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Equitable Health Care Financing and Universal Health Care Coverage in Nigeria

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Abstract

Background: Out-of-pocket payments (OOP) can impose financial hardship and limit the utilization of medical care. In countries where the OOP is the major source of health care financing and prepayment mechanism of health insurance is underdeveloped it can further impoverish already poor households. This realization has generated interest in the equity implication of the social health insurance contributions. This is imperative when considering universal health care coverage especially for the poor.

Methods: Data for the study was obtained from three sets of the General Household Survey (GHS) panel, 2010/2011, 2012/2013 and 2015/2016. Two measures of health care financing: out of pocket payments (OOP) and health insurance contribution (HIC) by those enrolled in the National Health Insurance Scheme (NHIS) were employed in the analysis. The ability to pay measure was household consumption expenditure. Equity implication of the financing options was analysed using the Kakwani Progressivity Index, Lorenz and concentration curves and the Multiple Comparison Estimation Technique.

Findings: For the three periods the KPI estimates for the OOP (-0.035, -0.12, -0.097) were significantly negative (regressive). In 2012, the KPI estimate for the HIC (-0.037) though negative was not statistically significant (proportional) and the estimate (-0.18) was regressive in 2015. This suggest that in Nigeria the poor bear the burden of health care financing.

Conclusion: Efforts should be aimed at reducing the share of out-of-pocket payments for health care and provide financial protection for the poor. This can be achieve through improving the operations of the National Health Insurance scheme (NHIS).

Keywords: Equity, Health care financing, Health insurance contribution, Out-of-pocket payments, Universal health care coverage**.**

Introduction

An equitable health care financing system is crucial to ensuring access to health care and improved health outcomes. The overall performance of health systems is evaluated against three objectives provision of good health, responsiveness and fairness in financial contribution. Fairness or equity in financial contribution has implication for access to health for all but especially for the poor [1]. The 58th world health assembly called for health systems to move towards universal coverage where all individuals have access without discrimination to promotive, preventive, curative and rehabilitative health intervention at an affordable cost [2]. Achieving equity in access to health care entails that the utilization of health services does not expose the users especially the poor, vulnerable and marginalized segments of the population to financial hardship. The goal is promoting fairness in terms of health care financing and delivery. Equitable health financing requires that health care payments are made on the basis of individual's ability to pay [3]. This ensures that everyone particularly the poor who need health services are able to obtain them without facing the risk of financial catastrophe.

The poor are not only prone to health shocks associated with direct expenditure on transportation to health facilities, treatment, medication and hospitalization but also to indirect cost associated with a drop in health status culminating in a reduction in labour supply and productivity. The lack of financial resources required to provide efficient and equitable health services is a key challenge confronting many health systems in Africa. Governments of African states are recognizing that financing approaches are critical for the effective performance of any health system and vital for achieving universal coverage [4]. Understanding the comparative advantages of different financing strategies including tax financing, out-of-pocket payments, social health insurance scheme, private health insurance, community health insurance and donor funding is essential for developing countries like Nigeria.

Out-of-pocket payments account for approximately 69 per cent of health care payments in the country. This estimate far exceeds the 15 per cent threshold beyond which households risk being pushed into poverty [5]. In a bid to reduce the catastrophic consequences of out-of-pocket expenditure among households and ensuring universal health coverage for its citizens, the Nigerian government established the National Health Insurance Scheme (NHIS) in 2005. This federally funded social health insurance scheme was designed to facilitate fair financing of health care cost through risk pooling and cost sharing arrangement for individuals but the scheme has not been effective in its coverage and benefits of the scheme accrue mainly to persons employed in the formal sector of the economy [6]. Those working in the formal sector constitute 3 percent of the working population while individuals working in the informal sector which comprise over 65 per cent do not have access to health insurance.

