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EXPLORING OUT OF POCKET HEALTH EXPENDITURE AND HEALTH INSURANCE AMONG RESIDENTS IN KAKAMEGA, KENYA

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Abstract:
Introduction: Strategies for access and utilization of health care by all its citizens to ensure equity and equality in terms of quality health services is an important factor for governments to consider. The three basic goals of a country's health care system are illness prevention, treating the sick and protecting people from financial catastrophes that come with medical bills. Despite this, the threat that out-of-pocket (OOP) expenditures pose to households' living standards is increasingly recognized as a major consideration in financing health care **Objective:** The objective of the study was to determine the percentage contribution made by out of pocket expenditure on health care from the total household income of health care consumers in Kakamega County and also establish the association between out of pocket expenditure and insurance premium payments in Kakamega County. **Design:** The study design was a descriptive cross-sectional survey that utilized both quantitative methods. **Setting:** The study was carried out in Kakamega County **Sample:** A simple random sampling was applied to get participants (*n = 348*) **Analysis:** Data were analyzed through descriptive statistics, chi-square test of independence and logistic regression. **Main outcome measures:** Household income, expenditure on health and health insurance **Results:** Bivariate analysis on respondents' factors that are associated with household income showed that there was a borderline significant relationship between the level of education and household income in the study area (OR: 0.8; 95% CI: 0.6 – 1.2; p=0.02.Out of the 348 participants, 56.6%(n=197) of the respondents reported earning directly from business proceeds from their farm, as their key source of income,14.7%(n=51) reported to get

income from a relative, while 11.5%(n=40) earned directly from employment. 53.2%(n=185) reported that they spent between 1000ksh-5000ksh on food monthly. 45.1%(n=157) reported that they spent between 5000ksh-10000ksh on rent monthly. 65.8%(n=229) of the respondents reported spending between 1000-5000ksh on relatives' medical expense in a month.62.4%(n=217) reported to spend 10000-50000ksh on inpatient healthcare in a month while. Bivariate analysis on health expenditures that are associated with household income showed that there was a borderline significant relationship between the health expenditure on relatives' medical expense and household income (OR: 1.2; 95% CI: 0.8 – 1.4; p=0.01). 84.5%(n=294) said they were aware of insurance premiums. 37.4% of the respondents said they heard about insurance from radios. 65.5%(n=228) reported to have a family member on health insurance premiums. The findings showed that there was a significant association between out of pocket expenditure on relatives' medical expenses and ownership of health insurance χ^2(df=3) =9.112, p=0.028. **Conclusion:** Increased priority needs to be given to health, especially low-income countries which are in most need for additional spending on health.

Keywords: access to primary health care, direct cost, Kenya, health equity, health financing reform, health insurance coverage, low-income countries, outpatient care/cost of ambulatory care, out-of-pocket expenditure for health, sustainable health system

1. Introduction

Investment in health is not only desirable but an essential priority for all human beings, it is also the most productive venture the global community can make. Governments should ensure that its people are healthy by putting mechanisms in place for access to quality health services delivery. While health service delivery is an important aspect in health care, health utilization is yet another important determinant of the quality of the health services offered from the perception of that quality by the users (Devadasan et al., 2006). In Kenya, 46% of Kenyans live on less than a dollar per day (Delloitte, 2011), this represents 18.6 million people from Kenya's total population of 45 million (Kenya Demographic Health survey, 2014). The fundamental goal of health care systems is to ensure that its population has access to high-quality care. While trying to achieve this goal, the health systems should ensure that households are protected from incurring health care expenditure that is too high relative to income. This is often referred to as the 'financial protection' goal of the health system (Baeza and Packard, 2006).

The threat that out-of-pocket (OOP) expenditures pose to households' living standards is increasingly recognized as a major consideration in financing health care (van Doorslaer et al., 2006). Such a concern is justified based on: a) the unpredictability of OOP expenditures; b) their large magnitude relative to household resources; and c) their uneven distribution in relation to that of income. Thus, any health care system with the welfare of its citizens in mind, must work to reduce the adverse effects of OOP

