3.4 Methods

Data for analysis was obtained from Ethiopian demographic health survey (EDHS) 2005, 2011 and 2016 conducted under the aegis of the Federal Ministry of Health and implemented by the Central Statistical Agency (CSA). Data of 2000 was excluded because the data was difference in the measurement of wealth. The EDHS uses multiple stratified random sampling with interview survey and provides a comprehensive overview of population, maternal and child health issues in Ethiopia, Which means the data in this study are nationally representative. The sample data include 14,500(2005), 16,702(2011) and 16,650(2016) households and the respondents in our analysis are households. Inferential and descriptive statistical analysis of characteristics of household surveyed are presented in the summary.

The households were selected as the unit of analysis in our research, dependent variable or endogenous variable are defined as a dichotomous variable indicating poor or not and access to health service or not. Sampled households are classified as poor or non-poor if family income is below or above 46 percentile in income distribution respectively following the classification suggested by ministry of economic development and cooperation in 1999. Control variables include demographic, socioeconomic factor, Health behavior and Health service utilization, which were identified as influencing factors in the previous studies (Jinhyunkim, 2010).

3.4.1 Model

A regression simultaneous equation model, where in selection and causation models are combined in a structural form, was constructed to analyze the effect of access to health service on poverty and vice versa. The two variables access to health service and poverty are considered as endogenous variable to be estimated by applying second structural equation with non-zero coefficient (rank condition) estimation in the model. There are also exogenous variable in the model these variable are taken as given and not influenced by other variable in the model. As a selection model indicates household poverty is hypothesized to be a function of access to health service, demographics and socio economic factors, while access to health service is hypothesized to be a function of household poverty, demographics ,socioeconomic factors,

health behavior and health service utilization according the causation model. Both models are combined in to simultaneous equation model.

3.4.1.1 Model Specification

In a system of two regressions,

$$Y_1 = \beta_1 Y_2 + \varepsilon_1 \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (1)$$

$$Y_2 = \beta_2 Y_1 + \varepsilon_2 \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (2)$$

Variables Y_1 and Y_2 are endogenous and determined within the model simultaneously. For correct identification of the causal link between the two endogenous variables equation (1) and (2) should be augmented with additional exogenous regressesand can be re-specified as:

$$Y_1 = \beta_1 Y_2 + \gamma_1 Z_1 + \varepsilon_1 \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (3)$$

$$Y_2 = \beta_2 Y_1 + \gamma_2 Z_2 + \varepsilon_2 \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (4)$$

For identification of the parameter of interest, for instance β_1 there must be an exogenous variable Z_2 which is excluded from the first structural equation (order condition) but appears in the second structural equation with non-zero coefficient (rank condition).

In this particular study, the two endogenous variables which are simultaneously beingestimated are access to health service and poverty. Therefore, the final estimation models for this study are specified as:

$$P_i = \beta_0 + \beta_1 AH_i + \beta_2 DEM + \beta_3 SEC + \varepsilon_1 \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (5)$$

$$AH_i = \gamma_0 + \gamma_1 P_i + \gamma_2 DEM + \gamma_3 SEC + \gamma_4 HB + \varepsilon_2 \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (6)$$

Where P_i and $AH_i$are poverty and access to health care service indicators of households, ε_1 and ε_2 are error terms of the respective regression equations. β, And γ are parameters that will be estimated and DEM,SEC and HB exogenous variable that determine access to health care and poverty.

Based on conceptual framework in the above figure we formulate the following poverty function and Access to health care service function.

Poverty = F (AH, DEM, SEC,)

Where AH is access to health service, DEM are Demographic factor include, SEC are Socioeconomic factors and u indicate error term capturing unobserved influence on poverty. Life – course perspective indicates that poor health in adults may be due to ill health in childhood

Access to health care service =F (P, DEM, SEC, HB,)

Where p is poverty , DEM are Demographic factor include, SEC are Socioeconomic factors , HB health behavior and v indicate error term capturing unobserved influence on access to health service . specific determinants model suggest the causal effect of socioeconomic position on health instead of selecting only effect of poverty on access to health service , through number of specific determinants including Demographic factor , Socioeconomic factors and health related behavior(Rose .M , 1981)

In this model effect of each variable on access to health service and poverty

1. Demographic factor (DEM)

In this study Demographic factor is factor that has effect on access to health and poverty related with the characteristics of household and its members.

1.1. Age effect on access to health service and poverty

In fact Age is estimated to be the most important determinant for access to health service. Younger age group are estimated to have less needs for access to health care service. In United Kingdom aging can be the reason to seek health care service or it can be a reason not to seek health care service (Macled W, 2018). Once human health physical capital is limited it can be difficult to use health care service even if the service are available (Carvaldo et.al, 2017).