One way of evaluating how far the goal of universal health coverage has been achieved is by assessing the magnitude of vertical equity in the prepayment income distribution associated with various health care financing sources. Vertical equity is assessed by measuring the progressivity of financing sources [3, 6]. Previous studies for Nigeria have only examined the equity implications of health care payments made out-of-pocket using the aggregated measure of progressivity [7-10]. None of these studies have performed a disaggregated analysis of distributional burden of health care financing sources. The disaggregated analysis is an improvement over other measures of progressivity because it involves obtaining estimates of the distributional burden of

health care payments at various income levels. Also, studies on the equity implication of the social health insurance contribution of the NHIS have been majorly conceptual in nature [11, 12]. This study extends the literature on equity in health care financing literature in Nigeria by providing empirical evidence on the progressivity or otherwise of the social health insurance contribution and out-of-pocket payments as a means of evaluating if universal health coverage has been attained in Nigeria both at the national and regional levels. The trend of the equity implication of the out-of-pocket payment and the health insurance contributions was established over a three-year period: 2010/2011, 2012/2013 and 2015/2016. This is crucial for policy formulation regarding ensuring financial and social protection for the poor through health care financing.

Methods

The theory adopted for this study is the equity theory of taxation. It is embedded in the field of public finance and has been applied to the subject of equity in health care financing. It emphasizes the notion of financing health care according to "ability to pay" (ATP) rather than according to "need" focus is on progressivity in health care financing [3, 13, 14]. Progressivity is measured using the Kakwani Progressivity Index (KPI). The KPI "summarises the extent to which the distribution of health care payments, departs from proportionality; proportionality being measured against the distribution of ATP" [15-17]. The index can be further expressed as the difference between the concentration index of health care payments gotten from and the Gini coefficient of prepayment income. The value ranges from -2 to 1. A positive value indicates a progressive health financing system, households in the higher income quartile contribute a greater proportion of prepayment towards healthcare payments than those in the lower income group (Lorenz curve lies above the concentration curve) while a negative value is indicative of a regressive financial system (payment concentration curve lie above Lorenz curve of prepayment income) and zero depicts proportionality (the payment concentration curve lies on the Lorenz curve). The Kakwani index was computed using the convenient regression expressed in a convenient non- linear form as:

$$2\omega_r^2\left[\frac{t_j OOP,\ HIC}{\bar{t}} - \frac{x_j}{\bar{x}}\right] = \gamma + \rho r_i + u_i$$

Where; ρ is the Kakwani progressivity index. $t_i[OOP, HIC]$ is Out-of-pocket health care payments and National health insurance contributions , $\bar{t}$ is an estimate of the average health care payment. x_j, the household j equivalent consumption expenditure. $\bar{x}$, an estimate of the household average consumption expenditure. r is the household's fractional position on the consumption expenditure distribution. Estimates of the KPI are obtained through the weighted convenient regression using STATA. The test of dominance will be conducted using the Multiple Comparison Approach (MCA). The MCA was used to obtain disaggregated estimates of progressivity.

Data requirement and sources

The data used for analysis was obtained from three rounds of the General Household Survey (GHS) in 2010/2011, 2012/2013 and 2015/2016**.** The GHS-Panel is a nationally representative survey of 5,000 households obtained through a two stage stratified sampling design. The survey is representative of the six geopolitical zones in Nigeria: The South-South (SS), South East (SE), South West (SW), North East (NE), North West (NW) and North Central (NC). These zones are grouped into urban and rural areas. The variables utilized for the study include the out-of-pocket payment for health care (OOP) and the health insurance contribution (HIC). The out-of-pocket payment for health (OOP) comprised the cost of drugs and medical supplies, transportation

cost to hospital and hospitalization fees. The health insurance contribution (HIC) covered co-payments for medical treatments made by those enrolled in the NHIS. Prepayment income comprises total household consumption expenditures (food and non-food expenditure), gross of all health care expenditures. Post-payment income comprises total household consumption expenditures (food and non-food expenditure) net of all health care expenditures [20]. Household estimates of consumption expenditure and health care payments were adjusted using an equivalent scale to reflect household size and age composition.

$$AE = (A + \propto K)^{\theta}$$

Where; *AE* represents the adult equivalent. A is the number of adults in the household. K number of children. θ represents the degree of economies of scale and ∝ is the cost of children. An adult equivalent scale *AE* of 0.5 was utilized in the study because Nigeria is a developing country.

