

# Redistributive Effects of Health Care Out-of-Pocket Payments in Cameroon

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## Research Article

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# **Redistributive Effects of Health Care Out-of-Pocket Payments in Cameroon**

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## **Abstract**

**Background:** The bulk of health care financing in Cameroon is derived from out-of-pocket payments. Given that poverty is pervasive with a third of the population living below the poverty line, health care financing from out-of-pocket payments is likely to have redistributive and equity effects. Out-of-pocket payments on health care limit the ability of households to afford non-healthcare goods and services.

**Method:** The study uses data from the 2014 Cameroon Household Survey to estimate the Kwakwani index for analyzing tax progressivity and the model developed by Aronson, Johnson, and Lambert (1994) to measure the redistributive effect of out-of-pocket payments for health care. The estimated indexes measure the extent of the progressivity of health care payments and the reranking that results from the payments.

**Results:** The results indicate that out-of-pocket payments for health care in Cameroon in 2014 represented a significant share of household prepayment income. The estimates also show that the redistributive effect is positive implying that health care payments are weakly progressive and will weakly enhance equity and post-payment reranking is low.

**Conclusion:** The study concludes that out-of-pocket payments on health care in Cameroon are progressive (income redistributive effect = 0.00144). A positive redistributive effect suggests that out-of-pocket payments on health care exert an equalizing effect on the distribution of post-payment incomes. However, the existence of some horizontal inequity and re-ranking implying that people in the same income band are treated unequally depending on the burden of ill-health.

**Keywords:** Equity, health care financing, out-of-pocket payments, redistributive effects, income inequality

## **Introduction**

Although the public sector is the most important provider of health services in Cameroon, an estimated 69.63% percent of the funding for the health sector was generated from out-of-pocket payments in 2018. The problem of poverty is pervasive and about 37.5 percent of the population live below the poverty line according to the Cameroon Household Survey conducted in 2014. Health care financing with the participation of the population

is likely to have redistributive effects and equity consequences. Out-of-pocket payments on health care reduce the amount of disposable income available to households or individuals after health care payments thus limiting the use of health care services and widening the gap between the poor and the rich. Analogous to taxes, out-of-pocket expenses on health care affect the household proportionately, progressively, or regressively depending on the structure of the health payment system.

The study unlike others examines the extent of inequality in the distribution of incomes arising from the prevailing health care financing arrangements in Cameroon. In particular, the study investigates whether or not health care financing in the country through household out-of-pocket payments bridge or widen the gap between poor and rich households. A common way to achieve this objective is to compare the post-payment income distribution with prepayment distribution to gauge the extent of inequity created by out-of-pocket payments. Furthermore, the study determines the extent of horizontal inequity or inequity within bands of equal incomes and the re-ranking of individuals according to post-payment incomes.

Based on data drawn from the 2014 Cameroon Household Survey, the study uses an index developed by Kakwani (1977) for analyzing tax progressivity and the model developed by Aronson, Johnson, and Lambert (1994) to measure the redistributive effect of out-of-pocket payments for health care. By investigating whether or not health care out-of-pocket payments bridge or widen the gap between poor and affluent households,

the study attempts to fill the knowledge gap in the equity effects of health care out-of-pocket payments in Cameroon.

The rest of the paper is organized as follows. Section 2 presents a short description of the health care system in Cameroon. Section 3 presents the theoretical and empirical literature on equity in health care financing. Section 4 describes the methodology outlining the approaches that are used in measuring the progressivity of health care payments and the redistributive effects of such payments. Section 5 provides the empirical results and a discussion of results follows in section five. The paper ends with a conclusion in section 7.

### **Cameroon Health Care System**

The Cameroon health care system is structured into the central level, the intermediate level, and the peripheral level. The system is further subdivided into a public sub-sector, a private sub-sector, and a traditional sub-sector under the tutelage of the Ministry of Public Health (MOH, 2016). Each of the three levels of the Cameroon health care system has administrative, health, and dialogue structures.

