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Catastrophic health expenditure and household impoverishment in Togo

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Abstract

Background: The main way of financing healthcare in low-income countries continues to be out-of-pocket payments. Despite the efforts of national authorities and international partners to protect households from impoverishment arising from seeking healthcare, the risk of incurring catastrophic healthcare expenses remains very high for households in developing countries. This study aims to analyse catastrophic health expenditures and their effects on household impoverishment in Togo.

Design and methods: Data were obtained from the CWIQ survey, a nationally representative survey conducted in 2015 among 2400 households.We calculated the incidence and the intensity of catastrophic health expenditures in Togo through various thresholds and then estimated the effects of these expenditures on the level of households' impoverishment by determining poverty levels using consumption expenditure before and after making payments for healthcare.

Results: The results indicate that the incidence of catastrophic expenditure varies between 6% and 57% depending on the thresholds used. Households at risk of catastrophic expenditure spend between 19% and 64% of their spending on healthcare. Based on total expenditure and above 20%, the richest households are more prone to catastrophic health expenditures. The findings also show that the incidence of impoverishment caused by health expenditure payments is 8.2% in relative terms and 4.52% in absolute terms. In Togo, 4.52% of households are impoverished by catastrophic health expenditures. This impoverishment effect is greater for male-headed households.

Conclusions: Health system reforms aiming at accessibility to quality care and the development of pre-payment mechanisms will promote the earlier use of healthcare services and thus reduce the higher healthcare costs generated by later attendance at them.

Keywords

Catastrophic health, household impoverishment, health expenditure, expenditure, catastrophic health expenditure

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Background

The main way of financing healthcare in low-income countries continues to be out-of-pocket payments.[1] Despite the efforts of national authorities and international partners to protect households from impoverishment arising from seeking healthcare, the risk of incurring catastrophic healthcare expenses remains very high for households in developing countries. The Universal Health Coverage (UHC) advocated by the World Health Organization (WHO) that aims to protect households from catastrophic healthcare costs and to eliminate financial barriers to accessing healthcare, especially for the poorest,[2] stays a big challenge for poor countries. The risk of catastrophic healthcare expenditure occurs in all countries regardless of income level, however, more than 90% of affected households live in low-income countries.[3] Health expenditure becomes catastrophic when it endangers the ability of households to maintain their usual standard of living.[4] It occurs when households' out-of-pocket payments (OOP)

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exceed some fraction of their income or total expenditure in a given period, usually 1 year.[5–7] Expenditure is defined as catastrophic if a household's financial contributions to the health system exceed 40% of income remaining after satisfaction of subsistence needs.[8] These catastrophic health expenditures are caused mainly by OOP payments,[2,9] which incur financial hardship.[1] Indeed, each unit of financial resource spent on health is no longer available for the consumption of other goods and services, and the allocation of a significant share of income to health expenditures can lead to household impoverishment.

Between 2015 and 2017, the incidence of catastrophic spending rose from 12.7% of the world population spending more than 10% of their household income on health out-of-pocket (940 million) to 13.2% (996 million).[10] Likewise, many households have been pushed below the extreme poverty line due to OOP payments. While impoverishing health spending has decreased in recent years, 70% of the world's population has been impoverished by out-of-pocket spending in 2017 with impoverishing health spending at the $1.90 in purchasing power parity (PPP) a day poverty line of extreme poverty.[10] The WHO Africa region is the second region after the South-East Asia region, with the highest percentage of the population impoverished by out-of-pocket health spending at the PPP$1.9 a day poverty line.[10] In Togo, the incidence of catastrophic health spending at 25% of household total consumption is 2.4% in 2018[10] and 2.54% of the population is impoverished below the PPP$1.9 a day poverty line by OOP payments in 2010.[1] Study has found that 0.8% or 1.3 million Nigerians are pushed below the PPP$1.25 poverty line due to OOP payments[11] while other has shown that OOP impoverished about 4% of Ugandans in 2009/2010.[12] In Mongolia, for example, 20,000 people fell below the poverty line in 2012 because of healthcare spending.[13] In 2003 in Kenya, 3.5% of households are pushed below the poverty line because of direct payments,[14] while it was 2.7% of individuals in 2007.[15]