Results

The results of the descriptive are presented in Tables 1-3. After data cleaning the study covered 2,836 households (920 urban and 1,934 rural) in 2010, 3,999 households (1,278 urban and 2,721 rural) in 2012 and 4,051 households (1,305 urban and 2,746 rural) in 2015. Table 1 revealed that from the 2010/2011 data set at the national level, the mean equivalent prepayment expenditure was ₦ 160,517.9. The mean out-of-pocket payment and health insurance contributions were ₦11,988.4 and ₦ 48,332.8 respectively. The mean equivalent post-payment expenditure was ₦149,613.4. In the urban, the mean equivalent household consumption expenditure was ₦ 205,621.4. The mean out-of-pocket payment and health insurance contributions were ₦ 12,569.5 and ₦ 2,434.0. For the rural area, the mean equivalent household prepayment expenditure was ₦ 134,347.2. The mean out-of-pocket payment and health insurance contributions were ₦ 9,938.5 and ₦ 2,140.7.

For the 2012/2013 data, Table 2 revealed that the overall mean equivalent prepayment expenditure was ₦ 61,387.6. The mean equivalent out-of-pocket payment was ₦10,013.3. Health insurance contribution on the average was an estimated ₦9380.3. The mean equivalent post-payment expenditure was ₦51,374.3. In the urban area, the mean equivalent prepayment consumption expenditure was ₦77,114.4. The mean out-of-pocket payment and health insurance were ₦10,398.9 and ₦2,585.4. The equivalent post-payment consumption expenditure was ₦66,715.4. For the rural area, the mean equivalent prepayment expenditure was ₦51,954.1. The mean out-of-pocket payment and health insurance contributions were ₦9,781.9 and ₦2,185.7. The equivalent post-payment consumption expenditure was ₦ 42,172.2.

Table 3 indicated that for the 2015/2016 GHS data, the average the equivalent prepayment expenditure was ₦50,855. The equivalent out-of-pocket payment and the equivalent health insurance contribution were ₦10,262.4 and ₦9,865.1 respectively. The average equivalent post-payment expenditure was ₦ 40,592.7. In the urban area, the mean equivalent prepayment consumption expenditure was ₦ 59,830.1. The mean out-of-pocket payment and health insurance contribution were ₦ 10,975.6 and ₦ 2,690.2. The equivalent post-payment consumption expenditure was ₦ 48,854.5. For the rural area, the mean equivalent prepayment expenditure was ₦ 45,497.8. The mean out-of-pocket payment and health insurance contribution were ₦ 9,836.7 and ₦ 2,170.0. The equivalent post-payment consumption expenditure was ₦35,661.0.

Table 1: Descriptive Statistics 2010/2011

Overall	N	Mean	Std. Dev
OOP (Out-of-pocket)	2,836	10,904.5	58,936.1
Pre-pay_exp (Total consumption gross of all health care payments)	2,836	160,517.9	297,918.1
Post-payment_exp (Total consumption net of all health care payments)	2,836	149,613.4	286,327.5
HIC (Health Insurance Contribution)	191	11,988.4	8,915.67
hhsize (Household size)	2,836	1.0	.2
wt_wave1 (Household weights)	2,836	6,105.4	3,739.5
Urban			
OOP (Out-of-pocket)	920	12,569.5	74,534.1
Pre-pay_exp (Total consumption gross of all health care payments)	920	205,621.4	316,494.2
Post-payment_exp (Total consumption net of all health care payments)	920	193,052.0	301,392.9
HIC (Health Insurance Contribution)	135	2,434.0	10,336.2
hhsize (Household size)	920	1.0	.15
Rural			
OOP (Out-of-pocket)	1,934	9,938.5	47,573.7
Pre-pay_exp (Total consumption gross of all health care payments)	1,934	134,347.2	283,326.6
Post-payment_exp (Total consumption net of all health care payments)	1,934	124,408.7	274,083.6
HIC (Health Insurance Contribution)	56	2,140.7	7,974.7
hhsize (Household size)	1,934	1.0	.17

Source: *Authors Computation from GHS-Panel, 2010/2011*

The results for Gini coefficient of the out-of-pocket payment and the health insurance contributions alongside their respective Kakwani progressivity index for Nigeria and the six geopolitical zones are presented in tables 4 and 5 respectively. Table 4 showed that in the 2010/2011 period overall the estimates of the Gini index of the prepayment income 0.55 was statistically significant. This implies that the prepayment income was concentrated with the wealthy. This finding was indicative of the high level of income inequality that exist in the nation's distribution of income. The result was similar to that obtained for Nigeria [10]. In the 2012/2013 period the gini coefficient for the country was 0.58. This suggested a worsening of income inequality in the country especially when compared with the gini estimates for the 2010/ 2011 period. The gini estimate for the country in 2015/2016 period declined marginally to 0.55.