Table 1: Organization of the Cameroon Health System

	Structures		Sub-sectors	Functions
Level	Administrative	Health Care		
Central	Minister's Office, Secretariat	General hospitals; Central hospitals and other structures ranked as such for example	Public, private, Traditional	Development of concept, policies and

	General, Department, and Similar Structures	National Essential Drug Procurement Centre		strategies, coordination, Regulation
Intermediate	10 Regional Delegations	Regional hospitals and others ranking as such for example Regional Drugs Supply Centers	Public, Private, Traditional	Technical support to health districts
Peripheral	189 Health Districts	District hospitals, sub-divisional medical centers, integrated health centers,	Public, private, Traditional	Implementation of programs

Source: Ministry of Public Health, HSS 2016-2027.

The central level is at the top of the Cameroon health system and includes the central services of the Ministry of Public Health. The central level coordinates regulate and develop the country's health sector strategies and policies. Some of the key structures that provide care at the central level include the General Reference Hospitals, the University Hospital, the Central Hospital, and agencies under the purview of the Ministry of Public Health such as the Essential Drugs Procurement Center, Centre Pasteur du Cameroun, the Gynecological Endoscopic Surgery and Human Reproductive Teaching Hospital among others. The dialogue structures consist of the National Council of Health Hygiene and Social Affairs.

The administrative structures at the intermediate level consist of the ten regional delegations of public health. The regional delegations provide technical support to health districts. Health care is provided at this level by regional hospitals and assimilated

structures. The Regional Fund for health promotion is an important health and dialogue structure.

The district level is represented by the health district services and their role is to provide health care, coordinate and implement national health programs. Health services are provided at this level by district hospitals, medical centers, and district health centers. In 2016, there were a total of 189 health districts in Cameroon. Dialogue structures at the peripheral level of health include district health committees, district management committees, local health area committees, and district hospital management boards.

### **Health care financing from out-of-pocket payments**

Out-of-pocket payments also include direct payments to not-for-profit providers such as mission facilities and other for-profit health care providers ranging from services provided in public facilities, doctors working in private practice to informal drug vendors and traditional healers. These payments are made at the points of service and the amount paid for medical care depends on the severity of illness, the point of service, and the patient's ability and willingness to pay. The ability to pay for health services depends on income. Table 1 shows that households are by far the most important source of health care expenditure in Cameroon. The level of household expenditures is reflected in the value of private expenditure as a percentage of total health care expenditure. The total household expenditures were estimated at 70.2% of the total expenditures on health care in 2010 and 69.6% in 2018. (Figure 1). The increase in health care cost finance from out-

of-pocket payments and the growing cost of health services in Cameroon are likely to affect households especially those living below the poverty threshold adversely.

Table 2. Health Care Financing Sources (in millions of constant 2018 US\$).

Year	Health				Out-of-pocket			Total
	External	Government	insurance	NGOs	Companies	pocket		
2010	82.96	172.19	10.89	30.85	26.62	763.82		1087.35
2011	135.88	190.76	9.01	111.58	27.72	778.53		1253.47
2012	93.11	192.91	74.84	96.07	28.98	791.95		1277.86
2013	84.84	201.17	79.27	40.20	30.70	809.10		1245.28
2014	135.78	271.30	87.13	66.67	32.50	824.81		1418.19
2015	127.32	200.13	92.57	60.59	34.34	898.14		1413.08
2016	131.39	209.51	96.91	61.51	35.94	934.76		1470.01
2017	123.67	126.24	95.16	55.31	37.21	984.09		1421.68
2018	116.69	151.60	92.63	50.44	38.72	1031.80		1481.88

World Bank Atlas Sources – Knoema, 2021

Despite the rising burden of out-of-pocket payments, household participation in the financing of the health care system can generate additional resources for the public health sector and could potentially increase the utilization and the quality of health services (Litvack and Bordart, 1993; Ntembe, 2009). However, low-income households disproportionately face the brunt of the rising cost of health care through out-of-pocket payments.

