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**Health Insurance Types, Out-of-Pocket Payments, Government Subsidy and Healthcare
Utilization in Kenya**

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Government Subsidy and Healthcare Utilization in
Kenya**



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Abstract

Purpose: The use of healthcare is a necessity for every person. As such, there is a need to ensure that such services are made available to many people, especially in a developing country like Kenya. Health insurance provides added ease in how individuals access treatment and other continued care, as it eases the financial burden associated with treatment and care. This study investigates how health insurance types, out-of-pocket expenses, and government subsidy affects Kenyans' patterns of healthcare service utilization.

Methodology: This study is grounded in the Consumer Theory of Demand for Health Insurance, Grossman's theory of healthcare utilization, and the Behavioral Models of Health Care Utilization. To achieve this, the study employed multinomial logistic regression and binary logistic regression to analyze outpatient utilization and inpatient care utilization, respectively.

Findings: The key findings of the study affirm that NHIF had a positive and significant effect on health utilization; however, low enrolment, coverage, and attrition rates were also confirmed. Private and other forms of insurance had no significant effect on health utilization. Additionally, findings reveal that households suffering from chronic disease or those exposed to recurrent illnesses and lack health insurance coverage incur frequent out-of-pocket payments (OPP) to access medical care services. Lastly, findings revealed that social assistance by the government had a weak effect on the chances of visiting hospitals or other healthcare facilities for households seeking outpatient and inpatient health services.

Unique Contribution to Theory, Practice and Policy: The study recommended the enactment of policies that prioritize the expansion of public health insurance coverage. Additionally, public insurance schemes should formulate and implement policies that enhance targeted interventions by introducing specialized packages that address different health care needs and the burden of diseases. Lastly, the government should review health subsidization policies and introduce strategies that can enhance the identification and subsidization of the less privileged but disease-burdened households, particularly in rural areas and marginalized communities.

Keywords: *Health Insurance, Out-of-Pocket Payments, Government Subsidy, Healthcare Utilization*

JEL Codes: *I12, I13, I14, H51, D61*

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INTRODUCTION

Healthcare utilization is the quantification or description of how often people use services to prevent and treat health issues, learn about their present health condition, and anticipate future health outcomes. Healthcare service usage is evaluated based on how often individuals visit hospitals for outpatient care and the number of times they are admitted for inpatient treatment. The onset of an illness creates a need for healthcare services, which can be costly without health insurance. In Kenya, many individuals struggle to afford healthcare services, leading some to forgo treatment due to insufficient funds. These people resort to self-treatment or no treatment at all, which may have a long-term detrimental effect on their health (Carrasquillo, 2013; Wasala & Oyugi, 2005).

Health insurance aims to consolidate resources, distribute risks, and eliminate financial hurdles that hinder individuals from receiving healthcare (Kraushaar, 1994). The United Nations has made universal health insurance coverage a key priority on its global policy agenda. SDGs, under target three, which requires all countries to attain healthy lives for everyone across all age brackets by 2030. This policy outlines that health insurance can guarantee healthy lives, which ensures timely access to adequate, necessary, and quality healthcare, offers financial risk protection, and supports affordable universal immunization with safe, efficient, and high-quality vaccines and medicines (United Nations, 2015).

Out-of-pocket payments consist of the immediate costs' individuals and their families pay when receiving healthcare services. Payments are made to healthcare providers in cash or in kind to provide healthcare services. Unregulated OPP prevents individuals from receiving necessary medical care and will lessen the household's financial security in a medical emergency (WHO, 2023). Globally, around 2 billion people incur catastrophic or impoverishing health expenditures (WHO, 2023). Out-of-pocket payments can drive families into poverty (Xu et al., 2003) and lead individuals to dedicate a substantial part of their income to healthcare, decreasing expenditure on other vital necessities (Rono, 2017).

Healthcare utilization is the quantification or description of how often people use services to prevent and treat health issues, learn about their present health condition, and anticipate future health outcomes. Healthcare service usage is evaluated based on how often individuals visit hospitals for outpatient care and the number of times they are admitted for inpatient treatment. The onset of an illness creates a need for healthcare services, which can be costly without health insurance. In Kenya, many individuals struggle to afford healthcare services, leading some to forgo treatment due to insufficient funds. These people resort to self-treatment or no treatment at all, which may have a long-term detrimental effect on their health (Carrasquillo, 2013; Wasala & Oyugi, 2005).

The 2018 KHHEUS report indicates a noticeable decline in healthcare service utilization compared to previous years, with the average number of visits per 100 sick individuals within the four weeks before the survey dropping from 122 in 2013 to 83 in 2018., the average number of healthcare visits within four weeks before the survey declining from 24 to 19 between 2013 and 2018 respectively and the average yearly utilization per person declining from 3.1 visits in 2013 to 2.5 visits in 2018. Moreover, between 2013 and 2018, the annual inpatient admission rate for every 1,000 insured individuals fell from 76 percent to 53 percent (KNBS, 2018).

LITERATURE REVIEW

This study is anchored on the theory of consumer demand for health insurance; however, it has also borrowed from two other theories, that is, the behavioral model of healthcare utilization and Grossman's model of healthcare utilization.

The theory of consumer demand for health insurance was advanced by Nyman in the year 2003. He posited that people avoid risk and would rather pay monthly premiums for health insurance instead of paying huge medical bills in the event of illness. According to the theory, people's choice of health insurance depends on Risk aversion, income, price, and information asymmetry. Risk aversion is the perceived danger of accruing big medical costs. In the current study, different insurance types influence healthcare use through variations in coverage and out-of-pocket payments. Comprehensive insurance encourages higher utilization, whereas limited health insurance schemes lead to moderate use, linking affordability and benefit design to health care-seeking behavior.