The role of age in explaining the probability of a household being poor is very small once other socioeconomic aspects are considered and the most of the determinant of poverty remain the same across different age cohorts**(**Isabel P, R and Kittipong R, **2019).** Under age of 14 and above age of 65 are taken poor because they are non-productive as well as income inadequate to meet

their basic need. It is also argued that poverty increases at old age as the productivity of the individual decreases and the individual has few savings to compensate for this loss of productivity and income. This is more likely to be the case in developing countries like Ethiopia, where savings are low because of low income. However, the relationship between age and poverty might not be linear, as we would expect that incomes would be low at relatively young age, increase at middle age and then decrease again. Therefore, according to life-cycle theories we would expect to find that poverty is relatively high at young ages, decreases during middle age and then increases again at old age (Teshom k, 2014)

1.2. Sex

Accessible health care service specially for woman reproductive age prevent them from diverse health outcomes .In reproductive age women if accessing health care service is in trouble condition lead them to diverse health outcome like unwanted pregnancies, unsafe abortion , maternal and child mortality , low family planning uptake and home delivery in Ethiopia (Avasmus M, 2017). KokuSisay study also shows that in Ethiopia reproductive age women face barriers of health care access of which money and distance were the commonly perceived barriers.

According to UN data of 2020, women are more likely to assume responsibility for taking care of children, older persons and persons with disability and also European union repot at 2020 indicate women work part – time and on average spend around three times more hour on unpaid work than men, the amount of time devoted to unpaid care and household work negatively correlated with their social and pension benefits. As long-term consequence, women are more likely to experience pension poverty, receiving benefits on average 38% lower than men. Sex of household head i.e. being female (SEX) positively affects the likelihood of remaining poor(Teshom k ,2014) , other study conducted in Ethiopia by Meron (2003) found that female- headed households are poorer and more vulnerable to poverty than male- headed households in Urban Ethiopia.

1.3. Family size

Study conducted in Kenya indicatesthat small size household has more access to health care service than larger family size (Purity N, 2020).

Having children is usually found to increase the propensity of being poor, which can be explained by a higher dependency ration resulting in dilution of household economic resource (Musgrove, 1980; Schultz, 2006). The risk of being income poor for an individual living in a household with children was more than twice as high (21.1%) as for an individual living in a childless household(8.9%)(Alesio F and Nizamul I , 2017) , household size and composition can have an important on the incidence of income poverty (Jenkins, 2000) . Additional children generally increase the risk of being poor, which can be explained by lower amount of resources per capital and a higher dependency ratio, while additional adults usually reduce the risk (Musgrove, 1980; kuepie S, 2013) the presence of children may also affect poverty through a lower labor supply or human capital investment by the mother, which will reduce a mothers productivity and her family income (Aassve et al, 2006; Data Gupta and Dubey, 2006).

Study conducted in Ethiopian indicate Number of working household members/productive age (NWOR) has a potential in reducing the probability of remaining in the poor household category and also larger family size (FSZ) contribute positively to the probability of becoming a poor household for national level(Teshom k , 2014).

1.4. place of residence (location)

In this study place of residence refers to civil subdivision of the country. Study conducted in Ethiopia by AbebawAlemayiw Indicate that, in Ethiopia there are large gap in access to health service between urban and rural populations was a major motivation factor for launching the health extension programmer (HEP). Clinical curative health services provided in Ethiopia neglected the need of more than 80% of the population living in rural areas. . The target density of coverage was an average of two health extension workers for each population of 5000 people.

2. Socioeconomic factors (SEC)

Socioeconomic factor which have effect on access to health service and poverty included in the study are Education, support program, land access and income.

2.1 Family income

In economic prosperity can provide individuals access to resource to avoid or buffer exposer to health risks. Individual with higher income consistently experience better health outcomes than individual with low incomes (Berkam k, 2000).

2.2 Education

Education provides knowledge and skill of life, which will later be important to gain access to resources and information about health. not only that education provide opportunity to promote better income which will determine where you live , what you eat and the health insurance you will have , among other thing(Chiyoe et al , 2006) . Study in 2006 indicate stressed that those with higher level of education were found to be more aware of services available.

The impact of education on earning and thus on poverty works largely through the labor market, though education can also contribute to productivity in other areas, such as peasant farming (Orazem, G, 2007). In the labor market, higher wage for more educated people may result from higher productivity, but also perhaps from the fact that education may act as a signal of ability to employers, enabling the better education to obtain more lucrative jobs. Middle income countries which frequently have well developed markets for more educated labor are particular likely to see the benefits of education translated into better jobs and higher wages. (Ferreira L, 1998) Better educated people have a greater probability of being employed, are economically more productive, and therefore earn higher incomes.

Table 1. Education level and Expected Years of Schooling in Ethiopia

Education level	Expected Year of schooling
Primary school 1st cycle	4
Primary school 2nd cycle	4
Junior secondary school	2
Senior secondary general education	2
University education	3-6

Masters	2-3
Doctor of philosophy	2-3

Source: Education System in Ethiopia 2018

2.3 Support program

Support program are programs that help to improve easy access to health care service and programs that have impact to eradicate poverty.

The sustainable development goal (SDGs) by 2030 states that all people and communities everywhere in the world should have access to high quality health services. In this study supportive program done to improve access to health care service

Poverty reduction program can now found in most developing county includes microfinance and rural employment

2.4 Access to land (Property right to land)

In this study the effect of access to land on access to health care service and poverty were studied, access to land refers to the ability to use land and take advantage of other opportunities. In the sustainable livelihoods framework states that household welfare depends upon their level of cumulated assets, the type of activity in which they are involved and the context in which they develop their livelihood strategy (Carney, 1988; Ellis, 2000).