## **Review of Previous Literature**

The literature on equity in health care financing is quite recent. Developed from public finance literature, it analyses the extent to which the tax system redistributes income and wealth (Kakwani 1977; Wagstaff 1998; Aronson et al. 1994; Wagstaff and Doorslaer 1999). Studies on the progressivity of the tax system have been extensive in developed countries and have relied on the mathematical model developed by Kakwani (1977) for analyzing tax progressivity. Aronson et al. (1994) have also developed a model to decompose the redistributive effects of taxation.

The models developed by Kakwani and by Aronson and others have been extended to the field of health care financing (Wagstaff et al. 1989; Wagstaff and Van Doorslaer 1993; Wagstaff and Van Doorslaer 1999). The distribution of health care payments among households determines the extent to which their overall welfare is affected when they pay for health care. Equity concerns with regards to the burden of health care payments are critical when deciding on health care financing options. Equity in health care finance is the extent to which the various health care payment options contribute to the redistribution of income (Deaton and Muellbauer 1980).

Health care payments can be progressive or regressive depending on whether the burden falls on richer or on low-income individuals. While progressive and regressive payments have opposite effects on the distribution of incomes, progressive payments reduce post-payment income inequality whereas regressive payments increase post-payment inequality (Aronson et al. 1994; Wagstaff and Doorslaer 1997). Wagstaff et al (1989)

used the Kakwani index of progressivity to find that total contribution to health care financing in the United States of America and the Netherlands were regressive and the regressivity was more severe in the United States (-0.15) than in the Netherlands (-0.06). However, health care payments were found to be progressive in the United Kingdom (0.03).

In a study of the progressivity of health care financing mechanism, catastrophic spending on health, and the distribution of healthcare benefits in Ghana, South Africa, and Tanzania, Mills et al., (2012) found that the overall healthcare financing was progressive in all three countries. Out-of-pocket payments in particular were regressive in all three countries. The overall distribution of health service benefits in all three countries favored richer people, although the burden of illness was greater for lower-income groups.

Earlier studies found that out-of-pocket payments were progressive in Sierra Leone (Fabricant et al. 1999) and Burkina Faso (Makinen et al. 2000). In Mexico and Thailand, the poor were also found to be spending a higher proportion of their income on out-of-pocket payments than the rich (Gonzalez and Parker 1999; Pannarunothai and Mills 1997). Further evidence from a World Bank study of the redistributive effects of health care payments in Vietnam using the Aronson decomposition revealed that health care payments adversely affected income distribution (Wagstaff and Doorslaer 2001; Wagstaff 2000).

McIntyre et al., (2005) have reported that out-of-pocket payments are the single largest source of health care financing in many African countries and impose a very heavy burden on households, particularly the poorest. Data from the Cameroon National Health accounts as well as from the Cameroon Household and Consumption survey published in 2014 suggest that over 70 percent of health care expenditure in Cameroon is financed from household out-of-pocket payments. Out-of-pocket payments are expected to be regressive especially if the lowest income groups are paying a large share of their incomes for health care.

Antigua and McIntyre, (2012) use nationally representative datasets and standard methodology to examine for both the public and the private sector's equity in the delivery and financing of health care in South Africa. The study suggests an overall progressive financing system but a pro-rich distribution of health care benefits. The study further suggests that the distribution of health care benefits is pro-rich but not in need. Richer groups receive a far greater share of service benefits within the public and private sectors although with a relatively low burden of ill-health.

In most developing countries and especially in Africa where prepaid financing of health care is limited, low-income households are likely to be disproportionately hurt by reforms that implement user charges for health services. Data from the Cameroon National Health accounts as well as from the Cameroon Household and Consumption survey published in 2014 suggest that over 70 percent of health care expenditure in Cameroon is financed from household out-of-pocket payments. Out-of-pocket payments are expected to be

regressive especially if lower-income groups are paying a large share of their incomes for health care.

