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Financial and Geographic Barriers to Health Care Access in Kenya: The Quest towards Universal Health Coverage

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Abstract

Background: Access to health care services without being plunged into financial hardship is a life blood of the Universal Health Coverage. Kenya's health sector is heavily dependent on out of pocket health expenditure. This model of health financing is inequitable and leads to underutilization of the much needed health care services. Majority of Kenyans travel for longer distances to access health care services. The geographic access barrier is linked to delayed care, missed appointments, delayed medication and undue loss of life. This study examines the correlates of financial and geographic health care access barriers in the UHC implementing Counties in Kenya.

Methodology: The study used a cross-sectional data collected from 249 respondents using exit interviews at the health facilities drawn from the Kenya Master Health Facility List (KMHL). A multivariate log it regression model was used to analyze the predictors of probability of failure to access health care services owing to prohibitive health care and transport costs.

Results: High out-of-pocket monthly expenditure on medicine; wider proximity, higher transportation cost and a longer traveling time to a health facility increases the probability of not seeking medical treatment owing to prohibitive health care and transportation costs. These factors thus, acts as key barriers to health care access.

Conclusion: Financial and geographic access barriers negatively impact on health care access. To hasten the realization of the Universal Health Coverage, prepayment models such as use of taxes and insurance should be pursued.

Keywords

Universal Health coverage, Health care access, Financial and geographic access

Background

Notwithstanding the worldwide push for the Universal Health Coverage (UHC), half of the global population continue to be bereft of essential health care services [1]. Individuals living in Sub-Saharan Africa have the lowest health care access and service utilization, which is largely driven by underfunding, financial and geographical barriers [2]. Access to health care services without being plunged into financial hardship is a life blood of the Universal Health Coverage (UHC). UHC entail severy one being able to utilize health care services needed without being thrown into financial distress [3,4]. Health care access on the other hand measures what impedes and or enables people "in their ability to gain entry and to receive medical care from the healthcare system" [5]. Therefore, health care access and the Universal Health Coverage are inextricably linked.

Guaranteeing universal access to inexpensive and quality health care services can be a powerful tool to contribute to ending poverty by 2030 in low-and middle-income countries where majority of the global poorest lives [6]. UHC agenda, thus remains very critical for any country aiming to shield its citizenry from diverse health risks and realize the supreme objective of Sustainable Development Goals (SDGs), ending extreme poverty. Virtually, all countries around the globe have successfully embedded UHC into their national health policies. However, there is a disparity when it comes to access, utilization of health care services and health outcomes. Countries in the developed world have continued to document improved access to, and utilization of, health care services and hence a lower disease burden [6].

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The developing countries on the other hand, are riddled with constrained access and underutilization of health care services which eventually contributes to high disease burden [7]. The high disease burden has increasingly contributed to low Gross Domestic Product (GDP) growth in the developing countries by robbing these economies of productive labour [8]. Moreover, health care financing that is largely out of pocket impedes the utilization of health care services, compromise on quality and contributes to higher child and maternal mortalities [9]. This therefore, calls for policies that will lead to increased investments in the healthcare system for improved health fiscal space to guarantee universal health care access. This study examines the financial and geographic barriers of health care access in the UHC Implementing Counties in Kenya.

Universal Health Coverage in Kenya

From 2013, the government of Kenya embarked on reforming the National Hospital Insurance Fund (NHIF) to hasten the realization of the Universal Health Coverage in the country. Myriad policies that mirrored the UHC concept were introduced. The policies are however characterized by fragmentation as each only targeted a section of the population while excluding the rest of the population. (Figure 1) presents already implemented policies that tends towards Universal Health Coverage in Kenya. Despite the stated reforms, the NHIF has been struggling to offer health insurance cover to bulging Kenyan population as disease burden deepens and health care cost increases. Moreover, the Kenyan workforce in the informal sector (informal sector offers 70% of the jobs in Kenya) is either reluctant to register with, and or unable to sustainably raise the monthly contributions required by NHIF. The apathy in the uptake of NHIF has thus largely entrenched out-of-pocket health expenditure which is associated with myriad undesired health outcomes.

To realize the universal health coverage, it is imperative that the health care services be physically accessible, affordable and acceptable to the users [10]. Essentially, it is the actual use of health care services that should be of interest when analyzing health care access. There are five (5) dimensions of health care access which influences one's ability to get entry into a health care system and eventually utilize the services: Adequacy; affordability; acceptability; availability; and (geographic) accessibility [11]. These are presented in (Table 1). Breaking down health access into these dimensions enables policy makers to be well acquainted with the bottlenecks hampering the realization of the Universal Health final coverage goals of utilization relative to need, quality, and finance protection and equity in finance. This study will however focus on the geographic accessibility) and affordability (financial accessibility) dimensions of healthcare access in the four (4) UHC implementing Counties in Kenya.