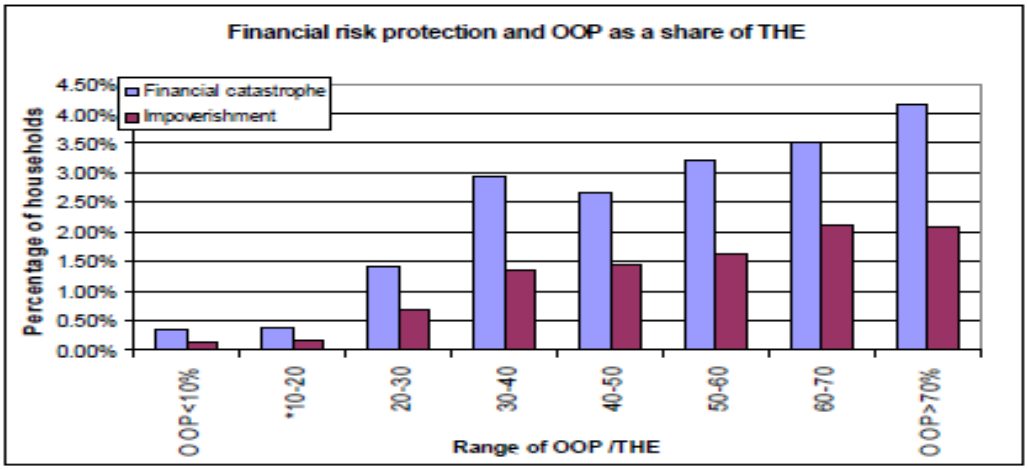
expenditures and especially catastrophic expenditure. In Kenya, out-of-pocket payments for health care are a substantial share of total health care costs accounting for 54 percent in 2001/2002, 39.3 percent in 2005/2006 and 36.7 percent in 2009/2010 (Government of Kenya, 2007; 2010c). They are charged for health services sought from both the public and private sectors. Out-of-pocket expenditures have impacted negatively on utilization of health care services in Kenya (Mbugua, Bloom and Segall, 1995; Ministry of Health, 2004; Government of Kenya, 2009). According to Elgazzara et al. (2010), out-of-pocket spending on health care has become a policy concern for three reasons: First, households may be pushed into poverty or deeper into poverty as a result of paying directly for health services. Second, households facing these health expenses may cut back on other essential household spending such as food and clothing. Third, households may, in fact, choose to forgo necessary health care services rather than face the steep financial consequences, thus creating a vicious cycle of ill health, disability, and poverty. If health care expenditure by a household is 10 percent of total expenditure, that might be considered catastrophic, but 10 percent of nonfood expenditure probably would not (O'Donnel *et al.,* 2008).

According to World Health Organization (WHO) (2000), direct out-of-pocket (OOP) payment for health at the point of service is considered an inequitable means of financing a health system, since there is danger of burdening different social sub-groups unequally, especially the poor and the elderly. In such systems, the greatest financial burden tends to be placed on the household, and if the cost of health care exceeds the ability to pay at the time of service use, it can give rise to avoidance of necessary care or to a delay in seeking health care. Poor families are often forced by OOP expenditures to choose between satisfying basic needs such as education, food and housing and saving loved-ones from illness and suffering (Knaul et al., 2006a). Thus, health spending can be an important cause of poverty (Baeza and Packard, 2006; Van Doorslaer et al., 2006; Wagstaff and Van Doorslaer, 2002). Though the share of OOP expenditures in total health expenditures has been decreasing over time, the 36.7 percent currently being financed by households is quite high bearing in mind the high poverty levels in Kenya. In 2005, 47 percent of the population was estimated to be living in poverty (World Bank, 2008). It is not known with certainty how poverty has changed since then, as there has not been another poverty estimate due to lack of data. However, World Bank projections using national health accounts data suggest that Kenya's poverty rate is around 42 percent (World Bank, 2013).

Most of the empirical work linking individual and household welfare to health covers the impact of health on productivity and earnings, consumption and poverty. For example, Gertler and Gruber (2002) examined the impact of health shocks on household consumption patterns in Indonesia. They found evidence that illness reduced labour supply and household income. Wagstaff (2005) also found that health shocks were associated with a reduction in consumption in Vietnam. Godlonton and Keswell (2005) examined the impact of health status on poverty status and found that households that contain more unhealthy individuals were more likely to be income

poor than those with fewer unhealthy individuals. Mendola *et al*. (2007) found that in Albania and Bosnia, the probability of poverty was higher among those who had experienced a chronic illness. O'Hara (2004) estimated the impact of demographic characteristics, insurance status, and medical usage of the family on poverty and found that older heads of the family, at least one family member in poor health, or some adults without health insurance were the most at risk of poverty. Previous literature has well documented that households face financial catastrophe and impoverishment as a result of out-of-pocket payments (OOP) (Ranson, 2002; Xu, Evans, Kawabata, Zeramdini, Klavus & Murray, 2003). Figure 1 presents the percentage of households with catastrophic expenditure and impoverishment against OOP of a share of total health expenditure. Catastrophic expenditure is defined as out-of-pocket health payment exceeding 40% of a household's non-subsistence spending.

Figure 1: Percentage of households incurring catastrophic health expenditure and impoverishment against OOP as a share of health expenditure



Source: Adapted from (Xu, Evans, Carrin, Aguilar, Musgrove & Evans, 2007)

The current study sought to fill existing knowledge gaps in the study area. Population-based household surveys are needed to estimate the extent of financial risk protection and the poverty impact of illness for specific interventions, such as primary health care services, such surveys are very limited (Sweeney et al., 2016), outpatient-focused research is needed to build well-designed delivery systems that both improve supply and demand of basic health care services (Yuan, He, Meng & Jia, 2017). Therefore, the researcher found it necessary to conduct this study. The objective of the study was to determine the percentage contribution made by out of pocket expenditure on health care from the total household income of health care consumers in Kakamega County and also establish the association between out of pocket expenditure and insurance premium payments in Kakamega County. The results of the study are hoped to be useful in refining the national health financing policy in Kenya.