## **Methodology**

To investigate the impact of household out-of-pocket payments on equity in Cameroon, the study uses the Aronson decomposition to measure the redistributive effects of health care payments and the effects of payments on the distribution of income. Thus, the study shows the redistributive effect of the average proportions of incomes spent on health care, the progressivity or regressivity of the payment structure, the horizontal inequities in the financing system, and the extent of re-ranking generated from the payments.

The health care payment system is progressive if health care payments rise by a higher proportion as income increases and regressive if the proportion of health care payment increases as income decreases. Health care payments can lead to a redistributive effect (*RE*). The *RE* of health care payments is simply the change in income inequality resulting from payments. The *RE* effect will be measured using the Lorenz and Gini coefficients by subtracting the post-payment Gini from the prepayment Gini coefficient.

## **Kakwani Progressivity Index**

Progressivity is often measured using an index proposed by Kakwani (1977). The Kakwani index measures the departure from proportionality as the difference between the

concentration coefficients of payments and the Gini of pre-payment income. It is calculated as,

$$\pi_K = C_T - G_X \quad (1)$$

where  $C_T$  is the health care payment concentration index and  $G_X$  is the Gini of pre-payment income. The value of  $\pi_K$  ranges from -2 to 1 so that a negative number indicates that the payment is regressive, zero if proportional, and positive if progressive. The Kakwani index is derived from the principle of the Lorenz curve such that

$$\pi_K = Lc(p) - Lx(p) \quad (2)$$

where  $Lx(p)$  is the Lorenz for pre-payment income, and  $Lc(p)$  is the concentration curve for health care payments. The health care system is proportional when  $Lx(p)$  and  $Lc(p)$  are equal and the index is zero. A departure of  $Lc(p)$  from  $Lx(p)$  is a measure of progressivity.

### **Decomposing the Redistributive Effect of Health care Payments**

Households' payments for health care does not only secure access to health services but may also redistribute incomes. The extent to which redistribution of income occurs has important implications for the distribution of goods and services other than health care (Wagstaff 2002; Wagstaff and Doorslaer 2003).

## The Aronson-Johnson-Lambert Decomposition

The redistributive effect ( $RE$ ) of health care payments can be measured by comparing the Gini coefficient of pre-payment incomes with that from post-payment incomes as follows:

$$RE = G^x - G^{x-p} \quad (3)$$

where  $G^x$  and  $G^{x-p}$  are respectively the pre-payment and post-payment Gini coefficients,  $x$  stands for pre-payment income and  $p$  denotes the payment. Following Aronson et al. (1994),  $RE$  is simply the difference between the Gini coefficient for pre-payment income and the Gini coefficient for post-payment income equal to the following:

$$RE = V - H - R \quad (4)$$

where, the vertical income redistribution  $V = \left( \frac{g}{1-g} \right) \pi_K$ , represents the change in income inequality that results from health care payments if everyone at each pre-payment income level had paid the same amount towards health care,  $g$  is the average share of prepayment income absorbed by health care payments.  $H$  is the effect of horizontal inequity and  $R$  is the degree of reranking of households compared to the distribution before paying for health care.  $R$  will be zero if no such reranking occurs. Aronson et al. (1994) express the  $RE$  in full as follows:

$$RE = \left( \frac{g}{1-g} \right) \pi_t^k - \sum \alpha_x G_{F(x)} - G_{x-T} - C_{x-T} \quad (5)$$

The first term on the right of equation (4) estimates the level of inequality that would result if everyone in each income band makes equal payments to the health care financing system. The term  $G_{F(x)}$  is the Gini coefficient that measures inequality in the post-payment period that arises when individuals having the same pre-payment income level are now less equal in the post-payment because individuals at the same pre-payment income level are contributing unequally to finance the health care system. The horizontal inequity ( $H$ ) in each income band is measured by the weighted sum of the groups (j) specific post-payment Gini coefficients,  $G_j^{x-p}$  where weights are given by the product of the group's population share and its post-payment income share,  $\alpha_j$ .

