The influence of gender of the household head on health expenditure in Kenya

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DECLARATION

This research is my original work and has not been presented for award of a degree in any other university.

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This research paper has been submitted to the Department of Economics, University of Nairobi, with my approval as university supervisor.

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DEDICATION

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ABBREVIATIONS AND ACRONYMS

CHE	Catastrophic Health Expenditure
ERC	Ethics Review Committee
FHH	Female Headed Households
KNH	Kenyatta National Hospital
KHHEUS	Kenya Household and Health Expenditure Survey
KNBS	Kenya National Bureau of Statistics
LMICs	Low and Middle Income Countries
MoH	Ministry of Health
MHH	Male-Headed Households
OOP	Out of Pocket
SSA	Sub-Saharan Africa
UHC	Universal Health Coverage
WHO	World Health Organization

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Abstract

Despite the growing budgetary allocation to health, the majority of the health system's funding continues to be private financing through out-of-pocket expenditure. Recognizing the household headship 'role' and the associated responsibility of the economic well-being of the household, this study used data from a recent household survey (KHHEUS 2018) to examine how the gender of the household head affects health spending in Kenya. We especially wanted to accomplish the following three goals: To examine trends in Kenyan household health spending, to investigate the factors that affect spending on healthcare in connection to the gender of the household head while controlling for covariates, and finally to provide policy suggestions based on the study's results. The approach of Ordinary Least Square Estimation was used in the investigation. We investigated significance values at 1%, 5%, and 10%. According to the study's findings, household health spending is positively correlated with a household head's age, gender, household size, work position, educational attainment, place of residence in an urban region, and proximity to a health facility. Conversely, having access to insurance, falling into a lower wealth quintile, and having at least one family member with a chronic illness all had a negative impact on health spending. Based on these findings, the study recommends that the health financing strategy be reviewed and revised to include gender-specific provisions that take into account potential inequalities and inequities caused by gender and how to mitigate them to ensure achievement of formulated UHC targets. Similarly, there should be a conscious effort made to ensure that national campaigns to increase insurance coverage are considering the unique needs of both male and female headed households. Only then can they create advocacy messages that are pertinent and targeted to respective households and thus produce the desired outcomes. The national and county governments need to work in concerted efforts to ensure reduce health expenditure at household level by continuing to avail education to all at higher levels and bringing health care services closer to the households in both rural and urban areas through construction and equipping of additional health facilities.

CHAPTER ONE:

INTRODUCTION

1.1 Background of the Study

The funding of the health system is one of the most significant variables determining the health and wellbeing of a people (Zhu et al., 2022). The World Health Organization (WHO) states that health finance is one of the health system's main responsibilities and is essential to a nation's progress toward universal health care (Cashin et al., 2017; Kieny et al., 2017; Tao et al., 2020; World Health Organization, 2020). In the Sixty-fourth World Health Assembly, in order to ensure financial risk protection and mitigate persons' poverty as a consequence of seeking care and recognizing the regressive nature of direct payments for health services, WHO urged member states to include prepayment methods of financial contributions for health (Akintoyese Oyekola et al., 2020; Badia et al., 2017; Barasa, Maina, et al., 2017a; Ota et al., 2018; WHO, 2010; Williams et al., 2020). There is a rising interest in this subject in the literature, as seen by the addition of SDG indicator 3.8.2 tracking to track the "Proportion of the population with large household expenditure on health as a share of total household expenditure or income" (Delhi, 2017; Wagstaff et al., 2020).

Globally, the number of people paying out-of-pocket for health care increased from 940 million in 2015 to 996 million in 2017 according to WHO forecasts (Aryankhesal et al., 2018; Cooper et al., 2016; Eze et al., 2022; Pandey et al., 2018; WHO, 2021; Xin Xu, PhD, Ellen E. Bishop, MS, Sara M. Kennedy, MPH, Sean A. Simpson, MA, and Terry F. Pechacek, 2015)

According to data from McIntyre et al. (2018), Sub-Saharan Africa has the greatest out-of-pocket spending, with an average of 36% of current health spending compared to 22% for the rest of the world, other authors share the same sentiments (Nkangu, M. et al, 2023; Frimpong, A. O. et al 2022). This has been associated with increased poverty rates which currently accounts for 60% of the global poor (Asante et al., 2016; World Bank Group, 2022). The rise in health expenditure is further compounded by the current high inflation rates, cost of living and global economic recession

notwithstanding the Covid 19 pandemic that has affected the source of livelihoods for many households (Aryankhesal et al., 2018; Dorjdagva et al., 2016; Eze et al., 2022; McHenga et al., 2017; WHO, 2021). This means that the majority of the households that can barely make ends meet will continue to be forced to decide between paying for health care services and other necessities (Lakdawalla et al., 2018)

Given these data and current circumstances, we posit that health expenditures will continue to rise in households unless effective measures are implemented to reverse this trend (Pan American Health Organization, 2021). The need to apply a gender lens on health financing and financial protection to accelerate the attainment of UHC has been underscored in the literature (Pan American Health Organization, 2021; Rodin, 2013; Witter et al., 2017). Gender inequities in decision making, power allocation and access to resources and allocation of the same (Badia et al., 2017; Barasa, Maina, et al., 2017a; Williams et al., 2020; Witter et al., 2017) have been perpetuated and exacerbated throughout history owing in part to inequitable access to education, with women having lower literacy level at regional (United Nations Education Social and Cultural Organization, 2019) and national levels (Kenya National Bureau of Statistics, 2014). At the global and national levels, women have been shown to have higher rates of unemployment, lower rates of participation in the paid labour market, and higher rates of participation in unpaid and domestic work than males. The ownership of assets is lower among women in Kenya (Ferrant et al., 2014; ILO, 2017; Kenya National Bureau of Statistics, 2022) and they experience greater levels of poverty than males (Onah & Govender, 2014).

According to research, when income rises, the likelihood that a greater proportion of it will be spent on out-of-pocket expenses decreases (Aryankhesal et al., 2018; Łyszczarz & Abdi, 2021; McHenga et al., 2017; Okello & Njeru, 2014). Therefore, it should come as no surprise that women have lower insurance coverage than men (Kazungu & Barasa, 2017; Kenya National Bureau of Statistics, 2014; Michael N. Onah & Govender, 2014; Witter et al., 2017) and disproportionately higher out-of-pocket expenses than men (Government of Kenya, 2018; Lambin & Nyyssölä, 2022). According to studies

(Mwenda et al., 2021; Michael N. Onah & Govender, 2014; Pan American Health Organization, 2021) the gender of the household head has a bearing on how much is spent on health care in the home.

According to WHO, health financing from Out of Pocket Expenditure (OOPE) in Kenya, as of 2019 constituted 24.3% of the Total Health Expenditure, reflecting a rise from 2018 and 2017 which were 23.37 and 23.28% respectively. (WHO, NHA & GHO data, 2022). Similar information may be found in the National Health Accounts (NHA) database, where out-of-pocket PPP per capita for the years 2017, 2018, and 2019 was 39.01, 43.32, and 50.45, respectively (WHO, n.d.). The Kenya Household Expenditure and Health Utilization Survey (KHHEUS) 2018 confirmed these findings, documenting OOP at Kes 118.2 billion shillings, an increase of 90% over the estimated OOP of 62.1 billion in 2013 (Government of Kenya, 2018). The lack of adequate financial risk protection among Kenyans—only 19.9% of the population had health insurance as of 2018 (Gov. of Kenya, 2018)—adds to the complexity of the situation.

The region is working to extend universal health coverage to the population, much like the situation in many LMICs (low and middle-income countries), and a number of initiatives have already been launched to do so (Aregbeshola & Khan, 2018; Doshmangir et al., 2021; Kaiser et al., 2023; Khan et al., 2017; Osei Afriyie et al., 2022; Piroozi et al., 2016; Sarker et al., 2017). Against this backdrop, the Kenya health financing strategy highlights 'ensuring financial risk protection' as one of its 3 top priorities (Ministry of Health, 2020). While the data shows a growth in public budgetary health allocations both at national and county levels, it conversely shows a disconcerting trend in the increase of private financing through out-of-pocket expenditure.

According to KNBS, (2019), a well-functioning household headship 'role' is associated with the responsibility of the economic well-being of the household and how resources are accessed, allocated and consumed within a household (Kishor & Neitzel, 1996; Mwenda et al., 2021). Given that Kenyan society is predominantly patriarchal, literature, for the most part typically associates the household head role with 'men'. However, in keeping with global trends, the number of Female-Headed homes

(FHH) has increased both nationally and across the continent (Mwenda et al., 2021) (Milazzo & van de Walle, 2017). FHH make up one-third of Kenyan households, according to statistics from the 2008 and 2014 censuses (KNBS, 2010, 2014).

Research has highlighted challenges and opportunities faced by both male and female headed households (Kenya National Bureau of Statistics, 2010) Yoosefi Lebni et al., 2020). There are widespread views that FHH are more vulnerable (Badia et al., 2017; Barasa, Maina, et al., 2017a; Budlender, 2003; Buvinić & Rao Gupta, 1997; Saad et al., 2022; Williams et al., 2020) and critiques have however argued against this notion, stating that there is a need to take into consideration the unique circumstances surrounding FHH.

On the one hand, FHH are cited as having a lower socio-economic status than the counterpart MHH (Bradshaw et al., 2017; Horrell & Krishnan, 2006), lower literacy levels (Appleton, 1996; Milazzo & van de Walle, 2017) lower income levels/wages attributed to in part lack of equitable access to the labor market, (Horrell & Krishnan, 2006) (Klasen et al., 2010) and fewer opportunities; a situation further compounded by lower sex and high dependency ratios which create more vulnerability in FHH (Milazzo & van de Walle, 2017). (Bradshaw et al., 2017), states that in addition to lower income levels FHH poverty levels are further exacerbated by 'gendered power' and 'time' poverty. This translates to Female Headed Households (FHH) having less access to resources and lower decision making authority over resource allocation thus the higher OOP expenditure (Onah & Govender, 2014).

On the other side, research has revealed that FHHs have helped Africa's overall rate of poverty drop (Milazzo & van de Walle, 2017), with several Sub-Saharan African nations indicating FHH to be at a lower risk of poverty in general (Aregbeshola & Khan, 2018; Bradshaw et al., 2017; Piroozi et al., 2016; Sarker et al., 2017). Research has also refuted the idea that FHHs are more likely to be poor than male-headed families. (2010) Klasen et al. According to data from Yoosefi Lebni et al. (2020), women in FHH have greater economic autonomy and decision-making freedom than those in MHH.