Out-of-pocket payments not only impoverish households but also prevent them from using healthcare services and lead to inefficiency and unfairness in the allocation of resources.[2] The incidence of both impoverishing and catastrophic spending is much higher among the uninsured and the poor.[9] The incidence of catastrophic healthcare spending is higher among the poor.[4] For these reasons, UHC has been at the heart of all debates and policies aimed at improving the well-being of the population. There is a growing recognition that progress toward UHC is essential for poverty reduction,[1,16,17] and UHC has been identified as a priority for the global health agenda.[1,17–19] UHC means that all individuals have access to high-quality health services they need without suffering financial hardship.[2,17] It combines financial protection against the risks of catastrophic health spending and household impoverishment while ensuring access to essential services.[2,16,17] While efforts are being made to achieve UHC, out-of-pocket payments are a major obstacle for developing countries. Then, the means to achieve UHC include prepayment and resource pooling mechanisms. For this purpose, to reduce the financial risk, Togo implemented a Mandatory Health Insurance (MHI) scheme for active and retired public and similar employees in 2011.

Togo's National Health Insurance Scheme (NHIS) aims to ensure universal access to quality care without incurring catastrophic expenditure. The NHIS is managed by the *Institut National d'Assurance Maladie (INAM)* of Togo and covered approximately 300,000 people in 2012.[20] To improve financial protection and the efficiency of the healthcare system, the Togolese Government launched the "School Assur" program in 2017 and the National Development Plan (NDP 2018–2022) in 2019. The "School Assur" program is health insurance for students in public schools while NDP includes the extension of UHC gradually to all Togolese households.[21] Despite the fact that the MHI scheme and the various policies adopted have increased the number of insured, the coverage remains low. Indeed, in 2019, the effective health insurance coverage rate is 6% of the country's population, including 4.7% under the INAM scheme and the rest of private or mutual health insurance systems.[21] The share of the MHI and of Voluntary Health Insurance (VHI) is respectively 5% and 6% of Current Health Expenditures (CHE) in 2020.[22] This results in a high rate of household contribution to health expenditure in Togo, which stood at 61% of CHE in 2020.[22] This level of OOP spending suggests that many households lack adequate financial protection for healthcare costs and represent more than three times the threshold for addressing catastrophic health expenditures and impoverishment. Several studies have shown that out-of-pocket payments lead to catastrophic expenditures when they exceed 15%–20% of total household expenditure or income.[3,8,18,23,24] In this context, it is relevant to analyze the effects of health expenditure on household impoverishment in Togo.

The literature suggests that two categories of studies have focused on the analysis of health expenditure. One has focused on the determinants of catastrophic health expenditures and the other on the analysis of the effects of catastrophic health expenditures on household welfare. The gender of the household head can be a risk factor for catastrophic health expenditures. By systematically reviewing 27 papers, some authors found that the gender of the head of household is not a significant factor in 16 papers while a female head of household is identified as a risk factor for catastrophic health spending in the other 11 studies.[25] Therefore, gender effects on catastrophic health expenditures appear to be context-specific. Furthermore, WHO suggested that analytic research to investigate differences in financial protection between men and women is needed.[18] This study on Togo follows this suggestion

and seeks to: (i) measure the incidence of catastrophic health expenditure, (ii) determine the intensity of catastrophic health expenditure, and (iii) estimate the effects of catastrophic health expenditure on the well-being of male and female heads of households in Togo.

Methods

Data sources

Data used are from a nationally representative cross-sectional household survey "the Core Welfare Indicators Questionnaire (CWIQ) survey (known in French as QUIBB)" conducted by the *Institut National de la Statistique et des Etudes Economiques et Démographiques (INSEED)* between August and September 2015 in Togo. The methodology used for conducting the CWIQ survey can be summarized as follows: Sampling; Questionnaire Development; Pretesting; Fieldwork; Data Collection; Data Entry and Cleaning; Data Analysis and Reporting.

The CWIQ survey collects information from 2400 Togolese households and is financed by the Togolese Government, the World Bank, the European Union, UNDP, and UNICEF. It aims to provide detailed data for the evaluation of poverty and focuses on three major dimensions of household well-being: consumption, access to basic social services, and human capital.

