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# Catastrophic Healthcare Expenditure Among Households in Sunyani West District, Bono Region of Ghana

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***Abstract***

*Catastrophic Healthcare Expenditure (CHE) among households is a global menace challenging the attainment of Universal Health Coverage (UHC). CHE refers to expenditure made by households on healthcare exceeding a certain proportion of the overall household income. This study assessed the prevalence of CHE; the socio-economic factors associated with CHE and the strategies for coping with CHE among households in the Sunyani West District of Ghana. A cross-sectional quantitative study was conducted among 300 households' that reported illnesses within the past three months. A multistage sampling technique was used to select the participants. Data was collected using a structured questionnaire and analyzed using STATA version 12.1. Descriptive statistics on the prevalence of CHE were generated. Logistic regression was performed to identify the socio-economic factors associated with CHE. The results showed that CHE prevalence was (55.1%) at 10% threshold and (31.5%) at 15% threshold. Respondent's age, marital status, educational status, occupation, household size, and type of health facility were statistically significantly ($p<0.05$; 95% CI) associated with CHE. Reliance on support from families, borrowing from friends/ families, and using personal savings were the main strategies households used to cope with CHE. Conclusively, CHE among households was slightly high, and has affected the household income level and has pushed many households into poverty, with significant factors influencing its occurrence. The study, therefore, recommends that the Government of Ghana through Parliament should increase the NHIS levy to enable the NHIS to provide services that cover the full cost of treatment for all diseases.*

**Keywords:** Catastrophic Healthcare Expenditure, Out-of-Pocket Payments, Universal Health Coverage, National Health Insurance Scheme, Household Health Expenditure, Socio-Economic Factors, Coping Strategies.

## Introduction

The impoverishing effects of healthcare expenditure have become a global health menace and a critical issue on the global health agenda [1]. Hence, there is an increased desire in monitoring the impoverishing impacts of healthcare expenditures on households. This desire is increasing because financial security is a vital necessity for Universal Health Coverage (UHC) [2]. UHC is defined as the situation where everyone is able to receive all needed health services while being protected from financial hardship [3]. Sustainable Development Goal (SDG) three (3) sought to promote healthy lives and well-being for all at all ages, and target 3.8 is on UHC, underscoring the position for all people and communities to have access to improved health care services without risking financial hardship.

According to the one of the core functions of a health system is to ensure that there are strong financing mechanisms for health care delivery that will aid the vulnerable people in the society to overcome the financial difficulties related to ailments [4]. The financial difficulties people go through are the results of catastrophic health expenditure (CHE) in the health system [5]. Out-of-pocket payments (OOP) leads to CHE, which refers to the expenditure made by households on healthcare exceeding a certain amount of overall household income [6]. According to

the effects of CHE could cause a household to fall into poverty because people are likely to pay huge sums of money for medical care and other health services [7, 8]. Krutilova and Yaya equally argued that household expenditure on health more than 10% of overall household income could cause household to run into poverty [9].

Reported that any household health expenditure, which is equal to or has exceeded 40% of the household's ability to pay (non-subsistence income) constitute CHE [10]. Subsistence need as a term is defined as the least obligation for people to keep vital life needs in a society. Subsistence needs or basic necessities of life include food, shelter, clothing and other household goods which often affect individuals in the household and their capacity to cope with OOP on healthcare services.

Globally, over 150 million people have annually been exposed to CHE [11, 12]. In addition to this, over 100 million people from 25 million households have been pushed by CHE into poverty [13]. It is therefore of necessity for all health systems to ensure the attainment of UHC that will protect people from the unwarranted burden of direct OOP payments [14].

CHE generally, is defined as when the expenditures of the household for health go above a given threshold of the available resources of the household. There is however no defined gold standard or methods that defined the threshold of household resources [15]. OOP payments in many countries has negative influence on the health and economic status of the people, most especially the vulnerable and poor people suffer much of the CHE effects. WHO argued that OOP payments involving people making direct payment at the point of the health services delivery create inequalities in the health systems thereby posing dangers to the less daunt and marginalized people such as the poor and the elderly. study equally cited that, when health care cost exceeds the household's capacity to pay, it creates a difficult situation for the households and leads to unnecessary delay at the point of healthcare services delivery and at some point, resulted into unquestionable consequences and lives losses [16].

