


Catastrophic health expenditure in Benin: Extent, drivers, and policy implications



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ABSTRACT

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Large out-of-pocket spending on medical issues can expose households to catastrophic health expenditure, which can result in poverty. This study aimed to estimate the extent of catastrophic health expenditure among households in Benin and to assess the association between household catastrophic health expenditure and household characteristics. We used the 2017 nationally representative household survey for Benin, the “Analyse Globale de la Vulnérabilité et de la Sécurité Alimentaire,” and a logit model to assess the association between catastrophic health expenditure and demographic and socioeconomic household characteristics. The results suggested that 25.49% of households spent 40% of their resources on healthcare. Moreover, households headed by women, the poorest households, those living in rural areas, those headed by a widow, and households with children and elderly members were identified as vulnerable groups that require protection against catastrophic health expenditure. The policy implication of these results is that healthcare financing strategies in Benin should concentrate on finding ways to reduce both out-of-pocket payments and the probability of catastrophic health expenditure. The health insurance policy that is under development in Benin is an opportunity to protect vulnerable groups.

Contribution/ Originality: This study is one of few to estimate the incidence of catastrophic health expenditure in Benin from a nationally representative random sample survey. It provides a more detailed and updated description of the extent and driving factors of catastrophic health expenditure in Benin. The results provide important contextual information for policy discussion and health financing reforms.

1. INTRODUCTION

Benin's National Health Account (NHA) shows that in the period 2000–2018, healthcare expenditure as a share of gross domestic product (GDP) increased from 2.491% to 3.414%. Out-of-pocket (OOP) healthcare payments as a percentage of total healthcare expenditure decreased from 53.091% in 2003 to 37.40% in 2012 before steadily increasing to 44.55% in 2018 (Ministry of Health, 2018). Although the percentage has decreased, the level of OOP payment is still quite high compared to the goal of 30% recommended by the World Health Organization (2020). Benin's socioeconomic context is characterized by a high poverty rate (33.3% in 2007 and 40.1% in 2015), high underemployment (72%), and a high informal employment rate (90.1%); therefore, large OOP payments may have a devastating effect on households.

The healthcare financing literature has reported that high OOP health payments can lead to catastrophic health expenditure (CHE) with negative effects on households' welfare, particularly for poor and vulnerable households

(Khan, Ahmed, & Evans, 2017; O'Donnell, Van Doorslaer, Wagstaff, & Lindelow, 2008; Wagstaff et al., 2018; Xu et al., 2003). Therefore, OOP payments by households are a key variable in economic policy and an important concern for policymakers, politicians, and households in the development and implementation of a healthcare system. The potential trade-off between OOP payments as an instrument of demand control and OOP payments as a driver of impoverishment is an important policy question. High OOP payments contribute to inequalities in the prevalence of disease among different socioeconomic groups. The [World Health Organization \(2020\)](#) reported that populations in low- and middle-income countries (LMICs), including Benin, may experience high levels of CHE.

OOP payments become financially catastrophic when they exceed a certain proportion of a household's capacity to pay for healthcare, and the family can no longer maintain its customary standard of living (Xu et al., 2003). There is no consensus on the threshold beyond which OOP payments are considered catastrophic (Knaul, Wong, & Arreola-Ornelas, 2013). Thus, previous studies have used many CHE threshold levels, ranging from 5 to 60% of either total household expenditure, total non-food expenditure, or non-subsistence expenditure (Su, Kouyaté, & Flessa, 2006; Wagstaff & Doorslaer, 2003; Xu et al., 2003). According to O'Donnell et al. (2008), lower thresholds are typically used when total income or expenditure is used as the denominator, whereas higher thresholds are used when food expenditure is subtracted from the denominator.

The incidence of CHE due to OOP is used as a target and indicator to monitor progress toward universal health coverage (UHC), which is part of the 2030 Sustainable Development Goals (Wagstaff et al., 2018). It is used to track households' level of financial protection (Boerma et al., 2014). Although there is emerging evidence on the issue in some African countries, the literature is scant (Eze, Lawani, Agu, & Acharya, 2022). A recent systematic review by Eze et al. (2022) suggested that Benin is among the countries where limited evidence on the extent of CHE is available. Using a threshold of 10% of annual income, Laokri, Dramaix-Wilmet, Kassa, Anagonou, and Dujardin (2014) showed that CHE was high (78.1%) among smear-positive pulmonary tuberculosis patients in six health districts of southern Benin. However, Laokri et al. (2014) focused on a small community and a specific disease, and their results were not representative at the national level. Using more representative household survey data from a 2009 survey by the Benin National Institute of Statistics and Economic Analysis, Houeninvo (2018) found that the incidence of CHE among Beninese households was 16.2%. However, the design and implementation of appropriate policies requires accurate, up-to-date evidence on the incidence of CHE, which is scant at present. The findings from studies in other countries may provide a useful guide to understanding CHE, but they cannot be generalized since they cannot capture and account for the complexity of the economic and social environment of Benin. Therefore, a country-specific case study is necessary for an in-depth investigation of CHE.

Therefore, this study fills the gap by investigating how CHE is distributed across Beninese households and what its drivers are. In addition, data from a recent nationally representative household survey and four alternative CHE cut-off values are used to avoid misinterpreting the importance of some variables. This is important because many African countries, including Benin, are moving towards universal healthcare coverage, and the findings could inform the government and policymakers about the necessity of designing programs and policies that provide financial risk protection to vulnerable populations.

The rest of this paper is organized as follows: Section 2 provides an overview of the healthcare sector in Benin. Section 3 reviews the literature. Section 4 discusses the data and model specification. Section 5 presents the results. Section 6 discusses the results. Finally, Section 7 offers some concluding remarks.