The consumption dimension of household well-being focuses on the material resources and economic activities of households. The access to basic social services dimension examines the availability and utilization of essential services that contribute to human development and well-being. The human capital dimension focuses on the education, skills, and health of individuals within households.

All statistical analyses were performed using STATA software version 17.

Study area

Togo is a West African country, neighbor to Burkina Faso, Ghana, and Benin with an area of 56,790 km^2 and a population estimated at 8,644,829 inhabitants in 2021, which is growing at a rate of 2.4%.[26] The majority of the population lives in rural areas (57%), and about three-fifths are aged 15–64, and female represents 49.7% of the total population in 2021.[26] Togo is a low-income country with GDP growth estimated at 5.3% and a GDP per capita of 973.2 US$ in 2021.[26] Socio-economically, the Human Development Index and the Gender Inequality Index are 0.539 and 0.580 in 2021, which ranks the country respectively at 162nd and 149th out of 191 countries.[27] Poverty is higher in female-headed households (45.7%) than in male-headed households (45.2%).[28]

Study population

Togo is the focus of this study and the study population is the 2400 Togolese households considered in the CWIQ survey, which were nationally representative.

Measuring the incidence and intensity of catastrophic spending

To operationalize catastrophic health expenditure, one common approach is to define a specific threshold, such as a percentage of household income or expenditure. For example, in this paper, it is defined as health expenditures exceeding 5%–40% of a household's income. When health expenditures surpass this threshold, it indicates a situation of catastrophic health expenditure.

Incidence and intensity are usually used to measure catastrophic health expenditures. To assess the incidence and intensity of catastrophic health expenditures, two standard approaches are employed. One is based on total household expenditures and the second is on the household's ability to pay. In this section, we present the analytical approach based on household ability to pay,[7] applied in some studies.[6,8] In this approach, the incidence is estimated by the proportion of a sample with healthcare costs as a share of total (or non-food) expenditure exceeding the chosen threshold,[6] usually 5%–40%, and is calculated following the different steps described below.

Step 1: The household's ability to pay is computed by subtracting food expenditures from total expenditures: $y = x - D(x)$ where y is a household's ability to pay, x total expenditure of household, and $D(x)$ the household's total food expenditure.

Step 2: Determine OOP health spending share of household capacity to pay (v) as the ratio of OOP payments (T) to household's capacity to pay:

$$v = \frac{T}{y}.$$

Step 3: Define an indicator (E_i) which equals 1 if the household i incurred catastrophic expenditure for a given threshold (z) and 0 otherwise,

$$E_i = \begin{cases} 1 & si \quad v - z \geq 0 \\ 0 & si \quad v - z < 0 \end{cases}.$$

Step 4: Estimate the incidence of catastrophic payments or the catastrophic payment headcount (H) which is defined as the percentage of households incurring catastrophic payments:

$$H = \frac{1}{N}\sum_{i=1}^{N} E_i \text{ where } N \text{ is the sample size.}$$

The incidence measured above does not reflect the amount by which the OOP payments exceed the chosen threshold.[6,7] This is done by calculating the depth to which OOP payments (as a proportion of total expenditure) exceed the selected threshold. This is the intensity or severity of catastrophic health spending estimated as:

$$O = \frac{1}{N}\sum_{i=1}^{N} O_i \text{ with } O_i = E_i\left(\left(\frac{T_i}{y_i}\right) - z\right).$$

Then, the Mean Positive Overshoot (MPO) which measures the mean overshoot indicates how much the share of direct payments in total expenditure exceeds the selected threshold. The MPO is equal to:

$$MPO = \frac{O}{H} = \frac{\sum_{i=1}^{N} O_i}{\sum_{i=1}^{N} E_i}.$$

Headcount and overshoot do not differentiate between poor and rich households.[6,7] To take into account the differences in the distribution of catastrophic payments between rich and poor households, we use the concentration indices. The concentration index is directly related to the concentration curve and quantifies the degree of socio-economic-related inequality in a health variable.[29] It is defined as twice the area between the concentration curve and the line of equality (the 45° line).[6,7,29] Then, the concentration index is computed as:

$$C = 1 - 2\int_0^1 L_h(p)\,dp, \text{ where } L_h(p) \text{ is the concentration function.}$$