To add, WHO noted that to prevent the effects of OOP and CHE, health systems could institute measures such as compulsory contributions from household members, governmental taxes or levies, and insurance contributions to form a fund pool that could be used to provide equitable health services to all household individuals. These funds from the individuals will be used in the situation of ailments without depending on the amount each person has contributed, and help to ensure equal distribution of health services and the spread of the financial risks across the population.

Health care in Ghana was made free of charge for all citizens after the country attained independence in 1957 [17]. However, along the line, a host of economic shocks that necessitated high amounts of medical spending made this approach too expensive to sustain, which led to the introduction of nominal payments under the Structural Adjustment Programmes which begun in the past decades [18]. indicated that financial risk protection against the cost of unforeseen healthcare has gained global attention in recent years [19]. With an effort to salvage the worsening situation of OOP, Community-based Mutual Health Insurance Schemes (CBMHIS) were introduced in the 1990s but by the year 2000, Ghana recorded high OOP health expenditures, leading to very low utilization of health services as would be expected of a low- income country.

In Lower-middle-income countries such as Ghana, a bold step was taken to ensure universal financial protection in 2004, and hence the introduction of mandatory National Health Insurance Scheme (NHIS) as a substitute of OOP health care also known as 'cash-and-carry' which has been designed to offer protection for both official and casual workers, and payment of levies and taxes for insurance, excluding children, older people and the destitute of communities [20-22]. The sole aim of the NHIS was to offer financial protection so that the poor would be able to access decent health care as against the cash and carry system that erected serious barriers to healthcare [23]. There is no surprise that the establishment of the scheme received immense applause, especially, among the more vulnerable income groups [24]. The NHIS has been seen as one of the best social intervention programmes in Ghana's history [25].

According to the WHO countries in African are at more risk to experiencing CHE, and CHE has already compelled over 100,000 families to go into poverty [26]. Boing cited 1.1% to 3.8% of people in China, India, Kenya, Vietnam, and Bangladesh to have been impoverished as a result of CHE. Wagstaff emphasized that OOP expenditure on health services has been a major difficulty as an increased number of people struck by disease or injury may risk a financial catastrophe or even impoverishment [27, 28]. A lot of these OOP payments are said to occur in most African countries [29].

Akazili opined that even though Ghana has implemented the NHIS with the aim of removing financial impediments to utilizing healthcare and preventing the OOP payments impoverishing effects of healthcare, access to health services in the country typically requires OOP payments. Additionally, even though the NHIS was introduced to replace the erstwhile cash and carry system in 2005 with the intent to improve OOP payments, evidence suggests that most households are unable to afford the NHIS as a result of poverty [30]. Also, evidence from National Health Insurance Authority (2019) suggests only 41% of the total population of Ghana are covered by the NHIS, 2% by Private Health Insurance implying that more than half of the population of Ghana are paying for their health care through out-of-pocket. Besides, NHIS excludes coverage for most cancers, renal dialysis and HIV/AIDS anti-retroviral therapy, and hence people must pay before accessing these health services.

A number of studies have been conducted to assess various aspects of CHE. A study by Ke Xu highlighted the negative consequences of direct payment for health services and the survival of households as well as possible ways deprived households can manage cost related health services and sure ways for insurance packages as used by countries such as the USA, Australia and India [31]. Found that households often reduce their basic expenditure over a period to cope with health costs [32, 33 34]. Per the WHO and World Bank databases OOP payments for health care are prominent in Ghana, and averaged 39.2% of total health spending in 2013 [35]. Private spending comprised 51% of total health care spending for the period of 2000-2009 and out of

pocket payments averaged 78.4% of this amount, increasing to 92% in 2013. Moreover, Ghana is undergoing epidemiological transition whereby chronic non-communicable diseases like cardiovascular disorders and cancer are becoming leading causes of mortality and morbidity [36]. This trend in addition to pervasive infectious and parasitic diseases and the growing physical injuries from accidents and violence means a triple disease burden. The health system is more acclimatized to acute treatment interventions than preventive services [37, 38]. This combination of factors leads to households having a higher dependency on curative and acute care which raises the stakes for affordability of health care, and consequently OOP payments.