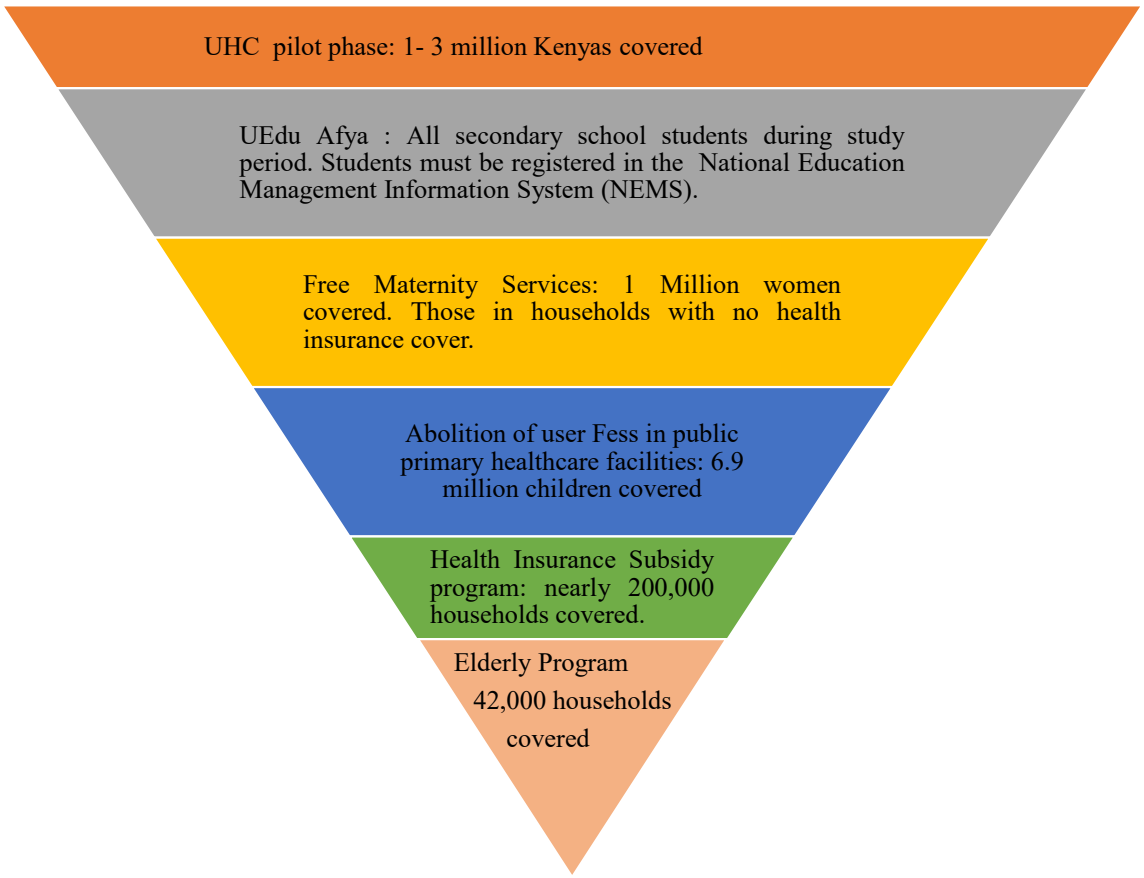

Figure 1: Health Policies (programmers) tending towards Universal Health Coverage in Kenya.
Source: MOH, 2018.

Table 1: Dimensions of Health care Access Barriers.

Dimension of Access barriers [11]	Descriptions	Barriers [12,13]
Affordability-(Financial Access)	Cost and prices of services Household wealth status and the willingness to pay	Health provider charges Opportunity cost Health financing system
Geographic Accessibility	Proximity to the health care facility Provider location	Measures the time taken Distance covered to reach a health facility
Acceptability	Patient's perception Nature of health care services	Health workers competence Cultural norms Household expectation
Availability	Health workers, drugs and equipment Demand for services	Waiting time Quality of staff Prices and quality drugs Education
Accommodation (Adequacy)	Quality of health care services Health workers	Length of time of operations Availability of wheelchair and ambulatory services