Let C_E and C_O the concentration indices for E_i and O_i respectively (resp.). These indices range from -1 to $+1$, a positive value (resp. negative) of C_E indicates that the richer households (resp. poor) are more likely to exceed the threshold and thus incur catastrophic health expenditures. Likewise, a positive value (resp. negative) of C_O indicates that the overshoot tends to be greater among the better-off (resp. worse-off). The distribution of the headcount and overshoot can be adjusted for socio-economic differences by calculating the weighted indices, which is to multiply each index by the complement of the respective concentration index. The weighted headcount $\left(H^W\right)$ and overshoot $\left(O^W\right)$ measures are computed as:

$$H^W = H.\left(1 - C_E\right) \text{and}$$

$$O^W = O.\left(1 - C_o\right)$$

The two weighted indices indicate that the lowest income household receives a weight of two and the richest income household receives a weight of zero, and the weight declines linearly with rank in the income distributions.[6] If those who exceed the catastrophic payments threshold tend to be poorer, the concentration index C_E will be negative, and this will make $\left(H^W\right)$ greater than $\left(H\right)$.

The indicators from the second approach are computed by replacing the household's ability to pay with total expenditures. The results are presented using both approaches.

Estimation of the effects of catastrophic health spending on household impoverishment

Catastrophic health spending can lead to household impoverishment.[6] The effects of catastrophic health spending on poverty are estimated by determining poverty levels using consumption expenditure before and after making payments for healthcare. To adjust measures of poverty to take into account spending on healthcare, we use the methods which involve the measurement of poverty based on household expenditure net of OOP spending on healthcare.[6] Three measures are usually used: Poverty headcount (H^{gross}), which gives the percentage of households living below the poverty line before health payments, Poverty gap $\left(G^{gross}\right)$, referring to the gross of health payments individual-level poverty gap, and Normalized poverty gap $\left(NG^{gross}\right)$, which is obtained by dividing the poverty gap by the poverty line. The poverty headcount is estimated as:

$$H^{gross} = \frac{\sum_{i=1}^{N} s_i p_i^{gross}}{\sum_{i=1}^{N} s_i}$$

with s_i the household size, N the number of households in the sample and p_i^{gross} equal to 1 if the per capita total expenditure of household i $\left(w_i\right)$ is less than the poverty line (PL) and otherwise 0, this is $p_i^{gross} = 1$ if $w_i < PL$ and 0 otherwise.

The poverty line is defined as the minimum amount of income or expenditure required for an individual to meet their basic needs and avoid extreme poverty. Poverty lines are either absolute or relative.[30] An absolute poverty line defines poverty in relation to an absolute amount of household expenditure per capita while a relative poverty line is defined as some fraction of mean or median household expenditure.[6] In this paper, to operationalize the poverty line we used the national absolute poverty line estimated in the CWIQ database and which is equal to US$1.50 per day per person. So, anyone who spends less than US$1.50 per day is considered living below the poverty line. Therefore, to measure poverty, data on individuals' daily income or expenditure are compared to the US$1.50 threshold. The difference between the US$1.50-a-day poverty line measures before and after paying for healthcare is the poverty impact of OOP payments for healthcare.

Table 1. Proportion of households experiencing catastrophic health expenditure.

Threshold budget share, z	5%	10%	15%	20%	25%	30%	35%	40%
Approach 1	Out-of-pocket health spending as a share of total monthly household expenditures							
Headcount (H)	0.51 (0.007)	0.33 (0.007)	0.21 (0.006)	0.16 (0.005)	0.13 (0.005)	0.09 (0.004)	0.08 (0.004)	0.06 (0.003)
Overshoot (O)	0.07 (0.002)	0.05 (0.002)	0.04 (0.002)	0.03 (0.001)	0.02 (0.001)	0.02 (0.001)	0.01 (0.001)	0.01 (0.001)
Mean positive overshoot (MPO)	0.14 (0.015)	0.15 (0.019)	0.19 (0.022)	0.19 (0.025)	0.15 (0.027)	0.15 (0.029)	0.12 (0.026)	0.17 (0.026)
Approach 2	Out-of-pocket health spending as a share of non-food monthly household expenditures							
Headcount (H)	0.57 (0.007)	0.37 (0.007)	0.28 (0.006)	0.20 (0.006)	0.16 (0.005)	0.13 (0.005)	0.09 (0.004)	0.07 (0.004)
Overshoot (O)	0.09 (0.002)	0.07 (0.002)	0.05 (0.002)	0.04 (0.002)	0.03 (0.001)	0.03 (0.001)	0.02 (0.001)	0.02 (0.001)
Mean positive overshoot (MPO)	0.16 (0.014)	0.19 (0.019)	0.19 (0.02)	0.19 (0.024)	0.19 (0.027)	0.20 (0.027)	0.22 (0.028)	0.24 (0.024)

Source: Authors based on CWIQ 2015 dataset.
Standard deviations in brackets.