The behavioral model of healthcare utilization was proposed by Ronald M. Andersen in 1968, laying the foundation for understanding healthcare service utilization through a structured framework. He argued that healthcare is a function of enabling, predisposing, as well as need factors. Predisposing factors enable or disable a person to seek or not to seek health services; they do not directly cause service utilization. This theory is relevant to my study because health insurance and government subsidies are enabling factors of healthcare utilization. The theory also shows that healthcare needs are vital for people to utilize healthcare services. Predisposing factors capture other variables increasing or reducing healthcare utilization apart from the study variables. It assumes both rational and social influences on behavior, but the theory provides a limited explanation in low- and middle-income countries due to difficulties in measuring beliefs, social norms, and access barriers. The other limitation of this theory is that it underestimates supply-side constraints like clinic shortages. Therefore, in the current study, Health insurance types are enabling factors, and OPP is treated as a barrier.

Lastly is Grossman's model of healthcare utilization depicts health as a capital investment that loses value over time. Thus, People choose how much of their money to invest in healthcare. According to the Grossman model, people will decide to spend money on their health if the marginal benefit (boost in productivity, wages, and well-being) is equal to the marginal cost (the Sum of money required to be spent on medical care, healthy activities, and refraining from unhealthy behaviors. From the theory, health investment implies that insurance and subsidies lower the cost of investing in health, encouraging care use, while high OPP reduces healthcare use.

Kazungu & Barasa (2017) examined health insurance levels, determinants, and distribution within Kenya. This research employed 2009 and 2014 data from KDHS. Health insurance 17 was assessed based on its types and the extent of its coverage in Kenya. Five socioeconomic status quintiles were created based on the clusters of households, and the health insurance coverage was mapped using a concentration curve. In this study, they used logistic regression analysis to study the factors affecting health insurance. The results revealed that the percentage of people with health insurance rose from 8.17 percent to 19.59 percent. However, the current study diverges by exploring the role of out-of-pocket expenses, different health insurance types, and government subsidies in influencing healthcare service usage.

Dugan (2020) investigated how different types of health insurance plans influence the use of healthcare services. Using data from the Medical Expenditure Panel Survey, a comprehensive

national survey, he applied multinomial logistic regression to assess the impact of various insurance coverage types on routine and emergency medical care utilization. He found out that individuals with private insurance utilized routine care more frequently and relied less on emergency room services than those without insurance. 18 Individuals with public insurance showed similar trends in routine care as those with private insurance, but were more likely to utilize both routine and emergency services. Additionally, privately and publicly insured individuals had higher rates of physician service utilization. However, there was no significant emphasis on cost-effective care schedules among the publicly insured population. The results indicate that despite efforts to address disparities, differences in healthcare utilization continue to exist among insured individuals based on their insurance type. The current study fills a critical gap by examining additional factors such as OPP, community health insurance, and government subsidies not considered in Dugan's study.

A study by Sisira Kumara and Samaratunge in 2019 investigated the relationship between healthcare utilization and household out-of-pocket healthcare expenditures in Sri Lanka. The researchers analyzed data from the Household Income and Expenditure Surveys conducted in 2013 and 2016, encompassing 42,288 households. The study utilized a double-hurdle model to assess the connection between inpatient care at public hospitals and out-of-pocket healthcare costs. The results indicated a positive association, suggesting that greater utilization of inpatient services contributed to a higher household financial burden. This impact was even more pronounced for private inpatient and outpatient care. Additionally, the study found that education level and employment in the informal sector were negatively associated with healthcare utilization. The current study fills a critical gap by applying multinomial logit and binomial techniques to examine both inpatient and outpatient cases.

Wanjiru (2024) conducted a study titled "The Impact of Out-of-Pocket Healthcare Expenditure on Utilization of Healthcare Services in Kenya," employing the Endogenous Switching Regression Model (ESRM) to examine data from the 2018 Kenya Household Health Expenditure and Utilization Survey. The research identified key factors influencing out-of-pocket (OOP) healthcare costs, including distance to healthcare facilities, living in rural areas, formal employment status, and education level. It also found that higher OPP expenses, particularly for inpatient services, reduce the likelihood of individuals using healthcare services. The study emphasizes the importance of financial safeguards, better healthcare accessibility, and socioeconomic improvements to support increased healthcare utilization and overall health outcomes. Despite valuable insights, Wanjiru's study employs the Endogenous Switching Regression Model, while the current study will use binomial and multinomial logit. Furthermore, the current study evaluates specific health insurance types not only out of pocket health expenditure.

