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A comparative analysis of the level of out-of-pocket healthcare expenditure in urban and rural communities in Edo state Nigeria

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ABSTRACT

In many low- and middle-income countries, individuals faced with financial hardship cannot afford medical treatments or even finance the purchase of medicines due to relatively high cost of health care services. In numerous low- and middle-income countries, individuals experiencing financial difficulties are unable to afford medical treatments or purchase medicines due to the relatively high cost of healthcare services. High cost of healthcare has often been recognized as one of the leading barriers to quality healthcare services with the potential to plunge households into poverty, which affects the type and quality of health services sought for at health facilities between urban and rural areas.

This cross-sectional descriptive study was among 495 eligible respondents in households in Edo State, Nigeria using the multi-stage sampling technique. The data collection tool was an interviewer-administered semi-structured questionnaire. The study found that in both urban and rural areas, 89.8% of respondents accessed care primarily by 'Out of Pocket Payment (OOPP)' however, this was higher among the rural households. Also, the purchase of drugs accounted for the largest proportion (71.9%) of the total expenditure on healthcare services.

Given the economic realities faced by many households, especially in rural areas, urgent measures are warranted to alleviate the financial strain of healthcare expenses. To address this issue, there is a critical need for the Edo state government and private sector to prioritize the enhancement of existing healthcare insurance schemes, particularly in rural regions, by expanding coverage and accessibility. Additionally, subsidizing the cost of medications, particularly for common illnesses like malaria, could significantly alleviate the burden of out-of-pocket healthcare expenditure.

Keywords: Out –of-pocket expenditure, pattern of costs, healthcare, urban, rural.

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Ethical approval-Ethical approval for this study was obtained from the Research Ethical Committee of the Irrua Specialist Teaching Hospital, Edo state and written informed consent was obtained from each participant.

INTRODUCTION

Healthcare financing in Nigeria is a multifaceted landscape that involves various sources such as tax revenue, out-of-pocket payments (OOPs), donor funding, and health insurance.[1] Despite efforts to achieve universal health coverage, there is a high reliance on out-of-pocket payments, leading to financial challenges for households and contributing to catastrophic health spending.[2] Private out-of-pocket expenditure remains high in Nigeria compared to other countries like Ghana, where the introduction of the National Health Insurance Scheme (NHIS) has significantly reduced OOPs.[3] Studies have shown that out-of-pocket spending accounts for a substantial portion of healthcare financing in Nigeria, ranging from 70% to 95%.[4]

This heavy reliance on OOPs has led to disparities in healthcare spending across different income groups, with the majority of the population accessing healthcare services through out-of-pocket payments.[5] The situation is further exacerbated by the inadequate budgetary allocation to health in Nigeria, barely exceeding 7% of the total budget.[6] The lack of financial risk protection mechanisms in Nigeria results in patients bearing the bulk of their healthcare costs through out-of-pocket payments, leading to challenges such as high treatment costs, poor financing of the health sector, and increased disease morbidity and mortality.[7] Furthermore, out-of-pocket payments for healthcare in Nigeria are particularly burdensome for women to access reproductive health services.[8] It has also been shown to result in catastrophic health expenditure in accessing care for acute conditions such as malaria and for chronic conditions such as HIV, Tuberculosis and Diabetes Mellitus.[8] Efforts to address these challenges include the establishment of the Basic Healthcare Provision Fund (BHCPF) as a radical shift in health financing in Nigeria.[9]

Although several studies have been done on the subject matter, majority of them were done in the southeast and northern part of the country which may not be easily generalized to the south-south Nigeria given it peculiarities. It was important therefore to conduct this study in at least one of southern state in Nigeria, disaggregating the population by geographic residence. This provides more robust evidence to which population bears the greater burden of out-of-pocket expenditure, thereby providing information for better decision making in allocating scarce resources to meet the Sustainable Development Goal 3 of attaining universal health coverage and ultimately improving health outcomes. Similar studies conducted in the past have led to policies such as user fees exemption for maternal and child health services and the establishment of the Basic Healthcare Provision Fund to address issues of access to quality healthcare services by the rural-poor and most vulnerable population.[2,10] Furthermore, this study provides useful information on what component of the healthcare expenditure accounts for the highest proportion thereby bringing to fore the health expenditure components for which public health interventions can produce the highest impact on the population"

Objectives of the study were:

-To compare the level of out-of-pocket expenditure (OOPE) in urban and rural communities in Edo state

-To determine the pattern of healthcare expenditure in rural and urban communities in Edo state.