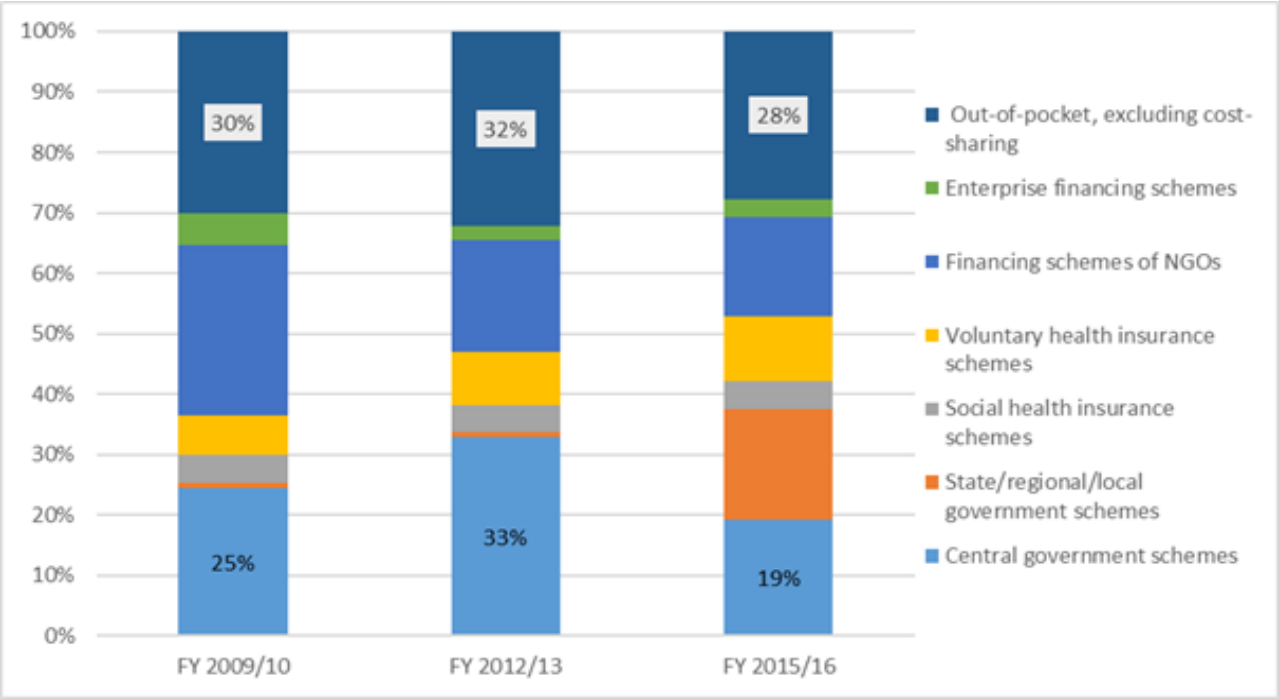
Therefore, in accordance with the preceding, it is safe to presume that the gender of the household's head influences and informs decision making associated with access to resources, utilization of resources for health and health outcomes. The overall determinants of household health expenditure households have been detailed in the literature, (Adisa, 2015; Barasa, Maina, et al., 2017a; Bhabesh & Himanshu, 2007; Chuma et al., 2007; Chuma & Maina, 2012; Ebaidalla & Ali, 2019; Eze et al., 2022; He & Zhou, 2022; Mwenda et al., 2021; Njagi et al., 2020, 2018; Njuguna, Diana, et al., 2017; Rasoulpour, 2022, 2022; Salari et al., 2019; Wu et al., 2018) however, they do not delve into how these vary in MHH and FHH, with gender only mentioned as one of the factors influencing household health expenditure.

Using data from KHHEUS 2018, this research seeks to determine the gendered determinants of household health expenditure in Male and Female headed households in Kenya. This research seeks to fill both knowledge as well as empirical gaps in gender specific data, required by researchers and policy makers to formulate and implement gender specific policies.

1.1.1 Health Financing in Kenya

Over the past few of years, there have been several changes to Kenya's health finance system. Currently, the majority of the health system's funding is private, including social health insurance and out-of-pocket family contributions (Aregbeshola & Khan, 2018; Dutta et al., 2018; Piroozi et al., 2016; Sarker et al., 2017). The health system is supported by a combination of public and private monies. The table below shows the prevalence of out-of-pocket costs in Kenya, a regressive method of paying healthcare (Munge & Briggs, 2014). Data from the KHEUSS, which indicates an increase in per capita out-of-pocket spending from Kes. 1,609 to Kes. 2,470 in 2018, further supports this trend. (Kenyan Government, 2018)...

Table 1: Trend of health financing by scheme in Kenya



Source: Adapted from National Health Accounts 2015/2016 (Ministry of Health, 2017)

1.1.2 Gender as a Key Determinant of Household Health expenditure

The World Health Organization (WHO) lists a number of traits that are thought to determine gender, including "socially created features of women and men - such as norms, roles, and connections of and between groups of women and men" (WHO, 2011, p. 79of Kenya, 2018). According to this theory, boys and girls are given different values and obligations before women and men (Dasgupta, 2016).

Household heads are an integral part of economic development as they are seen as crucial decision-making units in society (KNBS, 2016). Understanding how the gender of household heads affects access and utilization of resources in managing health outcomes is at the very core of ensuring data-driven policy formulation (Pan American Health Organization, 2021)

Gender has been positively associated with access to education, access to labour opportunities and income levels; key determinants of household health expenditure (Mwenda et al., 2021; Onah & Govender, 2014; Pan American Health Organization, 2021). Studies have shown distinct variances in access and utilization of resources for health and divergence in decision-making and risk-taking in FHH and MHH, leading to contrasts in household health expenditures. In Kenya, studies have shown

that the gender of the households' head and household health expenses are positively correlated (Mwenda et al., 2021; Onah & Govender, 2014; Pan American Health Organization, 2021), with FHH documented as incurring higher household expenditure.

To therefore homogenize the determinants of demand for health and allocation and utilization of resources in these households, would lead to formulation of ineffective and inefficient policies.

1.1.3 Household head Trends

Household heads are an integral part of economic development as they are seen as crucial decision-making units in the society (Badia et al., 2017; Barasa, Maina, et al., 2017a; KNBS, 2019; Williams et al., 2020). Previous studies have demonstrated the importance of having gender disaggregated data not only to meet SDG 5 set targets, but also to assist in the formulation and implementation of effective strategies (Onsomu, 2008; Osmani & Okunade, 2021; Pan American Health Organization, 2021). Therefore, to ensure financial protection at household level, it is imperative that we examine the homogeneity and heterogeneity of socio-economic determinants influencing household health expenditure across male and female headed households.

Given the rising trend and percentage of MHH in the globally (Milazzo & van de Walle, 2017) and within the nation, it is critical gender disaggregated data be made available to ensure gender equity and equality in policy formulation (KNBS, 2010, 2014; Mwenda et al., 2021).

1.2 Problem Statement

Over the years there has been growth in public budgetary health allocations both at national and county levels. However, there has also been a disconcerting trend in the increase of private financing through out of pocket expenditure, (Government of Kenya, 2018; Ministry of Health, 2010, 2012, 2017) which may see some households forgo much needed medical care to take care of other basic needs. Wagstaff et al., (2017), found that worldwide, 808 million people experienced catastrophic health expenditure in 2010 a rise from Kes. 588.5 and 741.3 million in 2000 and 2005 respectively. Research shows that

1 and 1.1 million Kenyans are forced into poverty as a result of out of pocket payments (Salari et al., 2019).

At the household level, the headship 'role' is associated with the responsibility of the economic well-being of the household and the way resources are accessed, allocated and utilized within a household (Kishor & Neitzel, 1996; Mwenda et al., 2021). That said, literature shows years differential access to education, equitable income, and employment opportunities between men and women, that have resulted in socio-economic differences which impact resource availability and decision making in resource utilization (Takwa, 2005). These Gender inequities have further been worsened by the Covid 19 Pandemic (WEF, 2021). Furthermore, the global gender report for 2021 ranked Kenya at 95 out of 156 (WEF, 2021) countries down from 88 in 2010 (WEF, 2008).

In Kenya, studies reveal that Female Headed Households (FHH) homes are more likely than male-headed households (MHH) to incur catastrophic health costs) (Njagi et al., 2020; Njuguna, Diana, et al., 2017). This may be attributed to widespread views that FHHs are more vulnerable than their male headed households (Budlender, 2003; Buvinić & Rao Gupta, 1997; Saad et al., 2022) due to lower education levels, lower income, and higher dependency ratios in female headed homes (Appleton, 1996; Bradshaw et al., 2017; Klasen et al., 2010; Milazzo & van de Walle, 2017). In addition, most FHHs categorized as single parent homes, widowed and characterized by higher levels of poverty than counterpart MHH (Kiringai & Mathenge, 2006).

The vast majority of the literature provides for health expenditure determinants (Attia-Konan et al., 2019; Azzani et al., 2019; Barasa, Maina, et al., 2017a; Mwenda et al., 2021; Shahraki & Ghaderi, 2021) but do not focus on the analogous or varying nature of these determinants across MHH and FHH. As a result, inefficient health financing policies devoid of a gender focus are developed and implemented. The current health financing strategy does not explicitly provide for gender specific policies aimed at financial protection across MHH and FHH (Ministry of Health, 2020).

The significance of having gender disaggregated data on household health expenditure to ensure equity and equality in the development and implementation of health financing strategies to ensure financial protection, has been highlighted in literature (Onsomu, 2008; Osmani & Okunade, 2021; Pan American Health Organization, 2021).

In light of the continent's ongoing efforts to achieve universal health care access and growing trend of FHH in Africa (Milazzo & van de Walle, 2017) and within the country (Mwenda et al., 2021), this research aims to identify and examine the factors influencing health expenditure on the basis of the gender of the household heads. These findings will guide on and add to the pool of literature advocating for the incorporation of gender considerations if equitable health financing policies are to be formulated.

1.3 Research Questions

1. What are the trends of household health expenditure in Kenya?
2. Which are the determinants of health care expenditure in relation to the gender of the Household head?
3. What policy options can we derive from the study?

1.4 Objectives

The overall aim of this study is to investigate the gendered determinants of household health expenditure, with a particular focus using recent household survey information for Kenya (2018).

1. To explore patterns of household health expenditure in Kenya using the KHHEUS 2018 data.
2. To explore the determinants of health care expenditure in relation to the gender of the Household Head while controlling for covariants.
3. To offer policy recommendation based on the stud findings.

1.5 Justification of the Study

The research will help with an in-depth understanding of how the gendered characteristics of household heads influence health expenditure in Kenya.

Through this insight, the policy makers can then formulate strategies aimed at ensuring gendered determinants are addressed to ensure equity in access and utilization of health services and goods. It will also help the government determine and prioritize areas of engagement at household and different levels of governance.

Finally, this study builds on a pool of literature that demonstrates a need to focus on gender determinants to eliminate inequality in access to health financing.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This section evaluates and summarises the body of knowledge available on the determinants of health expenditure specifically with regards to gender as a predisposing factor to level of household health expenditure. The first section focuses on the theories relevant to the research; the second section examines the empirical literature; and the third section provides a summary of the empirical literature.

2.2 Theoretical Literature

This section focuses on relevant theories to the study. The human capital model, the life cycle hypothesis and investment model of demand for health guided the research.

2.2.1 Human Capital Model

Human capital theory had a major influence on Grossman's (1972) health demand model. Since health declines over time if no investments are made in it, people spend a lot of money on healthcare, healthy eating and physical activity in order to slow the rate of depreciation. Grossmann (1972) argues that health is necessary for both consumption and investment, with the former contributing directly to an individual's utility function and the latter providing indirect satisfaction by shortening the time they spend unwell. This increases people's hours worked, increasing their income and hence their capacity to spend more on necessities like housing, education and food, all of which contribute directly to their utility function. This is similar to the theory of human capital, which argues that a rise in a one's education level raises their stock of knowledge, which in turn raises the likelihood that they will be more productive in both the market and the non-market sectors, leading to higher incomes (Grossman, 1972).

The Grossman model is based on the rule of demand, which holds that if the price of a thing goes up, people will consume less of it, all else being equal. This means that the demand for healthcare will have a negative correlation with its shadow price. Since the Kenyan health sector must pay a hefty fee to acquire numerous health inputs like pharmaceuticals, medical equipment, etc., the price of medical

services has increased, and as a consequence, fewer people are opting to use them. Since the likelihood of a person being unwell and spending more time in bed due to illness rises if he or she cannot get adequate medical support, this has an indirect impact on household consumption. Getting sick for a long period of time means missing work, which reduces production of consumer products and also reduces revenue, which might have been used to pay for other necessities at home (Grossman, 1999).

In conclusion, the Human Capital Model is a theoretical framework that explains how individuals invest in their education and training to enhance their productivity and earning potential. According to the model, those who make investments in their human capital are more likely to earn more money and have better employment possibilities than those who don't. Additionally, the model predicts that people with higher levels of human capital will likely experience better health outcomes. This is so that those who make an investment in their education and training have a higher chance of finding better-paying jobs with health insurance and as a result, are more likely to seek medical attention when necessary. The level of human capital investment, however, may differ depending on the gender of the family head. Due to factors such as gender discrimination, caregiving responsibilities, and restricted education and training opportunities women, are more likely to have lower levels of human capital investment than men.

As a result, women are likely to work in low-wage jobs that do not provide health insurance.