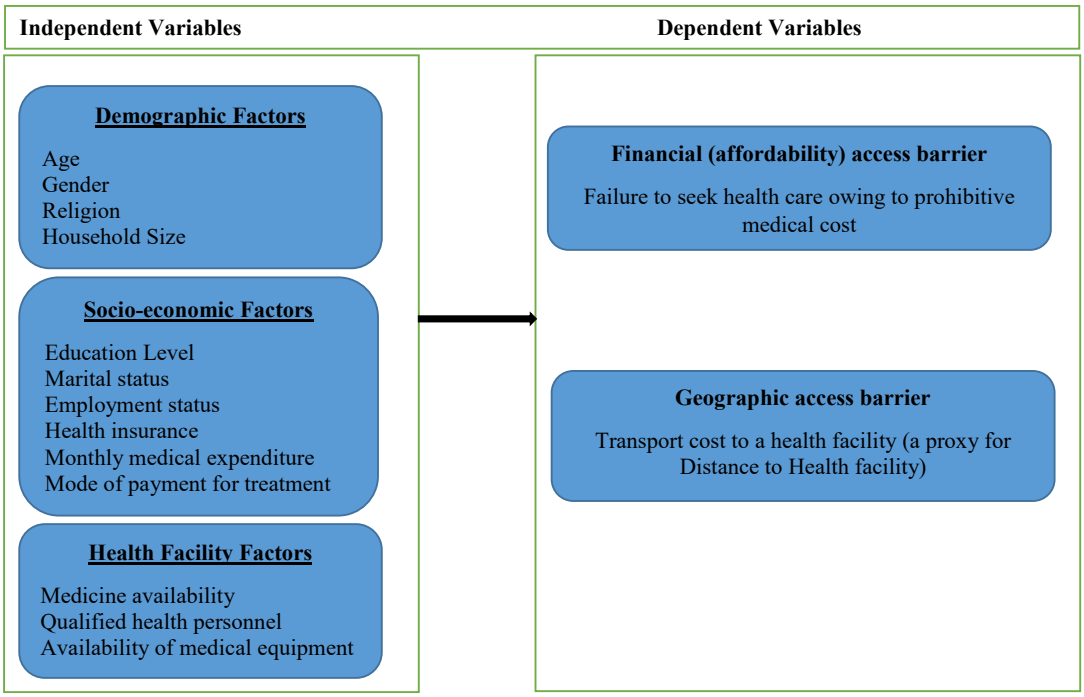

Figure 2: Conceptual Framework.

Source: Author

Problem Statement

UN Sustainable Development Goal 3 (SDG 3) aims to "ensure healthy lives and promote well-being for all at all ages." [14]. Embedded in the 3rd SDG, is target 3.8, the Universal Health Coverage, which stresses on the need for all people and communities to have access to quality health care services without being plunged into financial hardship. Achieving UHC remains critical to a nation's social and economic transformation, health security, and social stability [15]. Access to affordable and quality primary health care are the cornerstone of UHC. Despite health being made a basic right in virtually all the countries, majority of the global population struggle to ful fil their health care needs.

According to a report by the World Bank and World Health Organization in 2017, those incurring catastrophic and or impoverishing health spending were estimated to be between 1.4 billion and 1.9 billion. Many of these individuals are in the low-and upper- middle-income countries. Catastrophic and impoverishing health expenditures deepens household's poverty and exacerbates low health services utilization, a precursor for premature mortalities and worsening medical conditions [16-18]. Kenya's health sector is heavily dependent on out of pocket health expenditure- which are levied on services sought in both public and private health facilities [19]. The high share of out-of-pocket health care expenditure greatly impedes access to health care services [20,21]. Closer proximity to a health facility can correlate positively to improved health care access and service utilization. However, close to more than half the Counties in Kenya have less than two (2) health facilities per 10,000 people and less than 4 facilities per 100 square kilometers [22]. This forces many to travel for longer distances in order to access health services and could also point to serious health coverage gaps owing

to accessibility. Moreover, many of the health facilities are yet to meet the minimum set health standards. In Kenya, no study has attempted to analyze the barriers associated with affordability and geographic dimensions of health care access. This is a gap this study aims to fill. This study makes a fundamental contribution by analyzing separately, affordability and geographic access barriers in the four UHC implementing Counties which are; Kisumu, Nyeri, Isiolo and Machakos .The findings of this study will be fundamental in developing policies that will widen health care access and hasten the realization of the universal health coverage in the country.

Review of Related Literature

Health care access is a multidimensional concept having up to five (5) indicators; financial access; geographical accessibility, availability, acceptability, and adequacy. This study concerns primarily with financial and geographic dimensions of health care access therefore, literature relating to the two have been presented.

Geographic Accessibility

Geographic accessibility measures the burden of travel borne by a patient to a health facility [23,24]. This manifests itself in terms of transportation costs and time of travelling. From the literature, we can delineate the influence of geographic accessibility to health care access in five different ways: Service utilization; distribution and concentration of human resources for health (HRH); distribution of health facilities; gender driven disparities and regional (urban versus rural) inequalities in access and utilization of health care services. The cost of treatment is a key factor influencing geographic access [25]. Prohibitive medical cost can push patients to seek for treatment at low cost health facility even if they are miles away from their places of residence.

Wider proximity to a health facility has been found to contribute to adverse reproductive health outcomes. Low use of reproductive and child health services such as family planning and hospital (skilled) deliveries, and higher mortalities in mothers and children have been found to correlate positively with low proximity to a health care provider [26-32]. Quality of health care services offered influences whether patients will seek for treatment from a nearby health service provider and or from a distant facility [33]. Some studies have also documented that women to can opt to travel for longer distances in seeking maternal health care services if they are conscious that the nearer health facilities have services that are either of poor quality or are unavailable [34].