1.1 Theoretical Framework

Much of the economic theory of health care demand is based on the Grossman human capital approach to health (Grossman 1972; 1999; 2004). In his model, health services are sought because they improve health status implying that demand for health care is derived from demand for health. In the Grossman model, each person inherits an initial stock of health which decreases with age, but can be increased through investments. The decision to seek medical care is an input to help counteract the natural depreciation of the health stock. Other inputs include exercise, education, nutrition, and lifestyle choices.

Grossman argues that medical care is different from other goods and services, since what an individual is actually buying is better health. In addition to increasing productivity, increased health also increases the total amount of time that can be spent on producing earnings and commodities. Therefore, health is demanded, first as a consumption commodity which directly enters the individual's utility function, and second, as an investment commodity which increases the stream of healthy days that permit market and nonmarket activities. In typical consumer demand theory, each person has a utility function by which the various combinations of goods and services that can be purchased are ranked. The individual will choose the combination that maximizes utility function, subject to income constraint (Grossman, 1972). Human capital theory explains how individuals invest in human capital to raise productivity, and thus produce earnings and commodities which feed back into the individual's utility function. Grossman also incorporated a household production function of consumer behavior to explain the difference between medical care as an input and health as an output. He distinguishes goods and services from commodities, by presenting commodities as a function of goods and services, and consumer time. The individual buys medical services and other goods to produce commodity health, which enters the utility function rather than medical care being a direct input into the utility function.

2. Materials and Methods

2.1 Research Design

The study design was a descriptive cross-sectional survey that utilized quantitative methods. With regards to the quantitative methods, the particular design was ideal since the research entailed collecting and comparing data from the phenomena at the same time of study. Kothari (2004) describes descriptive surveys as formalized and typically structured fact-finding enquiries, involving asking questions (often in the form of a questionnaire) to a group of individuals, adding that the major purpose is description of the current state of affairs as it exists at present and describe "what exists" with respect to variables or conditions in a situation. Therefore, it was deemed the best strategy to fulfill the objectives of this study.

2.2 Study setting

Kakamega County is located in Western Kenya bordering Bungoma County to the North, Trans Nzoia County to the North East, Uasin Gishu County and Nandi County to the East, Vihiga County to the South, Siaya County to the South West and Busia County to the West. It lies 50km North of Kisumu and is home to Mumias Sugar Company, the largest sugar producing company in Kenya. According to the 2009 Kenya Population and Housing Census the population of Kakamega will be 1,660,651 with a population density of 515 people per Km2 and an annual growth rate of 2.12%. Age Distribution will be 0-14 years 46.6%, 15-64 years 49.7% and over 65 years 3.6%. (KDHS, 2010). Kakamega County has 214 health facilities with 1 Level five hospital, 4 District Hospitals, 7 Sub-District Hospitals, 101 Dispensaries, 40 Health Centres, 43 Medical Clinics, 10 Nursing homes, 1 Maternity Homes and 7 uncategorized institutions. The main hospitals in the county are Kakamega Provincial General Hospital, Butere, Iguhu, Malava, and Lumakanda District Hospitals. The most prevalent diseases in the county are Malaria, Diarrhoea Skin Diseases, Respiratory Tract Infections.

2.3 Participants

The population study was people of Kakamega County who access health care. The Doctor to Population Ratio is 1:14, 246, the infant Mortality Rates are 63.9/1000 while under five mortality rates are 122.5/1000. The prevalent diseases in the county are Malaria, Diarrhoea, Skin Diseases, Respiratory Tract Infections. Households were sampled for administration of study instruments. The study targeted household heads as informants to be interviewed; preferably they were to be adult members of the general population aged from 18 years and above. A Multistage cluster sampling technique was carried out where the first stage was to stratify the urban and rural sub-counties as clusters. Kakamega County has got 12 sub-counties; each sub-county has wards. The total number of wards in the 12 sub-counties is 60. All wards were included in the study. The second stage was to select villages in the wards using purposeful sampling method. Number of households was proportionally selected from villages using systematic sampling method through their villages from a random selection procedure using the Kish table method.

2.4 Research Instruments

Data was collected using a structured questionnaire. All the completed questionnaires were examined for internal validation. Data was externally validated by randomly selecting one in twenty completed questionnaires and revising the household to confirm responses. To increase the validity and reliability of the instruments, the questionnaire was evaluated by experts. Then based on the feedback the final questionnaire was prepared for pre-test. The reliability of the scale of the items was found to be: Internal consistency = (Cronbach's α = 0.727). Deleting selected items would not increase the alpha. The researcher used a structured questionnaire divided into 4 sections. Section 1- sociodemographic characteristics: - gender, age, marital status,

educational status, Religion, and occupation. Section 2 - contribution made by out of pocket expenditure on health care. Section 3 - insurance premium payments and access to quality health. The questionnaire was in English language and translated into Kiswahili as the community does not share the same dialects to facilitate communication, ease its execution and standardize responses.