2.2.2 The Life Cycle Hypothesis

The life cycle hypothesis developed by Modigliani and Brumberg (1954) analysed people's retirement-age spending and saving habits. There is a disparity between what people spend and what they earn throughout their lives, according to the life cycle hypothesis; in the beginning of the life cycle, people spend more than they earn and have to borrow money to get by; in the middle of the life cycle, people earn more money and use some of it to save and pay off the debts they racked up in the beginning; and in the end of the life cycle, people earn less money due to retirement. Whereas traditional economic theory predicts an increase in national saving as the population ages, life cycle theory predicts a

decrease in saving as the population ages. According to the life cycle theory, this is because people are less likely to save for retirement when they have access to other retirement and social security benefits (Ando, Albert & Modigliani, 1963).

Individuals' spending habits must be tracked alongside their saving habits if the life cycle theory is to be believed. In general, as people age, their health systems become more complex, making them more vulnerable to illness attacks that can drag on for a long time. This is often accompanied by steadily rising medical expenses, and when combined with the fact that pension payments tend to decrease with age and may not be sufficient to cover straight healthcare costs, this can lead to a rise in dissaving in old age.

A nation's financial allocations may change as a result of an aging population, for example, if the government decides to cut back on housing programs and youth education in favour of pension and healthcare insurance programs because of the expense of caring for the elderly. It is clear that there is a connection between demographic factors like age and consumption like healthcare and income, implying that this connection should be taken into account when designing a policy framework for the elderly, and more importantly, policymakers should be aware of how life-cycle events influence consumption behaviour in old age (Banks et al., 1998).

In a word, the LCH is a hypothesis that explains how people choose their lifetime's worth of consumption. The LCH asserts that people adapt their spending habits in order to maintain a consistent quality of living throughout their lifespan. It suggests that individuals save during their working years to ensure that they have enough resources to maintain their standard of living during retirement. The LCH can be applied to healthcare expenditure by considering the different stages of an individual's life. For instance, during the early stages of life, individuals are generally healthy, and their healthcare expenditure is relatively low. As they age, their healthcare needs increase, and they spend more on healthcare. The LCH suggests that individuals save during their working years to ensure that they have enough resources to cover their healthcare needs during retirement. There is a gender-based household

difference in healthcare spending, according to studies. This implies that households with female heads spend less on health care than those with male heads. In addition to living longer than men, women are also more likely to develop chronic illnesses. However, women also typically tend to earn lower wages than men, which means that they may not have enough resources to cover their healthcare needs adequately. This makes this theory a potential candidate in the current study.

2.2.3 Andersen healthcare utilisation model

According to the model that Andersen and Newman (1973) developed, the utilisation of medical services is grounded on a mix of three diverse components. The first component that should be taken into consideration is a person's predisposing factors, which may be classified into demographic and social categories such as gender, education level, age and whether or not they are under social protection (related to health). The enabling factors that contribute to increased service utilisation make up the second component. These are income and wealth of an individual/entity (for this study it will be the wealth of the household head). Those people who are able to meet these components will have a higher purchasing power when it comes to medical services. The third component is an individual's perspective or the impact that person has on whether or not they are required to use health care. As a component of the evaluation process, individuals research and evaluate their own overall condition of health. This pertains to the functioning and symptoms of disease, as well as the necessity of seeking the support of a trained medical professional while one is ill. Health services utilisation is occasioned by a wide diversity of varying socioeconomic determinants. As such, Andersen healthcare utilisation model informs the study’s investigation on engendered factors that influence household health care expenditure in Kenya

In conclusion, the Andersen Healthcare Utilization Model provides a theoretical framework for understanding the variables that affect healthcare spending and utilization. According to the concept, there are three key elements that affect how people use healthcare: enabling factors, need factors, and predisposing factors. Predisposing factors are the person's demographic features, such as gender, age, and education level. These elements have a significant role in determining the difference in healthcare

spending between households headed by different genders. Women are more likely than males to be the head of homes with lower levels of education and income.

Examples of enabling factors that influence a person's ability to get healthcare include income, health insurance, and transportation. Understanding the effect of the head of household's gender on healthcare spending discrepancies depends in part on these characteristics. Health insurance coverage is less common among women than among males, which may restrict their access to healthcare services. Women may also shoulder additional caregiving duties, which can make it challenging for them to take time off work to access medical care.

Need factors refer to the individual's health status, such as chronic illnesses or acute conditions. These factors also contribute to the gender-headed household differential in healthcare expenditure. Women are more likely to suffer from chronic illnesses such as arthritis and depression than men. These conditions require ongoing medical care, which can be expensive and may lead to higher healthcare expenditure.

Thus the Andersen Healthcare Utilization Model provides a useful framework for understanding the gender-headed household differential in healthcare expenditure. Predisposing factors, enabling factors, and need factors all contribute to this differential. Addressing these factors requires a multi-faceted approach that involves policymakers, healthcare providers, and women themselves. By working together, we can reduce the gender-headed household differential in healthcare expenditure and guarantee access to high-quality healthcare services to everyone2.3 Empirical Literature Review

WHO estimates that the populace spending over 10% of household income on health out of pocket globally rose from 940 million to 996 million in 2015 and 2017 respectively (WHO, 2021) The report by the WHO and World Bank further indicates that SDG indicator 3.8.2 on financial protection reveals that between 2000 and 2017 the incidence on catastrophic spending increased continuously.

Data from 133 countries between 1984 and 2015 were used in a retrospective observational analysis by Wagstaff et al. (Wagstaff et al., 2018) to determine the prevalence of catastrophic health

expenditures worldwide. When survey data for the pertinent years was available, the authors used interpolation and model-based calculations to apply estimated worldwide incidence. They found that there was a rising trend in catastrophic spending, regardless of catastrophic metric utilized.

In 2000, 2005 and 2010, at 10% threshold, catastrophic spending was estimated at 588.5, 741.3 and 808.4 million globally, while Africa catastrophic spending was estimated at 70.0, 94.1 and 118.7 million representing a percentage of 11.9%, 12.7% and 14.7% of the global catastrophic spending respectively.

In a similar spirit, an article detailing the difficulties of financing UHC in SSA by (McIntyre et al., 2018) offered a summary of major study findings during the previous ten years. They discovered that Sub-Saharan Africa had the greatest out-of-pocket costs relative to the rest of the world, accounting approximately 36 percent healthcare expenditure currently. For the purpose of reversing the trend of increased out-of-pocket spending, it is essential to evaluate and develop policies that take the factors into consideration. In order to identify the determinants influencing household catastrophic health costs in both high- and low-income countries, Azzani et al. (2019) conducted a systematic review using 44 publications, the recommended reporting items for systematic reviews, and Metanalyses criteria.

These authors discovered that the CHE factors were same regardless of the designated country's economic condition. It was discovered that CHE was more likely to occur in rural households and those with lower incomes. Additionally, they discovered a link between health spending and households headed by women. Furthermore, CHE was more likely to occur in homes where the heads had poor educational levels or were unemployed. The presence of an elderly or disabled person, as well as a family member who has a chronic illness, were additional factors that made families more susceptible to CHE. Overall, the study found that low-income households worldwide were more likely to experience CHE.

These results are consistent with research done in Iran's East Azerbaijan Province using the Heckman regression model by Yousef Rasoulpour (2022) on socioeconomic factors influencing household

health expenditures. The cross-sectional study identified a positive correlation between household health expenditure and household head's, marriage status, and poor education level. The study also found that being in employment, having a household member with a chronic illness and having health insurance had positive correlation with health expenditure, however property ownership showed no significant relationship. Contrary to Azzani et al. (2019), Wu, Yu, and Nie (2018) conducted research to pinpoint the contributing factors that result in catastrophic health spending (CHE), analyse their effects, and provide recommendations for decreasing the likelihood of CHE within the framework of China's current public health insurance system. In order to determine the trend of home medical costs, the financial information from all hospitalization cases from a sample hospital in 2013 was obtained and analysed. In order to analyse the financial burden of medical services on Chinese patients and to assess the risk of CHE, the author developed a simulation model based on the country's present public health insurance system utilizing system dynamics and statistical theory. The study discovered that whether or not a patient qualifies for financial assistance under China's present public health insurance system depends on their location (urban or rural) and degree of employment. Due to differences in insurance plans and earnings between urban and rural areas, inhabitants of rural areas were far more financially susceptible during medical emergencies. Rural low-income households had a factor of more than 50% higher likelihood of having CHE.

Rasul et al., (2019), evaluated the trends of healthcare use and associated out-of-pocket expenses in Bangladesh. The research adopted a multinomial logistic regression to evaluate determinants to health care seeking decisions The study came to the conclusion that having a higher education level, being free of communicable chronic diseases, having a higher socioeconomic status, having a smaller percentage of chronic patients in a household, residing closer to a public referral health facility all enhanced the chance of getting qualified treatment. 87% of the respondents reported out-of-pocket expenses, with pharmaceuticals accounting for the highest number of overall expenditures.

Eze et al. (2022) utilized the random effects and the MetaProp Stata tool with the Freeman-Turkey double arcsine transformation in a comprehensive study to estimate the frequency and patterns of

catastrophic health spending in Sub-Saharan Africa. Similar results are shown by studies on the factors of CHE done in Sub-Saharan Africa. They found 111 articles that covered 1,040,620 households in 31 Sub-Saharan African nations, one of which was for Kenya. The study found that, on a population level, using maternal, neonatal, and child health care services and having a chronic disease were all positively connected with CHE.

Njagi et al. (2018) performed a scoping review with a focus on the breadth, variability, and root causes of catastrophic health spending in Sub-Saharan Africa. 18 papers that were among the 34 studies that were part of the systematic review focused on the factors that influence catastrophic medical spending. The findings showed a significant association between risk variables and catastrophic health expenditures. Lower income levels, presence of a chronic illness, households heads who are older, have lower education or unemployed were all factors that were positively correlated with catastrophic health expenditure. Additionally, the study discovered that households with a female head of household, those who reside in rural regions, and those who lack insurance were more likely to incur catastrophic medical expenditures.

A study was carried out in Pakistan in 2012 by Ashar-Muhammad Malik et al. to determine the factors that influence out-of-pocket spending. Data from a household survey conducted in 2004–2005 was utilized by the writers. They used OLS, or Ordinary Least Squares, to apply a multiple linear regression model. The results showed a positive correlation between health spending and the household head's literacy level, urban households, and distance from a health facility. According to the authors' findings, families with male heads were more likely to have lower health expenditures than those with female heads.

The results of research carried out in many African nations, including Cote d'Ivoire, Nigeria, Zimbabwe, and Kenya, concur with the factors identified by Njagi et al. (2018) and Eze et al. (2022) as predictors of health spending. Attia-Konan et al. examined the ratios in Abidjan, as well as in rural and urban regions, and the population's out-of-pocket (OOP) health expenditures in a 2019 research.

The anova or t-test was used in the study to examine the relationship between location of residence and out-of-pocket expenses using data from the National Institute of Statistics' 2015 regular household living survey. The findings indicated that Abidjan residents spend 1.60 and 1.50 times more than their urban and rural counterparts respectively. Hospitalization was the expenditure that cost the most money, regardless of the person's place of residence, while medication was the expenditure that was utilized the most frequently. In addition, using a generalized linear regression model, the study found that being a woman, high socioeconomic status and large household size (more than 7 individuals) substantially increased out-of-pocket health expenditures in all places of residence. In addition, being insured reduced direct payments. The existence of a chronic disease, level of education, living conditions were not deemed to be predictors of OOP.

A nationwide household cross-sectional study on the burden of out-of-pocket medical expenses in Zimbabwe was carried out by Zeng, Lannes, and Mutasa (2018). Using a logistic regression model, the authors calculated the causes of catastrophic health expenses. Findings showed that poor people utilized less inpatient care than the richer counterparts, which is significantly associated with CHE. In 2015, for instance, a quarter of overall health expenditures in Zimbabwe were household out-of-pocket expenses, whereas the proportion of families incurring CHE was around 7.6%. Similarly, when comparing the wealthy with the poor, 13.4% of the poor and 2.8% of the wealthy reported having CHE; socioeconomic status determines health care expenditure and type of health care service (Inpatient and Outpatient) to consume. In addition, a larger household size and those in urban areas were positively associated with higher Out of Pocket Health expenditure. Like Attia-Konan et al. (2019), education level was not deemed to be associated with occurrence of OOP however linked to the amount when it did occur.