2. THE HEALTHCARE SYSTEM IN BENIN

Benin is a low-income country with a population of 12,870,340 (2020), and an urbanization rate of 48.4 % (World Bank, 2021). In the last two decades, the per capita GDP growth rate averaged 4.6%, and total health expenditure as a percentage of GDP averaged around 4.286%. The domestic government health expenditure as a share of total health expenditure and OOP as a share of total health expenditure are 31.09% and 44.03%, respectively (Ministry of Health,

2018). The proportion of poor households has increased over the last decade from 28.9% in 1995 to 40.3% in 2017 (World Bank, 2021). The high proportion of OOP payments is one of the consequences of the government's introduction of the user fees policy (Boidin & Savina, 1996; Ronen, 1984). Also, an organized bureaucracy has developed within the health system in favor of the financial profitability of public health structures. Revenues from user fees are listed as performance indicators for public health facilities in Beninese health statistics (Dossou et al., 2018; Ministry of Health, 2015). These changes have led to the development of a significant network of private health providers and an increase in OOP expenditure as a proportion of total health expenditure. As of 2019, the private sector in Benin provided around 60% of healthcare to the population. However, recent governmental reforms have resulted in the closure of many private health facilities, causing a decline in the private sector's contribution to healthcare services. Only 8.14% of the population is insured under voluntary health insurance or the public health insurance scheme (Ministry of Health, 2018). In 2011, the government set up a national health insurance called the «Régime d'Assurance Maladie Universelle» to reduce barriers to accessing good-quality healthcare; however, this national health insurance is not yet effective. Voluntary private insurance includes private companies and mutual health organizations, and they use a co-payment system of 20% as a means of healthcare demand management.

In this context, the large proportion of uninsured people, ineffective social health insurance, and high economic growth reflect poorly on the health sector, and we can expect a high CHE ratio. The geographical distribution of services, including health facilities and health workers, is biased against rural areas. Indeed, 74% of the health facilities are located in urban areas, compared to 26% in rural areas (Ministry of Health, 2018). Moreover, 48% of private health facilities are concentrated in the southern region (Ministry of Health, 2018). Therefore, OOP payments may affect the poorest households disproportionately, thereby exacerbating inequality among the population of Benin.

3. LITERATURE REVIEW

Several researchers in both advanced and developing countries, including those in Africa, have studied CHE behaviors using different types of microeconomic survey data (Aregbeshola & Khan, 2018; Attia-Konan et al., 2020; Liu, Coyte, Fu, & Zhang, 2021; Xu et al., 2003; Xu et al., 2007). While some authors used multi-country analysis (Xu et al., 2003; Xu. et al., 2007), others conducted case studies of specific countries (Cleopatra & Eunice, 2018; Falconi & Bernabé, 2018). Various thresholds of CHE have been reported in the literature, although the thresholds of 10% and 40% have been most commonly used (Eze et al., 2022). The studies that set the threshold at 10% often used household expenditure as the denominator (Aregbeshola & Khan, 2018; Wagstaff & Doorslaer, 2003), and those that set the threshold at 40% used non-subsistence expenditure as the denominator (Falconi & Bernabé, 2018; Xu et al., 2003). Another group of studies used thresholds within the range of 10–40% to show the differences among different households/countries under different socio-economic conditions (Aregbeshola & Khan, 2018; Cleopatra & Eunice, 2018; Su et al., 2006).

One robust result is that the incidence of CHE varies widely among countries and is high in developing countries, particularly those in West Africa (Azzani, Roslani, & Su, 2019; Njagi, Arsenijevic, & Groot, 2018). Xu et al. (2007) used survey data from 116 countries and suggested that the prevalence of CHE is lower in high-income countries than in middle-income countries and is very high in low-income countries. Cleopatra and Eunice (2018) showed that the intensity and occurrence of CHE are high among Nigerian households and vary with the threshold levels. In Kenyan slum communities, Buigut, Ettarh, and Amendah (2015) found that a considerable proportion of households faced CHE (Aregbeshola & Khan, 2018). If the OOP exceeds the household's ability to pay, the likely response is to avoid or delay seeking necessary care. Consequently, households are often forced to choose between saving members from illness and purchasing healthcare by sacrificing other basic needs, such as children's education, food, and housing (Falconi & Bernabé, 2018; Russell & Gilson, 1997). In Benin, for example, households facing CHE cut back on essential household spending, such as education expenditure, which is also an input into the health production function (Houeninvo, 2018). Wyszewianski (1986) reported that for poor uninsured households in the United States, even

small amounts spent on healthcare can be financially devastating. These findings agree with a large literature review reporting a high prevalence of CHE (Azzani et al., 2019; Chuma & Maina, 2012; Njagi et al., 2018).

The risk factors for CHE vary between studies, across and within countries, and over time. Nevertheless, lower socioeconomic status of the household, health condition of the household member, type of health services used by the household, and reduced access to health insurance have been widely identified as major risk factors of CHE. For instance, in the case of the United States, some authors found that poor people were more likely to be affected than other households (Berki, 1986; Merlis, 2002; Wyszewianski, 1986). In the same vein, Su et al. (2006) concluded that low income had a positive and significant effect on the probability of CHE in the Nuna district of Burkina Faso. Likewise, households headed by older people and poor households without health insurance coverage were more likely to suffer from CHE than other households. Su et al. (2006) also showed that, in Uganda, the use of public and private inpatient services was the most important risk factor for the non-poor, while for the poor, the use of private outpatient facilities was the riskiest choice. Likewise, Gotsadze, Zoidze, and Rukhadze (2009) suggested that in Georgia, the hospitalization of a household member and the presence of a chronically ill person in the household increased the risk of CHE. The location of the household has also been identified as a risk factor. In India, for example, households in rural areas are more likely to incur CHE than other households (Garg & Karan, 2009). Similar results were found in China by Li et al. (2012) and Li et al. (2014). The occurrence of illness episodes among household adults significantly increased the probability of CHE for low-income quintile households, even though richer households reported more illness than lower-income households and received more treatment than poor households. More recently, Shikuro, Yitayal, Kebede, and Debie (2020) found a high incidence of CHE in Western Ethiopia. In addition, they found that household members with chronic illnesses, the sex of the household head, and employment were significant determinants of CHE. In Côte d'Ivoire, Attia-Konan et al. (2020) used the Household Living Standard survey and concluded that households facing CHE were the ones with chronic disease and members over 65. However, households without health insurance were least affected in Côte d'Ivoire. Ahmed et al.'s (2022) results for Bangladesh were similar to those reported for Côte d'Ivoire. Recent studies also include that of Liu et al. (2021), who used 40% of non-food expenditure as the threshold and found that among elderly Chinese individuals, individuals with a spouse in the household, who were disabled, lived in middle and western zones, lived in urban areas, and fell in the lowest quantile were more prone to CHE.

In summary, the incidence of CHE varies widely among countries and has been seen to be lower when higher thresholds are applied. Most of the reviewed studies used cross-sectional data, making cross-country comparisons challenging because they used different thresholds, sample sizes, and data sets.