The estimates from the zones for the 2010/ 2011 period revealed that the South-South had the highest Gini estimate of 0.72 and was followed by the South- East with an index of 0.52. The North-Central zone had the lowest value of 0.41. Intuitively, these results indicated that the South- South and South-East regions have the bulk of their income concentrated among the upper-half of the income distribution. In the 2012/2013 year the estimates from the zones tended to indicate that the South-South and South East have the

worst unequal distribution of income with a gini index of 0.68 and 0.65 respectively. These findings were similar to those obtained from the 2010/ 2011 data set. The North East and the North West zones had the least values of 0.41 and 0.42. In the 2015/2016 period the South-South had the highest gini index of 0.72 and was followed by the South-West 0.55. The North-East zone had the lowest value 0.41. Intuitively, these results indicated that the South- South and South-West regions had the most unequal distribution of income with the largest share of their income concentrated with the better-off. The overall estimates of the Kakwani Progressivity Index (KPI) for the out-of-pocket health care payments (OOP) in Table 4, suggest that overall the OOP was regressive for the three periods. The negative significant value of the KPI for the out-of-pocket payment fluctuated between -0.04 in 2010/2011 to -0.12 in 2012/2013 and thereafter to -0.09 in 2015/2016. This is an indication that between the period 2010 and 2015, the proportion of consumption expenditure spent as OOP for health care was higher for individuals on lower income quintiles than those on higher income quintiles. The regressive KPI however improved slightly by 25 per cent in 2015/ 2016.

Table 2: Descriptive Statistics 2012/2013

Overall	**N**	**Mean**	**Std. Dev**
OOP (Out-of-pocket)	3,999	10,013.3	28,849.0
Pre-pay_exp (Total consumption gross of all health care payments)	3,999	61,387.6	104,339.4
Post-payment_exp (Total consumption net of all health care payments)	3,999	51,374.3	97,164.7
HIC (Health Insurance Contribution)	345	9,380.3	8,631.5
hhsize (Household size)	3,999	1.1	1.0
wt_wave2 (Household weights)	3,999	7,055.2	4,818.9
Urban			
OOP (Out-of-pocket)	1,278	10,398.99	31,019.86
Pre-pay_exp (Total consumption gross of all health care payments)	1,278	77,114.4	126,519.8
Post-payment_exp (Total consumption net of all health care payments)	1,278	66,715.4	119,098.4
HIC (Health Insurance Contribution)	181	2,585.4	9,240.7
hhsize (Household size)	1,278	1.1	.4
Rural			
OOP (Out-of-pocket)	2,721	9,781.9	27,462.7
Pre-pay_exp (Total consumption gross of all health care payments)	2,721	51,954.1	87,053.7
Post-payment_exp (Total consumption net of all health care payments)	2,721	42,172.2	79,813.7
HIC (Health Insurance Contribution)	164	2,185.7	8,241.0
hhsize (Household size)	2,721	1.1	.4