The length of time taken to travel to a health facility has also been found to pose a geographic access barrier when it comes to timely access of health care services needed. Studies reviewed have found health care service usage to be lower among those who travel for a longer period of time to reach a health facility [35]. Others have found patients traveling for a longer period of time to a desired health care provider to experience increased medical costs (due to increased transport costs) and higher hospitalization rates [36]. Traveling for a long period of time can also lead to late medicine usage and non-attendance to doctor appointments [37]. All these have the potential to expose an individual to adverse health outcomes. Geographic accessibility dimension is a precursor for inequality in health care access. Equity in health care access is a key tenet of a well-functioning healthcare system [38,39]. Studies have found those who stay in urban areas to have higher access and utilization rates than their counterparts in the rural areas due to efficiency and availability of the transport system [40-42]. Weak transport system that is rampant in most rural areas in the developing countries has been found to be a foremost obstacle in accessing and utilizing the required health care services [30,43-46].

Financial Access

Financial access measures the health provider's cost to be borne by the patient and their ability and willingness to pay for the health care services sought [11]. Essentially, to guarantee financial access, policies that will ensure a reduction of cost barriers such as prohibitive user fees, out of pocket expenditures, and other indirect costs such as transportation, man hours and childcare costs needs to be put in place. Many individuals especially, in the least developing countries are unable to receive the needed medical attention owing to structural and individual financing challenges such as high medicine costs, low insurance penetration, and overstrained public health systems [47].

Literature on financial access barriers has been organized around how health provider charges, opportunity cost in accessing treatment (indirect cost), poverty (wealth) status, out of pocket health expenditure and health insurance cover impede and or facilitate access and utilization of health care services. Studies have found poverty to be highly correlated with low health care access [48]. Financial hardship is also a significant barrier to access for maternal, reproductive, and child health [49-52]. Poor countries also tend to devote low amount of resources towards their healthcare systems thus only limited amount of services can be offered. Healthcare in such countries also tend to be financed largely through direct user fees which potentially locks out many from the healthcare system. Health insurance is a key element of financial access. Possession of a health insurance cover is associated with increased access to health care services [53-55]. There is a negative association between Out-of-pocket (OOP) health expenditure and health care access and service utilization [20,21]. Households in low resource settings are unduly exposed to catastrophic and impoverishing health care expenditure due to direct user fees [56-58].

Theoretical Framework

The study borrows from the random utility model framework from the works of Grossman [59], and Becker [60], where individuals seek to maximize their utility based on their preferences on health and other composite goods subject to their budget constraints (a function of income and price).

Estimating the probability of seeking health care-dichotomous outcome

Given that the utility function of a patient is in the form:

$$U_I = (H_i, Z_i) \quad \text{.....1.}$$

Where H_i is the health status and Z_i represents other composite goods consumed by person i. Improvements of health status gives individuals indirect utility. They however, have to choose from combinations of health care and other composite goods that maximizes their utility as below:

$$U_i^* = \text{Max}\ (U^{ul}, U^{uo}) \quad \text{.....2}$$

Where $\mathbf{U^{u1}}$ and $\mathbf{U^{u0\ are}}$ utility levels attached to seeking health care and not respectively.

Since H_i and Z_i are influenced by a combination of demand characteristics (individual, household, community) and supply factors (health care specific). We specify health seeking decision model as specified below:

$$H_{cs} = \beta_0 + \beta_1 X_i + \varepsilon \quad \text{.....3}$$

Where H_{cs} measures health care access- geographical and affordability access, Ximeasures demand and supply-side factors such as age, marital status, education level, gender, employment status, possession of health care insurance cover, and income which influences one's ability and willingness to seekfor health care.

Econometric Model

To realize the objectives of the study, two regression models were fitted necessitated by two outcome variables-affordability and geographic access. Affordability was measured by failure to seek treatment owing to prohibitive health care cost whereas geographic access was measured by a proxy variable for the location of the health provider, the transportation cost [61]. The respondents were probed to state whether they have failed to access health care services due to prohibitive medical and transportation costs in the last one year, thus necessitating the use of a log it regression model. We thus specify an econometric model as follows:

$$\begin{aligned} FHC = {} & \beta_0 + \beta_1 AG + \beta_2 GE + \beta_3 RE + \beta_4 HS + \\ & \beta_5 EDUC + \beta_6 MS + \beta_7 FE + \beta_8 HIC + \\ & \beta_9 MME + \beta_{10} IECL + \beta_{11} MOP + \beta_{12} DHF + \\ & \beta_{13} DNHF + \beta_{14} INC + \beta_{15} MOT + \beta_{14} SE + \varepsilon_i \quad \text{.....4} \end{aligned}$$

Where: FHC is Failure to seek treatment due to prohibitive health care and transportation costs, AG is age, GE is gender, RE is religion, HS is household size, EDUC is education level, MS is marital status, FE is formal employment, HIC is health insurance cover, MME is monthly medical expenditure, IECL is informal employment as casual labourer, MOP is mode of payment for treatment, DHF is the distance to the health facility attended, DNHF is the distance to the nearest health facility (may not be the one attended at the moment), INC is income, MOT is the mode of transportation of the health provider and SE refers to self -employment (business and farming).