4. MATERIALS AND METHODS

4.1. Data Source and Variable Measurement

This study used data from a national household survey called the “Analyse Globale de la Vulnérabilité et de la Sécurité Alimentaire.” It was conducted in 2017 by the National Institute of Statistics and Economic Analysis of Benin. The unit of analysis was the household. The survey collected data on the demographic characteristics of household members, the socioeconomic characteristics of the household, household assets, household income, consumption expenditure, and medical expenditure. We used a sample of 14,952 households for which complete information on these variables was available. OOP expenditure included the cost of medical consultation, hospital services, medical services, medical tests, medications, and various therapeutic appliances and equipment.

CHE was estimated as the ratio of OOP payments of all household members [OOP_exp] to the household's capacity to pay [CTP], using the methodology outlined in Xu et al. (2003). OOP payments comprised the amount of money spent on health services by the household in the six months preceding the survey as reported in the survey. A household's capacity to pay was calculated by subtracting the subsistence need from the household expenditure. Subsistence need was defined as the percentage share of the average household food expenditure (Falconi & Bernabé,

2018; Xu et al., 2003). The use of Xu et al.'s (2003) approach ensures our study is comparable to previous studies. According to O'Donnell et al. (2008), lower thresholds are typically used when total household income or expenditure is used as the denominator, whereas higher thresholds are used when food expenditure is subtracted from the denominator. In this paper, we used the threshold of 40% or more, as recommended by the WHO. However, we also tested the thresholds of 10%, 20%, and 30% of household CTP to capture the best possible sensitivity. If OOP during the last six months was more than the threshold value, then it meant the household had faced CHE. The CHE was estimated as follows:

$$CHE = 1 \text{ if } \left(\frac{OOP_{exp}}{CTP} \right) * 100 > \alpha_i \text{ and } CHE = 0 \text{ if } \left(\frac{OOP_{exp}}{CTP} \right) * 100 \leq \alpha_i \quad (1)$$

Where α_i denotes the threshold for identifying CHE with threshold values set at any of the following levels: $i = 1, 2, 3$ and 4 ; $\alpha_1 = 10\%$; $\alpha_2 = 20\%$; $\alpha_3 = 30\%$ and $\alpha_4 = 40\%$. Equation 1 thus provides four outcome variables.

The explanatory variables used in this study were those commonly used in the literature on CHE (Falconi & Bernabé, 2018; Gotsadze et al., 2009; Khan et al., 2017). These variables were categorized into individual and household characteristics as shown in Table 1. The individual variables were gender, age, religion, education, marital status, and work status of the household heads. The educational qualification of the household head (*educ*) was defined according to the survey questionnaire and divided into four binary variables (0/1): uneducated, primary qualification, secondary qualification, and higher qualification.

The work status of the household head (*Work status*) was defined according to the survey questionnaire and was coded into four binary variables (0/1): receiving a regular wage, self-employed, casual labor, and unemployed. The marital status and religion of the household head were considered since marriage and religion can affect the healthcare-seeking behavior of a household.

The household variables included were household income, household size, and household composition. Household income (*inc*) was measured by household consumption instead of by reported income for three reasons. First, many households did not report their income in the survey. Second, expenditure fluctuates less than income over time. Income data reflects random shocks, while consumption expenditure conforms better to the notion of effective income. Third, expenditure data from household surveys is usually more reliable than income data, particularly in developing countries where the informal sector is relatively large, tax or payroll data are not available, and survey respondents may not wish to reveal their true income (Deaton, 1997). Household consumption expenditure was used to categorize households into five quintiles for comparison purposes. Household size (*hsize*) was defined as the number of individuals in the household. It was recorded as a dummy variable, taking 0 if the household size was less than or equal to five members, and 1 if the household size was more than five members. Like Kim and Yang (2011), we used the age of the household head to define four dummy variables to account for the differential effect of the age group of the household head: as children and old people may demand more healthcare services than the average individual, we defined three dummy variables to capture this reality. The presence of children in the household was defined as a dummy variable taking the value 1 if at least one member of the household was younger than 5 (*Age0_5*) and 0 otherwise. The presence of the elderly in the family was defined as a dummy variable taking the value 1 if at least one member of the household was older than 60 (*Age60*) and 0 otherwise. The presence of both children and the elderly in a household was defined as a dummy variable taking the value 1 if the household had a member younger than 5 and a member older than 60 and 0 otherwise (*Age5_60*). The residence of the household (*Urban*) was a binary variable taking a value of 1 if the household was located in an urban area and 0 otherwise. As in Deaton (1997), we used the region of residence as an indicator of regional variation in prices to control for price differences in healthcare. Table 1 provides a detailed description of all the variables.

Table 1. Variables and their definition.

Variables	Description
Outcome variables	
<i>CHE10</i>	1 if OOP health expenditure equals or is greater than 10% of the household's capacity to pay, 0 otherwise
<i>CHE20</i>	1 if OOP health expenditure equals or is greater than 20% of the household's capacity to pay, 0 otherwise
<i>CHE30</i>	1 if OOP health expenditure equals or is greater than 30% of the household's capacity to pay, 0 otherwise
<i>CHE40</i>	1 if OOP health expenditure equals or is greater than 40% of the household's capacity to pay, 0 otherwise
Individual characteristics	
<i>Sex</i>	1 if the head of the household is male, 0 otherwise
<i>Age groups</i>	Age of the head of the household
16-34	1 if age of the household head is between 16-34, 0 otherwise
35-50	1 if age of the household head is between 35-50, 0 otherwise
51-65	1 if age of the household head is between 51-65, 0 otherwise
66+	1 if age of the household head is greater than 65, 0 otherwise
<i>Marital status</i>	Marital status of the head of the household
Single	1 if the head of household is single, 0 otherwise
Married	1 if the head of household is married, 0 otherwise
Divorced	1 if the head of household is divorced, 0 otherwise
Widow	1 if the head of household is widowed, 0 otherwise
<i>Working status</i>	Working occupation of the head of the household
Regular wage	1 if household head is in wage employment, 0 otherwise
Self-employed	1 if household head is self-employed, 0 otherwise
Casual labor	1 if household head has casual employment, 0 otherwise
Unemployed	1 if household head is unemployed, 0 otherwise
<i>Educ</i>	Education of the head of the household
Uneducated	1 if no formal education, 0 otherwise
Primary	1 if primary education, 0 otherwise
Secondary	1 if secondary education, 0 otherwise
High	1 if post-secondary education, 0 otherwise
<i>Religion</i>	Religion of the head of the household
Traditional	1 if traditional worshiper, 0 otherwise
Christian	1 if Christian, 0 otherwise
Muslim	1 if Muslim, 0 otherwise
Other religion	1 if other religion, 0 otherwise
Household characteristics	
<i>Size</i>	Household size: 1 if household size is more than 5 members, 0 otherwise
<i>Residence</i>	Residence of household
Urban	1 if the household lives in an urban area, 0 otherwise
<i>Social assistance</i>	1 if the household received any assistance from the government, 0 otherwise
<i>Inc</i>	household total expenditure
1 st Quintile (Lowest)	1 if household income is less than the first quintile, 0 otherwise
2 nd Quintile	1 if household income is greater than the first quintile and less than the third quintile, 0 otherwise
3 rd Quintile	1 if household income is greater than the second quintile and less than the fourth quintile, 0 otherwise
4 th Quintile	1 if household income is greater than the third quintile and less than the fifth quintile, 0 otherwise
5 th Quintile (Highest)	1 if household income is greater than the fourth quintile, 0 otherwise
Household composition	
<i>Age0_5</i>	1 if presence of children in the family, 0 otherwise
<i>Age60</i>	1 if presence of older adults in the family, 0 otherwise
<i>Age5_60</i>	1 if there are both children and older adults in the family, 0 otherwise