3 Health seeking behavior (HB)

Health seeking behavior is the behavior of an individual who expose themselves to have a health problems. In this study current smoking status and there effect on access to health service and poverty was studied. peoples decision on accessing a formal health system or not even if they have opportunity. Some people may not have the will to use modern health.

The grave social problem today is that socially weak members of the population are more likely to abuse the self-destructive legal and illegal drugs than those with higher incomes and better

qualifications. Consequently the socially vulnerable are leading the disease statistics in a dual sense under the motto ‘Because you are poor, you have to die sooner’ (Mielck .A 1986)

4 Distance to the health care facilities(D)

In developing countries, the effect of distance on service use becomes stronger when combined with the dearth of transportation and with poor roads, which contributes towards increase costs of visits. (Islam A, 2002, Noorali R, 1999)Availability of the transport, physical distance of the facility and time taken to reach the facility undoubtedly influence the health seeking behavior and health services utilization. (Fatimi Z, 2002) .study conducted in Pakistan indicate the distance separating patients and clients from the nearest health facility has been remarked as an important barrier to use, particularly in rural areas. The long distance has even been a disincentive to seek care especially in case of women who would need somebody to accompany. As a result, the factor of distance gets strongly adhered to other factors such as availability of transport, total cost of one round trip and women’s restricted mobility.

This study use distance to main road facility health facility as exogenous variable which access to health service in the model.

Good road are essential, for

- To get health facility
- Easy distribution of medicines
- For timely transfer in case of emergency

Long distances entail higher cost of transport, it specifies that cost includes hiring a vehicle and drivers, fuel expenses and the opportunity cost of the person accompanying the patient (Adesiji k 2012). But for this study it is difficult to get indicators that capture the distance to health care facilities. Hjorstsberg (2003) captures indirectly the quantity of petrol/ diesel used in all vehicles in the country, as a proxy for the distance between the health care facilities and patient location. But it misses to capture for fact that most of our country people walk to go to the health care service.

As discussed above, poverty is dummy variable that equals 1 if family income falls below the 46 percentile in income distribution. Access to health service is a dummy variable that equals 1 if

self-assessed access to health service is very good or good, and 0 otherwise. Age represents the age of household members. Family size represents the number of total household Members. Income source is the number of earners in household. Elderly represents the number of house members older than 60. Family income is measured by total amounts from all income sources. Other control variable such as sex, place of residence, education level, social class, health behavior, and health service utilization are dummy variable that equals 1 if they are women ,rural , more than college level, currently smoking , and experienced disruption of treatment , respectively , as a base.

Chapter 4

4. RESULTS AND DISCUSSIONS

This section presents the result of the study .we first show the definition of variable and then the descriptive statistics. The unit of analysis is the individual household member.

Table 2: variable Definition

Variable	Definition
Wealth – Poverty Level	Composite measures of household cumulative living standard and 1-poorest, 2-poor, 3-middle , 4-richer, 5-richest
Heal Facility Visit	1 if the woman visited a health facility in the past 12 month for the treatment of herself or her child, 0 if the women doesn't have visit
No. of Antenatal Visits	Number of Women receive antenatal care (pregnant women more likely to have their blood pressure, blood sample taken than to have their urine sample or nutritional counselling) before delivery.
Attended Birth	1 if Birth attended by health professionals past five years before each year of the survey, 0 if not
Female dummy	1 for male and 0 for female.
HH Head's Age	Age of the head of the household
HH Head's Education	Education level of the head of the household
HH Size	Number of members in house hold
Rural dummy	1for rural and 0 for urban

Source: own computation

4.1. Descriptive Analysis

Table 3 below shows the descriptive statistics derived from the data and summary of main variable that were used. The statistics include number of observation, mean, standard deviation and range of variable.

Table 3: Summary Statistics of Main Variables

	Number of Observation.	Mean	Standard deviation	Minimum	Maximum
Wealth – Poverty Level	77454	3.22	1.62	1.00	5.00
Heal Facility Visit	61940	0.37	0.48	0.00	1.00
No. of Antenatal Visits	28627	2.12	2.59	0.00	24.00
Attended Birth	28727	0.27	0.45	0.00	1.00
Female dummy	77454	0.30	0.46	0.00	1.00
HH Head's Age	77432	44.40	15.68	9.00	97.00
HH Head's Educ	77167	3.50	4.88	0.00	22.00
HH Size	77454	5.07	2.64	1.00	22.00
Rural dummy	77454	0.67	0.47	0.00	1.00

***Source*: Author's computation, study data 2005, 2011, 2016.**

Table 3 shows that household size range from 1 to 22 members with a mean of six members and a deviation of three members. These statistics finding about household size correspond with finding of Peter (2019) ON Kenya who respond an average of household size 5.42 with a deviation of 2.62 and a maximum number of household members of 22.

Age of individual covered in the survey ranged between 9 and 99 years old with a mean of 44.40 and a deviation of 15.68. This implies on average, those in the sample were the youth and those in their most productive age. These were indicated in the study conducted in Ethiopia in 2014 indicate that under the age of 14 and above age of 65 are taken poor because they are non-productive as well as income inadequate to meet their basic needs.