2.5 Data Analysis

The data was entered, cleaned, coded and analyzed using SPSS software (statistical package for social sciences) Version 25. Variables were examined through bivariate and multivariate analysis by computing odds ratio at 95% confidence interval. A *p*-value of ≤ 0.05 was considered statistically significant. Multiple logistic regression was applied to determine the relationship between the independent variables that showed significance with outcome variable. The Dependent variable for this study was house hold income and house hold expenditure on health. During analysis, the researcher omitted those questionnaires without responses on vital information of this study. The researcher conducted analyses of normality, for the outcome variable, prior to hypothesis testing by examining kurtosis and skewness of the data. In order to test and identify possible outliers in the data, graphical assessment visuals, including scatter and box plots were used. Elimination of observed outliers was based on a case by case basis, dependent on standard deviations, and on normality and homogeneity of variance assessments. Normality was assessed using examination of the histograms by seeing how they related or deviate against a normal bell curve distribution and observing the levels of kurtosis and skewness present. Univariate analysis was used to describe the distribution of each of the variables in the study objective; appropriate descriptive analysis was used to generate frequency distributions, tables and other illustrations used to analyze knowledge of self-medication. Bivariate analysis was used to investigate the strength of the association and check differences between the outcome variable and other independent variables. Chi square test of independence at 0.05 level of significance was used to determine if there is an association between out of pocket expenditure, health insurance and access to quality health care.

2.6 Data Collection Procedures

Data was collected using a structured household-level questionnaire with close ended questions about socio-demographic characteristics, household income, health seeking behavior, and health care expenditure. The questionnaire was field tested and refined. Trained data collectors from a similar socio-economic background to that of the respondents and are fluent in area language were used to administer the questionnaire.

2.7 Ethical Considerations

Ethics approval was obtained from Masinde Muliro University of Science and Technology ethics board. No further approval was needed since the project did not require access to patients or personal data. For this research to be of quality, integrity

and transparent, the researcher ensured that it was designed, reviewed and undertaken. Participants were informed fully of their roles, purpose of the survey, risks involved if any and how they were to benefit from the study. To meet the above criteria, participation was voluntary free of coercion. The researcher ensured confidentiality of the information and anonymity of the respondents was respected (Ritchie *et al*., 2013 & Webster *et al*., 2013).

3. Results

The study involved 384 household heads residing in Kakamega County. A total of 348 questionnaires were clean and complete for data analysis. This represents 90.6% of the sample size. According to Mugenda and Mugenda (2003) a response rate of 50 percent is adequate, a response rate of 60 percent is good, and a response rate of 70 percent is very good. Therefore, the 90% percent response rate reported for this study formed an acceptable basis for drawing conclusions. While we should not expect full response in studies where responding is voluntary, scholars utilizing questionnaires should aim for a high response rate (Baruch & Haltom, 2008). A few questionnaires were incomplete in most of the survey questions and were therefore excluded. According to Burns & Grove (2011), subjects must be excluded from the analysis when data considered essential to that analysis are missing.

Table 1: Background characteristics of respondents

Category	Frequency	Percentage
Gender		
Male	143	41.1
Female	205	58.9
Total	348	100
Age		
18-19 years	4	1.1
20-29 years	61	17.5
30-39 years	99	28.4
40-49 years	104	29.9
50-59 years	40	11.5
60+ years	40	11.5
Total	348	100
Marital Status		
Never married	18	5.2
Currently Married	267	76.7
Separated	13	3.7
Divorced	54	1.1
Widowed	42	12.1
Cohabiting	4	1.1
Total	348	100
Education Level		
No formal education	25	7.2

Less than primary	70	20.1
Primary completed	118	33.9
Secondary completed	92	26.4
High school completed	17	4.9
College/pre-university	23	6.6
University post-graduate	3	0.9
Total	348	100
Religion		
Protestant	220	63.2
Catholic	84	24.1
Muslim	41	11.8
Hindu	1	.3
Buddhist	1	.3
Other	1	.3
Total	348	100
Occupation		
Government employee	23	6.6
Non-government employee	13	3.7
Self-employed	181	52
Un employed	131	37.6
Total	348	100

Many household heads were female (n=205, 58.9%). Many respondents were of age bracket 40-49 years (n=104, 29.9%). many (188 (33.9%) had primary school education, 181 (52%) were self-employed. Majority of the respondents were married 76.7% (n=267) and 220 (63.2%) of the respondents were protestants. Table 1 above gives a summary of responses.

3.1 Household income among household heads

The Table 2 below is a summary of household income variables. In assessing respondents' household income two questions were used. With regards to the specific questions asked, 56.6% (n=197) of the respondents reported to earn directly from business proceeds from their farm, as their key source of income,14.7%(n=51) reported to get income from a relative, while 11.5%(n=40) earned directly from employment. When asked to rate their monthly household income per month, 71.8% (n=250) estimated a range of 10,000ksh- 20,000ksh monthly, while 21.6%(n=75) estimated a range of 5,000ksh-10,000ksh. The 10,000 -20,000 is still low amount to sustain families given the high inflation rate.