4.2. Statistical Analysis

First, we examined differences in the incidence of *CHE* among different socioeconomic groups of the population using bivariate analysis, namely two-sample t-tests to compare the means of two different groups. Categorical data were compared with the Pearson chi-squared test. Summary statistics were computed for the whole sample and subgroups, and between-group comparisons were conducted using t-tests and chi-squared tests.

Next, we assessed the association between household demographic and socioeconomic characteristics and *CHE* in Benin, using the multivariate logit model as in previous studies as follows:

$$\ln\left(\frac{\hat{p}}{1-\hat{p}}\right) = \alpha_0 + \alpha_1 X_1 + \alpha_2 X_2 + \alpha_3 X_3 + \dots + \alpha_k X_k + \varepsilon \quad (2)$$

Where \hat{p} is the occurrence of *CHE*, defined as 1 when the household has *CHE* and 0 otherwise; X_1, X_2, X_3, X_k are the determinants; $\alpha_1, \alpha_2, \alpha_3, \alpha_k$ are the parameters to be estimated. Equation 2 argues that the logarithm of the ratio of the probability of suffering *CHE* divided by the probability of not suffering *CHE* depends on the household's characteristics. The determinants include household expenditure, location, gender, education, household socioeconomic features, household size, age group, and occupation status. We fitted four logit regressions using different dependent variables, i.e., the *CHE* status of a household estimated using four threshold levels (10%, 20%, 30%, and 40% of the household's capacity to pay, respectively). The results are reported as coefficients and odds ratios. However, in Appendix 1, we present the marginal effect, which measures how the incidence of *CHE* changes when a specific explanatory variable changes – that is to say, the ratio of the odds of an event occurring in one group compared to the odds of that event occurring in another group.

5. RESULTS

5.1. Characteristics of the Study Sample

The characteristics of the study sample are provided in Table 2.

Table 2. Population characteristics.

Individual and household characteristics	Sample					
	Obs. (n=14,952)	Percentage (%)	Mean	Std. dev.	Min.	Max.
Gender of household heads						
Men	11,932	79.80				
Women	3,020	20.20				
Age groups of household heads						
16-34	3,892	26.03				
36-50	5,873	39.28				
51-65	3,478	23.26				
66+	1,709	11.43				
Marital status of household heads						
Single	568	3.80				
Married	12,339	82.52				
Divorced	480	3.21				
Widowed	1,565	10.47				
Education of household heads						
Uneducated	7,659	51.22				
Primary	3,880	25.95				
Secondary	2,548	17.04				
Tertiary	865	5.79				
Working status of household heads						
Regular wage	1,398	9.35				
Self-employed	7,249	48.48				
Casual labor	4,947	33.09				
Unemployed	1,358	9.08				
Household total expenditure						
1st Quintile (Lowest)	2,992	20.01				
(lowest)						
2nd Quintile	2,989	19.99				

Individual and household characteristics	Sample					
	Obs. (n=14,952)	Percentage (%)	Mean	Std. dev.	Min.	Max.
3 rd Quintile	2,991	20.00				
4 th Quintile	2,992	20.01				
5 th Quintile (Highest)	2,988	19.98				
Residence						
Urban	6,856	45.85				
Rural	8,096	54.15				
Social assistance						
No	13,848	92.62				
Yes	1,104	7.38				
Household size and composition						
Less than 5 members	2,755	18.43				
5+ Members	12,197	81.57				
Children in the family						
No	2,606	17.43				
Yes	12,346	82.57				
Older adults in the family						
No	11,341	75.85				
Yes	3,611	24.15				
Both children and elderly in the family						
No	12,542	83.88				
Yes	2,410	16.12				
<i>Households with positive OOP health expenditure</i>						
Age	14952		47.105	14.993	16	100
OOP health expenditure	14,952		80190.27	218471	0	1.00e+07
Household total expenditure	14,952		984106	2.109e+06	0	2.150e+08
Household capacity to pay	14,952		177937.7	902323.7	0	1.01e+08

The distribution of household characteristics shows a higher percentage of male household heads (79.8%). Next, 54.15% of households live in rural areas, while 45.85% live in urban areas. A high proportion of households (81.5%) have more than five members, compared to 18.43% with less than five members. 82.57% of households have at least one child in their family, 24.15% have at least one elder in the family, and 16.12% have both children and elderly members in the family. About half (48.48%) of household heads are self-employed, 33.09% perform casual labor, only 9.35% are in regular wage employment, and 9.08% are unemployed. The proportion of household heads with no formal education was 51.22%, compared to 25.95% of household heads with a primary school qualification. The average per capita household expenditure of households in the fifth quintile group is 4 times that of the households in the first quintile group. Only 7.38% of the households receive social assistance from the government, non-governmental organizations, and friends. The mean values of household size and household head age are 6.83 members and 44.68 years, respectively. Around 80.56% of households had made OOP payments on healthcare in the six months preceding the survey. The mean household OOP payment of the total population was 80190 FCFA. The mean household OOP represents 8.87% of total household expenditure.

5.2. Incidence of CHE by Demographic and Socioeconomic Characteristics

Table 3 shows the extent and distribution of the probability of facing CHE for different measures of CHE (10%, 20%, 30%, and 40%) by household characteristics, using bivariate chi-squared analysis.