The poverty gap before healthcare payments is given by:

$$G^{gross} = \frac{\sum_{i=1}^{N} s_i g_i^{gross}}{\sum_{i=1}^{N} s_i} \text{ where } g_i^{gross} = p_i^{gross}\left(PL - w_i\right).$$

The net of healthcare payments poverty gap is given by replacing p_i^{gross} and g_i^{gross} by p_i^{net} and g_i^{net} with $p_i^{net} = 1$ if $\left(w_i - T_i\right) < PL$ and 0 otherwise, T_i the total health expenditure of household i; $g_i^{net} = p_i^{net}\left(PL - \left(w_i - T_i\right)\right)$.

The proportion of individuals that are not counted as poor despite their household resources net of spending on healthcare lying below the poverty line is given by $H^{net} - H^{gross}$ and $G^{net} - G^{gross}$ measured the fraction of individuals that are pushed into poverty by out-of-pocket payments.

The normalized poverty gap which allows comparisons across countries with different poverty lines and currency units, is estimated by $NG^{gross} = G^{gross}/PL$.

Results

Incidence and intensity of catastrophic health spending

Table 1 presents the incidence and the intensity of catastrophic payments for healthcare in Togo using eight various thresholds ranging from 5% to 40%. Catastrophic payments are defined for health payments with respect to total household expenditures (approach 1) and non-food household expenditures (approach 2).

The results indicate that, regardless of the approach used, there is an inverse relationship between the headcount and overshoot of catastrophic health expenditures and the thresholds used. Indeed, as the threshold is raised from 5% to 40% of total monthly household expenditure, the incidence of catastrophic health expenditure (H) falls from 51% to 6%, and the overshoot drops from 7% of total household expenditure to 1%. At the threshold of 5% of total monthly household expenditures, 51% of Togolese households incur catastrophic health expenditures due to out-of-pocket payments, while the Togolese households incurring catastrophic health expenditures at 40% represent 6% of the sample. For a given threshold, both the headcount and the overshoot are higher, as they must be when catastrophic payments are defined with respect to health payments relative to non-food expenditures. In this case, at the threshold of 5% (resp. 40%) of non-food expenditure, 57% (resp. 7%) of households face catastrophic health expenditure. The overshoot (O) decreased from 9% to 2% as the threshold increased from 5% to 40% of non-food monthly household expenditure. At the threshold of 5% of non-food monthly household expenditure, 9% of the Togolese households spend in excess of 5% of their non-food monthly expenditure on healthcare.

In contrast to intensity (overshoot) and incidence (headcount), the Mean Positive Overshoot (MPO) increases as the threshold increases. This MPO shows that at the 20% threshold, households facing catastrophic health expenditures, spend on average 39% (20% + 19%) of their total monthly expenditures on healthcare. For households incurring catastrophic health expenditures at the 40% threshold, healthcare cost represents 57% (40% + 17%) of their total monthly expenditures. Using non-food monthly expenditure, we found a similar trend as observed in approach 1 but with bigger magnitudes. Thus, considering the threshold as a share of non-food monthly expenditures, households in the sample facing catastrophic health expenditures allocate 64% (40% + 24%) of their non-food expenditures to healthcare payments at the 40% threshold.

Distribution-sensitive measures of catastrophic payments

The concentration indices and the rank-weighted headcount and overshoot measures of catastrophic spending are

Table 2. Distribution-sensitive catastrophic payments measures.