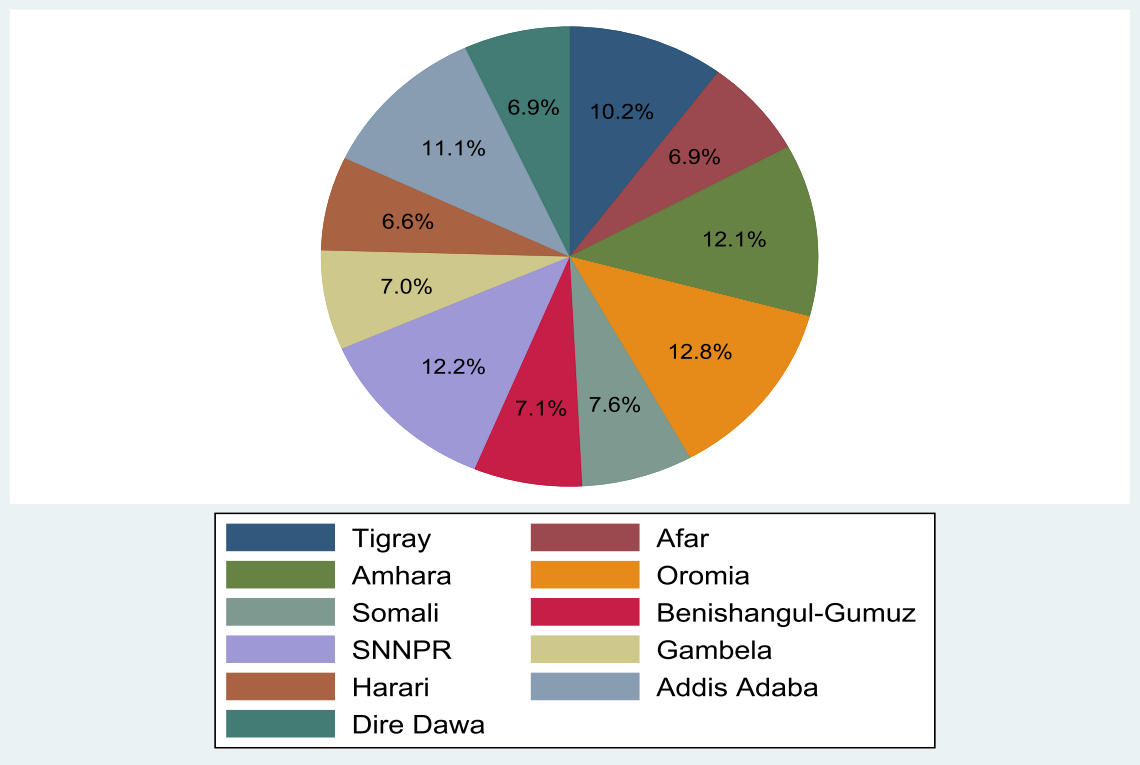
In terms of health facility visits, the number of facility visit range between 0 and 1 visits with a mean of 0.37 visit and deviation of 0.48 visits, thus. From sampled individual 37% individual visits. This could mean that after visits individual got wee. Alternatively, it could imply that people stop going for health care due to other engagements even if they are unwell.

Wealth index, which is a measure of the value of household assets range between 1 and 5 scores with a mean of 3.22 scores and a deviation of 1.62 score. The wealth index was calculated using

principal component analyses. The scores were then rotated for easier interpretation of result household with consideration of their assets level were clustered together in to five level to indicate the wealth levels.

The table also indicate years of household spend on education, head of the household education level in the survey range between 0 and 22 years with mean of 3.5 and deviation of 4.88. Thisshows most of student enter complete primary school implies that low level of education were found to be less aware of service availability (chiyoe, et.al 2016).

Figure 3: *RegionalDistribution of the Sample*



Source: Own computation

Figure 2 shows the regional distribution of the sample in the study, according to given data 12.8 % of the respondents from Oromia region, 10.2% from Tigray, 6.9% from Afar, 12.1 from Amhara, 7.6% from Somali, 7.1% from Benishangul, 12.2 from SNNPR, 7% from Gambela, 6.6% from Hararia and 6.6% from Afar, 11.1 from Addis Ababa and 6.9% from Dire Dawa to determine the effect of access to health service and poverty.

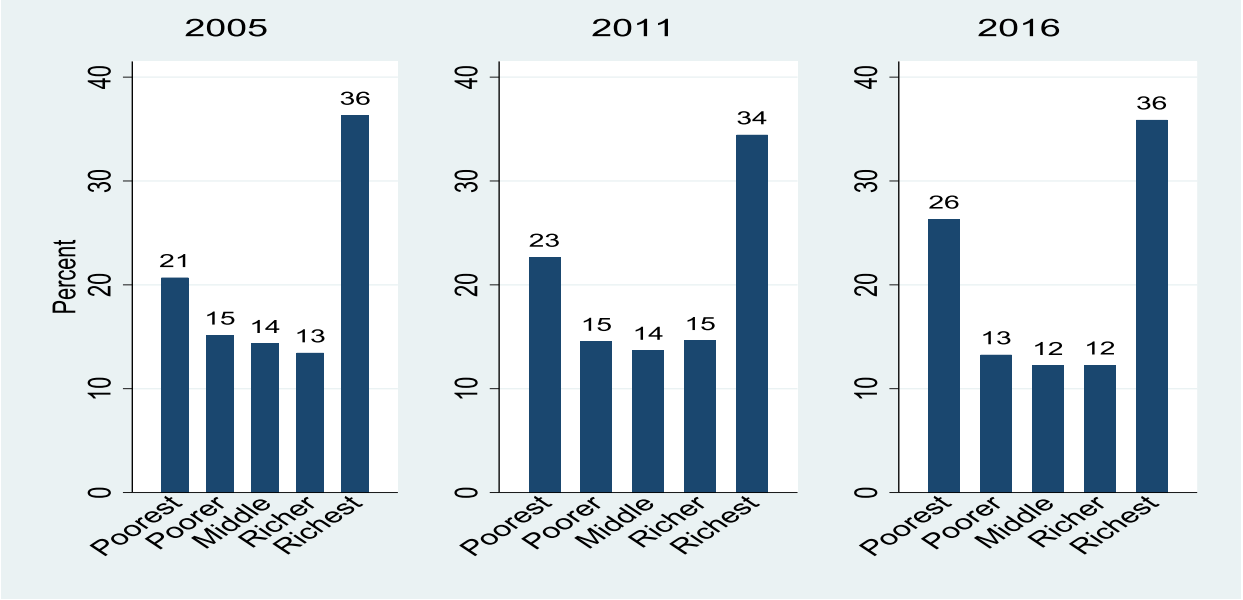
Table 4: Overall Poverty Status and Regional Distributions