Table 2: Summary of questions on household income

Items	Response	N	%
Main source of income	Earning from employment	40	11.5%
	Business/sales proceeds from the farm	197	56.6%
	Monthly income from a relative	51	14.7%
	Pension and retirement income	13	3.7%
	Workers compensation for injury/disability	5	1.4%

	Government allotment for belonging to a special group	8	2.3%
	More than one source of income i.e. employment/business	3	0.9%
	Other	31	8.9%
On average how much money do you receive per month in Ksh?	Below 5,000	11	3.2%
	5001-10000	75	21.6%
	10001-20000	250	71.8%
	Above 20,000	12	3.4%

3.2 Characteristics of household heads and household income

The Table 3 is a bivariate analysis of respondents' characteristics and household income. The proportion of males earning over 10,000ksh was higher (55.3%) compared to females. The proportion of respondents earning 10,000ksh and above was higher in the age group 39 years and below. The proportion of those employed earning 10,000ksh and above was higher (57%) compared to the unemployed.

Table 3: Respondents characteristics associated with household income

Characteristic	N	Household Income		Overall OR	95% CI	p value
		>10,000ksh	<10,000ksh			
Gender						
Male	143	55.3	44.7	1.1	0.7 – 1.5	0.7
Female	205	53.8	46.2			
Age						
39 years and below	164	54.7	45.3	1.3	0.7 – 2.3	**0.01**
41 years and above	184	47.9	52.1			
Marital status						
Alone	127	47.9	52.1	0.7	0.5 – 1.0	**0.06**
Married	271	56.6	43.4			
Education level						
Primary and below	213	50.6	49.4	0.8	0.6 – 1.2	**0.02**
Secondary and above	135	55.6	44.4			
Religion:						
Protestants	220	58.2	41.8	1.6	1.1 – 2.2	**0.01**
Others	128	47.2	52.8			
Occupation						
Employed	217	57.0	43.0	2.0	1.3 – 3.2	**0.002**
Unemployed	131	39.6	60.4			

3.3 Social Demographic factors that Affect household income

Bivariate analysis on respondents' factors that are associated with household income shows that there was a borderline significant relationship between level of education and household income in the study area (OR: 0.8; 95% CI: 0.6 – 1.2; p=0.02) as shown in Table 4.7. House hold income was lowest among clients who had attained at least primary school education compared with those who had secondary or tertiary education. Household heads who were protestants were one-and a half more likely to earn 10,000ksh and above than those who belonged to the other religions such as

Catholics and Muslims, among others (OR: 1.6; 95% CI: 1.1 – 2.2; p=0.01). The number of age group of the household head was statistically significantly in household income with the results showing that respondents who were 39 years and below were one point three times more likely to earn 10,000ksh and above compared to respondents in the ages 41 years and above (OR: 1.3 95% CI: 0.7 – 2.3; p=0.01). Similarly, respondents who were employed were about two times more likely to earn 10,000ksh and above in contrast to those who were unemployed (OR: 2.0; 95%CI: 1.3 – 3.2; p=0.002).

3.4 Household heads' expenditure

Table 4 below is a summary of variables on expenditure. 53.2%(n=185) reported that they spent between 1000ksh-5000ksh on food monthly. 45.1%(n=157) reported that they spent between 5000ksh-10000ksh on rent monthly. 59.5%(n=207) reported that they spent 1000-5000ksh monthly on fuel for cooking and lighting, 74.1%(n=258) said that they spent between 1000-5000ksh on farm inputs monthly while 74.1% (258) reported to spending between 1000-5000ksh on school fees monthly.

Table 4: Household expenditure

Items	Response	N	%
How much do you spend on food monthly?	Below 500	1	.3%
	501-1000	135	38.8%
	1001-5000	185	53.2%
	Above 5000	27	7.8%
How much do you spend on rent monthly?	Below 1000	6	1.7%
	1001-5000	136	39.1%
	5001-10000	157	45.1%
	Above 10000	28	8%
	None	21	6%
How much do you spend on fuel for cooking and lighting monthly?	Below 500	4	1.1%
	501-1000	129	37.1%
	1001-5000	207	59.5%
	Above 5000	8	2.3%
How much do you spend on the farm monthly	Below 1000	4	1.1%
	1001-5000	258	74.1%
	5001-10000	67	19.3%
	Above 10000	18	5.2%
How much money do you spend on school fees monthly?	Below 1000	3	.9%
	1001-5000	258	74.1%
	5001-10000	54	15.5%
	Above 10000	33	9.5%

3.5 Household heads' expenditure on health

Respondents were asked how much they spend on healthcare and their responses are presented in the Table 5 below.65.8%(n=229) of the respondents reported to spend between 1000-5000ksh on relatives' medical expense in a month. 62.4%(n=217) reported to spend 10000-50000ksh on inpatient healthcare in a month while 81.9%(n=285) spend between 1000-3000ksh on outpatient healthcare per month. 84.5%(n=294) of the

respondents reported to spend between 1000-5000 on transport to health facility in a month.