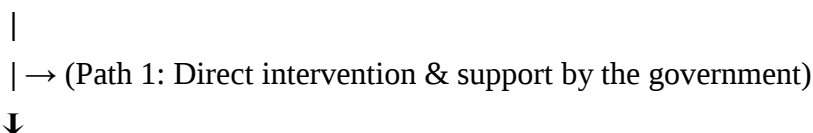
In 2019, Miyawaki and Kobayashi studied how a medical subsidy affected healthcare use among Japanese schoolchildren, comparing a monthly stop-loss policy to free prescriptions. Analyzing Claims made to the National Health Insurance between April 2013 and January 2017 in one community, the researchers utilized a difference-in-differences (DID) method to analyze the phased implementation of a maternal healthcare subsidy program. Treating it as a natural experiment, they found that the stop-loss policy helped lower OPP for frequent users without raising overall spending. In contrast, free prescriptions led to higher medication costs, mainly among healthier children who used fewer services. They concluded that the stop-loss policy might be more efficient, easing families' financial burden without increasing total healthcare expenses. The current study used multinomial logit and binomial logit instead of the

DID method used by Miyawaki and Kobayashi's study. The current study addresses a necessary gap left by Miyawaki and Kobayashi's study by examining the effect of each of the government subsidies, out-of-pocket payments, and health insurance types on healthcare utilization in Kenya.

The literature analysis reveals a strong relationship between having health insurance and seeking healthcare services. According to Jütting (2001), Were et al. (2017), and Mutua (2003), those covered by health insurance are more inclined to seek out and make use of healthcare services compared to those without healthcare coverage. However, these studies used the combined effect of all types of health insurance; they didn't delve into specific types of health insurance available in those countries. Few of the existing studies employed multinomial and binary logistic regression, and they did not examine the specific impact of variables such as public, private, and community schemes, direct out-of-pocket expenses, and government subsidies affecting healthcare utilization. The current study aims to fill that gap left by the existing studies.

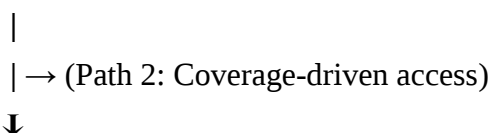
Mini conceptual map

Government Subsidies (e.g., Linda Mama)



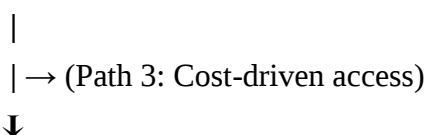
Healthcare Utilization (e.g., more clinic visits and more hospital admissions)

Health Insurance Types (e.g., NHIF, private, community-based)



Healthcare Utilization (e.g., more clinic visits for outpatient care and more hospital admissions for inpatient)

Out-of-Pocket Payments (e.g., direct payments)



Healthcare Utilization (e.g., more clinic visits for outpatient care and more hospital admissions for inpatient and outpatient care)

Key Paths.

Government Subsidies → Healthcare Utilization-Subsidies, such as directly funding free or low-cost services by the government of Kenya, increase healthcare utilization. Subsidized programs increase healthcare utilization, particularly for both inpatient and outpatient services.

Health Insurance Types → Healthcare Utilization, Insurance types, such as public (e.g., NHIF), private, and community-based schemes, provide coverage that improves healthcare utilization.

Out-of-Pocket Payments → Healthcare Utilization- financial barriers, discouraging greater use of healthcare services.

METHODOLOGY

This study used a non-experimental research design to investigate how health insurance, direct payments, and government subsidies influence the use of healthcare services. The analysis was grounded in the 2022 Kenya Demographic and Health Survey data.

The foundation of this study lies in the theory of consumer demand for health insurance. This theory is centered around the principle of utility maximization. Consumers are risk-averse and choose a type of health insurance plan that is best for their needs. When consumers expect a high likelihood of illness, they often opt for health insurance to safeguard against the financial burden of direct medical expenses. Individuals' utility is affected by the incidence of an illness. The probability of occurrence of an illness is π and $1 - \pi$ when there is no illness.

The original income before illness was Y_0 , but after illness, a person spends some amount of his/her income or wealth on healthcare Y_0 is reduced to Y_1 , so the loss here becomes $Y_0 - Y_1$.

The expected utility without any form of health insurance.

$$E_u = \pi u[Y_0 - (Y_0 - Y_1)] + (1 - \pi)u(Y_0) = \pi(Y_1) + 1 - \pi u(Y_0) \dots \dots \dots (1)$$

People are assumed to be responsible for their health-seeking behavior by avoiding moral hazard, so the optimal coverage level by health insurance is the expected value of loss. This means that there will be no out-of-pocket payments. Y^* is the new income after the expenditure of a particular amount in paying for the health insurance premium. Therefore, the actuarially fair amount of premium is $Y_0 - Y^*$. The expected health insurance policy that maximizes individuals' utility is:

$$\begin{aligned} E_{U \text{ insured}} &= \pi u[(Y_0 - (Y_0 - Y_1)] + (Y_0 - Y_1) - (Y_0 - Y^*) + (1 - \pi)u(Y_0 - (Y_0 - Y^*)) \\ &= \pi u(Y^*) + (1 - \pi)u(Y^*) = u(Y^*) \dots \dots \dots (2) \end{aligned}$$

Consumers are better off purchasing health insurance policies when the marginal utility of income is diminishing to avoid a loss of spending on healthcare. Hence, consumers maximize utility when:

$$u(Y^*) > \pi u(Y_1) + 1 - \pi u(Y_0) \dots \dots \dots (3)$$

Individuals prefer a health financing mechanism that maximizes their utility. Thus, an individual will choose a particular health insurance type, private community, or public health insurance. If the anticipated benefit of a kind of health insurance exceeds that of the alternative, equation:

$$U_{(pu, Pri, com)} = U_T Pri > U_L Pu > U_K com \dots \dots \dots (4)$$

Where $U_{pu, pri, \text{ and } com}$ are the utilities of having either public, private, or community health insurance for individuals T, L, and K.