The mean percentage values of households incurring CHE dropped steadily from 66.26% to 25.49% as the threshold level increased from 10% to 40% for all socioeconomic characteristics. These percentages mean, for example, that at cut-off levels of 40% of the household's capacity to pay, 25.49% of households spent 40% of their effective income on healthcare. Irrespective of the CHE threshold, we observed statistically significant differences in the prevalence of CHE across the household socioeconomic characteristics of gender, age group, marital status, education, employment status, presence of children in the family, and presence of elderly family members. There are statistically significant differences among the expenditure quintiles. Moreover, excepting the 10% threshold level, the

probability of facing CHE is higher among households in the first expenditure quintiles than among those in the highest expenditure quintile. We found a pro-poor incidence of CHE in the threshold levels of 20% to 40%, while a pro-rich incidence of CHE was found for the 10% threshold level. The probability of facing CHE was high among households that received social assistance from the government, and these differences were found to be statistically significant except when employing the 10% threshold (p -value = 0.170). The occurrence of CHE was more common among households where the head was female, less educated, self-employed, or unemployed. CHE was also more common among households in rural areas, those with children, and those with older adults.

5.3. Multiple Logit Regression Analysis

Table 4 presents the socioeconomic and demographic factors associated with the incidence of CHE at the 10%, 20%, 30%, and 40% capacity to pay thresholds using a logistic regression model. Table 4 shows that factors associated with CHE probability change with the threshold levels in terms of the coefficient signs, odd ratio sizes, and levels of significance. The results suggest that irrespective of the CHE threshold, households headed by men ($p < 0.050$) were less likely to suffer from CHE than households headed by women. Households headed by a person aged 35 to 50 were negatively and significantly associated with the risk of incurring CHE at all threshold levels. Similarly, a negative association was found for households headed by individuals aged between 50 and 65, with a p -value of 0.001. In contrast, having a household head aged more than 65 years old increased the occurrence of CHE, and this increase was statistically significant at the 30% and 40% threshold levels. At these thresholds, the probability of experiencing CHE in a household with a head aged more than 65 was, respectively, 1.182 and 1.194 times the probability of CHE in a household with a head aged between 16 and 34. Compared to single household heads, marriage was not a protective factor against CHE, with odds ratios of 1.239 at 20%, 1.326 at 30%, and 1.6385 at 40%. For widowed heads of households, the risk of incurring CHE was 2.027 times that of households with single heads. A household in which the head had a university education was less likely to experience CHE than a household in which the head had not received any formal education. Households belonging to the highest expenditure quintile had a significantly lower probability of facing CHE than those in the lowest quintile (poorest group). Surprisingly, at all threshold levels, households in the 2nd, 3rd, and 4th quintiles were statistically more likely to suffer CHE than households in the lowest quintile. The religious beliefs of the head of the household appear to be significantly related to the risk of incurring CHE; adherents of Christianity and Islam were significantly less likely to suffer CHE than their traditional counterparts in Benin. The employment status of the household head is another driver of CHE. Compared with household heads working in the formal sector and receiving a regular wage, household heads who were self-employed were less likely to suffer CHE. However, unemployed heads of households were positively linked with the occurrence of CHE, although the relationship was statistically insignificant. Similar results were obtained for the casual employment variable. Living in an urban area was negatively and significantly correlated with the occurrence of CHE at the one percent level ($p = 0.000$). This means that households in urban areas are less likely to incur CHE than households in rural areas. Finally, as expected, households with children and elderly members have a higher risk of experiencing CHE than households with neither children nor elderly family members.

Table 3. Bivariate analysis of some household characteristics in relation to CHE.

% CHE in this subgroup Individual and household characteristics	10%			20%			30%			40% (WHO)		
	%	[95%CI]	P-value	%	[95%CI]	P-value	%	[95%CI]	P-value	%	[95%CI]	P-value ^a
Mean percentage value	66.26			48.70			35.15			25.49		
Sex			0.00			0.000			0.000			0.000
Men	65.40	[64.52-66.24]		47.34	[46.47-48.21]		33.68	[32.83-34.53]		27.22	[26.46-28.04]	
Women (Reference)	69.63	[67.90-71.34]		54.04	[52.39-55.81]		40.92	[39.17-42.68]		32.64	[30.90-34.33]	
Age groups			0.000			0.000			0.000			0.000
16-34	66.98	[65.53-68.47]		48.79	[47.22-50.3]		34.55	[34.55-36.05]		26.849	[25.43-28.2]	
36-50	65.08	[63.85-66.29]		46.11	[44.80-47.44]		31.56	[30.37-32.75]		25.591	[24.41-26.70]	
51-65	64.72	[63.17-66.37]		47.64	[45.96-49.23]		34.87	[33.29-36.46]		29.499	[27.96-31.09]	
66+	71.79	[69.61-73.95]		59.51	[57.26-61.82]		49.32	[46.95-51.69]		38.677	[36.37-40.95]	
Marital status			0.000			0.000			0.000			0.000
Single (Reference)	54.92	[50.82-59.03]		37.14	[37.14-41.13]		26.23	[22.60-29.86]		38.90	[34.82-42.97]	
Married	66.32	[65.49-67.16]		4.80	[47.16-48.92]		34.15	[33.31-34.98]		26.22	[25.42-26.96]	
Divorced	65.00	[60.71-69.28]		48.12	[43.63-52.61]		33.33	[29.10-37.56]		33.71	[29.58-37.92]	
Widowed	70.22	[67.95-72.49]		58.21	[55.76-60.65]		46.77	[44.29-49.24]		39.47	[37.07-41.83]	
Education			0.000			0.000			0.000			0.000
Uneducated (Reference)	68.74	[67.70-69.78]		53.76	[52.64-54.88]		40.26	[39.16-41.36]		32.145	[31.00-33.19]	
Primary	66.21	[64.72-67.70]		47.13	[45.56-48.71]		33.53	[32.04-35.01]		28.323	[27.62-29.04]	
Secondary	62.08	[60.20-63.97]		40.18	[38.28-42.09]		26.88	[25.16-28.60]		23.463	[21.85-25.13]	
Tertiary	54.70	[50.92-58.49]		32.43	[28.87-35.99]		18.23	[15.30-21.16]		24.854	[21.90-27.74]	
Working status of household heads			0.000			0.000			0.000			0.000
Regular wage	57.86	[55.27-60.45]		36.90	[34.37-39.44]		22.460	[20.27-24.65]		23.533	[21.31-25.72]	
Self-employed	68.46	[67.39-69.53]		51.59	[50.44-52.74]		76.74	[36.55-38.78]		28.196	[27.15-29.26]	
Casual labor	64.94	[63.61-66.27]		46.10	[44.71-47.49]		32.12	[30.81-33.42]		26.318	[25.01-27.59]	
Unemployed	67.89	[65.40-70.38]		54.78	[52.13-57.43]		45.72	[43.07-48.38]		41.237	[38.64-43.87]	
Household total expenditure			0.000			0.000			0.000			0.000
1st Quintile (Lowest)	54.04	[52.25-55.83]		46.62	[44.83-48.41]		40.01	[38.25-41.76]		54.311	[52.53-56.09]	
2nd Quintile	68.78	[67.12-70.44]		55.14	[53.36-56.93]		41.37	[39.61-43.14]		30.411	[28.72-32.04]	
3rd Quintile	73.72	[72.14-75.30]		53.51	[51.72-55.30]		35.70	[33.99-37.42]		23.069	[21.51-24.50]	
4th Quintile	73.27	[71.69-74.86]		49.89	[48.10-51.69]		32.60	[30.92-34.28]		19.117	[17.74-20.51]	
5th Quintile (Highest)	61.47	[59.72-63.21]		38.29	[36.55-40.03]		26.02	[24.44-27.59]		14.692	[13.49-15.90]	
Residence			0.000			0.000			0.000			0.000
Urban	62.77	[61.63-63.92]		44.31	[43.13-45.48]		30.87	[29.78-31.97]		27.771	[26.71-28.87]	
Rural (Reference)	69.20	[68.20-70.21]		52.40	[51.32-53.49]		38.75	[37.69-39.82]		28.792	[27.82-29.70]	
Social assistance			0.175			0.000			0.000			0.000
No	66.11	[65.32-66.89]		48.22	[47.39-49.05]		34.48	[33.69-35.28]		27.577	[26.86-28.33]	
Yes	68.11	[65.36-70.86]		54.61	[51.67-57.56]		43.38	[40.45-46.31]		37.681	[34.80-40.55]	
Household size and composition			0.000			0.786			0.000			0.000
Less than 5 members	63.01	[61.20-64.81]		48.92	[47.06-50.79]		38.80	[36.98-40.62]		40.00	[38.10-41.83]	
5+ members	66.99	[66.15-67.82]		48.64	[47.75-49.53]		34.31	[33.47-35.16]		25.686	[24.97-26.48]	