Region of the respondent	wealth index combined					
	poorest	poorer	middle	richer	richest	Total
Tigray	27.94	21.12	15.29	9.88	25.76	100.00
Afar	69.77	5.16	3.20	3.07	18.80	100.00
Amhara	18.17	21.57	22.62	20.80	16.84	100.00
Oromia	16.10	20.45	19.89	21.96	21.60	100.00
Somali	60.51	8.53	6.45	7.35	17.17	100.00
Benishangul-Gumuz	26.63	20.67	19.13	18.51	15.05	100.00
SNNPR	16.36	19.83	21.98	23.48	18.36	100.00
Gambela	42.80	10.71	8.01	12.47	26.02	100.00
Harari	4.28	7.93	8.32	12.01	67.45	100.00
Addis Ababa	0.12	0.12	0.13	0.33	99.31	100.00
Dire Dawa	9.69	7.51	5.92	3.22	73.65	100.00
Total	24.13	14.03	13.08	13.16	35.60	100.00

Source: Own Estimation

Table 4 show overall poverty status of the country and regional distribution of poverty status in the country. The result in the table show that 69.77 percent of afar region and 0.12% of Addis Ababa region are poorest wealth index level. The table also 99.31 % of Addis Ababa region population are richest wealth level and 15.05 percent of Benishangul region are richest wealth index level. As the table also indicate the wealth level of the country Ethiopian was 35.6 % of individual at household lever were richest and about 24.13 percent of individual at household level were poorest wealth index condition.

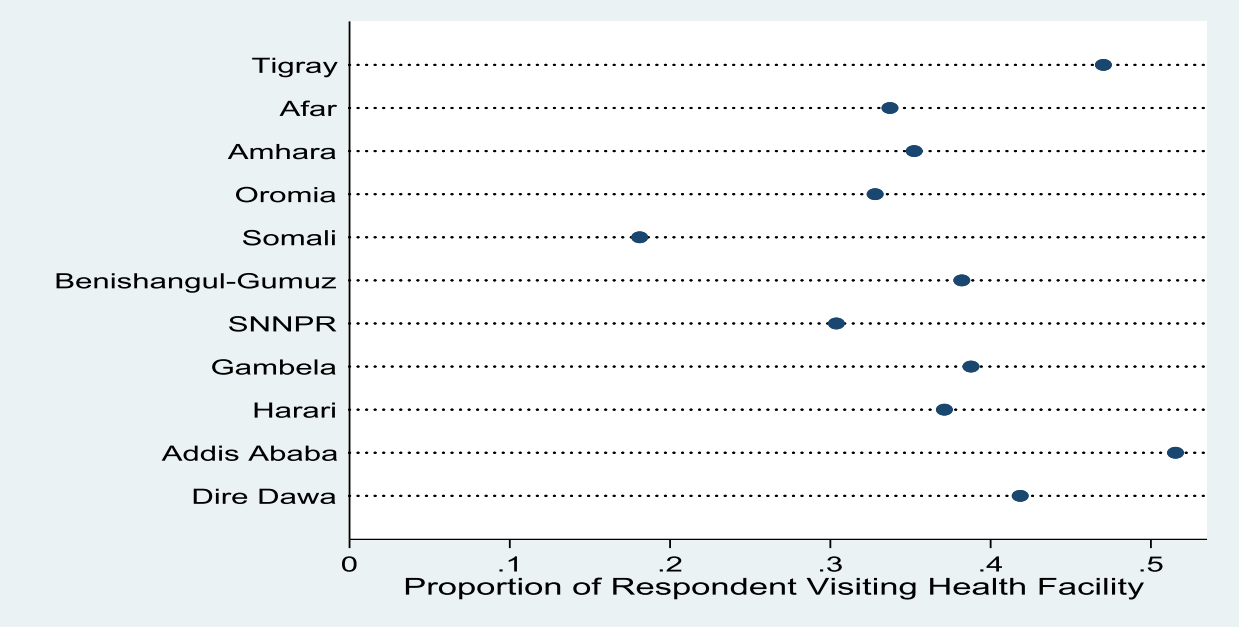
Figure 4: Changes in Poverty Status Overtime



Source: Own Estimation

Figure 3presents the change of poverty status overtime during the period of 2005, 20011 and 2016 we can observe the percent of poverty status of middle and richest wealth index at individual household level was constant throughout the change in the years but poorest household individual percent increased as change in the years.