Saksena, Hsu and Evans further argued that for some years now, the concept of financial risk protection has become a new area of research interest and many scholars are now developing ways to ensure sustainable financial risk protection for people against difficulties associated with health cost financing issues [39]. However, in the views of Ke Xu the negative impact of health care payments on households has not received the needed attention by researchers and health policy makers. According to Kwakye OOP payments form a major component of health expenditures in Ghana [40]. In Bono region, and for that matter Sunyani West District, there has not been any research that investigates CHE. CHE has influence on household welfare therefore merits investigation. An investigation into the impoverishing effects of CHE on households could provide useful information for effective implementation of reforms to protect households against the financial risks of seeking health care in Ghana. The study therefore, contributes to the discussion by providing a detailed analysis of key issues surrounding the effects of CHE on households in the Sunyani West District. It would estimate the level of CHE among households, and ascertains the socio-economic factors associated with CHE and finally examine the strategies households use to cope with CHE in Sunyani West District.

## Research Methods

### Study Area

The study was conducted in the Sunyani West District (SWD) of the Bono Region. Geographically, the district lies between latitudes 7º 19' N and 7º 35' N and longitudes 2º 08' W and 2º 31' W according to the Ghana Statistical Service [41]. According to the 2010 Population and Housing Census, the District household population was 84,630 and average household size was 4.3 persons per household. Literacy rates in the study area was reported as about 79.6% of the residents aged 11 years and above were literate and only 20.4%were not literate. In terms of economic activities, about 70.4% of the population aged 15 years and older was economically active, and 29.6% were economically non- active.

Of the economically active population, 92.9% were employed while 7.1% were unemployed. The main occupation in the study area was agriculture, and about 47.1% were engaged as skilled agricultural activities such as forestry and fishery, with 20% being in service and sales, 12% in craft and related trade, and 9.6%were engaged as agricultural activity managers, professionals, and technicians. In terms of disability, about 3.6% of the district's total populations have one form of disability or the other. The housing stock of the Sunyani West District is 10,715 representing 3.2% of the total number of houses in the Bono Region. The main source of fuel for cooking for most households in the district is wood (48.3%). The proportion for rural (71.3%) is higher than that of urban (40.3%). The four main sources of water in the district are boreholes (32.3%), public tap and pipe (19.6%), protected well (15.5%) and pipe-borne outside dwelling).

### Study Approach and Design

The study adopted a quantitative approach. The quantitative approach was deemed appropriate to achieving the study objectives because the objectives sought to estimate the prevalence of CHE, associated socio-demographic factors influencing household expenditure and households coping strategies which at the end were expressed in numbers and proportions to give clear meaning to the study findings. The study design was cross-sectional which equally was deemed appropriate to achieving the study objectives. Cross-sectional design was deemed appropriate for a prevalence study because it analyzes data from a representative subset or population, at a specific point in time [42]. This study examined the catastrophic healthcare expenditure of selected households within a defined period (July to September, 2020).

### Sampling Procedure

This study adopted a multistage sampling technique to arrive at the participants from the district, sub-districts and household level in getting the required number of study participants of the determined sample size. Sunyani West district has eight (8) sub-districts namely Fiapre, Chiraa, Nsoatre, Kwatire, Boffourkrom, Odomase, Adoe and Dumasua, and for time constraints and limitation of resources; four (4) sub-districts were randomly selected without replacement through the hat method whereby all the sub-districts names were written on piece of papers and placed in a hat for random selection. After selection of the sub-districts, three (3) communities from each sub-district were randomly selected through the same process of sub-districts selection. The number of respondents in each sub-district at the various communities was determined through population proportional to size.

Population proportional to size was determined by taking data from health facilities within the district of the total number of people who have reported ill for the past 3 months in each selected sub-district and then divided by the overall total of all the sub-districts, and multiplied by the determined sample size to get a quota or number to administer the questionnaire in each sub-district. After determining the number/quota to administer the questionnaires for each sub-district from the determined sample size, each sub-district was then serving as a cluster and a quota was then assigned to each sub-district for the administration of the questionnaires. The researcher then visited the selected district, and at the community level on arrival, a convenience and snowball sampling method were used to identify the first household with a recently ill person for at least the past three months.

The Snowball sampling was used because individual study participants were not uniformly distributed in the selected communities in the study area, and hence the best sampling method to get in touch with the study participants was the snowballing sampling method. All participants who has either obtained health

services at a hospital/health center or any other informal sources such as over-the-counter medications and traditional healers within the period in the study area were selected for administration of the questionnaire. Subsequent selection of households was based on the first selected household where the selected individual administered the questionnaire with or any other person in that household was asked to identify a next household with a sick person whom he/she have heard of to have reported to the hospital for treatment or visited any other sources for medical care, and the procedures were repeated until the desired sample size for the community was achieved. At the household level, permission was obtained and individuals who had reported ill within the past three (3) months, and have obtained health services at the hospital or any other source was then selected for the administration of the questionnaire. But if the individual was a child or less than 15 years, the household head or parents of such child was selected for the administration of the questionnaire.