Model Specification

This study evaluated how healthcare financing strategies, including out-of-pocket costs and various insurance types, influence healthcare use. To achieve this, the study employed multinomial logistic regression and binary logistic regression to analyze outpatient utilization and inpatient care utilization, respectively. Multinomial logistic regression is appropriate for this study because it will enable us to model the probability of a patient choosing a given

medical treatment bundle instead of another alternative bundle. It allows for the dependent variable to be more than two unordered categories. In this case, we have hospital visits for outpatient care utilization and admissions for inpatient care utilization. This method is appropriate because interpretability is improved through the conversion of coefficients into marginal effects from odds ratios (Dugan, 2020).

Binary logistic regression is appropriate for this study because the dependent variable, healthcare utilization, is binary (admitted to the hospital or not admitted), making it ideal for modeling dichotomous outcomes. This method effectively evaluates the effect of multiple independent variables, such as health insurance, out-of-pocket payments, and government subsidies, on the likelihood of healthcare utilization by estimating probabilities and log-odds.

It also allows for simultaneous analysis of predictors while controlling confounding factors, providing clear insights into their contributions

Outpatient Care

$$\text{Number Hospital visits} = \ln \left[\frac{P_i}{1-P_i} \right] = B_0 + B_1 \text{Cash} + B_2 \text{COM} + B_3 \text{PUBLIC} + B_4 \text{PRIVATE} + B_5 \text{GOVERNMENT SUBSIDY} + B_6 \text{CT} + \varepsilon \dots \dots \dots (5)$$

Equation 3.5 was used to estimate the log likelihood of making hospital visits depending on cash (out-of-pocket payments), a particular type of health insurance, or having a government subsidy.

P is the probability of making P hospital visits. B₁, B₂, B₃, and B₄ are the loglikelihood of visiting the hospital multiple times for each unit increase or decrease in OPP (cash), public (NHIF), private, and community health insurance. A positive Beta means that the log likelihood of individuals with a particular type of health Insurance making more visits is higher than those using out-of-pocket payments(cash).

B₅ coefficient for government subsidy represents the change in log-odds of healthcare use associated with a unit increase in government financial support. This coefficient helps assess how government subsidies influence healthcare utilization, such as by making services more affordable and accessible, thereby potentially increasing the likelihood of hospital visits among subsidized populations. B₆ was used to capture the effects of the control variables, which include region (rural/urban), wealth index, age of the household head, size of the household, education level, and the natural log of outpatient cost. These variables were included to adjust for demographic and socioeconomic factors, ensuring their independent contributions to the outcome's log odds were accounted for.

Inpatient Care

$$\text{Hospital admissions} = B_0 + B_1 \text{OPP} + B_2 \text{COMMUNITY} + B_3 \text{PUBLIC} + B_4 \text{PRIVATE} + B_5 \text{GOVERNMENT SUBSIDY} + B_6 \text{CT} + \varepsilon \dots \dots \dots (6)$$

Equation 3.6 is a model used to evaluate health-seeking behavior for inpatient care; the explained variable represents admissions of individuals at a healthcare facility and staying overnight within the past twelve months. Therefore, the equation estimated the log likelihood of being admitted to the hospital overnight depending on a particular type of health insurance or having a government subsidy.

B₁, B₂, B₃, and B₄ are the likelihood of staying overnight at a healthcare facility for each unit increase or decrease in OPP (cash), public (NHIF), private, and community health insurance.

A positive beta means that the likelihood of individuals with OPP (cash), public (NHIF), private, and community health insurance being admitted is higher.

B₅ coefficient for government subsidy represents the change in log-odds of healthcare use associated with a unit increase in government financial support. This coefficient helps assess how government subsidies influence healthcare utilization, such as by making services more affordable and accessible, thereby potentially increasing the likelihood of hospital admissions among subsidized populations.

B₆ was used to capture the effects of the control variables, which include region (rural/urban), education level, wealth index, age of the household head, household size, and the natural log of outpatient cost. These variables were included to adjust for demographic and socioeconomic factors, ensuring their independent contributions to the log-odds of the outcome were accounted for.

RESULTS AND DISCUSSION

Three continuous variables, namely household size, age of the head of the household, and outpatient cost, were used in the analysis. Descriptive statistics of these variables included the average, standard error, the smallest, and the largest values observed.

Table 1 provides an overview of the descriptive statistics.

Table 1: Descriptive Statistics

Variable	Obs.	Mean	Standard Deviation	Minimum	Maximum
Household Age	12793	46.65	15.72	16	98
Household Size	12793	5.12	2.597	1	22
Outpatient Cost in KES	12079	1954	13707	5	750,000

Source: Author Computation

The results show that the average age of a typical household head was approximately 47 years of age, with a standard deviation of roughly 16 years. The average household size was 5 members, but the distribution varied widely, ranging from one member to approximately 22 members. Based on the sample used in the analysis, the average cost of outpatient treatment was KES 1954, and as expected, this varied widely across households from KES 5 to KES 750,000.

Further evaluation of demographic characteristics included evaluating the distribution of households' education and socio-economic status. Two main variables were chosen, which include the level of education of the household head and the wealth index as estimated by the Kenya National Bureau of Standards. Table 2 shows the distribution across different levels of education.