Data sources

The study used Cross-sectional primary data collected from 521 respondents at the health facilities in 8 Counties (4 UHC and 4 Non-UHC implementing proximal Counties). A total of 249 respondents came from the UHC implementing counties, while 272 respondents were from the non-UHC implementing Counties. Simple random probabilistic sampling technique was used to sample a total of 100 health care facilities drawn from the universe given by the Kenya Master Health Facility List (KMHFL). Exit interviews was used to collect data from patients after seeking services at the health facilities. The cross-sectional primary data was collected from February 10, 2020, to February 28, 2020. Data was then entered into Stata14, cleaned, transformed and analyzed.

Variables and their Measurements

The table below indicates the outcome and the explanatory variables used in the study.

Results

Descriptive statistics

(Table 3) shows the descriptive statistics for both the outcome and explanatory variables. From the table, the respondents in the age bracket of 25-34 years were the highest at 26.5 per cent, followed by those in the age bracket of 15-24 years at 25.3 Gender wise, the majority of the respondents were female at 63.5 per cent. For the marital status, those who were married were the highest at 71.1 per cent. Based on the religious affiliation, 60.2 per cent of the respondents were Protestants, while 21.3 per cent were Catholics. The respondents who were in self- employment (business and or farming) had the highest representations at 45.3 while those who reported to be unemployed were at 20.2. By education level, respondents with primary level of education were the highest at 38.5, followed by those with secondary level of education at 35.3 per cent. Respondents who attended level 3 and level 4 health facilities were the highest at 34.9 and 30.9 per cent respectively. For distress health financing, those who had sold property, borrowed, and used savings to pay for medical bills stood at 30.5, 37.4, and 42. 7 per cent respectively.

The high prevalence of distress health care financing shows financial protection remains a critical issue when it comes to health care access in Kenya. On the distance travelled to a health facility, those who travelled for less than 5 km were the majority at 62 per cent, those who had travelled for between 5 and 10 km followed at 20 per cent while those who did travel for between 26 and 30 km were nearly 7 per cent. On the other hand, those who had travelled for more than 30 km to reach a health service provider were 3.2 per cent. The longer distances travelled is a sure indication that Kenyan's still travel for very long distances to access health care services. World Health Organization regulation recommends that the proximity to a health facility should be not more than 5 km.

In terms of transport costs to reach a health facilities, those who spent less than 100 shillings as transport cost were the

Table 2: Variables and their Measurements.

Variable	Measurement
Outcome Variable (s)	
Affordability Access Barrier	Failure to access health care services due to prohibitive health care access
Geographic Access Barrier	Failure to access health care services due to prohibitive transport cost (to the health facility)
Explanatory Variables	
Age	Age in years
Gender	1 If Male, 0 if Female
Religion	0 If No religion, 1if Protestant, 2 if Catholic, 3 if Muslim
Household size	The number of household members
Education level	0 if no education, 1 if primary, 2 if secondary, 3 if tertiary (college), 4 if university,
Marital status	0 if single, 1 if the patient is married, 2 if widowed/widower
Employment status	1 if has formal employment, 0 if unemployed
Health Insurance cover	1 if yes, 0 otherwise
Health Facility Level	0 if level 2, 1 if level 3, 2 if level 4, 3 if level 5
Monthly medical expenditure (in Ksh.)	0 if <Ksh. 1000, 2 if Ksh. 1001-2500, 3 if Ksh. 2501-5000, 4 if Ksh. 5001-10,000.
Mode of payment for treatment	1 if by health insurance, 0 if by out of pocket expenditure
Availability of medicine	0 if always available, 1 if rarely, 2 if never
Distance to a health facility	0 if <5 km, 1 if 5-10 km, 2 if 11-15 km, 3 if 16-20 km, 4 if 21-25 km, 5 if 26-30km, and 6 if >30 km
Distance to the nearest health facility	0 if <5 km, 1 if 5-10 km, 2 if 11-15 km, 3 if 16-20 km, 4 if 21-25 km, 5 if 26-30 km, and 6 if >30 km
Time taken to reach a health facility	0 if 0-30 minutes, 1 if 1-2 hours, 2 if 3-4 hours, 3 if 4 hours or more.

Source: Authors

majority at 32 per cent followed by those who spent between 101 and 200 shillings stood at 21 per cent. Those who spent between 201 and 500 were 18.2 per cent. Respondents in the UHC Counties who experienced prohibitive transport and medical care costs stood at 35 and 34 per cent respectively. These two measured affordability and geographic health care access barriers. Further, the respondents who spent less than 1000 shillings monthly on medicine stood at 70 per cent. Those who spent between 1001-2500 and 2501-5000 shillings monthly on medicine stood at 15 and 9 per cent respectively. Possession of health insurance cover stood at 31 per cent. Those who didn't have any health insurance cover in UHC Counties stood at 69 per cent.