**Statistical Analysis**

Data was analyzed using STATA version 12.1 Computer software program (StataCorp LP 4905, Lakeway Drive College Station, TX 77845, USA). Frequencies for categorical demographic and economic variables like sex, marital status, educational level, and occupation and as well as proportions of households' healthcare expenditure were presented into tables, graphs and bar charts. Continuous variable such as age, households' incomes and expenditures were summarized into means and standard deviations. Reported strategies used by respondents to cope with catastrophic healthcare expenditure in the Sunyani West district were equally summarized into numbers and percentages. Household non-food expenditure was used as a proxy measure for a household's capacity to pay. Dummy variables were created for some demographic characteristics such as sex, disease condition and catastrophic health expenditure (CHE). Household consumption expenditure made up of both monetary and household food and non-food expenditures.

Test for association of socio-demographic and economic factors/variables with catastrophic healthcare expenditure was determined using chi-square. Associated independent variables with the dependent variable was subjected to further analysis through logistic regression to evaluate the factors influencing catastrophic healthcare expenditure using 95% CI to generate odd ratios at 5% ($p \leq 0.05$) significant level. In order to identify strategies that households use to cope with CHE, the researcher presented the results descriptively in the form of frequencies and percentages in graphs.

## Results

Table 1 presents results on the socio-demographic characteristics of the respondents. A total of 300 out of 315 initially sampled respondents were studied, and all questionnaires were attended to giving a 95% response rate. The average (mean) age of the respondents was 37.13 with a standard deviation of 14.40. The median age was 31 years and the minimum and maximum ages were 21 and 86 years, respectively. Nearly two-third (62%) of the respondents were in the 19-40 years age category, with 32.3% of them being in the 41-59 years age category and 5.7% being in the 60 and above years age category. More than half (54.3%) were females and 45.7% were males, and about 43.7% were married, with the singles being 37.7% and 17.6% being in the divorced or separated category. A little above a third (34%) had college level education, 28.7% had university level education and 3.6% had primary level education. With the religion of respondents, it was revealed that more than three-quarters (77%) were Christians and 18.7% were Muslims. With occupation, the results showed that about a third (30.3%) were either into teaching and other salaried workers, 24.3% were into farming and 6.3% were into construction work.

The average household size was 4.88 persons. 42.1% of the households had above five (5) persons in the household, 26.3% had four (4) persons, 22.3% had three (3) persons in the household and 9.3% had two persons in the household. The means household monthly income was GH¢1, 509.67, with a minimum earning income of GH¢200 and the maximum earning income of GH¢5000 per month. 12% of the households belong to the lower income level (≤400GH¢), about 29.3% earned within the middle-income level (GH¢401-1000) and more than half (58.7%) were found in the upper income level of above GH¢1000.

**Table 1:** Socio-Demographic Characteristics of the Respondents

| Variable | Frequency (N =300) | Percentage (%) |
|---|---|---|
| Age category: (Mean = 37.13 (±14.40sd) | | |
| 19-40 | 186 | 62 |
| 41-59 | 97 | 32.3 |
| 60+ | 17 | 5.7 |
| Sex of respondents: | | |
| Male | 137 | 45.7 |
| Female | 163 | 54.3 |
| Marital Status: | | |
| Never married | 113 | 37.7 |
| Married | 131 | 43.7 |
| Divorced/separated | 56 | 17.6 |
| Education: | | |
| None | 29 | 9.7 |
| Nursery | 15 | 5 |

| | | |
|---|---|---|
| Primary | 11 | 3.6 |
| Post Primary/Vocation | 24 | 8 |
| Secondary | 33 | 11 |
| College | 102 | 34 |
| University | 86 | 28.7 |
| Religion: | | |
| Christian | 231 | 77 |
| Muslim | 56 | 18.7 |
| Traditionalist | 13 | 4.3 |
| Occupation: | | |
| Commerce/Business | 34 | 11.3 |
| Farming | 73 | 24.3 |
| Construction | 19 | 6.3 |
| Mining | 23 | 7.7 |
| Teaching/Salary worker | 91 | 30.3 |
| Unemployed | 60 | 18.7 |
| Household Size: (mean = 4.88(±2.29sd) | | |
| 2 | 28 | 9.3 |
| 3 | 67 | 22.3 |
| 4 | 79 | 26.3 |
| 5+ | 126 | 42.1 |
| Household Income level (Mean =1509.67 (±1441.11sd) | | |
| Lower Income (≤400GH¢) | 36 | 12 |
| Middle Income (401-1000 GH¢) | 88 | 29.3 |
| Upper Income (Above 1000 GH¢) | 176 | 58.7 |