Table 2: Level of Education

	Percentage	Std. Err.	[95%_Conf	Interval]
Level of Education				
No Education	29.1%	0.4%	28.4%	29.9%
Primary Education	39.6%	0.4%	38.8%	40.5%
Secondary/ "A" Level Education	20.7%	0.4%	20.0%	21.4%
Middle-Level College	6.1%	0.2%	5.7%	6.5%
University	3.2%	0.2%	2.9%	3.5%
Vocational	1.2%	0.2%	1.0%	1.4%

Source: Author Computation

Table 2 indicates that the level of education was slightly skewed, with the majority of the households having either no education (29 percent) or some primary education (39.6 percent). Only 20.7 percent of households had pursued secondary education, while less than 10 percent had pursued tertiary education. Table 3 evaluated the distribution of Households' economic status using a five-point ordinal scale from the poorest to the richest.

Table 3: Distribution of Wealth

	Percentage	Std. Err.	[95%_Conf	Interval]
Wealth Index				
Poorest	19%	0.3%	18.3%	19.7%
Poorer	20.2%	0.4%	19.5%	20.9%
Middle	21.4%	0.4%	20.7%	22.2%
Richer	22.9%	0.4%	22.2%	23.7%
Richest	16.4%	0.3%	15.8%	17.1%

Source: Author Computation

The findings shown in Table 3 show the distribution of households based on wealth status. Notably, 19 percent of the households were categorized as the poorest, and the middle three categories ranged from 20.2 percent to 22.9 percent. These results suggest that among the households sampled for analysis, the distribution of households' wealth was somewhat uniform across the five categories.

Several study variables' distribution attributes were reviewed. Firstly, Outpatient health utilization was measured using the frequency or number of hospital visits, which ranged from 1 visit to 5 visits. Notably, a higher level of frequency of visits is an indication of the burden of disease or health incidents during the period under study. Table 4 shows the distribution of outpatient health utilization across sampled households.

Table 4: Number of Hospital Visits

	Percentage	Std. Err.	[95%_Conf	Interval]
Hospital Visits				
1	81.2%	0.3%	80.5%	81.9%
2	13.1%	0.3%	12.5%	13.7%
3	3.6%	0.2%	3.3%	3.9%
4	1.2%	0.1%	1%	1.4%
5	0.9%	0.1%	0.8%	1.1%

Source: Author Computation

Table 4 shows the distribution of hospital visits across sampled households. Notably, up to 81.2 percent of the households reported having visited the hospital once. Approximately 13 percent visited the hospital twice, while less than 4 percent visited the hospital three times. Preliminary indications from the distribution of hospital visits suggest that most cases of disease burden across the sampled households were minor and could be addressed in a single visit. It's worth noting, however, that potential barriers may exist that restrict hospital visitation or access to healthcare services. Table 5 shows the proportion of selected binary variables that were utilized to evaluate the determinants of health utilization in Kenya.

Table 5: Distribution of Selected Study Variables

	Percentage	Std. Err.	[95%_Conf	Interval]
Hospital Admissions				
No	86.1%	0.6%	84.9%	87.2%
Yes	13.9%	0.6%	12.8%	15.1%
Cash Payment				
No	16.0	0.6%	14.8%	17.3%
Yes	84.0	0.6%	82.7%	85.2%
NHIF				
No	7.9%	0.5%	7.1%	8.9%
Yes	92.1%	0.5%	91.1%	92.9%
Private Insurance				
No	85.3%	0.6%	84.0%	86.4%
Yes	14.7%	0.6%	13.6%	16%
Community Insurance				
No	97.9%	0.3%	97.3%	98.3%
Yes	2.1%	0.3%	1.7%	2.7%
Other Types of Insurance				
No	99.8%	0.1%	99.6%	0.99.9%
Yes	0.02%	0.1%	0.1%	0.4%
Government Subsidy				
No	87.5%	0.6%	86.4%	88.6%
Yes	12.5%	0.6%	11.4%	0.13.6%
Region				
Urban	46.7%	0.9%	45.0%	48.4%
Rural	53.3%	0.9%	51.6%	0.55%

Source: Author Computation

Table 5 shows the percentage of binary variables included in this study. Firstly, the variable called hospital admission captures inpatient health utilization. This variable was measured by asking respondents whether any member of the household had been hospitalized within the past year. The results show that approximately 14 percent of the household members used inpatient services within the study period. 16 percent of households had utilized cash as a means of payment for health services. Notably, only 8 percent of households had NHIF insurance, while up to 14.7 percent utilized private insurance for either inpatient or outpatient health services. Only 2 percent of households used community insurance.

Due to data unavailability, a proxy variable was used to capture government subsidies. This variable was captured by households that received some form of social assistance from either

the national government or the county government. The results in Table 4.5 show that only 12.5 percent of households reported having received social assistance from either the national or county government. Lastly, the results show that the sample used for analysis was evenly distributed across regions, with 46.7 percent of households residing in urban areas, while 53.3 percent reside in rural areas.

Therefore, it's worth noting that the sample captured the key demographic attributes of the Kenyan household, considering the region, education level, household size, and socio-economic status. Given the representative sample, inferential statistics were conducted, and the results are presented in the succeeding sections.

Inferential Analysis

This section presents the regression model used to address the study objectives. Two variables were chosen to represent how healthcare services were used. The count of visits made to the hospital was used to capture outpatient health utilization, while the number of admissions was used to capture inpatient health utilization. To this end, Binary logit and multinomial logit regression were used to estimate the coefficients and marginal effects of outpatient health utilization.