$$H = \sum_j \alpha_j G_j^{x-p} \quad (6)$$

$H$  is non-negative since the Gini coefficient for each group of pre-payment is non-negative. Thus, horizontal inequity will always make a post-payment distribution of income more unequal than it would have been in its absence. The reranking of household which occurs in the move from pre-payment to post-payment income distributions is captured with  $R$ . The latter is measured as the difference between the Gini index for post-payment income  $G^{x-p}$  and the concentration index for post-payment income  $C^{x-p}$ .

$$R = G^{x-p} - C^{x-p} \quad (7)$$

When  $R$  is zero, there is no reranking in the transition from pre-payment to post-payment periods causing the two curves to coincide.  $R$  cannot be negative because the concentration curve of post-payment income cannot lie below the Lorenz curve of post-payment income.

Aronson et al., (1994) decomposition shows that the total contribution of the health care payment system to income inequality can be decomposed into the vertical equity, which represents the degree of progressivity of the health care financing system. A progressive health care financing system exerts an equalizing effect on post-payment income distribution. Horizontal inequity resulting from the health care financing system is estimated as the level of inequality in the post-payment income. The weighted sum of the within-group Gini coefficient gives the level of horizontal inequality  $H$  in the post-payment distribution. The last component is re-ranking among households as they move from the pre-payment income distribution to post-payment income distribution.

### **Data sources and variable definition**

The data used for this study is drawn from the Second Cameroon Household Survey (ECAM IV) conducted in 2014 by the National Institute of Statistics. ECAM IV is a multipurpose household survey covering all 10 regions of Cameroon as well as urban and rural areas using a sample of 12,847 households distributed in 1024 clusters or survey areas in 12 regions covering the national territory. The survey was designed to measure socio-economic factors relevant to the standards of living. The survey includes

information on household characteristics, various sources of income, household expenditures on goods and services including health and education. Detailed information was collected on expenses on health care expenses.

Household pre-payment income is measured by total household consumption, gross of out-of-pocket payment for health services. Household post-payment income so defined net of out-of-pocket payments. Pre-payment and post-payment incomes are both defined to be gross food consumption on a per capita basis. The decomposition analysis was done at the level of the household. To gain a better insight into the impact of health care payments on the income distribution of households in Cameroon, the distribution of income before and after payments is calculated. In the calculations, households were divided into bands of pre-payment income in which they were considered as equals. Altogether a total of sixteen bands were generated using multiples of the poverty line established in 2014.

## **Results**

Out-of-pocket payments for health services and the extent to which such payments affect the distribution of post-payment income determine the fairness of the health care system. Although the treatment of an illness episode can help to restore an individual's previous health status, if the payments compromise the household's ability to afford other services especially food, the situation becomes one of great concern.

According to estimates from the Cameroon National Institute of Statistics, each Cameroonian household spent an annual average of 59,163 FCFA on health care and that was about 9,860 CFA francs per person in a family of six (INS, 2015). Health care expenditures rose by 6.8 percent point between 2007 and 2014 imposing a huge financial health care access cost to households. The rise in health care payments has the potential of aggravating existing inequalities in the distribution of income. Household out-of-pocket payments on health care in Cameroon represent 70.6 percent of the total financing of the health sector in 2014.

The Gini coefficient for household consumption expenditure increased by 13 percent from 0.39 in 2007 to 0.44 in 2014 (INS, 2015). Also, the decline in absolute poverty from 39.9 percent in 2007 to 37.5 percent in 2014 was not accompanied by any reduction in income inequalities between these two time periods. The high Gini coefficient shows the limitation of the poverty reduction strategies that were being implemented to reduce inequalities in the distribution of incomes in Cameroon<sup>1</sup>.