Children in the family			0.000			0.001			0.046			0.0001
No	59.28	[57.39-61.17]		45.81	[43.90-47.73]		36.83	[34.98-38.69]		30.465	[28.69-32.23]	
Yes	67.73	[66.90-68.55]		49.30	[48.42-50.18]		34.78	[33.94-35.62]		24.43	[23.67-25.19]	
Older adults in the family			0.000			0.000			0.000			0.000
No	64.92	[64.04-65.80]		46.56	[45.64-47.48]		32.62	[31.76-33.48]		22.87	[22.09-23.64]	
Yes	70.45	[68.96-71.94]		55.38	[53.76-57.00]		43.062	[41.44-44.67]		33.70	[32.16-35.24]	
Both children and older adults in the family			0.000			0.000			0.000			0.000
No	65.18	[64.34-66.01]		47.43	[46.55-48.30]		34.06	[33.23-34.89]		24.59	[23.84-25.35]	
Yes	71.86	[70.07-73.66]		55.26	[53.28-57.25]		40.78	[38.82-42.75]		30.12	[28.29-31.95]	

Note: a indicates that for P-values, a chi-squared test was used for comparison.

Table 4. Determinants of CHE using logistic regression model.

Thresholds of CHE	10%		20%		30%		40%	
	Coef	Odds ratio	Coef	Odds ratio	Coef	Odds ratio	Coef	Odds ratio
Gender of household heads (Reference: Women)								
Male	-0.200*** (0.058)	0.819*** (0.048)	-0.155*** (0.054)	0.856*** (0.047)	-0.141** (0.056)	0.868** (0.049)	-0.146** (0.061)	0.865** (0.053)
Age group of household heads (Reference: 16-34 Years)								
35-50	-0.184*** (0.047)	0.832*** (0.039)	-0.161*** (0.044)	0.851*** (0.038)	-0.162*** (0.047)	0.851*** (0.039)	-0.216*** (0.052)	0.806*** (0.041)
51-65	-0.225*** (0.059)	0.798*** (0.047)	-0.170*** (0.055)	0.844*** (0.047)	-0.112* (0.058)	0.894* (0.052)	-0.142** (0.064)	0.868** (0.055)
More than 65	-0.035 (0.088)	0.966 (0.086)	0.067 (0.082)	1.070 (0.088)	0.167** (0.084)	1.182** (0.099)	0.177** (0.090)	1.194** (0.107)
Marital status of household heads (Reference: Single)								
Married	0.088 (0.103)	1.092 (0.113)	0.214** (0.103)	1.239** (0.128)	0.282** (0.115)	1.326** (0.148)	0.522*** (0.135)	1.685*** (0.216)
Divorced	0.094 (0.140)	1.099 (0.154)	0.202 (0.135)	1.224 (0.166)	0.138 (0.148)	1.149 (0.168)	0.352** (0.168)	1.422** (0.234)
Widowed	0.186 (0.122)	1.204 (0.148)	0.394*** (0.120)	1.484*** (0.177)	0.435*** (0.130)	1.544*** (0.196)	0.706*** (0.149)	2.027*** (0.290)
Education of household head (Reference: Uneducated)								
Primary	-0.071 (0.046)	0.932 (0.043)	-0.120*** (0.043)	0.887*** (0.038)	-0.072 (0.044)	0.931 (0.041)	-0.121** (0.049)	0.886** (0.044)
Secondary	-0.169*** (0.057)	0.844*** (0.048)	-0.285*** (0.055)	0.752*** (0.041)	-0.242*** (0.059)	0.785*** (0.046)	-0.239*** (0.066)	0.787*** (0.052)
Tertiary	-0.315*** (0.100)	0.730*** (0.073)	-0.420*** (0.103)	0.657*** (0.067)	-0.516*** (0.120)	0.597*** (0.071)	-0.651*** (0.143)	0.521*** (0.074)
Religion of household head (Reference: Traditional)								
Christian	-0.509*** (0.080)	0.601*** (0.048)	-0.345*** (0.078)	0.708*** (0.055)	-0.200** (0.082)	0.819** (0.066)	-0.200** (0.091)	0.819** (0.074)
Muslim	-0.387*** (0.080)	0.679*** (0.055)	-0.444*** (0.078)	0.642*** (0.050)	-0.438*** (0.083)	0.646*** (0.053)	-0.405*** (0.092)	0.667*** (0.061)