The binary logit regression was estimated using hospital admissions as the dependent variable. Additionally, a multinomial variable was estimated by regressing the number of hospital visits as the dependent variable. Independent variables consisted of selected study variables namely types of health insurance cover, (NHIF, Private and community), out of pocket payment and government subsidy and other controls used to fit the model included demographic variables namely region (rural/urban), wealth index, Age of the head of the household, household size, education level, and the natural logarithm of outpatient costs.

Table 6: Binary Logit and Multinomial Regression Results

	Logit Model Dep. Variable Admissions	Multinomial Logit Model (Dep variable: Number of Hospital Visits From 1 Visit to:			
	Coefficients	2	3	4	5
Age: Household Head	0.0109*** (0.0036)	-0.005 (0.004)	-0.012* (0.006)	0.024 (0.017)	-0.022 (0.015)
Size of the Household		0.028 (0.025)	-0.094** (0.041)	-0.032 (0.105)	-0.015 (0.078)
Region: Rural	0.329*** (0.109)	-0.022 (0.136)	-0.039 (0.258)	-1.723*** (0.548)	0.342 (0.385)
Education		0.006 (0.010)	-0.004 (0.017)	0.012 (0.042)	0.033 (0.041)
Cash payments	-0.267* (0.142)	-0.53*** (0.151)	-0.224 (0.249)	1.121 (0.762)	-0.429 (0.584)
NHIF	0.613** (0.301)	0.085 (0.292)	0.364 (0.404)	0.454 (0.788)	15.327*** (0.960)
Private Insurance	-0.187 (0.207)	-0.169 (0.195)	0.390 (0.303)	1.485** (0.600)	-1.218 (0.994)
Community Insurance	0.383 (0.395)	0.323 (0.458)	0.886 (0.543)	-14.586*** (0.729)	2.228* (1.168)
Government Subsidy	-0.156 (0.160)	-0.170 (0.180)	-0.757* (0.406)	-0.144 (0.667)	1.069** (0.444)
Wealth Index: Poorer	-0.311 (0.206)	-0.193 (0.298)	1.105* (0.627)	15.792*** (0.775)	14.417*** (0.632)
Middle	-0.469** (0.195)	-0.430 (0.276)	0.553 (0.617)	15.346*** (0.606)	15.082*** (0.334)
Richer	-0.701*** (0.185)	0.063 (0.264)	0.500 (0.609)	13.068*** (0.875)	14.505*** (0.539)
Richest	-0.833*** (0.184)	-0.212 (0.277)	0.513 (0.623)	13.479*** (0.640)	15.103*** (0.191)
Outpatient Cost		-0.059 (0.038)	-0.085 (0.068)	0.106 (0.130)	-0.028 (0.143)
Constant	-2.252*** (0.403)	-0.951* (0.519)	-2.257** (1.023)	-21.894*** (1.532)	-33.710*** (1.441)
Diagnostic tests					
Observations	3,317	3,318	3,318	3,318	3,318
Pseudo R-squared	0.0198	0.0268			
Likelihood ratio test	6425.9	11,564			
P-Value	(0.000)	(0.000)			
Hausman IIA test	37.06	12.37			
P-Value	(0.000)	(0.000)			

Robust standard errors in parentheses

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

Table 6 represents binary logit and multinomial logit regression results with Hospital admission and number of hospital visits as the dependent variables. The coefficients were evaluated using the maximum likelihood estimator. Due to heteroskedasticity, both models employed robust standard errors to evaluate the significance of the coefficients. Multiple diagnostic tests were carried out to check the model's consistency. Firstly, the likelihood ratio and Independence of

Irrelevant Alternatives (IIA) tests were used to test whether the model that includes health payment variables was adequate.

The likelihood ratio test and Hausman IIA tests were evaluated using the restricted and unrestricted models defined as follows: The restricted model was specified by regressing the dependent variable against control variables captured by the demographic variables. In contrast, the unrestricted model was specified with the additional independent variables that capture health payment plans.

The results in both models show that the null hypotheses stating that the unrestricted model was not adequate were rejected based on the likelihood ratio test and the Hausman IIA test. These results confirm that the unrestricted binary logit and multinomial logit models were validated. The results imply that the inclusion of health insurance coverage, government subsidy, and out-of-pocket payment was instrumental in explaining outpatient health utilization for both inpatient and outpatient models.

Evaluation of the control variables' coefficients results in both models showing that households with higher socio-economic status are significantly more likely to make three or more visits compared to their counterparts. Additionally, demographic factors such as household size, age, and type of residence had a significant influence on health utilization. However, it is worth mentioning that while demographic variables have some significant effects, these results should be interpreted cautiously since KDHS data is pooled from different regions nationwide, yet clustering was not accounted for in this analysis.

Therefore, to address the objectives, Marginal effects were calculated to show how the dependent variable changes when each independent variable shifts, and to ensure robustness, the marginal results of the multinomial logit model were calculated using one hospital visit as the reference and comparing it with subsequent hospital visits. Table 7 shows the marginal outcomes for both the binary logit model (column 2) and the multinomial model (columns 3 to 6).