Threshold budget share, z	5%	10%	15%	20%	25%	30%	35%	40%
Approach 1	Out-of-pocket health spending as a share of total monthly household expenditures							
Concentration index, $\mathbf{C_E}$	−0.043	−0.089	−0.056	−0.035	0.042	0.082	0.133	0.167
Rank-weighted head count, $\mathbf{H^W}$	52.26%	35.44%	23.26%	18.33%	12.30%	7.73%	6.04%	4.70%
Concentration index, $\mathbf{C_O}$	0.020	0.055	0.103	0.150	0.205	0.261	0.296	0.345
Rank-weighted overshoot, $\mathbf{O^W}$	7.17%	5.07%	3.61%	2.60%	1.83%	1.30%	1.00%	0.71%
Approach 2	Out–of–pocket health spending as a share of non–food monthly household expenditures							
Concentration index, $\mathbf{C_E}$	−0.052	−0.045	−0.081	−0.106	−0.013	−0.020	−0.023	0.161
Rank-weighted headcount, $\mathbf{H^W}$	60.25%	37.59%	30.25%	24.14%	16.61%	12.91%	9.50%	5.63%
Concentration index, $\mathbf{C_O}$	−0.003	0.016	0.045	0.084	0.127	0.164	0.217	0.261
Rank-weighted overshoot, $\mathbf{O^W}$	9.25%	6.87%	5.16%	3.81%	2.81%	2.11%	1.55%	1.17%

Source: Authors based on CWIQ 2015 dataset.
Standard deviations in brackets.

Table 3. Measures of poverty based on expenditure gross and net of spending on healthcare.

	Gross of health payments (a)	Net of health payments (b)	Difference	
			Absolute (c) = (b)−(a)	Relative [(c)/(a)] × 100
$1.90 Per day World Bank poverty line				
Poverty head count	55.11%	59.63%	4.52%	8.2%
Poverty gap (F CFA)	87,690	100,499	12,809	14.61%
Normalized poverty gap	27.12%	31.08%	3.96%	14.60%
Normalized positive mean gap	49.20%	52.11%	2.91%	5.91%

Source: Authors based on CWIQ 2015 dataset.

presented in Table 2. Results show that whether healthcare payments are expressed as a share of total expenditure or of non-food expenditure, the distribution of catastrophic payments varies. In the former case, the concentration indices of headcount are negative up to the 20% threshold, above which they become positive. Thus, below the 20% threshold, poor households are likely to spend more than 20% of their total expenditure on healthcare, while above 20%, rich households tend to exceed this threshold. But results from using OOP health spending as a share of non-food monthly household expenditures show that the concentration indices of the headcount are negative, with one exception (40%), indicating that the poor households are more likely to incur catastrophic payments defined in this way. Furthermore, it can be observed that the concentration indices of overshoot are positive for all various thresholds and for the two approaches with one exception (threshold of 5%) in approach 2. This indicates that the overshoot tends to be greater among the better-off of Togolese households.

Effects of catastrophic health spending on household impoverishment

The poverty due to healthcare payments corresponds to the difference between poverty estimates derived from household expenditures before and after health payments. To determine the percentage of the Togolese households impoverished by health spending, we present the poverty headcount, poverty gap, and normalized poverty gap before and after accounting for OOP payments in Table 3. The World Bank poverty line, $1.90 per day in 2011 purchasing power parity exchange rate is used in this study. Table 3 shows that, at the World Bank poverty line, 55.11% of the Togolese population is estimated to be in poverty using total household expenditures as a living standard indicator. This percentage rises to 59.63% after accounting for OOP healthcare payments. So about 5% of the Togolese population is forced into poverty due to OOP healthcare payments. The poverty gap, the average deficit to reach the poverty line in the population, also rises from 87,690 to 100,499 F CFA, that is, an increase of 14.61%.

The normalized poverty gap expressed as a percentage of the poverty line and the normalized positive mean gap are increased by 14.60% and 5.91% respectively after taking into account health expenditure payments. This suggests that the poor fall into extreme poverty after health expenditure payments.

The differential effects of catastrophic health payments on household impoverishment are estimated according to the gender of the household head. Thus, a decomposition of the previous results according to the gender of the

Table 4. Measures of poverty based on expenditure gross and net of spending on healthcare according to the gender.