The analysis of the progressivity and redistributive effects of health care payments in Cameroon is based on data from the fourth Cameroon Household Survey. The sharing unit as well as the unit of analysis is the household. The sample used for the analysis has been weighted using sampling weights. On average, out-of-pocket payments absorbed about 7.77 percent of total household expenditures. Higher-income groups in Cameroon use health services in greater quantities so that higher income is associated with greater

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<sup>1</sup> Poverty incidence has reduced but differences in the distribution of household consumption across the country show severe inequalities.

utilization of services and greater out-of-pocket payments on health care. It is also necessary to highlight the fact that health care payments reflect illness reporting which is biased in favor of richer households.

Table 3. Progressivity Indexes for Out-of-pocket payments for health care, 2014

Measure	Formula	Value
Gini for pre-payment income	$G_x$	0.45744
Gini for post-payment income	$G_{x-T}$	0.45600
Redistributive effect	$RE = G_x - G_{x-T}$	0.00144
Mean out-of-pocket payment (in FCFA)	$T$	28,620
Mean pre-payment income (in FCFA)	$X$	392,440
Mean fraction of pre-payment income spent on health care	$g = T/X$	7.3 %
Concentration index post-payment income	$C_{x-T}$	0.45530
Concentration index payments (assuming within-group equality)	$C_T$	0.48715
Kakwani index (assuming within-group equality)	$\pi_T^K = C_T - G_x$	0.02971

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Computed by the author from ECAM IV data files using STATA 11.0

Tables 3 shows the values of income  $X$ , out-of-pocket payments ( $T$ ), the income share of out-of-pocket payments  $g$ , the Gini coefficient for pre-payment income  $G_x$ , the concentration index for out-of-pocket payments  $C_T$ , the concentration index for post-

payment income to pre-payment income  $C_{X-T}$ , and the Kakwani index of progressivity of out-of-pocket payments on pre-payment income  $\pi_T^K$ .

Households were then regrouped into these groups of pre-payment equals. The concentration index for post-payment income ( $C_{X-T} = 0.4553$ ) was then computed from groups of pre-payment income. The Kakwani index ( $\pi_T^K = 0.02971$ ) was calculated as the difference between the payment concentration index  $C_T$  and the Gini coefficient  $G_X$ .

Table 4 shows the Reynolds-Smolensky index of redistributive effects of out-of-pocket payment to pre-payment income ( $\pi_T^{RS} = 0.03204$ ), the vertical redistributive effect ( $V=0.00234$ ), the horizontal equity ( $H=0.0002$ ), and re-ranking ( $R=0.0007$ ).

Table 4. Composition of Redistributive effect of out-of-pocket health care payments in Cameroon, 2014

Measure	Formula	
Redistributive effect	$RE = G_x - G_{X-T}$	0.00144
Reynolds Smolensky (RS) Index	$\pi_T^{RS} = \frac{1}{1-g} \pi_T^K$	0.03204
Vertical Redistribution Effect	$V = \frac{g}{1-g} \pi_T^K$	0.00234
Horizontal Equity (computed as Residual)	$H = V - R - RE$	0.0002
Re-ranking	$R = G_{X-T} - C_{X-T}$	0.0007
Sum of H and R	$H + R$	0.0009