Table 5: Health expenditure among house hold heads

Items	Response	N	%
Money spent on a relative's medical expense in the last month?	<1000	**1**	**.3%**
	1001-5000	**229**	**65.8%**
	5001-10000	**93**	**26.7%**
	>10000	**25**	**7.2%**
How much do you spend on inpatient healthcare per month?	10000-50000	**217**	**62.4%**
	50000-100000	**108**	**31%**
	Above 100000	**23**	**6.6%**
How much do you spend on outpatient healthcare per month?	<1000	**1**	**.3%**
	1001-3000	**285**	**81.9%**
	3001-5000	**42**	**12.1%**
	Above 5000	**10**	**2.2%**
How much do you spend on transport to health facility in a month	Below 500	**3**	**.9%**
	501-1000	**47**	**13.5%**
	1001-5000	**294**	**84.5%**
	Above 5000	**4**	**1.1%**

3.6 Association between Household income and expenditure on health

The Table 6 below is a bivariate analysis of respondents' health expenditure and household income.

Table 6: Health expenditure associated with household income

Items	N	Household Income		Overall OR	95% CI	p value
		>10,000ksh	<10,000ksh			
Money spent on a relative's medical expense in the last month?						
5000ksh and below	230	45.9	54.1	1.2	0.7 – 1.5	0.01
Above 5000ksh	118	58.3	41.7			
How much do you spend on inpatient healthcare per month						
50000ksh and below	217	44.4	55.6	1.1	0.7 – 2.3	0.12
Above 50000ksh	131	60.2	39.8			
How much do you spend on outpatient healthcare per month?						
3000ksh and below	286	42.8	57.2	0.6	0.5 – 1.0	0.2
Above 3000ksh	52	55.9	44.1			
How much do you spend on transport to health facility in a month						
1000ksh below	50	46.4	53.6	1.3	0.6 – 1.2	**0.02**
Above 1000ksh	298	62.3	37.7			

Bivariate analysis on health expenditures that are associated with household income shows that there was a borderline significant relationship between the health expenditure on relatives' medical expense and household income (OR: 1.2; 95% CI: 0.8 – 1.4; p=0.01) as shown in Table 4.10. Household heads who spent 1000ksh and above on transports to the health facility were one point three time more likely to earn 10,000ksh

and above than those who spend below 1000 Kshs on transport to the health facility (OR: 1.3; 95% CI: 0.9 – 1.6; p=0.02).

3.7 Health insurance among Household heads

The Table 7 below summarizes responses of respondents on insurance premiums. 84.5%(n=294) said they were aware of insurance premiums. 37.4% of the respondents said they heard about insurance from radios. 65.5%(n=228) reported to have a family member on health insurance premiums. With regards to sources of payment, 35.3%(n=123) reported to pay through their salary. When asked how the house hold members have benefited from insurance premiums, 49.1%(n=171) said in-patient hospital bills have been fully paid for in the past.

Table 7: Health insurance among Household heads

Items	Response	N	%
Are you aware that there is medical insurance scheme?	Yes	294	84.5%
	No	54	15.5%
Where did you hear about it?	Radio	130	37.4%
	Television	58	16.7%
	Newspaper	31	8.9%
	Relative/friend	58	16.7%
	Health worker	71	20.4%
Is any member of the house hold on medical insurance?	Yes	120	34.5%
	No	228	65.5%
Which health insurance	Government	92	.9%
	Saf com insurance	1	13.5%
	Groups health	10	84.5%
	Other	12	1.1%
	N/a	233	
Source of payment for the monthly premiums	Out of pocket	55	15.8%
	Salary	123	35.3%
	Employer	101	29%
	Relatives	29	8.3%
	Income generating activities	28	8%
	Temporary employment	4	1.1%
	Other	8	2.3%
Do you think that the monthly insurance premium is affordable?	Yes	131	37.6%
	No	216	62.1%
How has the household members benefited from the medical insurance?	Has received services without paying at the outpatient including tests, all procedures and medication.	109	31.3%
	In-patient hospital bill has been fully paid for	171	49.1%
	In-patient hospital bill has been paid for half way	47	13.5%
	In-patient hospital bill has been paid for less than half way	4	1.1%
	All medical procedures were paid for (e.g. wound stitching)	8	2.3%
	Some medical procedures were paid for and	6	1.7%

	some were not paid for		
	Was treated for major chronic illnesses (diabetes, cancer, hypertension) without paying	1	.3%
	Bills for medical professionals (e.g. surgeons, gynecologists etc.) were paid for.	2	.6%

3.8 Association between health expenditure and health insurance ownership

The Table 8 below shows a cross tabulation of out of pocket expenditure and ownership of health insurance. The findings show that there was a significant association between out of pocket expenditure on relatives' medical expenses and ownership of health insurance $\chi^2(df=3) = 9.112$, $p=0.028$. The findings also showed that there was a significant association between the out of pocket expenditure on inpatient services and ownership of health insurance $\chi^2(df=2) = 7.113$, $p=0.029$.