**Source:** Field data, 2019

Table 2, summarizes the bivariate analysis of association between socio-demographic and health characteristics and CHE. From the analysis, age of respondents was statistically significantly associated with catastrophic health expenditure (Chi2 = 9.778; p = 0.01). However, sex of respondents was not significantly associated with catastrophic health expenditure (Chi2 = 2.602; p = 0.11). Marital status of respondents was also found to be significantly associated with catastrophic health expenditure (Chi2 = 8.291; p = 0.02) as well as educational status of respondents (Chi2 = 10.579; p = 0.01). To add, religion of respondents was not statistically significant (Chi2 = 5.775; p = 0.06) but occupation was significantly associated with catastrophic healthcare expenditure (Chi2 = 34.887; p<0.001). Additionally, households consisting of about 4 to 5 members were statistically more likely to experience catastrophic health expenditure comparative to those below 4 members (Chi2 = 12.434; p = 0.002). Also, the type of health facility, the household had visited for medical care had significant relationship in which those who had ever visited either a hospital or private clinic/maternity were statistically more likely to have run into catastrophic healthcare expenditure than their counterpart (Chi2 = 85.902; p<0.001). Notwithstanding type of disease condition status respondents had reported to health facility being either acute or chronic was not statistically associated with catastrophic expenditure on healthcare (Chi2 =0.007; p = 0.94), but the individual type of insurance cover was significantly associated with catastrophic healthcare expenditure as those who had private insurance cover could run more into catastrophic health expenditure than those who were with the national health insurance cover (Chi2 = 35.653; p<0.001).

**Table 2:** Association Between Socio-Demographic and Health Characteristics and Overall CHE Status

| Variables | Number (Percentages) CHE Status | | Chi-square (Chi2) Test | |
|---|---|---|---|---|
| | CHE | Non-CHE | $X^2$ | P-value |
| Age category: | | | | |
| 19-40 | 63 (33.9) | 123 (66.1) | 9.778 | 0.01 |
| 41-59 | 18 (18.6) | 79 (81.4) | | |
| 60+ | 8 (47.1) | 9 (52.9) | | |
| Sex: | | | | |
| Male | 47 (34.3) | 90 (65.7) | 2.602 | 0.11 |

| | | | | |
|---|---|---|---|---|
| Female | 42 (25.8) | 121 (74.2) | | |
| Marital Status: | | | | |
| Never married | 43 (38.1) | 70 (61.9) | 8.291 | 0.02 |
| Married | 28 (21.4) | 103 (48.6) | | |
| Divorced/separated | 18 (32.1) | 38 (67.9) | | |
| Education: | | | | |
| None | 9 (31.0) | 20 (69.0) | 10.579 | 0.01 |
| Nursery/primary | 10 (38.5) | 16 (61.5) | | |
| Secondary (JHS/SHS/Voc) | 7 (12.3) | 50 (87.7) | | |
| Tertiary (Colleges/University) | 63 (33.5) | 125 (66.5) | | |
| Occupation: | | | | |
| Unemployed | 32 (53.3) | 28 (46.7) | 34.887 | <0.001 |
| Commerce/Business | 15 (44.1) | 19 (55.9) | | |
| Farming | 23 (31.5) | 50 (68.5) | | |
| Construction | 3 (15.8) | 16 (84.2) | | |
| Mining | 4 (17.4) | 19 (82.6) | | |
| Teaching/Salary worker | 12 (13.2) | 79 (86.8) | | |
| Household Size: | | | | |
| Below 4 | 1 (3.6) | 27 (96.4) | 12.434 | 0.002 |
| 4-5 | 53 (36.3) | 93 (63.7) | | |
| Above 5 | 35 (27.8) | 91 (72.2) | | |
| Type of Insurance Coverage: | | | | |
| NHIS | 56 (23.1) | 186 (76.9) | 35.653 | <0.001 |
| Community Insurance | 17 (43.6) | 22 (56.4) | | |
| Private Insurance | 16 (84.2) | 3 (15.8) | | |