In Nigeria, Adisa (2015) looked on the main causes of CHE for older households with insufficient health insurance. The 2010 Nigerian General Household Panel Survey (NGHPS), which was conducted by the National Bureau of Statistics with help from the World Bank, covered out-of-pocket expenses and self-reported health concerns.

Using probit regressions, the drivers of CHE and their marginal impacts were explored. Study results showed that 9.6% of senior homes (homes having at least one person above the age of 50), was positively associated with CHE. Poorer and smaller senior homes were especially susceptible to CHE. Families with unofficial health funding plans, however, had a decreased chance of developing CHE. The study also found that older families led by women had lower OOP levels than elderly homes headed by men, although it did not discuss the causes of these gender inequalities.

In Kenya, health and access to healthcare are two areas which continue to draw attention and concern from the public, legislators and policy makers. In 2018, after decades of consistent policy attempts, Kenya began a universal health care system, with a trial program in four counties and a full deployment throughout the country scheduled for 2022. Ilinca et al. (2019) established a comprehensive baseline assessment of socio-economic inequality and unfairness in health care usage in Kenya just before the policy introduction, with the intention of contributing to monitoring and evaluation activities alongside policy implementation they also looked at the characteristics associated with catastrophic expenditure at household level. A multilevel logistic regression analysis was used in the study to examine household traits associated with CHE. With the exception of education level, the findings indicated that characteristics of household heads were not associated with the likelihood of developing CHE. Although the effect of the household's gender was not immediately apparent, at the 10% threshold, homes with a female head had a positive correlation with developing CHE. CHE was also positively connected with having a chronically ill household member, having a high income, and residing in a rural location.

Studies that looked at the determinants of health spending used the Kenya Household Health Expenditure and Utilization Surveys (KHHEUS) from 2007, 2013, and 2018; Njagi et al. (2020), Barasa et al. (2017), and Mwenda et al. (2021) all found a positive correlation between socioeconomic status and health spending.

The socioeconomic causes of CHE disparities in Kenya and how they have changed over time were examined by Njagi et al. in 2020. Data from the 2007 and 2013 Kenya household health expenditure and utilisation surveys (KHHEUS) were used in the study. Socioeconomic differences in CHE were quantified using a concentration index, and their evolution over time and the causes of the shift were investigated using an Oaxaca-style decomposition. They used a logistic regression model to examine variables related to CHE in 2007 and 2013. Despite a decrease in the overall incidence of CHE, the findings showed that CHE disparities increased from -0.271 to -0.376 and were concentrated more heavily among the less wealthy. Inequalities in CHE were positively influenced by wealthier quintiles and employed household heads. Therefore, socioeconomic class and employment status were positively correlated with CHE. In addition, female heads, homes with a head who had a primary education and below or heads who was above 40 were all positively correlated with CHE. In addition, a household with a chronically ill member and living in the rural area were also positively correlated with CHE.

The effects of poverty and the contributing factors to the occurrence of catastrophic medical costs in Kenya were evaluated by Barasa et al. in 2017. Data from the 2013 Kenya Household Expenditure and utilization surveys was employed in the study. The study looked at parameters connected to CHE using logistic regression analysis. The authors discovered that having an older relative, an unemployed household head, a person with a chronic condition, having a poor socioeconomic position, and living in a marginalized area all increased the likelihood of encountering catastrophic medical costs.

Mwenda et al. (2021) conducted a cross-sectional study using data from the 2018 Kenya Household and Health Expenditure and Utilisation Survey to investigate the factors that influence outpatient expenditures in Kenya. The study used saddle-point approximation to estimate the starting values for generalized estimating equations under the generalized linear model (GLM). It has been found that outpatient expenditure is positively correlated with the wealth index, age, and educational attainment of the family head. While households headed by older persons and those in the richest quintiles spent

more on health care, those with a secondary or basic education spent less than those without a formal education.

Buigut, Ettarh and Amendah (2015) examined the prevalence and predictors of catastrophic health costs in Kenya's urban slum populations. The research used a dataset on inhabitants of informal settlements in Kenya, as well as the families' out-of-pocket healthcare payments to overall expenditure adjusted for by subsistence or income. A multivariate logistic regression analysis was used in the study to identify families whose out-of-pocket medical expenses were higher than a preset threshold. The results show that between 1.52 and 28.38%, CHE affects a large number of households. The likelihood of catastrophic costs is reduced by having insurance and having a large number of working residents. However, hospitalization increased the risk of CHE.

Pan American Health Organization (2021), highlight the need for gender analysis in reviewing out of pocket health expenditure patterns. The report draws on data from Nicaragua, Bolivia, Peru and Guatemala, Latin America. The report states that as of 2021, women in the 3 countries incurred higher out of pocket payments than male counterparts. It points out the importance of gender analysis and how this discourse can contribute to equitable health financing policies and strategies. The authors further underscore the significance of taking into consideration the social inequities, how they may intersect and shape how households respond and cope with Out of Pocket Expenditure (OPE). The report further explores male and female headship and impact on out-of-pocket expenditures indicating that female- headed households may not be as impoverished as documented in literature that said, the authors acknowledge that gender disparities in resource access, control and utilization of the same can contribute to poverty among children and women.

An analysis of DHS data across 25 countries (Kishor & Neitzel, 1996) found that the household headship ‘role’ is associated with the responsibility of the economic well-being of the household and the means in which resources are accessed, allocated and consumed within a household. All these factors have implications for women who are household heads. They further highlighted several

different aspects measuring women's status including education, employment, marital status and their impact to vulnerability. The effect of gender on access to health care and outcomes has been extensively recorded in research.

In Tanzania, Lambin & Nyyssölä, (2022) examined Tanzanian Policy advances and possibilities seen via a gender lens from the perspective of women of working age, with a focus on the extension of health insurance. Applying a desktop-based scoping study, the authors, drew existing literature, statistics and relevant data sources. According to the study, women and female heads are more likely to experience greater levels of poverty, participate in a disproportionate amount of unpaid and informal labour, and have less access to health care due to opportunity costs. The authors show that compared to MHHs, FHHs had higher out-of-pocket costs and catastrophic health spending. They further state that in order for the country to realise UHC there is need to ensure insurance coverage takes into consideration employment types, income groups, areas of residence and household compositions only then can they ensure women's equitable coverage.

Gender was one of the most significant determinants of demand for health care in a Nairobi slum, according to a 2008 research by Muriithi (2013). In order to determine what factors affect people's decisions to seek medical care in a Kenyan slum in Nairobi, the study utilized a multinomial logit regression model. Data were gathered for the study via focus groups and medical facilities. The findings revealed that women sought medical care at a higher rate than males did. However, more women than males went to public hospitals and clinics, suggesting that women might not have as much money to pay for care at private institutions. The study's supplementary research of health seeking behaviour in relation to facility distance found that longer distances were related with patients choosing to attend formal or informal health facilities. According to the same survey, those from higher socioeconomic classes were also more likely to go farther and spend more money doing so.

Even still, women were more likely than males to visit public hospitals and clinics, suggesting that they might not have as much money to pay for care in private institutions. The study's supplementary

investigation of health seeking behaviour in relation to facility distance found that longer distances were related with patients choosing to attend formal or informal health facilities. According to the same survey, those from higher socioeconomic classes were also more likely to go farther and spend more money doing so.

In Nigerian homes, Shagidigbi et al. (2022) looked into the relationship between empowerment, gender, and food security. The empowerment index and the nutritional variety score were utilized as stand-ins for the study's actual study variables, and Tobit and ordered probit regression models were employed to model the association. The results show that Nigeria's empowerment level is poor overall (21,63%) but significantly lower for women (11.78%) Additionally, women who resided in rural areas in the Pacific Northwest made up the bulk of those who were food insecure and disempowered. The results of the study confirm the necessity of food policy efforts that increase women's control and access to financial and productive resources. Only after that will hunger be eradicated and gender equality be achieved. According to a study by Ashagidigbi et al. (2022), gender and the employment of the family head are important factors influencing child malnutrition in Nigeria. The researchers examined the data from the Nigerian National Demographic Health Survey (NDHS) database using Z-scores, the ordered probit model, and descriptive statistics. Boys from female-headed homes in rural areas of the country's northwest region made up the bulk of the malnourished children. Therefore, Ashagidigbi et al. (2022) recommended that policies that place an emphasis on human capital and gender be implemented in order to address childhood malnutrition in Nigeria. The two studies conducted by Ashagidigbi et al. in 2022, however, did not concentrate on healthcare spending.

In disagreement, Onyango et al., (1994), in a study on household headship and child nutrition conducted in door-to-door survey in the Western region in Kenya. The research found no statistically significant difference in nutritional status between FHH and MHH.

Mrisho et al., (2007), conducted in-depth interviews, focus groups, and participant observations to gather quantitative information from the cross-sectional study of 21600 households on the variables

influencing home delivery in rural Tanzania. The multivariate analysis used generalized linear regression model to review the relationship between variables. According to the research, women who lived in families with a male household head were less likely to give birth in a medical institution. In addition, the wealth quintile, mother's level of education the mother's age at the time of childbirth, and the gender of the household head were all positively correlated to the choice of the delivery place.

There is evidence that shows women in FHH have economic empowerment and autonomy in decision making in comparison to those in MHH. A qualitative study carried out in Iran by Yoosefi Lebni et al., (2020), depicted the obstacles and possibilities faced by households headed by women in Iran. The data analysis was performed based on the method of Graneheim and Lund-man, results highlighted the fact that female headed homes experienced economic empowerment, social maturity and public participation.

A report by Milazzo et. al., (2017) titled "Women Left Behind? Poverty and Headship in Africa", examines where has been more or less female headship during a period where there has been a decline in poverty levels in the continent and whether poverty is also falling in FHHs. The report draws on micro data from suitable national household surveys from 24 countries in Africa. According to the authors there is an increase of households headed by women in the continent furthermore, poverty has been on a more rapid decline in FHH than MHH, accounting for 27% of the poverty level decrease in the continent. On overall, poverty rates are going down while the incidence of FHH is on the rise.

2.4 Overview of the Literature Review

According to studies (Hsu et al., 2018; Zeng et al., 2018), both developed and developing countries substantially rely on out-of-pocket (OOP) expenditure to fund their healthcare systems. According to research by Adisa (2015), Attia-Konan et al. (2019), Barasa et al. (2017b), Mwenda et al. (2021) and others, a number of demographic and socioeconomic factors, including gender, age, diagnosis of chronic illness in the household, and socioeconomic status, have been found to positively correlate

with the magnitude of OOPE. Due to socioeconomic considerations, CHE has a disproportionately negative impact on the poor.

Studies have shown a positive correlation between FHH and high out-of-pocket expenses, which has been associated to health access and outcomes (Lambin & Nyyssölä, 2022; Njagi et al., 2020). FHH have also been connected to children's malnutrition (Ashagidigbi et al., 2022). However, a study conducted in Kenya in 1994 by Onyango et al. disputes these findings, claiming that there was no significant difference in nutrition across the various households.

Gender has also been highlighted as a factor in resource allocation, the use of healthcare services, and the behavior of those seeking care (Muriithi, 2013; Michael Nnachebe Onah & Horton, 2018). A fact that is further confirmed by studies showing that the household head's gender has a significant impact on the uptake of maternity services (Hou & Ma, 2013; Kwambai et al., 2013;

The literature has shown that FHH have lower insurance enrolment (Kazungu & Barasa, 2017; Michael N. Onah & Govender, 2014; Witter et al., 2017), and the heterogeneity of factors influencing voluntary health insurance across MHH and FHH identified disparities on how respective households evaluated health risks and decisions to enrol in health insurance (Oraro et al., 2018)..

In addition to binary regression, multinomial logit, and ordinary least square (OLS) models, other econometric models have also been utilized. Insufficient research has been done on these determinants across MHH and FHH despite the rise in FHH in the nation (Mwenda et al., 2021) and the fact that gender-disaggregated data has been shown to be important (Onsomu, 2008; Osmani & Okunade, 2021; Pan American Health Organization, 2021). This is true even though there have been many studies outlining the determinants of health expenditure.