Computed by the author from ECAM IV data files using STATA 11.0

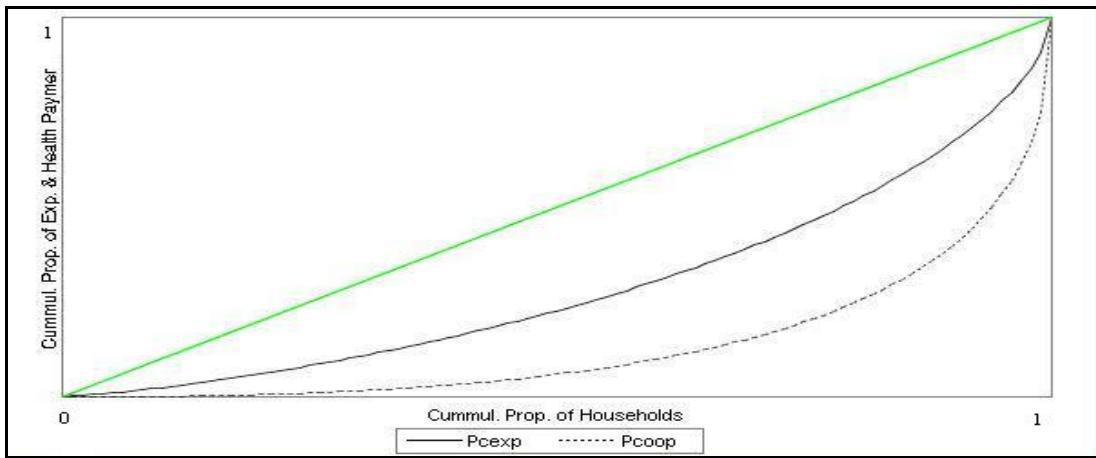
$G_{X-T}$  and  $C_{X-T}$  are almost the same implying an insignificant re-ranking. The horizontal equity ( $H=0.0002$ ) offsets the disequalising effect of vertical income redistribution ( $V = 0.00234$ ). The choice of bandwidth has an effect on the computed values of  $H$  and  $R$ . As the bandwidth is widened, horizontal inequity falls and re-ranking rises. Consequently, it becomes necessary to emphasize the sum of  $H$  and  $R$  rather than on their respective individual values.

The calculations in tables 3 and 4 indicate that out-of-pocket payments for health care in Cameroon in 2014 were estimated at 7.3 percent of the total household expenditures and represent a significant share of household prepayment income. The estimates also show that the redistributive effect is positive implying that health care payments are weakly progressive and will weakly enhance equity. However, the total effect on the distribution of disposable income is weak and almost negligible. Although out-of-pocket payments for health care in Cameroon represent a significant share of household pre-payment income, the results of the study show that total health care payments were slightly progressive and have little effect on the distribution of post-payment income in Cameroon.

The estimated value of the Kakwani ( $\pi_T^K = 0.0297$ ) is positive indicating a progressive payment structure. Also, the Reynolds-Smolensky index ( $\pi_T^{RS}$ ) is positive implying that the concentration curve for post-payment income ( $Lpcexp$ ) lies above the Lorenz curve for pre-payment income ( $Lpre$ ) in figure 2 indicating in effect that out-of-pocket

payments for health services do not result in inequality in the distribution of post-payment income. However, the low values of the Kakwani index ( $\pi_T^K$ ) and Reynolds-Smolensky index ( $\pi_T^{RS}$ ) suggest that post-payment re-ranking is low. Figure 1 shows the concentration curve of health care payments and the Lorenz curve of pre-payment income variables, which are both, plotted against the cumulative proportion of the sample ranked by income on the horizontal axis.

Figure 2. Lorenz and health payments concentration curves, Cameroon 2014



Source: Author's computation based on data from the 4th Cameroon Household Survey, 2014

The vertical redistributive effect  $V$  expressed, as a percentage of the  $RE$  is approximately 14 percent and this tells us that in the absence of horizontal differences and re-ranking, the pro-poor income redistribution associated with out-of-pocket payments would have been only 14 percent of its actual value. Although the two indices are not equal, they are quite close indicating that re-ranking resulting from payments is low. The estimated horizontal differences arise probably because of different levels of utilization at a given pre-payment income level which is partly attributed to differences in illness severity or

because of different prices paid per unit of service. The latter may reflect differences in quality especially in the for-profit and not-for-profit private sector.