Table 8: Association between health expenditure and health insurance ownership

Items	**N**	**Health insurance**		**Chi square value**	**Chi square *df***	**Chi square *p* value**
		yes	**No**			
Money spent on a relative's medical expense in the last month?						
<1000	1	0	1	9.112	3	0.028
1001-5000	229	67	162			
5001-10000	93	41	52			
>10000	25	12	13			
How much do you spend on inpatient healthcare per month						
10000-50000	217	66	151	7.113	2	0.029
50000-100000	108	41	67			
Above 100000	23	13	10			
How much do you spend on outpatient healthcare per month?						
<1000	1	1	2	14.79	4	0.005
1001-3000	285	87	199			
3001-5000	42	22	21			
Above 5000	10	10	5			
How much do you spend on transport to health facility in a month						
Below 500	3	2	1	**14.45**	**3**	**0.002**
501-1000	47	27	20			
1001-5000	294	90	204			
Above 5000	4	1	3			

The bar graphs showing this information are presented graphically below.

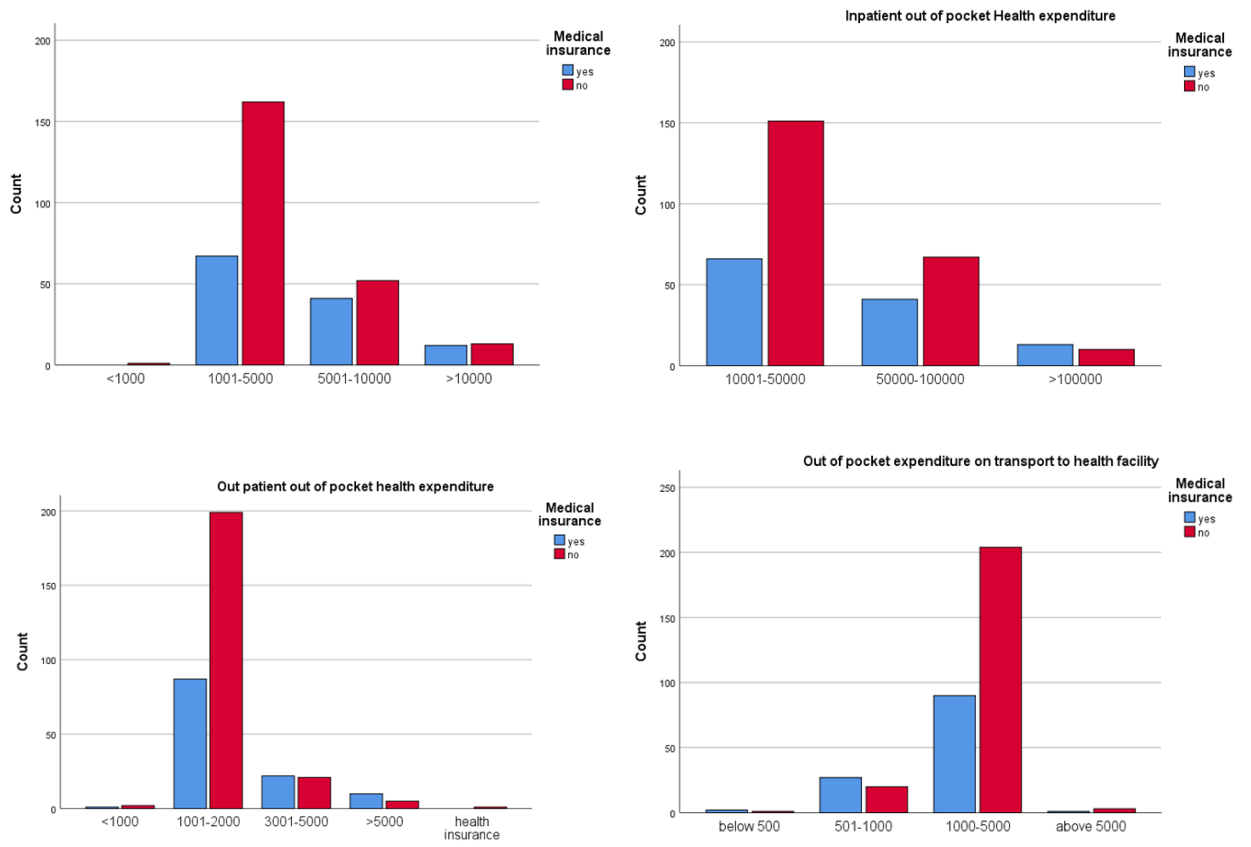


Figure 4.5: Bar graphs

4. Discussion

The objective of the study was to determine the percentage contribution made by out of pocket expenditure on health care from the total household income of health care consumers in Kakamega County and also establish the association between out of pocket expenditure and insurance premium payments in Kakamega County. The current study found that there was a borderline significant relationship between level of education and household income in the study area (OR: 0.8; 95% CI: 0.6 – 1.2; p=0.02). House hold income was lowest among clients who had attained at least primary school education compared with those who had secondary or tertiary education. Education is an important determinant of household poverty. Results show that poverty is a decreasing function of education attainment. This finding is consistent with earlier findings for Kenya (Geda *et al*., 2001, Mwabu *et al*, 2000, Oyugi, 2000; Kabubo-Mariara *et al*., 2006; Mberu *et al*., 2011). It is especially significant in explaining urban poverty, where employability, especially in the formal sector, depends on the level of education unlike in rural areas. In Mexico, for example, Knaul *et al*. (2006b) found that education of the household head is associated with a lower probability of catastrophic health expenditures. Similarly in Uganda, having a household head with low education increased the odds of catastrophic health expenditures (Xu *et al*., 2006c).