Therefore, this study fills this gap by exploring engendered household heads and its effects on household health expenditure in Kenya.

CHAPTER THREE: METHODOLOGY

3.1 Introduction

The analytical approach used to explain the relationship between several factors and healthcare spending is illustrated in this chapter. Both the model specification and the data source are described. Additionally, it shows how the variables are defined, measured, and spelled out.

3.2 Analytical framework

The analytical framework of this study is focused on determinants of health care expenditure in relation to the gender of the Household Head. This has been established through the healthcare utility maximization concept, inspired by the works of Mwabu (2007) and Grossman (1972). Essentially, this principle posits that individuals seek to maximize their expected future utility, taking into account both their health status and consumption (C). Given that an individual's access to necessary healthcare will influence their future health outcomes, their overall lifetime utility function can be represented as follows:

$$U = U(C, H) \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots . 1$$

The Grossman model, developed by Michael Grossman in 1972, is a widely used framework for understanding the relationship between health and healthcare expenditure. The model posits that individuals make decisions about their health based on their own preferences and constraints. These decisions include choices about healthcare utilization, such as whether to seek medical care and how much to spend on healthcare. One important factor that can influence these decisions is the gender of the household head. That is as per Grossman (1972), health depends on the investments made towards it, which is a function of medical care received and other characteristics of the individual such as age, choice of healthcare facility, among other factors, which influences the nature of health services received. This is represented as follows:

$$H = F(H_0, M) \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots . 2$$

Where, H represents the individual's health after receiving medical services, H_0 is the initial health of the individual before treatment while M is the medical care utilization say, accessibility to cancer medical care. Further, according to Grossman's theory, gender-headed households may exhibit differential patterns of healthcare expenditure due to differences in preferences and constraints. For example, female-headed households may face more constraints on their healthcare spending due to lower income levels or other financial burdens. As a result, they may be less likely to seek medical care or to spend as much on healthcare as male-headed household. Thus the sum of money/ resources the person uses on accessing the medical care is constrained by the individual's income/wealth, which presents us with the following budget constraint:

$$P_m M + P_c C = Y \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots..3$$

Where, P_m represents the net price of medical services towards health care treatment, P_c represents the price of other goods which are non-medical in nature, and Y is the income of the individual which is exogenously determined. The individual chooses to maximize the lifetime utility function (given in eq. 1) subject to Eq. 2(which is represents the health production function) and eq.3 (budget constraint). The equation is characterized by the following Lagrangian function:

$$l = U\big(C, °\mathrm{F}(H_0, M) + \emptyset(Y - P_m M + P_c C)\big) \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots..4$$

According to Mwabu (2007) solving healthcare utility maximization problem leads to health demand function of the form:

$$H = H(M, Y, P_m, P_c, H_0) \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots 5$$

The expense of Medical care service depends on other factors which may be individual characteristics or non-individual characteristics, hence considering prices on medical services as an exogenous factor. This factor determines the choice of inputs (such as choosing private health facility or public health facility). Considering that we interpreted equation 5 as a demand function, hence we can represent the cost (health care expenditure) of medical service as the dependent variable rather than the health status, denoted as F (the assumption holds for as long as the demand function is optimal level for a given level

of income). To simplify the model, the final equation for estimating healthcare care expenditure Y is presented as follows:

$$Y = F(X, M, Y, P_c, H_0) \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 6$$

Where X represents other factors, which are non-individual.

3.3 Empirical model

From the analytical framework in section 3.3, healthcare care expenditure for each individual household can be expressed as

$Y_i = X\beta_i + \varepsilon_i$…….(7)

Where Y_i is the healthcare care expenditure for the i^{th} individual of the sample under investigation. X is a set of explanatory variables influencing the health care expenditure for i^{th} individual of the sample under investigation. β is the unknown sample parameter of interest while $\in$ I the error term. Aggregating for the whole sample, equation 7 transforms to equation 8 as below

Y = X β + $\in$…….(8)

The study will apply linear regression analysis, where we shall expand equation 8 by including the specific explanatory variables (socio-demographic factors, socio-economic factors and health status) as follows

$Y=\beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9 + \beta_{10} X_{10} + \beta_{11} X_{11} + \in$…….(9)

Where Y – Household Health Expenditure (Dependent variable), X_1 – Sex of Household head, X_2 – Age of Household head, X_3 – Marital Status, X_4 – Education level, X_5 – Wealth Index, X_6 – Employment Status, X_7 – Household size, X_9 – Chronic Health condition, , X_{10} – Distance to health facility, and X_{11} – Residence .

3.4 Definitions of Variable, Measurement and Expected Signs

The table below presents the study variables, their definitions, measurements and expected sign.

Table 3. 1 Description of Variables used in the Study

Variable	Definition	Measurements	Expected sign	Authors
Dependent Variable				
HH Health expenditure	This is the total cost of seeking for healthcare services (both in cash and total market rate equivalent to the kind) for the total visits household members had during the survey period.	Its continuous variable and measured in Kenya shillings for the total visits (q60_11 of KHHEUS, 2018)		
Independent Variables				
Gender of HHH	This is the sex of the household head under study	It is measured as a dummy variable (Q04 of KHHEUS, 2018) Sex HHH={1, $if\ a\ male$ 0, $otherwise$	Positive	Adisa (2015), Njagi et al (2020) Njagi et.al (2018),
Age of HHH	Age in Years	Continuous values	Positive	Njagi et.al (2018), Rasoulpour, Y. (2022) Barasa et. al., (2017) Mwenda et al., 2021
Marital Status	This is the HHH's marital status	It's a dummy variable (Q10 of KHHEUS, 2018) $\{1, if\ Married\ 0, otherwise$	Indeterminate Indeterminate Positive Positive	Njuguna et al (2017)
Educational levels	This is the household head's highest level of schooling.	It's a categorical variable (Q08 of KHHEUS, 2018), 2018 ● 1 if primary level, 0 otherwise ● 1 if secondary level, 0 otherwise	Positive Negative Negative Uncertain Uncertain	Mwenda et al., 2021

		• 1 if university and college level, 0 otherwise • 1 if no education, 0 otherwise	Uncertain Uncertain	
Wealth Index	A measurement of living standards based on the total worth of income and the cost of the necessities for one adult. The worldwide poverty line, which is now $1.90 per day, will be used in this study to evaluate if someone is considered to be living in poverty.	It will be a categorical variable assuming the values (Q90 of KHHEUS, 2018), 1, if the household belongs to poorest quintile 2, 1, if the household belongs to poor quintile 3, 1, if the household belongs to middle quintile 4, 1, if the household belongs to rich quintile 5, 1, if the household belongs to richest quintile	Positive	Mwenda et al., 2021 Njagi et.al (2018)
Employment Status of the household head	This is the employment status of the household head	It is a dummy variable variable(Q11 of KHHEUS, 2018), assuming $\{1, if\ employed\ 0, otherwise$	Negative Positive Positive Indeterminate Indeterminate	Njuguna et al (2017) Barasa et. al., (2017) Njagi et.al (2018)
Household size	Measured as the number of persons living in the household	Continuous variable	Positive	Adisa (2015) Barasa et. al., (2017)
Insurance	Whether the household is covered by insurance or not	Dummy variable 1 If Yes, 0 otherwise	Negative	Adisa (2015) Attia-Konan et al. (2019)

				Njagi et.al (2018),
Health Status	Presence of Chronic Health condition - whether one or more household members is suffering from a chronic illness (Other Cardiac disorders, Other respiratory disorders, HIV/AIDS, TB, hypertension, diabetes, cancer, arthritis, mental disorders, Other)	Dummy variable 1 If Yes, 0 otherwise	Positive	Eze et al (2022) Rasoulpour, Y. (2022)
Distance to Health Facility	How far in km from the nearest health facility	Continuous variable	Negative	Njuguna et al (2017) Muriithi (2013)
Residence	This is where you live, and it may be urban or country.	Dummy variable 1 if urban 0 if rural	Positive	Ilinca (2019) Njagi et al., (2020),

3.5 Data Source and Type

In order to investigate the gendered drivers of household health expenditure in Kenya, this study will make use of data from a cross-sectional survey performed by the Kenyan Ministry of Health (KHHEUS) in 2018. The 2018 Kenya Household Health Expenditure and Utilization Study, which was based on a sample frame from the fifth National Sample Survey and Evaluation Programme (NASSEP V), aimed to estimate a variety of variables at the national, county, and rural/urban levels. The cluster units identified by NASSEP V include one or more EA and roughly 100 households per cluster. The sample frame includes 5360 clusters spread across 47 counties, with the exception of Nairobi and Mombasa, which are made up entirely of urban areas. A final selection of 37,500 households from 1,500 geographically distributed clusters (577 urban and 923 rural) make up the 92

strata that arise from sampling. The study used a two-step stratified cluster sampling procedure, choosing a uniform sample of 25 households from each of the 1,500 clusters in NASSEP V in the first round of selection and 1,500 clusters in NASSEP V in the second round. The database is updated regularly and contains information on people in Kenya looking for inpatient medical care.

3.6 Diagnostic tests

3.6.1 Heteroscedasticity

The issue of heteroscedasticity is one that arises frequently in cross-sectional data, and it is a matter we will be investigating in this study. When the error term across observations exhibits non-constant variance, we refer to the dataset as suffering from heteroscedasticity. This characteristic has the potential to introduce unreliable and inconsistent estimates. As a result, we will be conducting a Heteroscedasticity Breusch-Pagan-Godfrey test in this study to determine if this issue is present. If Heteroscedasticity is present, we will make use of robust standard errors to correct for heteroscedasticity.

3.6.2 Multicollinearity

Cross-sectional data analysis presents a significant challenge due to the issue of multicollinearity, which will be addressed in this study. This arises when one or more explanatory variables are represented as a linear combination of other variables, leading to biased coefficient estimates and potentially unreliable results. To test for multicollinearity, we will apply the Variance Inflation Factor (VIF) test. Any variables with a high VIF, exceeding a value of 10, will be dropped from the model.

CHAPTER FOUR:

DATA ANALYSIS, FINDINGS AND DISCUSSION

4.0 Introduction

In this chapter, we provide a description of the data used in the study's analysis. The descriptive statics explore the basic information (such as the mean, standard deviation, minimum and maximum value) of each variable used in the study. Along with it, we present the regression analysis and the discussions of the study's key findings. Important diagnostic tests supporting the model's robustness. In the next subsection, we begin with a descriptive analysis and their interpretations.

4.1 Descriptive statistic

The descriptive analysis is done at the overall sample (in Table 2) and disaggregated at household head level (Table 3). Male headed household formed the majority (53.10%) while female headed household formed about 46.90 % of the sample under study. Overall, the average age of the household head was found to be about 43.56 years with the male headed household was about 42.42 years while that of the female headed was about 41.05 years. On average, the household size for the entire sample was about 4.37 (or 4 person). However, it was found to be highly heterogeneous across different household heads with the number of persons living in a male headed household being 4.64 (or 5 persons) while that of female headed household being 3.90 (or 4 persons).

On average, household of spent about Ksh. 3602.066 on healthcare expenditure for the total visits their household members had during the survey period. However, we observed that there was a variation between male headed and female headed household. For instance, while female headed household spent about Ksh 16,237.73 on household health expenditure, male headed household were found to

spend about 23,531.12. This implies that male headed household, on average, spent slightly higher than their female headed household counterparts on the same service.

About 25.82% household of the entire population had access to insurance. However, comparing between male headed household and female headed households, the results shows that about 36.97% of the male headed household had their household covered by insurance while about 26.31% of the female headed household were covered by insurance. 58.63% of the entire population under study were employed. However male heads were more employed (51.57%) than their female heads (about 45.20%)

Equally, about 43.53% of the entire population household heads under study had a primary level of education. Most of these (42.41%) were male household heads while the female heads were about 37.46%. 27.21% of the entire population household heads under study had a secondary level of education of which majority (22.25%) were male heads while the female heads were about 19.50%. A respective 6.64% and 2.52% of the entire population household heads under study had a college and university education level. A further 0.82% of the entire population household heads under study had a vocational level of education. Finally, a respective 0.29% and 18.09% of the entire population household heads under study had an informal and no education level. However, majority (43.87%) of those with no education were male heads while female heads accounted for 31.89%.