Other religion	-0.453*** (0.087)	0.635*** (0.056)	-0.488*** (0.083)	0.614*** (0.052)	-0.579*** (0.087)	0.560*** (0.049)	-0.584*** (0.094)	0.558*** (0.052)
Work status of household head (Reference: Regular wage)								
Self-employed	-0.171 (0.145)	0.843 (0.121)	-0.404*** (0.140)	0.668*** (0.093)	-0.431*** (0.148)	0.650*** (0.096)	-0.450*** (0.162)	0.637*** (0.104)
Casual labor	0.016 (0.133)	1.016 (0.133)	-0.167 (0.126)	0.846 (0.107)	-0.149 (0.132)	0.861 (0.114)	-0.135 (0.143)	0.874 (0.127)
Unemployed	0.124 (0.147)	1.132 (0.165)	-0.016 (0.140)	0.984 (0.138)	0.130 (0.146)	1.139 (0.168)	0.174 (0.160)	1.190 (0.192)
Household total expenditure (Reference: 1 st Quintile)								
2 nd Quintile	0.719*** (0.055)	2.052*** (0.114)	0.449*** (0.053)	1.567*** (0.084)	0.192*** (0.055)	1.211*** (0.066)	0.012 (0.058)	1.012 (0.059)
3 rd Quintile	1.010*** (0.058)	2.746*** (0.160)	0.438*** (0.054)	1.549*** (0.084)	0.013 (0.056)	1.013 (0.057)	-0.290*** (0.061)	0.748*** (0.046)
4 th Quintile	1.036*** (0.059)	2.819*** (0.167)	0.337*** (0.055)	1.401*** (0.078)	-0.078 (0.058)	0.925 (0.053)	-0.362*** (0.064)	0.697*** (0.044)
5 th Quintile	0.589*** (0.060)	1.802*** (0.108)	-0.049 (0.059)	0.953 (0.056)	-0.301*** (0.062)	0.740*** (0.046)	-0.405*** (0.068)	0.667*** (0.045)
Location (Reference: Rural)								
Urban	-0.205*** (0.040)	0.815*** (0.032)	-0.140*** (0.037)	0.869*** (0.032)	-0.134*** (0.039)	0.875*** (0.034)	-0.168*** (0.043)	0.846*** (0.036)
Household received social assistance (Reference: No)								
Yes	0.044 (0.071)	1.045 (0.074)	0.130* (0.067)	1.139* (0.076)	0.158** (0.068)	1.171** (0.080)	0.217*** (0.073)	1.242*** (0.089)
Household size (Reference: More than 5 members)								
Less than 5 members	0.097 (0.060)	1.102 (0.066)	0.078 (0.056)	1.081 (0.061)	0.114** (0.058)	1.121* (0.065)	0.108* (0.062)	1.114* (0.070)
Presence of children in family (Reference: No)								
Yes	0.499*** (0.072)	1.646*** (0.119)	0.386*** (0.072)	1.472*** (0.106)	0.307*** (0.077)	1.359*** (0.105)	0.123 (0.084)	1.131 (0.094)
Presence of older adults in family (Reference: No)								
Yes	0.506*** (0.098)	1.659*** (0.163)	0.406*** (0.094)	1.501*** (0.143)	0.411*** (0.099)	1.508*** (0.149)	0.354*** (0.106)	1.424*** (0.150)
Presence of both children and older adults in family (Reference: No)								
Yes	-0.336*** (0.102)	0.715*** (0.073)	-0.257*** (0.098)	0.773*** (0.076)	-0.315*** (0.102)	0.730*** (0.074)	-0.260** (0.109)	0.771** (0.084)
Constant	0.214 (0.199)	1.239 (0.245)	0.007 (0.193)	1.007 (0.194)	-0.339* (0.205)	0.719* (0.146)	-0.683*** (0.228)	0.505*** (0.115)
Prob > Chi2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Observations	14,952	14,952	14,952	14,952	14,952	14,952	14,952	14,952

Note: Robust standard errors in parentheses. ***, **, and * denote significance levels of 1% (P-values<0.01), 5% (P-values<0.05), and 10% (P-values<0.1), respectively. Regional dummies were included in all regressions.

6. DISCUSSION

We have provided a more detailed and updated description of the extent and driving factors of CHE in the context of Benin. This article is among only a few to estimate the incidence of CHE in Benin based on a nationally representative probability-sampled survey. The paper shows that in the six months preceding the survey, around 25.49% of Beninese households incurred OOP healthcare expenditure surpassing 40% of their capacity to pay. It should be noted that the fact that the incidence of CHE was higher when lower thresholds were applied was consistent with the literature (Ichoku, Fonta, & Onwujekwe, 2009; Mchenga, Chirwa, & Chiwaula, 2017; Njagi et al., 2018). The proportion of households with CHE could be higher than that found in this study if specific diagnostic criteria, such as human immunodeficiency virus (HIV)/antiretroviral therapy (ART) patients, malaria hospitalized patients, tuberculosis patients, etc., were used. Furthermore, the proportion of households experiencing CHE depends on the threshold used to define it. Our results are to some extent consistent with previous studies. For instance, household income level is the most consistent driver of CHE, with higher-income groups being less likely to incur CHE than middle- and lowest-income groups (Cleopatra & Eunice, 2018; Su et al., 2006; Yardim, Cilingiroglu, & Yardim, 2010). Moreover, the finding that households headed by women, those in the poorest households, those living in rural areas, and those with both children and elderly family members were more likely to incur CHE is in line with the literature (Knaul et al., 2013; Li et al., 2014; Xu et al., 2006; Yardim et al., 2010). The fact that households with both children and older individuals are at greater risk may be explained by the fact that children and the elderly generally need more frequent, as well as more expensive, healthcare and are more likely to demand healthcare. The poor have limited resources to afford healthcare, and in rural areas, health facility access is also limited. This could explain why living in a rural area and being poor are risk factors.