Empirical Results

The study presents empirical results for the correlates of affordability and geographic access barriers for health care measured.

Financial (affordability) access barriers

(Table 4) present the marginal effects after log it regression model for the affordability access barriers for health care services. The respondents were asked, "In the past one year, did you fail to seek for treatment due to prohibitive health care costs?" This gave a binary response of either 1 for a 'yes' and or '0' for a no.

Discussion

The marginal effects presented in table 4 shows the log it regression model for failure to seek treatment due to prohibitive medical cost. From the results, Prohibitive transport cost, age 65 years and above, primary, secondary and tertiary education level, informal employment as a casual labourer, self-employment (business/farming, an income of Ksh. 30,001-40,000, 5-10kmto health facility, 21-25 km to health facility and 30km and above to health facility, 16-20 kmto nearest health facility, Ksh. 301-500 transport cost, Ksh.1,001-2,500 and 5,001-10,000 monthly expenditure on medicine are all statistically significant in predicting failure to access health care due to prohibitive medical cost. Prohibitive transport cost to a health facility increases the probability of not seeking treatment. An increase in prohibitive transport cost to a health facility by 1 shilling increases the probability of not seeking treatment due to prohibitive medical care cost by 0.82 compared to those who were able to pay for transport to a health facility.

This result corroborates a similar findings by other studies that found transport cost to be a barrier to health care access [25,35,62]. Other studies found a positive correlation between having access to a vehicle (through family and or friend) and increased access and utilization of health care services [63]. Age is negatively correlated with prohibitive medical care cost of treatment. An individual aged 65 years and above than those aged 15-24 years, has a lower chance of failure to seek treatment due to prohibitive medical cost. Being aged 65 years and above reduces the probability of failure to seek treatment due to prohibitive medical cost by 0.115 than those aged 15-24 years. A study by Kullgren, et al. [62], on the nonfinancial barriers to health care access for adults living in the US also concluded that those aged 30 years and below had a higher likelihood not to seek for treatment owing to financial costs. Education level correlates negatively with failure to seek treatment due to prohibitive medical cost in a UHC implementing County in Kenya.

Those having primary, secondary, tertiary, and University education levels have a lower probability of 0.333, 0.437, 0.154, and 0.131 respectively of failure to seek treatment due to prohibitive medical cost compared to those with no level of education in a UHC implementing County. Those with

Table 3: Descriptive Statistics.

Variables		Frequency	Percentage (%)
Age:	15-24	63	25.3
	25-34	66	26.5
	35-44	57	22.9
	45-54	26	10.4
	55-64	15	6
	over 65 years	22	8.8
Gender:	Male	91	36.6
	Female	158	63.5
Marital Status:	Single	59	23.7
	Married	177	71.1
	Widow	10	4
Religion:	No religion	1	0.4
	Protestant	150	60.2
	Catholic	53	21.3
	Muslim	45	18.1
Employment status:	Formal/ Salary	36	14.6
	Unemployed	50	20.2
	Self- business/ farming	112	45.3
	Self- casual labourer	41	16.6
Education Level:	No education	23	9.2
	Primary	96	38.5
	Secondary	88	35.3
	Tertiary	32	12.9
	University	10	4
Health Facility Levels:	Level 2	39	15.7
	Level 3	87	34.9
	Level 4	77	30.9
	Level 5	46	18.5
Ever sold property to pay medical bills:	Yes	75	30.5
	No	171	69.5
Ever borrowed to pay medical bills:	Yes	92	37.4
	No	154	62.6
Ever used Savings to pay medical bills:	Yes	100	42.37
	No	136	57.6
Distance to Health Facility:	<5KM	152	61.5
	5-10KM	49	19.8
	11-15KM	12	4.9
	16-20KM	4	1.6
	21-25KM	5	2
26-30KM		8	3.2
>30KM		17	6.9
Distance to Nearest Health Facility:	5KM	190	77.6
	5-10KM	34	13.9
	11-15KM	11	4.5
	16-20KM	2	0.8
	21-25KM	3	1.2
	26-30KM	2	0.8
>30KM		3	1.2
Time taken to Health Facility:	0-30 minutes	154	62.4
	1-2 hours	81	32.8
	3-4 hours	7	2.8
>4 hours		5	2
Transport Cost to Health Facility:	No cost	72	29
	<100	79	31.9
	101-200	52	21

201-300	24	9.7
301-500	21	8.5
prohibitive transport cost: Yes	86	34.8
No	161	65.2
Prohibitive Medical Cost: Yes	85	34.1
No	164	65.9
How often get medicine: Sometimes	130	52.63
Rarely	22	8.9
Always	91	36.8
Never	4	1.6
Monthly Expenditure on Medicine: <1000	174	69.9
1001-2500	37	14.9
2501-5000	22	8.8
5001-10,000	7	2.8
Have Health Insurance cover: Yes	76	31.2
No	168	68.9
Mode of Payment for health care services: NHIF	16	6.5
UHC Card	160	65.6
Out-of-Pocket	29	11.9

Table 4: Marginal Effects after Logit Model for Failure to seek treatment due to prohibitive Medical Cost (Financial access.