	Gross of health payments (a)		Net of health payments (b)		Difference			
					Absolute (c) = (b)−(a)		Relative [(c)/(a)] × 100	
	Male	Female	Male	Female	Male	Female	Male	Female
$1.90 Per day World Bank poverty line								
Poverty headcount	52.70%	64.39%	57.65%	67.29%	4.95%	2.90%	9.39%	4.50%
Poverty gap (F CFA)	79,461	119,368	92,651	130,711	13,190	11,343	16,600	9500
Normalized poverty gap	24.57%	36.91%	28.65%	40.42%	4.08%	3.51%	16.61%	9.51%
Normalized positive mean gap	46.62%	57.32%	49.70%	60.07%	3.08%	2.75%	6.61%	4.80%

Source: Authors based on CWIQ 2015 dataset.

household head was made and presented in Table 4. Table 4 shows that the poverty headcount, the poverty gap, and the normalized positive mean gap after accounting for the payment of healthcare spending are greater for households headed by women. However, the impoverishment of households induced by health expenditures is greater in male-headed households. The poverty headcount increased by 9.39% for male-headed households after payment of health expenses while it raised by 4.50% for female-headed households. The poverty gap and the normalized positive mean gap increased by 16.60% and 6.61% for male-headed households, compared to 9.50% and 4.80% for female-headed households. Thus, about 5% of male-headed households are impoverished by catastrophic health expenditures compared to 2.9% for female-headed households. Consequently, catastrophic health expenditures affect male-headed households more than female-headed households.

Discussion

The analysis of data collected from Togolese households 4 years after introducing of compulsory health insurance scheme in 2011 shows that many households still spend a significant proportion of their financial resources on out-of-pocket healthcare payments. The results show that the incidence and intensity of catastrophic health spending depend on whether the thresholds are expressed into total monthly household expenditure or non-food monthly expenditure. If the thresholds are defined in terms of non-food expenditure (approach 2), the incidence and intensity of catastrophic health expenditures are higher. This result is consistent with those obtained in some studies in Vietnam,[7] in Kenya,[15] in Mongolia,[13] and in Nigeria.[11] At the threshold of 40% of non-food monthly expenditure, 7% of Togolese households incur catastrophic health spending. This result is similar to those found in other African countries, Kenya (9.8%),[31] Burkina Faso (10.8%),[32] and Nigeria (13.7%),[11] and shows that households in developing countries continue to allocate a substantial portion of their financial resources to healthcare. Compared to other study,[33] our result is slightly different. Indeed, it was found that the incidence of catastrophic health expenditure is 9.71% among insured households while our results show 7% in all the Togolese population.[33] This indicates that the easing of the budget constraint due to the possession of health insurance allows Togolese households to use more health services. Thus, when households become wealthy, they devote a significant share of their resources to financing healthcare. In this case, our result on distribution-sensitive corroborates the distribution theory which implies that the rich spend more than the poor and therefore incurred the risk of suffering catastrophic health expenditures. Indeed, our results indicate that beyond the threshold of 20% of total monthly expenditures, wealthy households are more likely to incur the risks of catastrophic health expenditures. This can be explained by the fact that poor households, because of incapacity to pay, may seek low-quality health services, avoid healthcare at all or engage in self-medication.[34] Moreover, better-off households, in search of a guarantee of quality services, are more willing to use health services from private facilities where healthcare is expensive. However, when thresholds are expressed in terms of non-food expenditures, the poor are more likely to incur catastrophic health expenditures.

The results also show that at the threshold of 40% of capacity to pay, households likely to incur catastrophic healthcare expenses allocate 64% (40% + 24%) of their total non-food expenditures to healthcare. Thus, Togolese households still face a heavy burden of out-of-pocket payments for healthcare. These findings in Togo reflected the weak implementation of the poverty reduction strategies and the healthcare system is still facing a considerable challenge of the predominance of fee-for-service. In such a system, to cope with a single episode of illness, households are forced to reduce their savings, go into debt or sell off their assets.[35,36] As a result, this system impoverishes the poor and moves Togo away from the UHC, which is considered one of the fundamental drivers of sustainable and inclusive economic growth and development.[1]