Source: *Authors Computation from GHS-Panel, 2012/2013.*

Table 3: Descriptive Statistics for 2015/2016

Overall	**N**	**Mean**	**Std. Dev**
OOP (Out-of-pocket)	4,051	10,262.4	31086.1
Pre-pay_exp (Total consumption gross of all health care payments)	4,051	50,855.1	73583.4
Post-payment_exp (Total consumption net of all health care payments)	4,051	40,592.7	64872.3
HIC (Health Insurance Contribution)	416	9,865.1	8335.6
hhsize (Household size)	4,051	1.1	.3
wt_wave3 (Household weights)	4,051	6,670.3	4,398.7
Urban			
OOP (Out-of-pocket)	1,305	10,975.6	28,289.7
Pre-pay_exp (Total consumption gross of all health care payments)	1,305	59,830.1	77,163.24
Post-payment_exp (Total consumption net of all health care payments)	1,305	48,854.54	71,036.43
HIC (Health Insurance Contribution)	320	2,690.2	7,476.2
hhsize (Household size)	1,305	1.1	.3
Rural			
OOP (Out-of-pocket)	2,746	9836.7	32,634.32
Pre-pay_exp (Total consumption gross of all health care payments)	2,746	45,497.8	70,822.3
Post-payment_exp (Total consumption net of all health care payments)	2,746	35,661.0	60,360.8
HIC (Health Insurance Contribution)	94	2,170.0	8803.143
hhsize (Household size)	2,746	1.1	.2

Source: *Authors Computation from GHS-Panel, 2015/2016*

The findings from the North central zone revealed that in 2010/2011 the OOP was a progressive health care financing source having a positive and significant KPI of 0.56. However, in 2012/2013 and 2015/2016 the KPI estimates (-0.16 and -0.13) were negative and significant, indicating that the OOP was regressive. The KPI of out-of-pocket finance in the North East zone for the period 2010/2011, 2012/2013 and 2015/2016 were negative and statistically significantly (-0.12, -0.05 and -0.15 respectively). The findings showed that the OOP was regressive for the three periods. This result suggested that the poor bore the burden of direct health care payments. The KPI for out-of-pocket payment in the North West zone experienced some oscillatory movements. In 2010/2011 and 2015/2016 the estimates were significantly negative (-0.27 and -0.08). In 2012/2013 the estimate of the KPI although positive was not significantly different from zero suggesting that the OOP was a proportional financing source. The findings from the South East zone for the period of the study reveal that the estimates of the OOP for the first and third periods were positive and significant KPI (0.19 and 0.06) suggesting that it was a progressive health care financing source. In 2012/2013, the KPI estimate for the OOP -0.07 was negative but not significant indicating that it was a proportional financing source. The findings from the South-West zones indicated that for the period of the study that KPI for the out-of-pocket payment for the period of 2010-2015 was significantly negative (-0.45, -0.26 and -0.11) indicating that the OOP was generally

Table 4: The Trend of Changes in the Gini coefficient, Concentration Index and Kakwani Progressivity index for out of pocket payment.

Out-of-Pocket Payment (OOP)	2010/2011	2012/2013	2015/2016
Gini index /robust standard error	0.546 (0.006)	0.578(0.003)	0.5489(0.003)
Concentration index / robust standard error	0.5111(0.021)	0.454(0.008)	0.452(0.008)
KPI/ standard error	-0.035*(0.02)	-0.123(0.007)	-0.097**(0.007)
North Central			
Gini index /robust standard error	0.406(0.011)	0.525(0.115)	0.443(0.006)
Concentration index / robust standard error	0.965(0.104)	0.361(0.018)	0.312(0.013)
KPI/robust standard error	0.559**(0.095)	-0.165**(0.019)	-0.132**(0.013)
North East			
Gini index /robust standard error	0.478(0.015)	0.409(0.005)	0.435(0.0071)
Concentration index / robust standard error	0.349(0.024)	0.358(0.021)	0.286(0.026)
KPI/robust standard error	-0.129**(0.029)	-0.051**(0.019)	-0.149**(0.022)
North West			
Gini index /robust standard error	0.448(0.014)	0.415(0.004)	0.457(0.004)
Concentration index / robust standard error	0.178(0.133)	0.428(0.014)	0.380(0.016)
KPI/robust standard error	-0.27**(0.02)	0.013(0.014)	-0.0765**(0.015)
South East			
Gini index /robust standard error	0.525(0.008)	0.645(0.007)	0.533(0.007)
Concentration index / robust standard error	0.714(0.035)	0.567(0.017)	0.596(0.018)
KPI/robust standard error	0.189**(0.034)	-0.078 (0.164)	0.064**(0.015)
South-South			
Gini index /robust standard error	0.722(0.024)	0.687(0.011)	0.715(0.009)
Concentration index / robust standard error	0.53(0.062)	0.575(0.022)	0.527(0.022)
KPI/robust standard error	0.192**(0.061)	-0.112**(0.0214)	-0.189**(0.021)
South West			
Gini index /robust standard error	0.639(0.019)	0.598(0.009)	0.549 (0.005)
Concentration index / robust standard error	0.183(0.023)	0.33(0.015)	0.43(0.015)
KPI/robust standard error	-0.456**(0.029)	-0.268(0.016)	-0.119**(0.014)