The current study also found that female household heads were more compared to the male (n=205, 53.8%). In other studies, female headed households and those with

an educated household head were found to be less likely to face catastrophic health expenditures in Botswana (Akinkugbe *et al*., 2011). On the contrary, female-headed households are more likely to encounter financial catastrophe than households headed by males in Argentina (Cavagnero *et al*., 2006). However, the sex of the household head did not influence the probability of catastrophic expenditures among the poor in Uganda, but female-headed households were more likely to encounter financial catastrophe than those headed by males among the non-poor (Xu *et al*., 2006c). In Kenya and Argentina, Xu *et al*. (2006a) and Cavagnero *et al*. (2006) found that household head with high education and working, decreased the odds of catastrophic expenditure.

The findings show that household heads who spent 1000ksh and above on transports to the health facility were one point three time more likely to earn 10,000ksh and above than those who spend below 1000 Kshs on transport to the health facility (OR: 1.3; 95% CI: 0.9 – 1.6; p=0.02). In addition, there was a borderline significant relationship between the health expenditure on relatives' medical expense and household income (OR: 1.2; 95% CI: 0.8 – 1.4; p=0.01). Our findings tend to corroborate the inverse care law phenomenon (Hart, 1971), as individuals in the poorest quintile were three times more likely to forego care than individuals in the wealthiest quintile. A study by Su *et al*. (2006) found that economic status was a key determinant of catastrophic health expenditures in Burkina Faso. In Georgia, Gotsadze *et al*. (2009) found that households in the richest quintile were four times less likely to face catastrophic expenditure when compared with the poorest quintile. Catastrophic health expenditures were positively associated with the change in poverty in Mexico, implying that households had more income to spend on health as poverty declined (Knaul *et al*., 2006b). In Tanzania, low socioeconomic status of the household increased the probability for catastrophic expenses (Brinda *et al*.,2014). Though many studies have not linked OOP expenditures as has been done in this study, the few that have found health care utilization (Mendola *et al*., 2007; O'Hara, 2004) and health status (Godlonton and Keswell, 2005; Mendola *et al*., 2007) to be significant determinants of poverty. This points to the importance for policies that will reduce OOP expenditures, which constitute a significant share of health care financing in Kenya. Many studies that have included health variables have used health status (Godlonton and Keswell, 2005; Mendola *et al*., 2007; O'Hara, 2004) and health care utilization (Mendola *et al*, 2007; O'Hara, 2004). Studies which have linked OOP expenditures to poverty are mainly qualitative studies (Whitehead *et al*., 2001; Mbugua *et al*., 1995; Asingwire, 2000) and have concentrated on identifying channels through which the expenditures affect poverty. An empirical investigation of these channels by modeling poverty and health expenditure variables while controlling for confounding factors, will provide firm empirical support for their arguments. This is basically lacking in these studies.

The current study found that 84.5% of the respondents (n=294) said they were aware of insurance premiums, 37.4% of the respondents said they heard about insurance from radios. 65.5%(n=228) reported to have a family member on health insurance premiums. Previous studies have found that health insurance reduces the

risk of catastrophic health spending (Gakidou *et al.*, 2006; Galarraga *et al.*, 2010). In the study, there was a significant association between out of pocket expenditure on relatives' medical expenses and ownership of health insurance $\chi^2(df=3) = 9.112$, $p=0.028$.Inconsistent with this findings was a study by Wagstaff (2007) that found even with the introduction of social health insurance scheme in Vietnam in 1993 and the subsequent extension of the scheme to the poor, poor households were still spending a high proportion of their income on health care and at considerable risk of catastrophic spending. There are a few other studies which, surprisingly, have found a positive relationship between insurance and incidence of catastrophic health expenditures. In Zambia, health insurance did not provide financial protection against the risk of catastrophic expenditures, rather it increased the risk (Ekman, 2007a).

5. Conclusion

Overall, these results by no means suggest that income growth will automatically solve the problems of health care financing. Increased priority needs to be given to health, especially low-income countries which are in most need for additional spending on health. The findings of this study should be interpreted within the context of several limitations. First, due to the complexity of collecting sensitive data such as direct costs in low-income settings, misclassification, under-reporting of small or nonmedical costs categories, or misreporting of lump sum items may have occurred.

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Authors' contributions
GL conceived the study and wrote the first draft of the paper. All the coauthors participated in data collection as well as critical revision of the drafts of the paper. All authors read and approved the final manuscript.

Competing interests
The authors declare that they have no competing interests.

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