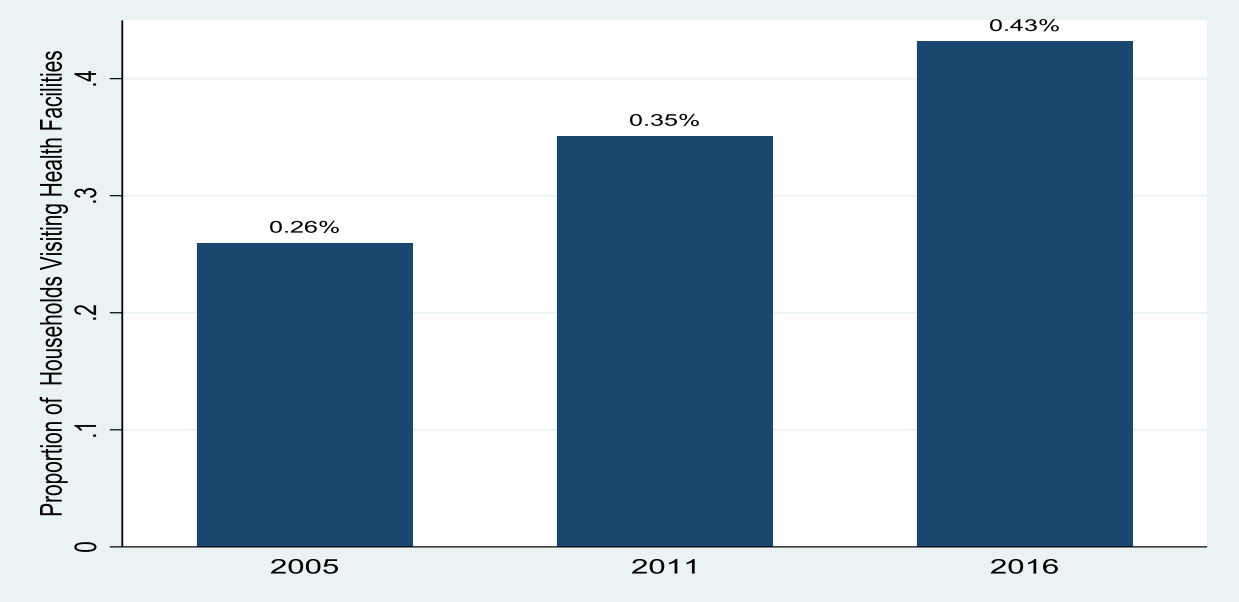
Figure 5: Distribution of Health Facility Visits across Regions



Source: Own Estimation

Figure 4 also shows that more Addis Ababa region household at the individual level visits health facility than other regions in the country, as indicated in wealth index table about 99 percent of Addis Ababa household were richest, this indicate that if the wealth condition of household increase the chance of visiting health facility were great.Somali were the second poorest region in the country and less health facility visits than other region of the country.

Figure 6: Progress in Visits of Health Facilities Overtime



Source: Own Estimation

Figure 5 shows that increased the proportion of household visiting health facility throughout the change in the years, 2005 the member's household visit health care facility indicate in the figure 0.26% in 2005 ,0.35% in 2011 and in 2016 it was about 0.43 %, this indicate visitors of health facility increased over time.

Table 5: Pairwise Correlation Analysis

	wi_pov~y	Healfv	femaled	hhage	hhedu	hhsize	rurald
wi_poverty	1.0000						
Healfv	0.1484*	1.0000					
femaled	0.0508*	-0.0125	1.0000				
hhage	-0.0598*	-0.0896*	0.0092	1.0000			
hhedu	0.4899*	0.1554*	-0.1032*	-0.3056*	1.0000		
hhsize	-0.0937*	-0.0563*	-0.2305*	0.1368*	-0.1344*	1.0000	
rurald	-0.7085*	-0.1395*	-0.1591*	0.0549*	-0.5080*	0.1546*	1.0000

Note: Star "*" represents the pairwise correlation is statistically significant at 0.1% level of significance.

Source: from Stata result

Table 5 show the correlation between variables in the study it indicate the strength and the direction of the relationship between two variables in the study. Thevalue of 1 indicates the perfect linear relationship. Correlation closed to 0 indicates no linearly relationship between the variable. The sigh of the coefficient indicate the direction of the relationship.

The variable have positive very strong in correlation if the value between 0.8 and 1, if the value between 0.6 and 0.8 strong positive correlation, if the value between 0.4and 0.6 moderate positive correlation, if the value between 0.2and 0.4 weak positive correlation, if the value between 0.2 and 0.0 very weak positive or no correlation , if the value between- 0.2 and -0.4 weak negative correlation, if the value between -0.4 and -0.6 moderate negative correlation, if the value between -0.6 and -0.8 strong negative correlation , if the value between -0.8 and -1 very strong negative correlation and value of -1 indicate perfect negative correlation between variables . So as indicated in the table 5. Household education and wealth index moderate positive correlated, as the household education level increases the wealth level of the household also increase.