Source: *Author's computation*

Note: **** significant at 1%; **significant at 5%; *significant at 10% Standard errors are reported in parenthesis.* ***KPI****: Kakwani Progressivity Index*

a regressive form of health care financing. The estimates of the South -South zone for the period of the study revealed that overall the out of pocket payment was regressive in nature with a negative but significant KPI of (-0.19, -0.11 and -0.19). The KPI estimate of the health insurance contribution (HIC) -0.16 in Table 5, revealed that in 2010/2011, the HIC was negative and statistically significant indicating that it was a regressive financing source. In 2012/2013, the KPI estimate of the HIC -0.03 was not significantly different from zero. This suggested that the HIC was marginally proportional. This finding suggests that the burden of payment was evenly distributed between the poor and non-poor. However, in 2015/2016 the KPI of the HIC -0.18 was negative and significant indicating that the HIC was a regressive funding source. The regressivity of the HIC in 2015/2016 was worse than that of the OOP at -0.09. The findings suggest that the burden of financing health care using the HIC was not evenly distributed across the population. Individuals on lower income levels spent a greater share of their consumption expenditure on health care when financing health using the health insurance contributions than when paying for

health care out-of-pocket. The health insurance contribution in the North Central zone for the period of 2010/2011 had a significant negative KPI (-0.36). In 2012/2013 and 2015/2016 the HIC was positive and significant 0.86 and 0.93 respectively. This suggest that the HIC was a progressive means of health care financing with contributions being an increasing share of consumption expenditure for persons on higher income levels. The results could also imply that the poor do not have access to health insurance but pay for health care out-of-pocket. The findings from the health insurance contributions of the North East zone indicated that the KPI 0.51 was significantly positive for the 2010/ 2011 period but experienced a change in trend in 2012/2013 and 2015/2016, having significantly negative KPI (-0.26 and -0.68). The estimates of the health insurance contributions suggested that in the North East health it was a regressive financing source. In the North West Zone the estimates of the KPI for the health insurance contributions (0.19, -0.27 and -0.09) was not significantly different from zero for the three periods. This finding tends to indicate that the health insurance contribution was a proportional financing source. The findings from the South East Zone indicated that the health insurance contribution was a progressive means of health care financing in the first period and proportional in the second period with KPI (0.46 and 0.08) respectively. In 2015/2016 the KPI estimate for the HIC -0.36 was negative and statistically significant indicating that the HIC was a regressive source of health care finance. Findings from the South West zone in 2010/ 2011 and 2012/2013 revealed that the KPI estimates of the HIC (0.32 and 0.65) were not significantly different from zero indicating that it was a proportional financing source. In 2015/2016 the statistically significant estimate of the KPI -0.39 confirmed that it was a regressive. The non-significant estimates in the South -South zone of the HIC (-0.35 and -0.14) in 2010/2011 and 2012 and 2013, periods confirmed that it was a proportional financing mechanism. The HIC was regressive with a significantly negative KPI of -0.39 in 2010/2011.

Results of the sensitivity analysis

The results of the disaggregated analysis for progressivity across income quintiles are presented in Table 6. The disaggregated results obtained using the Multiple Comparison Estimation Technique are shown as overall estimates and not across geo-political zones given that the estimation technique did not provide results for the zones. Overall the results of the dominance test show that for the three-year period except in 2012/ 2013 year for the health insurance contributions, the ordinates of the concentration curve of out-of-pocket payments and the health insurance contributions dominated those of the Lorenz curve of equivalent consumption expenditure at all income quintiles. This is an indication that for the study period across these income levels individuals on lower income quintiles spends a greater proportion of their consumption expenditure spent as OOP and HIC than individual's higher income quintiles. The results provide empirical evidence for existing vertical inequity in the Nigerian health care financing system.