Variables	Marginal Effects	Standard Error	z	P>z	[95% Confidence Interval]	
Prohibitive transport cost	0.820	0.10165	8.07	0.000***	0.62087	1.0193
Age 65 and above	-0.115	0.05808	-1.98	0.048**	-0.2286	-0.0009
Primary Education level	-0.333	0.09579	-3.48	0.000***	-0.5212	-0.1457
Secondary Education Level	-0.437	0.10268	-4.26	0.000***	-0.6384	-0.2359
Tertiary Education Level	-0.154	0.06816	-2.26	0.024**	-0.2876	-0.2047
University Education level	-0.131	0.05603	-2.33	0.020**	-0.2404	-0.0208
Informal employment- casual labourer	0.767	0.20896	3.67	0.000***	0.3581	1.1773
Self-employment (business/farming)	0.253	0.10436	2.43	0.015**	0.0487	0.4578
30,001-40,000 income	-0.1096	0.06475	-1.69	0.091	-0.2365	0.0173
5-10 km to health facility	-0.164	0.06003	-2.74	0.006***	-0.2822	-0.0468
16-20 km to health facility	-0.159	0.06604	-2.41	0.016**	-0.2889	-0.0299
21-25 km to health facility	0.125	0.05458	-2.30	0.022**	-0.2323	-0.0183
>30 km to health facility	0.655	0.3289	1.99	0.047**	0.0099	1.2992
16-20 km to nearest health facility	0.90	0.04763	18.90	0.000***	0.8069	0.9936
301-500 transport cost	0.725	0.30379	2.39	0.017**	0.1298	1.3207
1001-2500 monthly medicine	-0.126	0.0508	-2.49	0.013**	-0.2259	-0.0268
5001-10,000 monthly medicine	-0.119	0.05236	-2.33	0.020**	-0.2248	-0.0195

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

higher education level are more susceptible to land formal employments hence the ability to pay for the health care services sought. Being closer to a health facility attended has a lower likelihood of failure to seek treatment due to prohibitive medical cost in a UHC County. Those who travelled for 5-10km and 16-20 km to a health facility had a decrease in probability of 0.164 and 0.159 respectively for failure to seek treatment due to prohibitive medical cost. On the other hand, those who travelled for 21-25 km and more than 30km to the health facility attended had a higher probability of 0.125 and 0.655 respectively for failure to seek treatment due to prohibitive medical cost compared to those who travelled for less than 5 km to a health facility attended in a UHC County. Longer distances would imply more expenditure on transportation cost that eventually contributes to higher cost of treatment. Several studies have corroborated these findings as those in close proximity to a health facility reported increased access to health care services than those who are distant from the health facilities [28-31]. When it comes to distance to the nearest health facility (not necessarily the one attended), those who travelled for 16-20 km to the nearest health facility had a higher probability of 0.9 for failure to seek treatment due to prohibitive medical cost in UHC implementing Counties. Lower monthly expenditure on medication correlates negatively with the failure to seek treatment owing to prohibitive health care costs. The respondents who had a monthly expenditure on medication of between Ksh. 1,001-2,500 and 5,001-10,000 had a lower probability of 0.126 and 0.119 respectively for failure to seek for treatment due to prohibitive medical care cost. Studies have also come to the conclusion that purchases of medicine that are largely through out of pocket payments impedes health care access [64-69].

Table 5: Marginal Effects after Logit Regression Model for failure to seek treatment due to prohibitive Transport cost (Geographic access).

Variables	Marginal Effects	Standard Error	z	P>z	[95% Confidence Interval]	
Age 55-64	0.9462	0.28744	3.29	0.001***	0.3828	1.5095
University level of education	0.9976	0.00604	165.26	0.000***	0.9857	1.0093
16-20 km to health facility	0.9976	0.00629	158.59	0.000***	0.9853	1.0099
21-25 km to health facility	0.9973	0.00722	138.14	0.000***	0.9831	1.0115
3-4 hrs to health facility	0.9981	0.00511	195.39	0.000***	0.9881	1.0081
201-300 transport cost	0.9315	0.18184	5.12	0.000***	0.5751	1.2879
5001-10,000 monthly medicine	0.8834	0.31234	2.83	0.005***	0.2712	1.4956
Have health insurance cover	-0.5933	0.15166	-3.91	0.000***	-0.8905	-0.296

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

Geographicaccess barriers

(Table 5) shows the marginal effects after Log it regression model for failure to seek treatment due to prohibitive transport cost. To measure geographic access barrier, the respondents were asked, "In the past one year, did you fail to seek for treatment owing to prohibitive transport costs?" This gave a binary response of either 1 for the affirmative and or 0 for the negative response. The results are as presented in (Table 5).