Health facility visit have positive but very weak correlation with wealth index and household head education level. Health facility visit have negatively very weak correlated with rural household but negatively no relationship with household size and household head age.

Age of head of the Household have negatively very weak correlated with wealth index and health facility visit but positively very weak correlated with family size of the household.

Table 5 also shows as Household head education level have positive and moderate correlation with wealth index level of the household and education level have positive but very weak correlation with visiting health care facility , with other variable in the study education level of the head of the household have negative and weak correlation.

Household size have positive very weak correlation with age of the head of the household, other variable in the study have negatively very weak correlated with Family members.

The table 5 also indicate that there are negative and strong correlation between rural household and wealth index of the household, rural household have negative and very weak correlation with

health facility visit but it have also negative moderate correlation with household head education levels.

Table 6: Partial Correlation Analysis – Wealth - poverty level as dependent variable

Partial and semipartial correlations of wi_poverty with

Variable	Partial corr.	Semipartial corr.	Partial corr.^2	Semipartial corr.^2	Significance value
Healfv	0.0574	0.0399	0.0033	0.0016	0.0000
femaled	-0.0248	-0.0173	0.0006	0.0003	0.0000
hhage	0.0808	0.0564	0.0065	0.0032	0.0000
hhedu	0.2076	0.1476	0.0431	0.0218	0.0000
hhsize	-0.0090	-0.0063	0.0001	0.0000	0.0256
rurald	-0.5743	-0.4878	0.3298	0.2380	0.0000

Source: from Stata result

Table 6 shows the partial correlation of wealth level of poverty and other two variables in the study, while controlling the effect of other variable in the study.The table indicates that the partial and Semipartial correlation of wealth index with health facility visit, head of household education level and household family size are near 0.

The non-significance of household size tells us that in the R^2 decreases by removing household size from the model is not significant.Butremoving either of one variable result in a significant drop in the R^2 of the model.

Table 7: Partial Correlation Analysis – Health facility visits as dependent variable.

Partial and semipartial correlations of Healfv with

Variable	Partial corr.	Semipartial corr.	Partial corr.^2	Semipartial corr.^2	Significance value
wi_poverty	0.0574	0.0563	0.0033	0.0032	0.0000
femaled	-0.0395	-0.0387	0.0016	0.0015	0.0000
hhage	-0.0708	-0.0696	0.0050	0.0048	0.0000
hhedu	0.0540	0.0531	0.0029	0.0028	0.0000
hhsize	-0.0143	-0.0140	0.0002	0.0002	0.0004
rurald	-0.0374	-0.0367	0.0014	0.0013	0.0000

Source: from Stata result

Table 7 indicate that the partial and Semipartial correlation of health facility visit with wealth poverty index and head of household education level are near 0.

The non-significance of household size also tells us that in the R^2 decreases by removing household size from the model is not significant. But removing either of one variable result in a significant drop in the R^2 of the model.

4.2. **Econometric Analysis**

Table 8: Simple and Multivariate OLS Regression Results

	(1) WealthWOC	(2) WealthWC	(3) HealthWOC	(4) HealthWC
Health facility visits	0.334***	0.032***		
	(0.009)	(0.004)		
Wealth index			0.067***	0.033***
			(0.002)	(0.004)
Female dummy		0.066***		-0.055***
		(0.005)		(0.004)
HH head's age		0.007***		-0.003***
		(0.000)		(0.000)
HH head's education		0.055***		0.003***
		(0.001)		(0.001)
HH size		0.011***		0.000
		(0.001)		(0.001)
Rural dummy		-1.253***		-0.055***
		(0.008)		(0.008)
Afar		-0.343***		-0.122***
		(0.008)		(0.009)
Amhara		-0.020**		-0.101***
		(0.007)		(0.008)
Oromia		0.003		-0.135***
		(0.007)		(0.008)
Somali		-0.348***		-0.297***

		(0.010)		(0.009)
Benishangul-Gumuz		-0.100***		-0.095***
		(0.008)		(0.009)
SNNPR		-0.054***		-0.153***
		(0.007)		(0.008)
Gambela		-0.264***		-0.106***
		(0.011)		(0.010)
Harari		0.272***		-0.163***
		(0.011)		(0.010)
Addis Ababa		0.775***		-0.065***
		(0.011)		(0.010)
Diredawa		0.268***		-0.122***
		(0.011)		(0.010)
2011 dummy		-0.094***		0.093***
		(0.005)		(0.005)
2016 dummy		-0.136***		0.177***
		(0.005)		(0.005)
Constant	-0.011*	0.435***	0.363***	0.557***
	(0.005)	(0.013)	(0.002)	(0.012)
N	61940	61670	61940	61670
R^2	0.023	0.822	0.023	0.075
F	1360.701	13140.556	1358.213	318.740

Standard errors in parentheses

*p< 0.05, **p< 0.01, ***p< 0.001

For region dummies the reference category is Tigray

For the year dummies the reference category is year 2005

Source: from Stata result

Table 8 indicate that wealth index level and health facility visitors as dependent variable which predict variable below. Constant variable indicate that it predict values of WealthWOC, WealthWC, HealthWoc and HealthWC when all other variable are 0. R^2 in the table indicate that value of independent variable in model are able to explain value dependent variable , R^2 of 0.822

shows that the independent variable included in the model are able to explain 82% of the variation in wealth index level which indicate that about 18 % of wealth were explained by health facility visit(access to health service) . 7.5% of the independent variable explain access to health service but about 92.5% of wealth index level were explain the access to health care service.