Discussion

The estimates of the Gini coefficient for the period of the study confirmed that high levels of income inequality exist in the country. It was observed that in the zones the South-South and South East had the worst unequal distribution of income which could be exacerbated with the regressivity of the health care financing sources. For the three periods of the study, the out-of-pocket payment was a regressive health care financing source.

Table 5: The Trend of Changes in the Gini coefficient, Concentration Index and Kakwani Progressivity index for the Health Insurance Contributions 2010-2015.

Health Insurance Contributions	2010	2012	2015
Overall			
Gini index /robust standard error	0.471(0.021)	0.5718 (0.043)	0.529(0.028)
Concentration index / robust standard error	0.311(0.074)	0.534(0.535)	0.344(0.062)
KPI/ standard error	-0.16**(0.034)	-0.037(0.075)	0.185**(0.065)
North Central			
Gini index /robust standard error	0.367(0.0325)	0.611(0.076)	0.421(0.049)
Concentration index / robust standard error	0.002(0.2)	1.468(0.438)	1.351(0.348)
KPI/robust standard error	-0.364(0.209)	0.858**(0.389)	0.9296**(0.302)
North East			
Gini index /robust standard error	0.481(0.023)	0.314(0.013)	0.729(0.136)
Concentration index / robust standard error	0.988(0.118)	0.049(0.023)	0.062(0.045)
KPI/robust standard error	0.507**(0.113)	0.265(0.03)	-0.668**(0.153)
North West			
Gini index /robust standard error	0.306(0.797)	0.288(0.019)	0.274(0.013)
Concentration index / robust standard error	0.506(0.509)	-0.002(0.189)	0.185(0.092)
KPI/robust standard error	0.2(0.431)	-0.289(0.201)	-0.089(0.094)
South East			
Gini index /robust standard error	0.627(0.082)	0.761(0.105)	0.410(0.03)
Concentration Index / robust standard error	0.17(0.1280	0.875(0.27)	0.042(0.029)
KPI/robust standard error	0.457**(0.162)	0.078(0.24)	-0.368**(0.042)
South South			
Gini index /robust standard error	0.517(0.031)	0.706(0.114)	0.847(0.109)
Concentration index / robust standard error	0.123(0.202)	0.564(0.175)	0.599(0.231)
KPI/robust standard error	-0.39**(0.198)	-0.142(0.122)	-0.248(0.284)
South West			
Gini index /robust standard error	0.528(0.04)	0.537(0.061)	0.423(0.032)
Concentration index / robust standard error	0.205(0.19)	-0.107(0.16)	0.024(0.023)
KPI/robust standard error	-0.323**(0.203)	-0.645(0.186)	-0.399**(0.039)

Source: *Author's computation*

Note: **** significant at 1%; **significant at 5%; *significant at 10% Standard errors are reported in parenthesis.* ***KPI****: Kakwani Progressivity Index*

This result was in tandem with those obtained from other studies [8, 21-23]. The results indicated that health care financing in Nigeria through the use of out-of-pocket health care payment and the health insurance contributions resulted in the poor spending more of their income on health care than the non-poor. This produced inequity in health care financing system and a widened of the income gap between the poor and the non-poor. Regressive health care payments imply that the poor do have the needed resources to access health care even when enrolled in the National health Insurance Scheme (NHIS) and have to make increased direct payments to cover their treatment cost resulting in the further impoverishment of already poor households. Although the NHIS was established to protect these households from inequities associated with out-of-pocket payments individuals on lower income levels spend more on health insurance contributions than their counterparts on higher income levels. These findings were confirmed for the lower income earners in the population using the disaggregated analysis indicating that the poor do not have access to universal health care coverage in Nigeria.