Discussion

From table 5, the variables; Age 55-64 years, University level of education, 16-20 km to health facility, 21-25 km to health facility, 3-4 hours to health facility, Ksh. 201-300 transport cost, 5,001-10,000 monthly expenditure on medicine, and have health insurance cover are statistically significant in predicting the failure to access health care services due to prohibitive transport cost to a health facility in the UHC implementing Counties. Older people have a higher chance of failure to seek treatment due to prohibitive transport cost. The probability of an individual in the age bracket of 55-64 years' failure to seek health care services due to prohibitive transport cost is 0.946 higher compared to an individual in the age bracket of 15-24 years. Perhaps higher transport cost would mean longer distance and older people may not be willing to travel for longer distances to seek medical care.

A study by Lee, et al. [70], in community of older people living in the urban areas in Australia found a positive relationship between efficient transport system and health care access. Higher levels of education increases the probability of not seeking medical care due to prohibitive transport cost. There is an increase in probability by 0.998 for an individual with university level of education to fail to access treatment due to prohibitive transport cost than those who have no level of education. Those with higher education levels could be having higher opportunity cost in seeking treatments from distant health care providers hence opting to be treated in nearer healthcare providers. The longer the distance to a health care facility, the higher the chance of not seeking treatment due to prohibitive transport cost in a UHC implementing County.

There is a higher probability of 0.998 and 0.997 respectively for an individual who travelled for 16-20 km and 21-25km to fail in seeking medical care due to prohibitive transport cost compared to those who travelled for less than 5km to a health facility in a UHC County. Longer distances would imply more transportation costs which then drives up the total cost of treatment up beyond the reach of many. A study by Gao & Kelley, et al. [71], in the rural Kenya and Haiti found households which have to travel for longer distances to reach a health facility to experience lower health care access rates.

Other studies have also found a negative association between longer distances travelled to health care access rates [72-75]. However, other studies documented a positive correlation between health care access and distance owing to quality of services offered and availability of medicine [76-79]. The longer the time taken to travel to a health facility, the more likelihood of adverse health outcomes such as lower access and utilization rates. The probability of failure for an individual who travelled for 3-4 hours to access treatment due to prohibitive transport cost is higher by 0.998 than those who travelled for less than 30 minutes. A study by Oluoch, et al. [80], in Siaya County, in Kenya corroborates this finding as their study also found longer traveling time to correlate positively with lower access and utilization rates of maternal health care services. In Malawi, a shorter traveling period was found to contribute to a higher uptake of health care services among HIV patients [81]. Higher monthly expenditures on medication increases the likelihood of not seeking treatment due to prohibitive transport cost in a UHC County. There is a higher probability of 0.8834 for failure to seek treatment due to prohibitive transport cost for an individual who spent Ksh.5,001-10,000 Kenya shillings monthly on medication compared to one who spent less than 1,000 Kenya shillings on medication in a UHC implementing County.

Studies have linked higher medical costs that is largely borne by out-of-pocket expenditure to impede health care access [82-84]. Having health insurance lowers the chance of failure to seek treatment due to prohibitive transport cost in a UHC implementing County. Health insurance correlates positively with health care services utilization rates. The probability of an individual with a health insurance to fail in seeking treatment due to prohibitive transport cost is lower by 0.593 compared to an individual with no health insurance in a UHC County. Health insurance takes the burden of payment for the services from the individuals to the insurance provider. Several studies in Kenya have also come to the same conclusion [20,85-91]. Studies in other parts of the world have also documented the positive relationship between health care access and possession of health insurance [53-55].

Conclusion

The study analyzed what influences financial and geographic dimensions of health care access. Financial and geographic access barriers negatively impact on health care access. High out-of-pocket monthly expenditure on medicine, higher transportation cost, possession of a health insurance cover, income, higher education level, and being employed are statistically significant in influencing geographic and financial dimensions of health care access. To hasten the realization of the Universal Health Coverage, prepayment models such as use of taxes and insurance should be pursued. Public health facilities also needs to be stocked by the right health care commodities- medicine, equipment and other technologies to remove the burden of buying them upon the patients. Counties also need to adopt the use of mobile clinics to enhance Primary Health Care access (PHC).

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The author declared no potential conflicts of interest with respect to the authorship and/or publication of this article.

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Strengths and limitations of the study

The study delves into key barriers hampering health care access and hence jeopardizing the realization of UHC in Kenya. Barriers arising from geographic and financial accessibility dimensions of health care access have been analyzed separately for a robust evidenced based policies. The aim is to hasten the realization of UHC in Kenya. The study had some limitations: Budgetary Constraints, thus we could only sample 8 Counties (4 implementing UHC and 4 proximal) out of a possible 47 counties; the use of intervals for some variables such as time taken to travel and distance to a health facility were a bit wide. However, these hasn't affected the regression results presented in this study in any way.

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