| Variable | 10% threshold of CHE | | | 15% threshold of CHE | | | 25% threshold of CHE | | |
|---|---|---|---|---|---|---|---|---|---|
| | Odd ratio | 95% CI | P-value | Odd ratio | 95% CI | P-value | Odd ratio | 95% CI | P value |
| Age | - | - | - | - | - | - | - | - | - |
| 19-40 | Reference (Odds ratio=1) | | | | - | - | - | - | - |
| 41-59 | 2.29 | 0.87-6.01 | 0.09 | - | - | - | - | - | - |
| 60+ | 0.73 | 0.07-7.61 | 0.79 | - | - | - | - | - | - |
| Religion | - | - | - | - | - | - | - | - | - |
| Christians | Reference (Odds ratio=1) | | | | | | | | |
| Muslims | 1.39 | 0.46-4.24 | 0.57 | - | - | - | - | - | - |
| Traditional | 0.58 | 0.05-6.49 | 0.66 | - | - | - | - | - | - |
| Occupation | - | - | - | - | - | - | - | - | - |
| Unemployed | Reference (Odds ratio=1) | | | | - | - | - | - | - |
| Commerce | - | - | - | 0.22 | 0.02-2.89 | 0.25 | - | - | - |
| Farming | - | - | - | 2.93 | 0.31-27.94 | 0.35 | - | - | -- |
| Construction | - | - | - | 1 | - | - | - | - | - |
| Mining | - | - | - | 1.12 | 0.19-6.61 | 0.91 | - | - | - |
| Salary worker | - | - | - | 0.22 | 0.02-3.08 | 0.26 | - | - | - |
| Household size | - | - | - | - | - | - | - | - | - |
| Below 4 | Reference (Odds ratio=1) | | | | - | - | - | -- | - |
| 4—5 | 1.09 | 0.32-3.81 | 0.88 | - | - | - | 0.24 | 0.06-1.01 | 0.07 |
| Health facility visited | - | - | - | - | - | - | - | - | - |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Others | Reference (Odds ratio=1) | | | | - | - | - | - | - |
| Hospital | 1.62 | 0.59-4.42 | 0.35 | 4.65 | 0.50-43.13 | 0.18 | - | - | - |
| Disease condition | - | - | - | - | - | - | - | - | - |
| Acute | Reference (Odds ratio=1) | | | | - | - | - | - | - |
| Chronic | 0.44 | 0.16-1.21 | 0.11 | 0.12 | 0.02-0.56 | 0.01 | - | - | - |
| Insurance cover: | - | - | - | - | - | - | - | - | - |
| NHIS | Reference (Odds ratio=1) | | | | - | - | - | - | - |
| Community Health Service | - | - | - | - | -- | 1.3 | 0.19-9.03 | 0.79 | |
| Private Health Insurance | - | - | - | - | - | 3.19 | 0.61-16.75 | 0.17 | |
| Average monthly income | - | - | - | - | - | - | - | - | |
| Lower | Reference (Odds ratio=1) | | | | | | | | |
| Middle | 12.79 | 1.33-23.52 | 0.03 | - | - | - | 0.15 | 0.01-1.72 | 0.13 |
| Upper | 3.87 | 0.44-34.18 | 0.22 | - | - | - | 0.29 | 0.05-1.66 | 0.16 |
| Constant | 0.03 | - | - | 0.08 | - | - | 0.23 | - | - |
| Observations | 210 | - | - | 205 | - | - | 272 | - | - |
| Prob > chi2 | 0.021 | | - | 0.001 | - | - | 0.03 | - | - |
| Pseudo R2 | 0.02 | - | - | 0.26 | - | - | 0.12 | - | - |
| Log pseudolikelihood | -86.4 | - | - | -39.9 | - | - | -48.8 | - | - |
| AIC | 192.9 | - | - | 93.87 | - | - | 109.5 | - | - |
| BIC | 226.3 | - | - | 117.1 | - | - | 131.2 | - | - |

**Source:** Field data, 2019

Figure 1, indicates the coping strategies adopted by households to cope with healthcare expenditure in the study area. A total of 300 respondents were studied, and almost half (49.4%) of the households have to sell their properties/assets to cope with their medical care, and about 19.1% actually borrowed from friends/families, 16.9% used their wages/pocket monies and 12.4% used savings made over the years to enable them cope with CHE, similar proportion of 1.1% depend on gifts from either family or friends and also 1.1% results to others sources to enable them cope up with CHE as illustrated below in Figure 1:

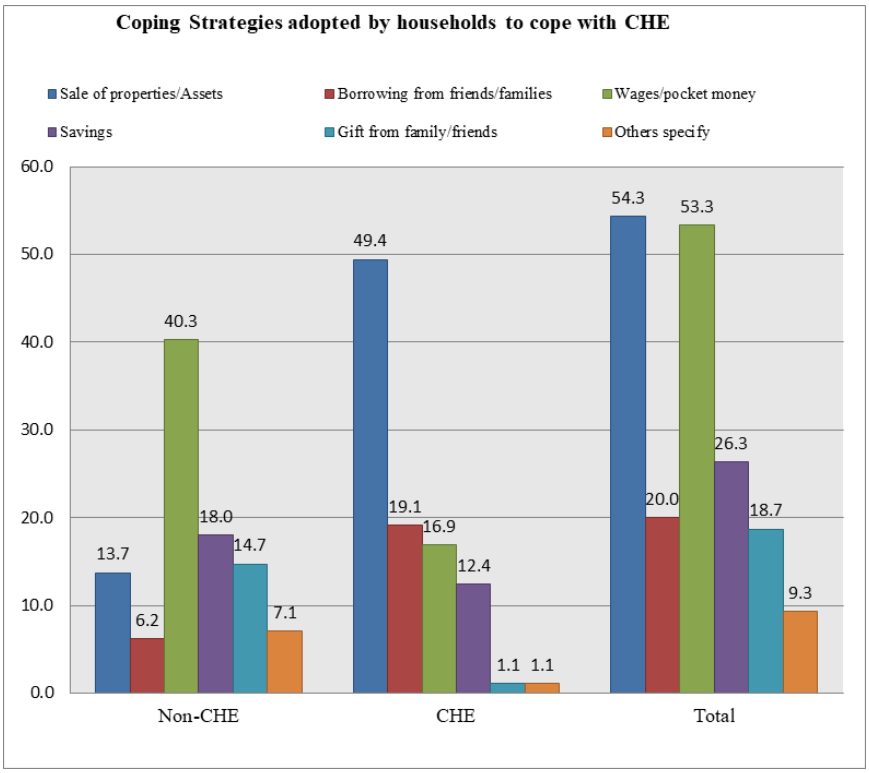


**Figure 1**

## Discussion

Findings from the current study showed over two-thirds of respondents had experienced CHE, and the average amount spent to access healthcare stood at GHS209.47 per household. The incidence threshold of CHE among households approximately ranged from 12.4% to 54.0% at the 40% and 10% of capacity to pay, respectively and 4.5% to 55.1%using the income proportionality method at similar thresholds, respectively. These estimates from the current study were high and could be related to the incidence of CHE in Africa as reported by WHO & the World Bank, indicating 11.4% of CHE among households. Besides, the rate of CHE decreases as the threshold increase [43]. For instance, using the Wagstaff and Doorslaer methodology: OOP payments as share of total expenditure (Proportionality of income approach), there was a decline in incidence of CHE as the thresholds increases from 10% to 40 % with over half of households experiencing CHE at 10% and 45% [44]. These findings shared similarities with existing literature which noted the differences in CHE estimates according to the increasing difference in thresholds, and a corresponding decrease in CHE as illustrated by the following studies [45-48].

### Socio-Economic and Health Factors Associated with CHE Among Households

At the 10% threshold, age of respondents was not statistically significantly associated with CHE in the multivariate analysis, however in the bivariate analysis; age of respondents was significantly associated with CHE as the aged were significantly more likely to have suffered CHE than the youth [49]. The findings conform to the WHO report, which cited age to have positive influence on CHE, and that of Njuguna study in Kenya which revealed age to be positively associated with the probability of incurring CHE [50, 51].

Marital status of respondents was statistically not significant in the multivariate analysis, but was also found to be statistically associated with CHE at the 10% thresholds in the bivariate analysis. Those respondents who were either divorced or separated had an increased chance of experiencing CHE as compared to those who were single. This finding corresponds with the study of Nundoochan in Mauritius which reported a higher level of CHE among households' heads who were either widowed or separated from 2.29% in 2001/02 to 2.63% in 2012 [52]. Also, Xu study equally reported marital status as a significant factor influencing CHE.