## **Discussion**

Evidence from the research suggests that health care financing in Cameroon through households' out-of-pocket payments contributes to a slight reduction in income inequality. The positive redistributive effect associated with out-of-pocket payments is consistent with findings reported in Ghana, South Africa, and Tanzania (Mills et al., 2012), Sierra Leone (Fabricant et al., 1999), and Burkina Faso (Makinen et al., 2000). While these studies examine overall sources of health care financing, this research focuses only on households' out-of-pocket payments.

Like in Antigua and McIntyre's (2012) study on South Africa, the progressive financing system of health care through out-of-pocket payments in Cameroon is pro-rich. The rich consume more health care in Cameroon than the poor and thus incur more out-of-pocket costs. The low per capita income for a large segment of the Cameroon population and the high incidence of poverty (37.5% in 2014) expose poorer households to high out-of-pocket expenses and limit access to health services. Health care financing through direct taxes may result in a reduction in income inequality. Furthermore, allocating more public expenditure to improve health infrastructure and services could expand access to health care and reduce inequity.

However, insufficient government funding of health care can result in escalating health care costs for low-income households. The allocation of scarce public resources to the health sector are biased in favor of high level curative services at the expense of

intermediate and peripheral levels and can potentially increase households' out-of-pocket for critical health services. This also tends to escalate inequity in access to health care services and the distribution of post-payment incomes.

Although government spending on health care in Cameroon is progressive, it is not pro-poor either (World Bank, 2018). It is also important to mention that in the 2014 ECAM 4 households survey, health care payments reflect illness reporting which was predominantly by richer households. Thus, the progressivity of out-of-pocket payments is not by coincidence but since more affluent households use more care and report more than poorer households.

In the current study, the progressive vertical effect dominates both the horizontal effect and re-ranking. Out-of-pocket payment in the absence of a well-developed and expanded private insurance can lead to catastrophic financial outcomes and impoverishment. Increases in government resources to health care along with equity in the distribution of health infrastructure across geographical areas and facilities can expand access to health services to all populations and reduce out-of-pocket payments.

## **Conclusion**

This study has found that the redistributive effect of household out-of-pocket payments for health services in Cameroon is weakly positive indicating that health care payments are to an extent progressive. The re-ranking of households, according to the findings is quite negligible implying that very few household members change position in the distribution of income after paying for health services. The third important finding is that there exists some amount of horizontal inequity among members of the same income

bands and this can be explained by differences in the levels of utilization at a given pre-payment income level. The differences in the level of utilization are attributed to differences in illness severity and perception on one hand and because of the differences in the prices paid per unit of service.

These findings should be interpreted with care as the inequality in access and payments for health care in Cameroon are proportional to the ability to pay for health services. The high utilization of health services by high-income groups translates into an expenditure pattern in which payments increase with incomes with the richest spending close to twelve times on health care than the poorest quintile. (World Bank, 2018). User fees were officially introduced into all public health care facilities in 1992. The institution of user charges into the public health sector and the prevalence of for-fee private health service providers have increased the health financing burden of households and individuals. The implication is that the system of health care financing has great potential for the redistribution of incomes.

Further studies of the redistributive effects of health care financing in Cameroon should include sources of health care financing such as direct taxes, indirect taxes, in addition to out-of-pocket payments should be taken into account. It is equally important to compare the relative income redistributive effects of public versus private health care markets given that these markets charge different prices for services and provide services that differ in quality.

### **Authors' contributions**

The first author conceptualized the paper, wrote the first, and revised the final drafts; the second author provided insights on the conceptualization and contributed to structuring and writing the paper. The third author also provided insights on conceptualization and contributed to structuring and writing the paper. The authors read and approved the final manuscript.

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### **Availability of data and materials**

Household survey data was obtained from the Cameroon National Institute of Statistics

### **Ethics approval and consent to participate**

No ethics approval was required as the study involved an analysis of secondary data from the Cameroon Household Survey (ECAM 4) conducted in 2014.

### **Consent for publication**

N/A

### **Competing interests**

The authors declared no potential conflict of interest to the research, authorship, and publication of this article.

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