Table 6: Dominance test result

Out-of-Pocket Payments

	2010-2011		2012-2013		20115-2016	
Quintile	**Cumulative share of eqoop**	**Dominance test**	**Cumulative share of eqoop**	**Dominance test**	**Cumulative share of eqoop**	**Dominance test**
q20	4.95%** (0.04)	CC	4.39%** (0.02)	CC	4.90%** (0.02)	CC
q40	13.93%** (0.13)	CC	14.06% **(0.06)	CC	15.07%** (0.06)	CC
q60	27.01% **(0.25)	CC	28.73%** (0.13)	CC	29.10% **(0.12)	CC
q80	46.11% ** (0.43)	CC	49.41%** (0.24)	CC	49.15%** (0.21)	CC

Health Insurance Contributions

	2010-2011		2012-2013		2015-2016	
Quintile	**Cumulative share of eqnhic**	**Dominance test**	**Cumulative share of eqnhic**	**Dominance test**	**Cumulative share of eqnhic**	**Dominance test**
q20	11.21%** (3.13)	CC	5.03%**(0.96)	CC	8.04%** (1.01)	CC
q40	25.86%** (4.93)	CC	17.78%** (2.74)	CC	21.42%** (2.19)	CC
q60	59.38%** (5.92)	CC	32.14%**(4.52)	CC	35.38%** (3.25)	CC
q80	73.58%** (5.98)	CC	46.06% (6.16)	LC	61.21%** (4.84)	CC

***Source**: Author's Computation. Percentage estimates of health care payments reported. eqoop: equivalent out-of-pocket payment. eqnhic: equivalent national health insurance contribution. CC: concentration curve dominance. LC Lorenz curve dominance. 5 % level of significance is applied at all quintile points. Standard errors are in parenthesis.*

The results for the six geopolitical zones suggested that the out-of-pocket payment for health care was most regressive in the South-South and South-West zones. The regressivity of the out-of-pocket payment in the South-West zone could be attributed to the regressivity of the social health insurance contribution within the zone. Health insurance contribution was generally a proportional financing arrangement although it was regressive in the North- East. The regressivity of the health insurance contributions in the North East could be attributed to the greater disease burden borne by the poor arising from civil unrest within the zone. This necessitated their greater need for health care leading to their increased health insurance payment. Proportionality of the health insurance contributions across the zones could have occurred because of the flat rate co-payments of 10 per cent paid at the point of service by those enrolled in the health insurance scheme for medical care received irrespective of income levels. This proportionality could also have occurred because of the scheme's mode of operation. Membership of the scheme only covers the formal sector that comprises only three per cent of the population while those in the informal sector are not covered. Furthermore, membership of the scheme is voluntary in nature and this greatly limits the pool of funds available for risk pooling and cross-subsidization of financial resources from the healthy to the sick and from the wealthy to the poor. The implication of this finding is that across the six geopolitical zones of the country, the NHIS has not been effective in protecting its members from the impoverishing effect of out-of-pocket payments. This could result in households neglecting the use of conventional health care, worsening of health outcomes, declining labour productivity and increasing mortality which are inimical to economic development.

Conclusion

The current health care financing arrangement in Nigeria reveals that the out-of-pocket payment for health which is the major health care financing source in the country results in the poor spending a greater share of their income on direct payments for health care. Although, the National Health Insurance Scheme was established to ensure universal coverage for the population and protect poor households from the impoverishment associated with direct payment for health care it has not been able to achieve this goal. The empirical evidence has shown that overall the social health insurance financing was regressive. For Universal coverage to be achieved in Nigeria, the National Health insurance Scheme (NHIS) must be expanded to cover the informal sector which makes up over 65 per cent of the working population. This will ensure increased pooling and cross-subsidization of financial resources which will tend to reduce the regressive effect of out-of-pocket payments. The membership of the scheme must be made mandatory for all formal sector workers. The flat co-insurance paid at the point of service implies that in real terms individual on lower income levels pay more for health than those on higher income levels resulting in regressive health financing mechanism. This is inimical to the survival of already poor households who may be forced into forgoing the consumption of health care due to the double burden of disease and the lack of financial resources to access much needed health care services.

Limitation

This study covered only the issue of equity in health care financing. Other grey areas that were not explored included equity in health care utilization and the benefit incidence of public health care funding. Health care funding arrangements examined in this study were mainly the national health insurance contributions and out-of-pocket health care payments. There are however other methods of financing that are not considered in this study such as tax revenue and the private health insurance premium. This is because the General Household Survey data does not provide data for these funding sources.

Author Contributions

Conceptualization of study – OO
Estimation/ Interpretation- CSO

Ethical Approval and Consent to Participate

This form of study does not require any form of ethical approval it is not a clinical study.

Conflicting Interest

None declared.

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