Again, religion of respondents in the bivariate analysis was found to be associated with CHE status at the 10% thresholds, and educational status of respondents equally showed significant relationship with CHE at 10% thresholds in the bivariate analysis. Those who had higher education (Tertiary education) had increased chance of experiencing CHE at the 10% thresholds as compared to their counterparts who had no formal education and however was found to have showed dissimilarities with the WHO report which findings showed a higher CHE among households who had a higher level of education were indicated to have less likely increased chance of suffering CHE as compared to their counterparts.

Also, occupation of the respondent had a significant association with CHE at the 10% thresholds, and at the 15% thresholds, as those who were employed had a more increased chance as compared to the unemployed possibly because the unemployed might not be visiting the hospital when sick, and could be related to [53, 54]. Households with occupancy of between 4 to 5 members were statistically associated with CHE in the bivariate analysis, and was more likely to have experienced high CHE comparative to those households with members below 4. This implies that high household size positively influenced the probability of experiencing CHE, and could be related to Njuguna who reported that household size, negatively influenced CHE.

Again, the type of health facility the household had visited for medical care showed statistical association with CHE, as those who had ever visited either a hospital or private clinic/maternity had higher CHE than their counterpart at both 10% and 15% thresholds. These showed that the households who made visits to health facility to obtain medical care were more likely to experience CHE than those who did not visit the health facilities. This finding shared similarities with the findings of Sharma in Haryana State of India citing households visit to private healthcare facility to be associated with the experience of CHE, and that of Akazili [55].

To add, type of disease conditions households reported to the health facilities were associated with higher CHE. Akazili noted unpredictable or unforeseeable illnesses to diminish the health status of respondents, and disease conditions of respondents in both bivariate and multivariate analysis to have had a significant influence on CHE at the 10% thresholds and at 15% and 40% thresholds with households CHE. This implies that households with chronic disease condition patients were more likely to experience CHE compared to households who had acute diseased patients in the households. The result equally corresponds to a descriptive study by Kavosi in Namazi Hospital, Shiraz, Iran among cancer patients that a higher proportion of the households with cancer patients had suffered CHE as compared to their counterparts' households without cancer patients [56].

Additionally, household average monthly income was also found to have significant association with CHE at the 10% thresholds. Average monthly income of households significantly influences CHE status of households at the 25% thresholds. This thus implies that, an increase in household average monthly income could possibly result in a decrease in the probability of such household experiencing CHE. Also, from the current study, type of insurance cover by households was significantly associated with CHE at the 10% and 25% thresholds. Households with private insurance cover were more likely to have run into CHE than those who were with the national health insurance cover. This increase could possibly be attributed to the fact that private insurance charged higher than the national health insurance and could have caused households to get into CHE state. However, this finding was closely related to Kavosi in India citing the influence of CHE by the type of insurance cover among households and Buigut, Ettarh, & Amendah, study [57].

### Coping Strategies Households used During CHE

Effective adoption of coping strategies by households helps them to efficiently manage the shortfalls associated with experiencing CHE. From the current study the most adopted strategy at all the thresholds (10%, 15%, 25% and 40%) was the use of house-

holds' wages or pocket money to cater for the household medical expenses, followed by gifts or support from families and friends as well as either borrowing from friends or families to pay medical expenses. This findings was however found to share similarities with studies by which showed that most households had resorted to similar coping strategies such as household income/ savings, contributions from friends and relatives, sale of physical household assets, insurance, selling of property, and receiving insurance compensation [58]. At the 10% thresholds, it was again noted that, almost half of the households use wages and pocket money as coping strategies for CHE, and nearly a quarter depend on gifts from friends and family members and similarly resort to personal savings as strategy to cope with CHE. This also shared some form of similarities with citing coping strategies of households to involve the reduction of basic households' consumption such as food, borrowing or selling vital household assets, and using current savings [59, 60].

Also, at the 15% threshold over three-quarters of households use wages or pocket money and less than a tenth resort to borrowing and personal savings to cope with CHE, and however similar coping strategies were found adopted by households at the 25% threshold except where a little above a tenth were found to have resorted to the sale of properties and personal assets as strategies to cope with CHE. However studies cited sale of physical household assets, insurance, selling of property, and receiving insurance compensation as coping mechanisms for households under CHE. In the current study at the 40% threshold, a little over two-thirds of households used wages/pocket money and about 16.7% used their savings and sale of properties and assets to cope with CHE.

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