Table 9: Three Stages Simultaneous Equation Estimation Result

	Coefficient	Standard Deviation
Wealth Score		
Health facility visits	3.197***	(1.135)
Female dummy	0.247***	(0.065)
HH head's age	0.017***	(0.004)
HH head's education	0.040***	(0.006)
HH size	0.013***	(0.003)
Rural dummy	-1.004***	(0.110)
Other controls	Yes	
Health facility visits		
Wealth score	0.612*	(0.346)
Female dummy	-0.098***	(0.024)
HH head's age	-0.029	(0.019)
HH head's education	-0.007***	(0.002)
HH size	-0.008*	(0.004)
Rural dummy	0.705	(0.451)
Other controls	Yes	
N	56341	
chi2	23726.462	

Source: from Stata result

Table 9 shows two sets of regression result for simultaneous equation model: poverty model and access to health care service (health facility visits) model. The first model examine the effect of health care access on poverty , while the second model provides the estimation of the effect of household poverty on access to health care service , based on 3SLSestimation and controlling for poverty and health status as endogenous variables.

POVERTY MODEL: EFFECT OF ACCESS TO HEALTH CARE SERVICE ON POVERTY.

The final estimation model for this study with result.

$$P_i = \beta_0 + \beta_1 AH_i + \beta_2 DEM + \beta_3 SEC + \varepsilon_1$$

Poverty = F (AH, DEM, SEC)

= 3.197 Access to health care + 0.017 Household head Age + 0.040 Household head spent year on education+ 0.013 Household family size

According to poverty model the coefficient of health facility visit was the positive with a magnitude of 3.197. This implies that the probability of reporting poverty (wealth index) increase by 3.197 with unit increase in health facility visits ceteris paribus. Thus, increment in access to health care service maximizes the probability of reporting wealthy. The reason could be that wealthy people are likely to report good access to health care service because they can afford to buy things that are available at health care. This could because wealthy individual have the capability and ability to purchase things needed for good health care.

The wealthy are also more likely to have more education compared to poor individual. Thus, they have information that is appropriate for promoting practices or they may lack voice that is needed to make access to health care service.

ACCESS TO HEALTH CARE SERVICE MODEL: EFFECT OF POVERTY ON ACCESS TO HEALTH CARE SERVICE.

The final estimation model for this study the result

$$AH_i = \gamma_0 + \gamma_1 P_i + \gamma_2 DEM + \gamma_3 SEC + \gamma_4 HB + \varepsilon_2$$

Access to health care service =F (P, DEM, SEC, HB,)

= 0.612 Wealth index level + (-) 0.029 Household head Age + (-) 0.007 Household head spent year on education+ (-) 0.008 Household family size

This implies that the probability of reporting health facility visits increase by 0.612 with unit increase in wealth index level ceteris paribus. Thus, increment in household wealth level maximizes the probability of reporting good access to health care service.

Overall, the two model reports presented and discussed revealed that increasing wealth increase health care access and vice versa. In this study, wealth was a proxy for poverty status. Thus, it could be argued that, decrease in poverty increased health care access and vice versa. It also indicates chis2 as with great value which indicate that model fit with the result of the study.

Chapter 5

5. CONCLUSION AND POLICY IMPLICATION

5.1 CONCLUTION

The main objective of this study has been to investigate the relationship between health care service and poverty in Ethiopia. The employed descriptive and econometrics analyses models. In descriptive analyses, summary of statistics of main variable, regional distribution of sample, over all poverty status of each region, change in poverty status over time visitors of health facility over time and distribution of health facility across region and statistics tools of analysis were used to have better understanding of the issue. The data cover under descriptive analysis were 2005, 2011 and 2016. Econometrics analysis was used to look over pairwise correlation between variables and partial correlation analyses of wealth poverty levels as dependent variable and health facility visit as dependent variable. To investigate the relationship between poverty and health care service simple and multivariate OLS regression were used.

In the model the main variable to measure access to health service was health facility visitors. Despiteimprovement of access to health service visit over time Study indicate limited access to health service in the country and also negative very weak correlation with rural household.

The result of the study led to the conclusion that there was relationship between access to health care service and poverty ,increase in the access to health care service , which implies reduction in poverty , due to increased wealth , individual are able to afford health care and hence they easily access health service more and motivate individual to seek health care service from provider who give quality service lead to improved health status and make productive, from Ethiopian it can do much better in her effort toward achieving SDGs in 2030 .

5.2 POLICY IMPLICATION

This study found that increaseaccess to health care serviceincrease the level of household wealth index. The study also establishes wealth level increased implies reduction in poverty. This study, therefore, recommend that both the country and the national government should pay attention to programs aimed to access to health care service in Ethiopia. The government should support and put more resource in the health sector, which provide access to health care, this will increase individual chance of access to health care service and maintain their health level which will increase household wealth level.

This study also found that increase in household family size , decrement in education level increase the probability of the poor wealth level, therefore, there is need for community education by the government and other stakeholders on the importance of family planning and Education .

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