From the results of impoverishment, at a threshold of $1.90 per day in 2011 purchasing power parity, it can be observed that 4.52% of Togolese households have been pushed into poverty by catastrophic health expenditures and the incidence varies by gender of the household head. Catastrophic health expenditures impoverish male-headed households more than female-headed households in Togo. The impoverishment effect is estimated at about 5% for male-headed households versus 2.9% for female-headed households. Thus, in the Togo context, the risk of incurring catastrophic health expenditures is gender sensitive and the male head of household is identified as a risk factor. This result is different from those found through 11 studies in the systematic review which showed that a female-headed household is a risk factor.[25] However, our result collaborates with the fact that richer households are more likely to incur catastrophic health expenditures. Considering that women lag behind in access to resources and employment opportunities in Togo and knowing the impact of this situation on income generation, it is understandable that female-headed households are poorer than male-headed households. In 2019, females are more vulnerable to employment than males (87.5%vs 62.1%) in Togo.[37] This situation prevents female-headed households from using appropriate healthcare.

Globally, using the relative poverty ratio, the percentage of Togolese households that are impoverished due to OOP healthcare payments is lower compared to Kenya (5%),[15] Uganda (18,1%),[38] Mongolia (12%)[13] but higher than that obtained in Nigeria (0,8%).[11]

Our results show that the health system reforms undertaken by the Togolese government to allow all Togolese to have universal access to quality care are struggling to achieve their objectives. They also show that prepayment and risk-sharing mechanisms are almost non-existent and compulsory health insurance is not achieving its aim of reducing the financial burden of OOP healthcare payment among Togolese households. More than 10 years after the implementation, the coverage rate of compulsory health insurance remains low and stood at 4.7% of the Togolese population[21] and its contribution to health expenditure is only 5% in 2020.[22] As a result, Togo must continue health policy reforms aimed at reducing out-of-pocket barriers to accessing health services.

Strengths and limitations

This paper has investigated the impoverishment effect of OOP payments between female and male-headed households and contributed to the literature in several other ways. Firstly, this paper adds new evidence to the scant literature on risk factors for catastrophic health expenditures associated with headed households' gender in developing countries, particularly in sub-Saharan Africa. Secondly, it contributes to a better understanding of the effects of OOP payments on catastrophic expenditures and impoverishment in West Africa. However, we should note some limitations of this study. On one hand, the data used to measure the various indicators cannot be verified using other administrative sources because it was declared by the respondents themselves. Furthermore, the data did not allow the analysis of the structure of catastrophic health expenditures in terms of inpatient and outpatient costs and their poverty effect. That information would help to show which payment category contributed most to catastrophic expenditures and impoverishment. On the other hand, the study does not consider all potentially catastrophic effects of illness, such as lost earnings, and fails to capture all households that postpone seeking healthcare because they lack financial resources.

Conclusion

The virtual absence of pre-payment mechanisms in Togo leads Togolese households to allocate a significant proportion of their financial resources to healthcare financing. This paper was interested in the consequences of such a health system by analyzing the effects of catastrophic health expenditures on the impoverishment of Togolese households.

Overall, we observe that the incidence of catastrophic expenditure varies between 6% and 57% depending on the thresholds used when these are expressed as a share of total expenditure, and households at risk of catastrophic expenditure spend between 19% and 64% of their total expenditures on healthcare. These proportions are higher when thresholds are defined in terms of non-food expenditures. There is a sensitivity in the distribution of catastrophic health expenditures. Below 20% of total expenditures, the poor are more likely to incur catastrophic expenditure, while above 20%, the better-off households tend to exceed this threshold. However, when thresholds are expressed in terms of non-food expenditures, the poor are more likely to experience catastrophic expenditures. Likewise, our results show that 4.52% of Togolese households are impoverished due to direct healthcare payments at the threshold of $1.90 per day in 2011 purchasing power parity. The normalized positive mean gap indicates that the poor become poorer after healthcare payments and this impoverishment effect is more pronounced in male-headed households.

Three policy implications emerge from our results. Firstly, the Togolese government has to increase public health spending to reach at least 15% of its annual budget per the Abuja declaration of 2001. The efficiency in health spending would allow this objective to be achieved. Secondly, health system reforms aiming at accessibility to quality care, essential drugs, and, above all, the development of pre-payment mechanisms will promote the earlier use of healthcare services and thus reduce the higher

healthcare costs generated by the later attendance to them. Thirdly, it is important to take gender into account in health system reforms in Togo, in order to ensure that women's lack of access to resources and inequitable decision-making power do not hinder their participation in Universal Health Coverage.

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