On average, about 18.77% of the household under study belonged to the poorest wealth quintile. Out of this, 20.42% were male headed household while 19.81% were female headed household.19.97% were belonging to the poor quintile with majority (20.74%) being the female headed while 15.44% being male headed household. Further, we observed that about 23.04% of the household under study were in the middle wealth quintile while a respective 22.94% and 15.28% were in the rich and richest wealth quintile. Interestingly, while the female headed household were the majority (24.15%) in the rich wealth quintile than their male counterpart (22.25%), in the richest wealth quintile, male headed household formed with majority (23.04) as compared to their female counterpart (17.34%).

About 3.61% of entire households in the study had one or more household members suffering from a chronic illness (such as Cardiac disorders, respiratory disorders, HIV/AIDS, TB, hypertension, diabetes, cancer, arthritis, mental disorders). However, most of the household that recorded a higher number of chronic diseases among their household members was the female headed household with about 2.48% while male headed household accounted for about 1.05%.

Generally, about 63.88% of the household heads were married with male headed household accounting for and 68.06% while female headed household accounting for 63.78%. On average, about 36.68% of the household under study were located in the urban areas, with male headed household residing in urban areas accounting for 40.05% while female headed accounting for 38.39%. Finally, the average distance to the nearest health facility was about 11.96Km. However, female headed households were on average, located far from the nearest health facility (about 26.58Km) than their female counterpart (about 14.05km). See Table 2 and Table 3.

Table 2: Overall descriptive statistics

Variable	Obs	Mean	Std Dev.	Min	Max
HH Health expenditure	16,803	3602.066	16141.18	0	490000
Gender of Household Head	16,803	.5309549	.4993029	0	1
Age of HHH	16,803	43.56423	20.22359	16	99
Marital Status	16,803	.638794	.4803645	0	1
Educational levels ● Primary level	16,803	.4352794	.4958083	0	1
● Secondary level	16,803	.2720943	.4450514	0	1
● College level	16,803	.0664167	.2490165	0	1
● University level	16,803	.0252931	.1570186	0	1
● Vocational level	16,803	.0081533	.0899295	0	1

• Informal level	16,803	.0029161	.0539242	0	1
• No education	16,803	.1808606	.3849141	0	1
Wealth Index • Poorest	16,803	.1877046	.3904877	0	1
• Poor	16,803	.1996667	.3997617	0	1
• Middle	16,803	.2303755	.4210857	0	1
• Rich	16,803	.2294233	.4204745	0	1
• Richest	16,803	.1528299	.3598341	0	1
Employment Status of the household head	16,803	.5862644	.4925169	0	1
Household size	16,803	4.372263	2.515941	1	14
Insurance	16,803	.258211	.4377271	0	1
Health Status	16,803	.036065	.1864574	0	1
Distance to Health Facility	16,803	11.95876	42.32333	.1	900
Residence	16,803	.3667745	.4819387	0	1

Table 3: Descriptive statistic by gender

	Female headed household					Male headed household				
Variable	Obs	Mean	Std Dev	Min	Max	Obs	Mean	Std Dev	Min	Max
HH Health expenditure	7881	16237.73	27911.25	0	161000	8922	23531.12	55808.14	0	490000
Age of HHH	7881	41.04954	20.09351	16	41.04954	8922	42.42147	18.83658	16	99
Marital Status	7881	.6377709	.4813903	0	1	8922	.6806283	.4668447	0	1
Educational levels • Primary level	7881	.374613	.4847738	0	1	8922	.4240838	.4948513	0	1
• Secondary level	7881	.1950464	.3968512	0	1	8922	.2225131	.4164794	0	1

• College level	7881	.0743034	.2626709	0	1	8922	.052356	.2230361	0	1
• University level	7881	.0216718	.1458355	0	1	8922	.0157068	.1245017	0	1
• Vocational level	7881	.006192	.0785667	0	1	8922	.0078534	.0883865	0	1
• Informal level	7881	.006192	.0785667	0	1	8922	.0104712	.1019252	0	1
• No education	7881	.3188854	.4667677	0	1	8922	.2591623	.4387495	0	1
Wealth Index • Poorest	7881	.1981424	.3992185	0	1	8922	.2041885	.403636	0	1
• Poor	7881	.2074303	.4060955	0	1	8922	.1544503	.3618538	0	1
• Middle	7881	.1795666	.3844216	0	1	8922	.1884817	.3916092	0	1
• Rich	7881	.2414861	.4286483	0	1	8922	.2225131	.4164794	0	1
• Richest	7881	.1733746	.3791582	0	1	8922	.2303665	.4216196	0	1
Employment Status of the household head	7881	.4520124	.4984641	0	1	8922	.5157068	.5004086	0	1
Household size	7881	3.900929	2.290156	1	13	8922	4.63089	2.583491	1	13
Insurance	7881	.2600619	.4393488	0	1	8922	.3586387	.4802299	0	1
Health Status	7881	.0247678	.1556579	0	1	8922	.0104712	.1019252	0	1
Distance to Health Facility	7881	9.803406	26.57673	.1	200	8922	14.05079	57.57953	.1	860
Residence	7881	.3839009	.4870888	0	1	8922	.4005236	.4906472	0	1

4.3 Diagnostic tests

4.3.1 Normality test

To determine whether or not our dataset was normally distributed in this study, the test for normality was run. Given that this study used general linear models (OLS), which by default assume that the model's errors are normally distributed, this assumption was crucial. In order to do this, a Shapiro-

Wilk test was performed, and the results are shown in Table 4. Table 4 shows that all the variables, with the exception of the household head's gender, work status, household size, and domicile, are non-normally distributed (i.e., P-Value 0.05). However, this was not an issue because our sample (3,215) was fairly big. According to the characteristics of a large sample, the distribution tends toward normalcy as the sample size increases.

Table 4 Shapiro-Wilk W test for normal data Test result

Variable	Obs	W	V	z	Prob>z	Status
HH Health expenditure (KSh.)	16,803	0.31550	1248.202	18.441	0.00000	Non-normal
Age of household head	16,803	0.93465	63.870	10.491	0.00000	Non-normal
Insurance access (1/0)	16,803	0.99928	1.881	1.656	0.04883	Non-normal
Gender of household head (1/0)	16,803	0.99996	0.039	-8.176	1.00000	Normal
Household size	16,803	0.99879	1.178	0.413	0.33969	Normal
Employment status of the household head	16,803	0.99996	0.450	-2.185	0.98557	Normal
Educational level of household heads	16,803	0.84208	1749.064	20.452	0.00000	Non-normal
Wealth Index	16,803	0.99567	47.971	10.602	0.00000	Non-normal
Health status of household head (1/0)	16,803	0.99910	10.013	6.310	0.00000	Non-normal
Marital status of household head (1/0)	16,803	0.99952	5.352	4.595	0.00000	Non-normal
Residence of the household head (1/0)	16,803	0.582	-1.484	0.93105	0.99995	Normal
Distance to Health Facility (KM)	16,803	0.10043	8147.997	24.534	0.00000	Non-normal

4.3.2. Correlation analysis

From 5 we observed that all explanatory variables in our model are weakly correlated with the dependent variable (health care expenditure) since they explained less than 50%. Age of the household head (5.6%), gender of the household (1.60%), household size (1.33%), employment status of the household head (6.12%), household education level, wealth quintile, residence of the household head (1.61%), and distance from the health centre (6.46%) are the variables that had a positive correlation with health care spending. Access to insurance (1.30%), the household head's educational level, and household members' health state (6.3%) were all adversely connected with health care spending. .

Table 5: Correlation Matrix

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
Household health care expenditure (1)	1.00																					
Age of household head (2)	0.056	1.00																				
Insurance access (3)	-0.013	0.018	1.00																			
Gender of household head (4)	0.016	0.024	0.084	1.00																		
Household size (5)	0.013	0.045	-0.078	0.157	1.00																	
Employment status of the household head(6)	0.061	0.152	0.047	0.06	0.03	1.00																
Primary level (7)	-0.020	-0.069	0.071	0.047	-0.007	0.076	1.00															
Secondary level (8)	0.016	-0.297	-0.025	0.028	-0.004	-0.035	-0.422	1.00														
College level (9)	-0.034	-0.028	-0.043	-0.048	-0.022	0.182	-0.197	-0.129	1.00													
University level (10)	-0.031	0.013	-0.038	-0.011	0.003	0.101	-0.115	-0.075	-0.035	1.00												

Vocational level (11)	-0.037	-0.049	0.008	0.066	0.002	0.074	-0.057	-0.037	-0.018	-0.010	1.00											
Informal level (12)	0.045	-0.001	0.011	0.026	-0.053	-0.064	-0.081	-0.053	-0.0248	-0.014	-0.007	1.00										
Never went to school (13)	.0292	0.353	-0.015	-0.069	0.039	-0.173	-0.517	-0.338	-0.158	-0.092	-0.046	-0.065	1.00									
Poorest (14)	0.001	0.072	-0.050	-0.026	0.020	-0.105	-0.007	-0.167	-0.085	-0.071	-0.035	-0.007	0.238	1.00								
Poor (15)	0.007	0.074	0.083	-0.059	0.038	-0.049	-0.026	-0.086	-0.077	-0.067	-0.0332	-0.047	0.188	-0.231	1.00							
Middle (16)	-0.060	-0.020	0.016	0.004	-0.028	-0.148	0.024	0.051	-0.074	-0.065	0.030	0.043	-0.031	-0.225	-0.213	1.00						
Rich (17)	0.046	0.028	-0.034	-0.012	-0.003	0.075	0.090	0.065	-0.017	0.005	-0.039	0.063	-0.157	-0.273	-0.259	-0.253	1.00					
Richest (18)	0.0004	-0.148	-0.009	0.089	-0.026	0.205	-0.083	0.127	0.238	0.185	0.077	-0.053	-0.215	-0.261	-0.247	-0.241	-0.292	1.00				
Health status of household head (19)	-0.062	-0.057	0.035	-0.024	-0.025	-0.012	0.072	0.018	-0.0268	-0.016	-0.0077	-0.011	-0.070	-0.015	-0.010	0.115	-0.024	-0.058	1.00			

Residence of the household head (20)	0.016	-0.059	-0.026	0.016	-0.072	0.098	-0.053	0.069	0.1044	0.075	0.0855	-0.015	-0.101	-0.299	-0.202	0.091	0.175	0.379	-0.027	1.000		
Distance to Health Facility (21)	0.065	-0.037	-0.028	0.059	-0.008	-0.017	0.039	-0.032	-0.050	0.015	-0.011	-0.003	0.014	0.010	0.019	-0.050	0.076	-0.060	0.002	-0.082	1.00	

4.3.3. Multicollinearity test

The cross sectional character of the study's data set was a major factor in the decision to undertake this test. According to theory, multicollinearity exists when two independent variables are linearly dependent on one another. When this happens, the variance of parameter estimates is inflated, which results in incorrect estimates of the magnitude and signs of the coefficients, which leads to poor and inaccurate conclusions (Gujarati, 2003). Therefore, the study used Variance Inflation Factors (VIF) to check for its existence. When the mean VIF is less than 8.0, multicollinearity in our data set is not a major issue, but when the mean VIF is higher than 8.0, multicollinearity issues are evident. A VIF with a value of 1 is often viewed to not be correlated, whereas values between 1 and 5 are judged to be moderately linked and values over 5 to be strongly connected (Miles, 2014). The outcomes of the VIF test are shown in Table 6 below:

Table 6: Multicollinearity test result

Variable	VIF	1/VIF	Status
Age of household head	1.09	0.918929	No serious Multicollinearity
Insurance access (1/0)	1.02	0.976640	No serious Multicollinearity
Gender of household head (1/0)	1.07	0.932345	No serious Multicollinearity
Household size	1.07	0.932527	No serious Multicollinearity
Employment status of the household head	1.13	0.883023	No serious Multicollinearity
Educational level of household heads	1.16	0.864982	No serious Multicollinearity
Wealth Index	1.40	0.712819	No serious Multicollinearity
Health status of household head (1/0)	1.10	0.906628	No serious Multicollinearity
Marital status of household head (1/0)	1.09	0.920040	No serious Multicollinearity
Residence of the household head (1/0)	1.32	0.755095	No serious Multicollinearity
Distance to Health Facility (KM)	1.01	0.990235	No serious Multicollinearity
Mean VIF	1.13		No serious Multicollinearity

The predictor variables were all moderately correlated, and all of the variables were still within the margin of moderate correlation, according to the VIF index for the predicted outcomes. Additionally, the average VIF was 1.13, which is below the 8.0 cut-off, indicating that multicollinearity was not a major issue.