Table 7: Marginal Effects from Multinomial Logit Model

	Logit Model	Multinomial Logit Model			
	Marginal Effects	Marginal Effects (Base outcome: 1 hospital Visit)			
		Two	Three	Four	Five
Cash Payments	-0.0335* (0.0189)	-0.062*** (0.012)	-0.006 (0.01)	0.0052** (0.0024)	-0.0032 (0.006)
NHIF Insurance	0.0598** (0.0239)	0.006 (0.03)	0.011 (0.011)	0.0023 (0.0037)	0.0093*** (0.0015)
Private Insurance	-0.0210 (0.0220)	-0.012 (0.018)	0.017 (0.014)	0.015 (0.01)	-0.0062** (0.003)
Community Insurance	0.0510 (0.0591)	0.023 (0.055)	0.041 (0.038)	-0.006*** (0.0013)	0.053 (0.063)
Government Subsidy	-0.0176 (0.0173)	-0.016 (0.017)	-0.021** (0.008)	-0.0007 (0.004)	0.013** (0.007)
Observations	3,317	3,318	3,318	3,318	3,318

Standard errors in parentheses

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

Effect of Health Insurance on Health Utilization in Kenya

The first goal was to study how a particular type of health insurance influences health care use in Kenya. The evaluation covered three health insurance types: NHIF, private insurance, and community insurance. Table 4.7 presents results where the marginal effect from the logit model was significant at the 5 percent level. This suggests that households with NHIF are 5.98 percent more likely to utilize inpatient health services than those without NHIF, holding other factors constant. The multinomial logit model shows that the marginal effect of NHIF for households that made five hospital visits was 0.0093 and was statistically significant at the 1 percent level. This implies that NHIF coverage increases the probability of a household making five hospital visits, holding other factors constant.

The study also examined private and community health insurance, and Table 4.7 shows that their marginal effects were not statistically significant in the binary logit model; however, a closer look reveals that private insurance had a negative and significant marginal effect for households that made five visits, while community insurance similarly showed a negative and significant marginal effect for households with four visits.

These results clearly show that National health insurance schemes positively and significantly impact health utilization. However, the findings have revealed several issues. First, the results show that NHIF enrolment is significantly low. According to the sample used in this study, only 7.9 percent of the households used NHIF. According to Oyando et al (2023), the NHIF scheme was ineffective because of the low enrolment rate, low depth coverage, and high attrition rate. Given these attributes, public insurance holders may not fully cover essential services, especially for households with health conditions such as ulcers, diabetes, and hypertension. In addition, households that require regular health services, such as regular screenings and specialist consultations, are inequitably exposed, leading to high attrition rates. Furthermore, affordability issues coupled with perceived lack of value are some of the reasons why NHIF performed dismally.

Anasel et al. (2024) noted that socio-demographic and health system determinants are some of the factors that influence the utilization of public health insurance schemes in Tanzania. The study championed targeted enrollment of households in rural areas and the informal sector. In addition, efforts to improve awareness about the benefits, types of services, and specialized packages that address different health care needs were also identified as a critical policy issue that must be addressed to reduce attrition and enhance better health outcomes.

Secondly, an increase in health utilization is observed for households that made four visits. This suggests that NHIF is likely to be utilized by households experiencing severe or higher chronic illnesses. Conventional wisdom dictates that health insurance coverage should ultimately yield positive health outcomes in society. However, these study findings provide evidence of the presence of moral hazard and adverse selection components. The findings may provide evidence of reverse causality, as they show that households with chronic health issues or those that are likely to suffer from poorer health are more likely to seek or retain insurance coverage (Oyando et al., 2020; Mugo, 2023).

Therefore, careful investigation should be conducted to evaluate whether the correlation between insurance and health status is the dominant driver of public health insurance enrollment. In-depth analysis of the role of moral hazard and adverse selection in insurance enrolment is vital in designing insurance schemes that can provide sustainable health benefits

to the Kenyan population (Suchman, 2020; Mugo, 2023).

Considering these results, the government should prioritize efforts to enhance National health insurance coverage. In addition, there is a need for the national insurance policy to diversify its mandate and incentivize community-based and private insurance providers to offer affordable, accessible, and comprehensive coverage that complements public health insurance.

Effect of Out-of-Pocket (OPP) payment on Health Utilization in Kenya

The second objective sought to examine the effect of out-of-pocket payment on health care utilization in Kenya. A binary variable capturing households using cash to settle their hospital bills was used for analysis. The results in Table 4.7 in the logit model show that the marginal effect of cash was -0.0335 and was negative and significant at the 10 percent level. Additionally, the marginal effect of households that made two visits was - 0.062 and statistically significant at the 1 percent level. However, the marginal effect of households that made four visits was 0.005 and statistically significant at the 5 percent level. These results suggest that households making fewer hospital visits, in this case, two visits, are less likely to utilize healthcare services. However, the likelihood of using out-of-pocket payment increases as the burden of disease increases, as shown by the positive marginal effect of four visits. These results reveal that households suffering from chronic disease or households that are exposed to recurrent illnesses and lack health insurance coverage must continue paying High out-of-pocket payments (OPP) to access medical services.

The study findings, therefore, reveal two key issues that are critical for policy. First, the study indicates that frequent hospital visits lead to a significant increase in OPP, pushing households into poverty. In addition, underutilization of healthcare, as captured by the low frequency of hospital visits, is less likely to seek medical care, possibly due to the heavy financial cost associated with healthcare utilization. Secondly, the positive relationship between OPP and high hospital visits is a clear indication of the financial burden uninsured households with chronic diseases face, which may ultimately lead to avoidance of care.

The findings show that households with chronic illnesses or medical conditions that require admission are more likely to seek healthcare services if they have NHIF. These results clearly show that strengthening public insurance programs plays a fundamental role in promoting the utilization of health services. This supposition is supported by the fact that the non-significance of both private and community health insurance schemes in inpatient and outpatient services is, in addition, that the cost of health services remains a fundamental barrier to health utilization in Kenya (Suchman, 2020).