The study also found some surprising results. For instance, households headed by persons working in the formal sector and receiving wages were at higher risk of CHE than those whose heads were self-employed. We would have expected households working in the formal sector to have greater opportunities (compared to those who are self-employed) to obtain social security benefits such as private health insurance to cover their healthcare expenses. Households working in the informal sector are more likely to experience health shocks than households working in the formal sector. For example, healthy people may be more likely to get a job in the formal sector, meaning that health status is an important determinant of health expenditure. The fact that unemployment of the head of the household was found to be insignificant is consistent with the findings of Masiye, Kaonga, and Kirigia (2016), who showed that the employment status of the household head is not significantly associated with the likelihood of incurring CHE. However, this contradicts other empirical studies that revealed that unemployed household heads were more likely to incur CHE (Barasa, Maina, & Ravishankar, 2017; Buigut et al., 2015). The fact that the risk of CHE is higher for households in the 2nd, 3rd, and 4th quintiles, compared to households in the lowest quintile, may be explained by the fact that the poorest households may reduce healthcare utilization due to poverty, even if their health needs are greater. The high prevalence of CHE we observed may be due to the fact that healthcare expenditure is not optimally shared between the family and the state. It suggests the failure of social protection interventions to reduce the financial risk of OOP payments for healthcare. In Benin, social protection policy since 2011 has focused on subsidizing medication for specific illnesses, providing free healthcare for specific categories of the population, and introducing the National Health Insurance Skim. The effectiveness of these interventions must be improved. As highlighted by Van Damme, Meessen, Por, and Kober (2003), reducing OOP payments through the development and implementation of national health insurance in countries where this does not yet exist is the preferred long-term solution. This paper has some limitations. First, it is based on cross-sectional data, and for that reason, only point estimations could be performed; consequently, we could not determine what proportion of households faced persistent CHE. Second, the survey did not collect information on the health conditions and insurance status of the households and relied upon respondents to recall the amount spent on healthcare, which they could not always precisely remember.

7. CONCLUSION AND POLICY IMPLICATIONS

The dependence on OOP payments as a healthcare-financing mechanism in Benin exposes households to CHE, especially households headed by women, the poorest households, households living in rural areas, households headed by widows, and households with elderly members. These are vulnerable groups that must be protected against CHE. The paper draws the government and policymakers' attention to the need to implement more effective policies and strategies, such as the healthcare financing national health insurance adopted by the government of Benin, to mitigate the adverse effects of OOP payments. However, putting effective national health insurance in place is a long-run action. Therefore, policymakers should take immediate action to reduce CHE levels by reducing the burden of OOP payments for vulnerable groups. One way of doing this would be to expand the indigent health funds of the Ministry of Health to these population groups.

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APPENDIX

Table 1. Marginal effects.

Threshold of CHE	10%	20%	30%	40%
	ME	ME	ME	ME
Gender of household heads (Reference Women)				
Male	-0.042*** (0.012)	-0.037*** (0.013)	-0.031** (0.013)	-0.027** (0.011)
Age group of household heads (Reference: 16-34 Years)				
35- 50	-0.039*** (0.010)	-0.039*** (0.011)	-0.035*** (0.010)	-0.039*** (0.009)
51- 65	-0.048*** (0.012)	-0.041*** (0.013)	-0.025* (0.013)	-0.026** (0.012)
More than 65	-0.007 (0.018)	0.016 (0.020)	0.038** (0.019)	0.035* (0.018)
Marital status of household head (Reference: Single)				
Married	0.019 (0.022)	0.051** (0.024)	0.059** (0.023)	0.083*** (0.019)

Threshold of CHE	10%	20%	30%	40%
	ME	ME	ME	ME
Divorced	0.020 (0.030)	0.048 (0.032)	0.028 (0.030)	0.053** (0.025)
Widow	0.039 (0.026)	0.094*** (0.028)	0.093*** (0.027)	0.118*** (0.023)
Education of household head (Reference: Uneducated)				
Primary	-0.015 (0.010)	-0.029*** (0.010)	-0.016 (0.010)	-0.029** (0.009)
secondary	-0.036*** (0.012)	-0.069*** (0.013)	-0.052*** (0.012)	-0.043*** (0.011)
High	-0.069*** (0.023)	-0.100*** (0.024)	-0.107*** (0.023)	-0.105*** (0.020)
Religion of household head (Reference: Traditional)				
Christianity	-0.108*** (0.018)	-0.083*** (0.019)	-0.046** (0.019)	-0.039** (0.017)
Muslim	-0.081*** (0.017)	-0.107*** (0.019)	-0.098*** (0.018)	-0.076*** (0.017)
Other religion	-0.095*** (0.018)	-0.118*** (0.020)	-0.127*** (0.019)	-0.105*** (0.017)
Working status of household head (Reference: Regular wage)				
Self employed	-0.036 (0.030)	-0.095*** (0.032)	-0.093*** (0.033)	-0.082*** (0.031)
Casual labor	0.003 (0.028)	-0.039 (0.029)	-0.033 (0.030)	-0.026 (0.028)
Unemployed	0.025 (0.030)	-0.004 (0.033)	0.030 (0.033)	0.036 (0.032)
Household total expenditure (Reference: 1st Quintile)				
2 nd Quintile	0.166*** (0.013)	0.108*** (0.013)	0.043*** (0.012)	0.002 (0.011)
3 rd Quintile	0.225*** (0.012)	0.105*** (0.013)	0.003 (0.012)	-0.054*** (0.011)
4 th Quintile	0.230*** (0.013)	0.081*** (0.013)	-0.017 (0.013)	-0.066*** (0.012)
5 th Quintile	0.138*** (0.014)	-0.011 (0.014)	-0.063*** (0.013)	-0.073*** (0.012)
Household size (Reference: More than 5 members)				
More than 5 members	0.020 (0.013)	0.019 (0.013)	0.025** (0.013)	0.019* (0.011)
Settlement (Reference: Rural)				
Urban	-0.043*** (0.008)	-0.033*** (0.009)	-0.029*** (0.008)	-0.030*** (0.008)
Household received social assistance (Reference: No)				
Yes	0.009 (0.015)	0.031* (0.016)	0.034** (0.015)	0.039*** (0.013)
Presence of children in family (Reference: No)				
Yes	0.110*** (0.016)	0.091*** (0.017)	0.064*** (0.015)	0.022 (0.014)
Presence of older in family (Reference: No)				
Yes	0.103*** (0.019)	0.097*** (0.022)	0.092*** (0.023)	0.067*** (0.021)
Presence of both children and older in family (Reference: No)				
Yes	-0.073*** (0.023)	-0.061*** (0.023)	-0.066*** (0.020)	-0.045** (0.018)
Observations	14,952	14,952	14,952	14,952

Note: ***, ** and * denote significance levels at 1% (p-values<0.01), 5% (p-values<0.05) and 10% (p-values<0.1), respectively.

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