4.3.4. Heteroscedasticity test

The next diagnostic test the study carried out was heteroscedasticity due to the nature of our data set. When the variance of the error term varies across observations, heteroscedasticity is present and makes inference testing useless. The Breusch-Pagan test was used in the study to determine if heteroscedasticity existed under the null homoscedasticity hypothesis. If the p value is less than the critical value in this test, the null hypothesis is not excluded. However, the null hypothesis is rejected and heteroscedasticity is determined if the P-value above the critical threshold. In the event of heteroscedasticity, robust standard errors are utilized to address the issue. Upon carrying out the test, the result is shown in the Table 7 below:

Table 7: Breusch-Pagan / Cook-Weisberg test for Heteroscedasticity

Breusch-Pagan / Cook-Weisberg test for Heteroscedasticity
Ho: Constant variance
Variables: fitted values of Household health expenditure
chi2(1) = 362.82
Prob > chi2 = 0.0000

According to Table 7's findings, heteroscedasticity is not an issue in the residuals since the likelihood of the chi-square statistic is less than 0.05. As a consequence, the null hypothesis is rejected. Therefore, while estimating the model, robust standard errors were utilized to address the issue.

4.4. Regression results

4.4.1. Results Interpretation

The outcome of the OLS regression analysis is displayed in Table 8. According to Table 8, the findings show that the age of the household head, access to insurance, gender of the head of the household, size of the household, employment status, educational level, wealth quintile of the head of the household, health status, marital status of the head of the household, distance to the health facility, and head of

the household's residence were the key determinants of healthcare spending among the understudied households. For instance, holding all other factors constant, male headed household was found to significantly increase household health expenditure by about 21.01% as compared to a female headed household.

The results show that when all other variables are held constant, an additional year of a household head significantly affects household expenditure increasing it by about 0.28%. Equally, holding all other factors constant, the study reveals that insurance access led to a reduction of 31.41% in health expenditure at 1% significant level. Further, holding all other factors constant, the study result shows that an additional household member significantly increased household health care expenditure by about 1.74%.

The study result further revealed that, under Ceteris Peribus, being an employed household head significantly increased health care expenditure by about 23.07%. Additionally, holding all other factors constant, a household head having completed primary and secondary school was found to decrease health care expenditure by about 47.83% and 54.93% respectively. However, completing university level was found to reduce healthcare expenditure by about 92.88%.

Additionally, the study findings revealed that being in a lower wealth quintile increased healthcare expenditure, while in middle there was a reduction effect and an increase in the rich quintile. For instance, holding all other factors constant, being in a poor wealth quintile increased healthcare expenditure by about 12.04%. However, belonging to a middle quintile reduced the healthcare expenditure by about 17.25%.

Having at least one member of the household suffering from a chronic disease was found to reduce healthcare expenditure by about 72.83%. Further, we observed that the residence of the household head had a significant influence on household healthcare expenditure among population under study.

For instance, the findings reveal that residing in an urban area increased household health expenditure by about 23.66% as compared to those in rural areas.

Lastly, distance to the health facility was found to significantly influence household healthcare expenditure. For instance, holding all other factors constant, an additional kilometre from the household to the nearest health centre increased healthcare expenditure by 0.22%.

Table 8: Gendered regression result

	OLS		
Variable	Coefficient.	t	P-Values
Age of household head	.0028217*** (.0006536)	4.32	0.000
Insurance access (1/0) ● Yes	-.3140024*** (.0240854)	-13.04	0.000
Gender of household head (1/0)			
● Male headed household	.2101329*** (.0224091)	9.38	0.000
Household size	.0174357*** (.0045447)	3.84	0.000
Employment status of the household head			
● Employed	.2306629*** (.0240947)	9.57	0.000
Educational level of household heads			
● Primary level (1/0)	.4782536** (.2170624)	-2.20	0.028
● Secondary level (1/0)	-.5492628** (.2177605)	-2.52	0.012
● Collage level (1/0)	-.408292 (.2217699)	-1.84	0.066
● University level (1/0)	-.9288143*** (.2354029)	-3.95	0.000
● Vocational level (1/0)	-1.924518*** (.5214754)	-3.69	0.000
● Informal education	.3585658 (.2471991)	1.45	0.147

● Never went to school	-.252509 (.2174506)	-1.16	0.246
Wealth quintile			
● household belongs to poorest quintile (1/0)	.0260214 (.0416961)	0.62	0.533
● household belongs to poor quintile (1/0)	.1203826*** (.0418192)	2.88	0.004
● household belongs to middle quintile (1/0)	-.172483*** (.0395362)	-4.36	0.000
● the household belongs to rich quintile (1/0)	.018688 (.0350701)	0.53	0.594
● the household belongs to richest quintile (1/0)	--	--	
Health status (1/0)			
● Yes	-.7283313*** (.0855976)	-8.51	0.000
Marital status of household head			
● Married	--	--	--
Residence of the household head			
● Residing in urban areas	.2365547*** (.025455)	9.29	0.000
Distance to Health Facility (KM)	.0021973*** (.0001989)	11.05	0.000
Constant	8.628539***S (.2209397)	39.05	0.000
Prob > F	0.0000		
R-squared	0.0347		
Adjusted R-squared	0.0341		
Observation	16,803		

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

4.4.2. Discussion of results

In line with findings from Kenya (Njagi et al., 2018, 2020), Pakistan (Muhammad Malik & Azam Syed, 2012), and Nigeria (Adisa, 2015), which showed a positive correlation between health expenditure and the gender of the household head, it was discovered that the gender of the household head was statistically significant at the 1% level of significance in determining the extent of household health expenditures. According to our study, household health spending is much higher in male-headed households than in female-headed households. Our study result is similar to that of Adisa (2015) in Nigeria and Rasoulpour (2022) in Iran who found that female headed households had lower health expenditure than the male counterparts. They attributed this to lower income levels as depicted in the wealth quintiles and lower rates of employment of female heads versus male heads, which is similar to the Kenyan context as they are both developing countries.

On age of the household, our results show that when all other variables are held constant, an additional year of a household head significantly affects household expenditure increasing. This is consistent with findings in Kenya by Mwenda et al., (2021) and Njagi et al., (2018) in Kenya. As household head age increases so does the household size, dependency ratio and susceptibility to chronic illness which would explain the increase in expenditure with age.

We found that insurance access led to a reduction of health expenditure. This implies that insurance access was crucial in reducing financial toxicity among households by reducing the total household health expenditure. These findings are in line with studies conducted in Nigeria, where limited insurance coverage predisposed the elderly to CHE (Adisa, 2015) similarly lack of insurance was seen as one of the reasons that households incurred OOP in Cote D'Ivoire (Attia-Konan et al., 2019) but contrary to finding by (Barasa, Maina, et al., 2017a) who found that having insurance did not necessarily offer protection against CHE. Despite government efforts to expand insurance coverage, data shows that to date the population coverage remains low. We found that coverage was lower in female than male headed households implying a need for aggressive campaigns to expand coverage to

female headed households. Particularly in light of longer life spans and greater prevalence of chronic illnesses among women as they age (Vlassoff, 2007), the high dependency ratios in female headed homes (Kishor & Neitzel, 1996) and increased health costs experienced by female during their reproductive years due to out of pocket for maternity care despite the existence of initiatives like the "Linda mama" program which was established to guarantee the provision of cost-free maternity services (Orangi et al., 2021).

Equally, from our regression results, evidence shows that an additional household member significantly increased household health care expenditure. In agreement with findings by (Barasa et al., 2017b), where large households were found to be more likely to spend more on health and had increased probability of seeking health care (Muriithi, 2013) and increased chances of incurring catastrophic health expenditure (Njagi et al., 2020) this research found that larger households spent more on health expenditure.

Further, the findings reveals that being an employed household head significantly increased health care expenditure. This is conformity to findings by (Ilinca et al., 2019) which showed that "health care utilization in Kenya increases with socio economic status", where employment may be associated with higher income levels, translating to a higher demand for health services.

The findings on education align with results in Kenya, Ethiopia, Iran and Thailand (Borde et al., 2022; Mwenda et al., 2021; Osmani & Okunade, 2021; Rasoulpour, 2022) that indicate that lower education levels are associated with an increase in health expenditure. Holding all other factors constant, a household head having completed primary and secondary school was found to decrease health care expenditure by about 48.39% and 53.90% respectively. However, completing college level and university level were each found to reduce healthcare expenditure by about 40.73% and 88.44% respectively. On overall higher education translates to access to more opportunities and higher income levels which then results in access to quality health services. Additionally, according to Grossman

(1972), education provides people with essential health skills that are necessary to develop and sustain health, which is a capital stock. Thus, low or no education would then translate to higher health expenditure. Lastly, when all other factors were held constant, having attained a vocational level of education reduced household health care expenditure by about 19.89%.

Additionally, the study findings revealed that being in a lower wealth quintile increased healthcare expenditure, while in middle there was a reduction effect and an increase in the rich quintile. For instance, holding all other factors constant, being in a poor wealth quintile increased healthcare expenditure However, belonging to a middle quintile reduced the healthcare expenditure. In alignment with findings by (Njagi et al., 2018, 2020), it was demonstrated that socioeconomic status as determined by the wealth index had a significant impact on out of pocket spending, The fact that poorer households spend more on health care aligns with findings by (Salari et al., 2019) which shows that poorer households are more likely to incur catastrophic health expenditure. In addition, it appears that both male and female households' needs for health services are decreasing as their incomes rises, which may be related to access to clean water, sanitary conditions and decent housing. The fact that there are more male heads in the rich and richest categories combined than there are female heads, and vice versa for the poor and poorest categories introduces a socio-economic inequality issue that needs review at a policy level.

Having at least one member of the household suffering from a chronic disease was found to reduce healthcare expenditure. These findings are contrary to findings in Iran, Ethiopia, Kenya (Barasa, Mwaura, et al., 2017; Borde et al., 2022; Njagi et al., 2020; Rasoulpour, 2022). The result was against our expectation and plausibly could mean that households with at least one member suffering with a chronic disease discouraged heath care demand from other members of the households or that the households were shifting towards alternative medicine options due to the rising cost of living.

On average, holding all other factors constant, married household heads were found in our study to have significantly increased health care expenditure as compared to unmarried counterparts. This was contrary to studies in Kenya and Ethiopia (Borde et al., 2022; Njuguna, Diana, et al., 2017) which documented a link between marital status and a reduction in household health spending.

Further, we observed that the residence of the household head had a significant influence on household healthcare expenditure among population under study. Studies have shown the impact of residence on health care expenditure(Njagi et al., 2020; Salari et al., 2019), rural areas are associated with higher poverty incidence: 40.1% than urban areas: 29.1% (KNBS, 2020) and that may contribute to reduced health seeking behaviour by households headed by women. This implies a need for different policies for rural and urban households taking into consideration the gender effect.

Equally, distance to the health facility was found to significantly influence household healthcare expenditure. The impact of distance to health facilities on health care utilization and expenditure has been documented in literature (Muriithi, 2013; Njuguna, et al., 2017). The study finding is in line with results by (Barasa, Maina, et al., 2017b) who found that the further the health facilities are the more households have to spend on health care; inclusion of cost of transport increased the incidence of catastrophic health expenditure. Ensuring access to health facilities is key to elimination of barriers to access preventive and curative services. The travel time and cost of travel to health facilities, leads to decreased demand of services for households or when incurred, leads to increased proportion of household resources allocated to health care.