The study supports the findings by Kamba (2022), who demonstrated that having an NHIF, private insurance, and community insurance coverage did not exclude households from using OPP payments as an alternative payment mechanism. Additionally, having insurance did not have a significant effect on the level of OPP spending in both outpatient and inpatient health services. These results are a clear indication of the low level of enrolment and utilization of both public, private, and community insurance by Kenyan households.

Therefore, this study recommends that the government should prioritize efforts to enhance public health insurance coverage through targeted interventions and substantive policy reforms. Health insurance schemes can be established based on regional characteristics, thereby addressing specific issues facing the local populace. In addition, health insurance schemes should be formulated by focusing on the health burden and illnesses of different households.

Effect of Government Subsidy on Health Utilization in Kenya

The third objective evaluated the effect of government subsidies on health care utilization in Kenya. Due to the unavailability of data, households that benefited from other forms of government subsidies, such as food assistance, were used as a proxy. Binary variable capturing households that received some form of social assistance from the government. The results in Table 4.7 in the multinomial logit model show that the marginal effect of government subsidy was -0.021 and statistically significant at the 5 percent level for households that made three visits and 0.013 and meaningful at the 5 percent significance level for households that made five visits.

The findings reveal that social assistance by the government has a weak effect on the chances of visiting hospitals or other healthcare facilities for households seeking outpatient and inpatient health services. These results suggest that households receiving social assistance from the government might allocate resources differently, potentially reducing hospital visits if they can afford better preventive care or medication. However, as the severity of the health condition increases, vulnerable households that receive government subsidies have a higher chance of accessing healthcare services.

The study's finding suggests that households receiving social assistance from the county or national government are more likely to allocate their meager resources differently compared to those who don't receive assistance. Potential government subsidies will reduce the number of hospital visits, possibly by improving the household's material welfare and disease burden. However, a review of the results shows that government subsidies alone may not improve healthcare utilization.

Despite the positive effect of government support, comprehensive support is needed to expand subsidies to include healthcare access. This study implies that it's important for the government to make improvements and expand the subsidization of health insurance by providing better ways to reach the less privileged in society. Enhancement of healthcare utilization required the government to complement subsidies and other forms of support by using targeted health insurance support.

CONCLUSIONS, PROPOSALS AND RECOMMENDATIONS

This study aims to explore how having health insurance, paying for healthcare directly from one's pocket, and government subsidies affect the use of medical services in Kenya. The specific objectives are to find out how different kinds of health insurance affect the way people use healthcare services in Kenya, to examine how paying for healthcare expenses directly from the pocket influences healthcare usage, and to assess how government subsidies affect the usage of healthcare services.

The first objective examined the effect of a specific type of health insurance on health care utilization in Kenya. Three types of health insurance were evaluated, namely NHIF, private insurance, and community insurance. The results revealed that households with NHIF are 5.98 percent more likely to utilize inpatient health services than those without NHIF, holding other factors constant. The multinomial logit model shows that the marginal effect of NHIF was for households that made five hospital visits was 0.0093 and was statistically significant at the 1 percent level. This implies that NHIF increases the probability of a household making five hospital visits, holding other factors constant. Other forms of health insurance coverage

evaluated were private and community health insurance. However, private and community health insurance were statistically insignificant. Further scrutiny shows that the marginal effect of private insurance was negative and significant for households that made five visits. Furthermore, the marginal effect of community insurance was negative and significant for households that made three visits.

The second objective sought to examine the effect of out-of-pocket payment on health care utilization in Kenya. A binary variable capturing households using cash to settle their hospital bills was used for analysis. The results reveal that the marginal effect of cash was -0.0335 and was negative and significant at the 10 percent level. Additionally, the marginal effect of households that made two visits was -0.062 and statistically significant at the 1 percent level. However, the marginal effect of households that made four visits was 0.005 and statistically significant at the 5 percent level.

The third objective evaluated the effect of government subsidies on health care utilization in Kenya. The results show that government subsidies had an insignificant effect on health-seeking behavior for households that made five visits only. Furthermore, the government social assistance had a weak effect on the probability of visiting a healthcare facility for households seeking both outpatient and inpatient health services. This study implies that the government needs to improve and expand the subsidization of health insurance by providing better ways to reach the less privileged in society.

The results confirm that NHIF had a positive effect on the health-seeking behavior of households seeking both inpatient and outpatient healthcare services. However, low enrollment in NHIF and high attrition rate reduced the effect of NHIF, and private and community insurance had no significant effect. Therefore, it was recommended that the government, through its public insurance scheme, should prioritize efforts to enhance public health insurance coverage. In addition, the government should incentivize community-based and private insurance providers to offer affordable, accessible, and comprehensive coverage that complements National health insurance.

The study findings further indicate that frequent hospital visits lead to a significant increase in OPP, pushing households into poverty. In addition, the positive relationship between OPP and high hospital visits is a clear indication of the financial burden uninsured households with chronic diseases face, which may ultimately lead to avoidance of care. Therefore, the public insurance scheme should focus on policy reforms that enhance targeted health insurance based on regional characteristics and household health utilization needs.

The evaluation of the effect of government subsidies on health care utilization in Kenya depicted an insignificant effect of government support; therefore, comprehensive support is needed to expand subsidies to make healthcare utilization possible for everybody. This study implies that the government, through its social protection department, needs to improve and expand the subsidization of health insurance by providing better ways to identify and cover the less privileged in society to improve both health access and utilization.

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