CHAPTER 5

SUMMARY, CONCLUSIONS AND POLICY IMPLICATIONS

5.1 Introduction

In this section, the study's summary of key findings is presented. Then followed by the conclusion of the study, policy recommendation and suggestion of areas of further study.

5.2 Summary

The primal drive of this study was to explore the gendered determinants of household health expenditure, in Kenya using recent household survey information (KHHEUS 2018). More specifically, the study aimed at obtaining three specifically objectives namely: establishing the patterns of household health expenditure in Kenya; exploring the determinants of health care expenditure in relation to the gender of the household head while controlling for covariant, and lastly and offering policy recommendation based on the study finding. In obtaining these objectives, the study anchored around three theories (the human capital model, the life cycle hypothesis and Andersen healthcare utilization theory). Further, the study relied on Ordinary Least Square (OLS) regression model to ascertain the effect and the significance of the variables of interest. For the purposes of making robust and unbiased inferences, statistical diagnostic tests including the normality test by Shapiro-Wilk test, VIF for multicollinearity and the Breusch Pagan test for Heteroscedasticity were carried out.

The key variables of interest in exploring the gendered determinants of household health expenditure, considered in our study include the gender of household head, age of household head, marital Status of household head, education level of household head, wealth Index, employment status of household head, household size, chronic health condition, distance to health facility and residence.

The finding reveals that key factors that increased healthcare expenditure included: age of a household head, gender of household head, household size, employment status, belonging to the poorest and poor wealth quintile, residing in urban areas and distance of health facility. On the other hand, those factors

found to significantly reduce healthcare expenditure include Insurance access, high education levels with university education levels having the highest reduction in health expenditure and having at least one member with chronic disease.

For example, *ceteris Peribus*, the study finds that an additional year-age year of a household increases household health spending by around 0.28%. Furthermore, when all other parameters are held constant, the study finds that households with insurance access had a 31.40% lower household health expenditure than those with no insurance access. This means that having access to insurance was critical in minimizing financial toxicity among households by lowering overall family health cost.

Equally, being a male-headed household increased household health care expenditure by approximately 21.01% when compared to a female-headed home. Additionally, keeping all other variables fixed, the study found that adding a family member increased household health care cost by around 1.74%. Furthermore, being a working family head raised health-care spending by roughly 21.79%.

On average, educational status of the household head was revealed to play a significant effect on the population under study's health care expenditure. Holding all other variables constant, the study found that lower levels of educational attainment by the household head were related with greater levels of healthcare spending in both genders than higher levels of education. Holding all other variables constant, a household head having completed primary and secondary school was found to decrease health care expenditure by about 48.39% and 53.90% respectively. However, completing college level and university level were each found to reduce healthcare expenditure by about 40.73% and 88.44% respectively. On overall higher education translates to access to more opportunities and higher income levels which then results in access to quality health services. Additionally, according to Grossman (1972), education provides people with essential health skills that are necessary to develop and sustain health, which is a capital stock. Thus, low or no education would then translate to higher health

expenditure. Lastly, when all other factors were held constant, having attained a vocational level of education reduced household health care expenditure by about 19.89%

Furthermore, the study found that being in the lower income quintile raised healthcare spending while being in the higher wealth quintile decreased it. Holding all other variables fixed, being in a lower wealth quintile increased healthcare expenditure, and while in middle there was a reduction effect and an increase in the rich quintile. For instance, holding all other factors constant, being in a poor wealth quintile increased healthcare expenditure However, belonging to a middle quintile reduced the healthcare expenditure. Rationally, the fact that poorer households spend more on health care aligns with findings by (Salari et al., 2019) which shows that poorer households are more likely to incur catastrophic health expenditure. In addition, it appears that both male and female households' needs for health services are decreasing as their incomes rises, which may be related to access to clean water, sanitary conditions and decent housing. The fact that there are more male heads in the rich and richest categories combined than there are female heads, and vice versa for the poor and poorest categories introduces a socio-economic inequality issue that needs review at a policy level.

It was discovered that having at least one member of the family suffering from a chronic condition reduced healthcare spending by around 70.31%. This result was unexpected and might imply that families with at least one person suffering from a chronic ailment prevented other members of the family from seeking health treatment.

The findings indicate that the gender of the household head has significant impact on household health expenditure. That said, with the exception of gender-based violence, reproductive and maternal health, the health financing strategy (Ministry of Health, 2020) does not reflect gender specific areas of focus or strategic interventions when it comes to the 3 key objectives: mobilization of resources, maximization of efficiency and value and ensuring equity in mobilization and allocation of health funds. As a result of the decision-making framework not taking into consideration the gender

perspective, health financing policies, strategies and interventions do not lead to desired financial protection at household level.

Based on country data, a significant part of households still lacks any type of basic and supplementary insurance, which is important from the point of view of policy making. Despite government efforts to increase insurance coverage it remains an underserved and unmet need across both male and female headed homes; with less female than male headed having insurance.

5.3 Conclusion

In conclusion, considering the findings stated in section 5.2 of this chapter, this study makes the following conclusions: one, household health expenditure is positively associated age of a household head, gender of household head, household size, employment status, educational level, being in the rich wealth quintile, residing in urban areas and distance of health facility. However, we found it to be negatively associated with insurance access, being in lower wealth quintile and having at least one member with chronic disease.

5.4 Policy Recommendations

The findings indicate that the gender of the household head has significant impact on household health expenditure. That said, with the exception of gender-based violence, reproductive and maternal health, the health financing strategy (Ministry of Health, 2020) does not reflect gender specific areas of focus or strategic interventions when it comes to the 3 key objectives: mobilization of resources, maximization of efficiency and value and ensuring equity in mobilization and allocation of health funds. As a result of the decision-making framework not taking into consideration the gender perspective, health financing policies, strategies and interventions do not lead to desired financial protection at household level. This effectively ignores the aspects of unpaid work that are typically carried out by women, such as caring for sick family members, access to the labour market, varying

levels of literacy, and other socio-cultural factors that may affect access to resources and, as a result, health expenditure.

Based on country data, a significant portion of households still lacks any type of basic and supplementary insurance, an ongoing issue of significance importance to policy makers. Despite government initiatives aimed at increasing insurance coverage it remains an underserved and unmet need across both male and female headed homes. In addition to which from a gender perspective fewer female headed households than male headed households have insurance. The study's findings demonstrate that households with insurance enjoyed spending reductions with both male and female heads, the former of whom had higher health expenditures. Therefore, gender specific initiatives are required to achieve increased coverage. Understanding the underlying the determinants of demand for insurance in both male and female headed households is key to formulation of effective enrolment strategies.

Access to healthcare and the realization of universal health coverage (UHC) can both be significantly impacted by the distance to health care facilities. The increase in out-of-pocket expenses was found to be significantly influenced by the distance to health facilities. Studies have shown how distance affects health outcomes and have recognized it as a hindrance to receiving medical care. It has been demonstrated that a lack of access to services causes treatment to be delayed or ineffective, which worsens health outcomes raises morbidity and mortality rates and lead to a worse health outcome and higher rates of morbidity and mortality. In addition, there is evidence that shows that transport costs can increase catastrophic health expenditure at household level. Given the fact that male headed households were shown to be further away than female headed households may be linked to the higher health expenditure in male headed households irrespective of the higher insurance levels. The government should look to invest in ensuring that health care facilities are accessible for the whole population regardless of whether they live in the rural or urban areas.

5.5 Suggestion for Further Research

Based on the fact that our R squared of 3.57%, we believe that there are more relevant variables that were not included in the model. Such variables may include other socio-economic factors, community factors, demographic factors, intervening and mediation factors such as government policies on health access and so on that have a significant influence on household health expenditures. We were limited by the secondary data used in our analysis. We thus recommend further studies on the same topic through increased relevant variables.

Whilst this research indicates the significance of gender on health expenditure it does not delve into the magnitude and effect of each of the variables on the male and female headed households. Further research that looks at the impact of each of the independent variables on respective households would further guide decision making on respective areas of intervention.

This study has made reference to the fact households headed by men spend more on health care than households headed by women; this could be attributed to the former having higher income levels and access to employment opportunities. To better understand the underlying causes of this variation in expenditure, more research is required.

In contrast to the majority of the literature, which suggests that having a family member with a chronic illness increases household spending, this study demonstrated a decrease in household health expenditure in male and female headed households. Additional research is required to determine the decline in expenditure.

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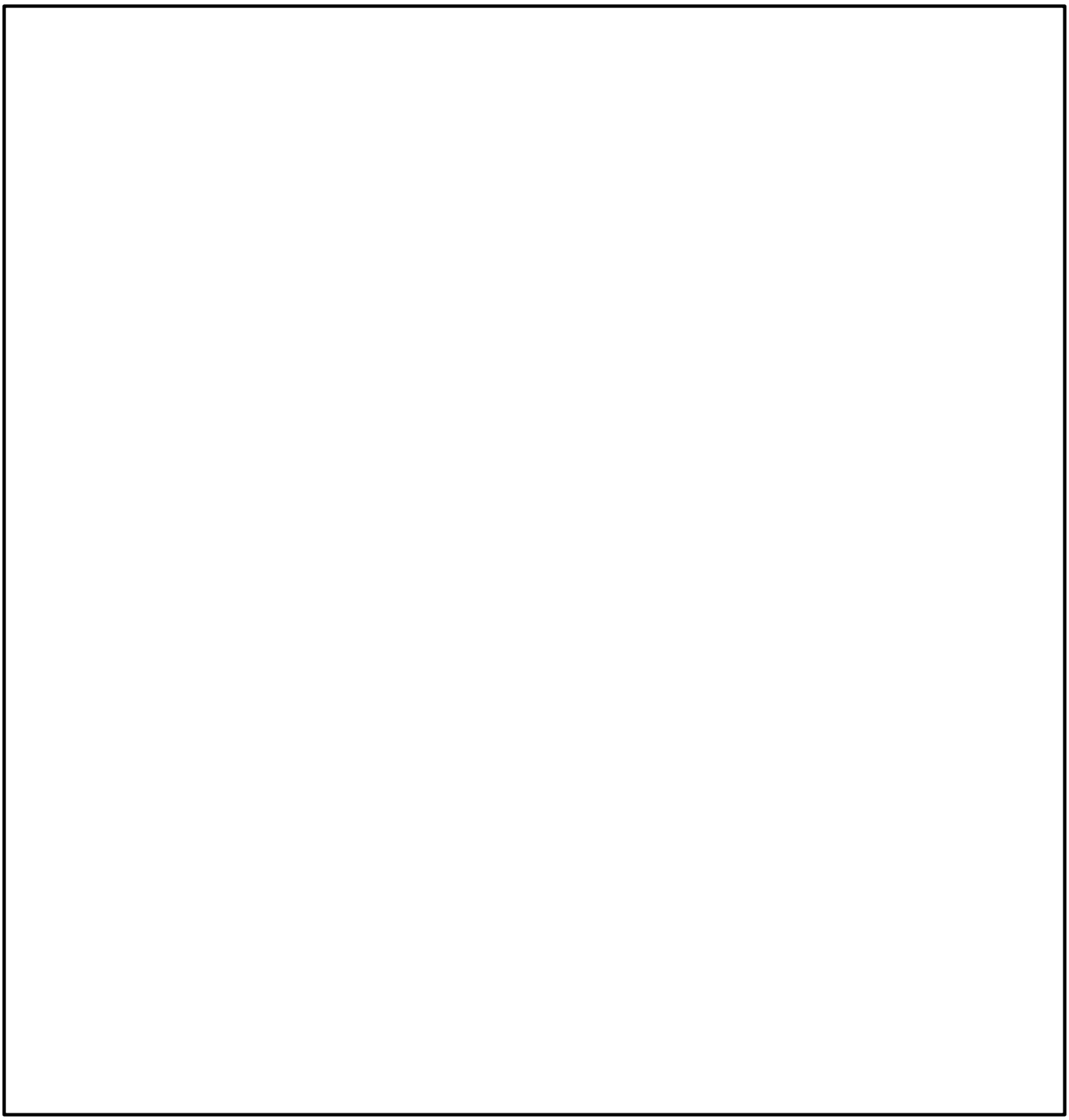
Appendix

Regression Results.



Correlation matrix