Methods

Study area

This study was conducted between November, 2016 to February, 2017 in Uhiele and Ekpoma, which are rural and urban communities respectively in Edo state, Nigeria. For political purposes, Edo state is divided into three senatorial districts (Edo north, Edo south and Edo central senatorial districts). Edo state is renowned for its rich cultural heritage and diverse economic activities. The State has an estimated population of 4,235,595 people and is divided into 18 Local Government Areas.[11] Economically, Edo State is abundant in natural resources like crude oil, limestone, and quarry, with agriculture playing a significant role in its economy.[12] The state is said to have about 445 health facilities, made up of 148 primary health facilities, 223 public, nine secondary health facilities and three government tertiary health facilities.[13] The per capita expenditure on health is about $4, the capital budget on health for 2009 was 3.97% of the total budget of Edo State and about 70% of health expenditure in Edo State is from out-of-pocket.[14]

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Study design

A cross-sectional study design involving quantitative data collection methods.

Study population

The study participants were household heads, or their spouses or an adult representative of that household in the Uhiele and Ekpoma communities.

Inclusion criteria

Adult male or female household heads who have been resident in that community for at least one year.

Exclusion criteria

Non-consenting household heads.

Sample size determination

The minimum sample size was calculated using the sample size formula for comparison groups, $2Z^2pq/d^2$. [15] (in this case urban and rural subgroups). The 'Z', corresponds to the desired confidence level and in this study, 1.96 was used. The 'p' used is the prevalence of respondents who made an OOP expenditure in a study in South-South Nigeria set at 78%.[16] The 'q' is the complement of p (q=1–p), hence, calculated as q=1-0.78=0.22. The 'd' is margin of error or the desired level of precision, which was 0.05.

Thus, the calculated sample size was 221 however based on a non-response rate of 10% and to improve the robustness of the study, a total of 243 and 246 household heads were sampled.

Sampling Technique

A multi-stage sampling techniques were used to select the study participants. In the first stage, the three senatorial districts in Edo state were line listed and Edo Central was randomly selected. In stage 2, the Local Government Areas (LGA) in the selected senatorial districts were line listed and Esan West was randomly selected. Stage 3, from a line list of urban and rural communities in Edo state, Uhiele was selected as a rural community while Ekpoma was selected as an urban community. In each community, the centre was determined and divided into 4 clusters from which one was selected. A starting point was thereafter determined by spinning a pen to select the first household and then every other household was selected and the questionnaire administered to the household head or a representative.

Study instrument

The study instrument used was an interviewer administered semi-structured questionnaire which was pre-tested in a community in another LGA. The questionnaire was subsequently updated based on the gaps identified during the pretesting.

Data collection

Data was collected from each household head in Uhiele and Ekpoma communities using a paper-based interviewer administered questionnaire. Respondents were interviewed on the cost of treatment for both in-patient in the last one year and out-patient healthcare services in the last 4 weeks prior to the study, to minimize recall bias. The question also elicited response on the type of payment methods used to procure medical services and the different components of the treatment paid for.

Data Analysis

Data were coded, entered, cleaned and analyzed with IBM Statistical Package for Social Science (SPSS) version 21.0 for Windows (SPSS, Chicago, Illinois, USA). Results were presented in text, tables and figures. Variables of interest such as payment methods and the different components of treatment were measured and expressed in frequencies and proportions. Amounts paid for health care for in-patient and out-patient services were calculated and expressed in means. Variables were further cross-tabulated by geographic location (urban versus rural). Bivariate analysis using chi-square and independent t-test were used to determine statistically significant differences as appropriate. A p-value equal to or less than 0.05 was considered significant.

Results

Table I shows that majority of the respondents in the urban, 160 (65%) and rural, 167 (67.3%) locations were in the age group 31-64 years. There were more female respondents in the urban area, 133 (54.1%) and male respondents in the rural area, 123 (50.6%) The major tribe and religion were Esan and Christianity in both urban and rural locations. Most of the respondents were married in both the urban 193 (78.5%) and rural, 206 (82.7%) areas. Close to half of the respondents in the urban area, 116 (47.2%) had tertiary level of education while in the rural area only 26 (10.4%) had tertiary level of education.

Table 1: Socio-demographic characteristics of respondents

Variables	Urban (n=246) Frequency (%)	Rural (n=249) Frequency (%)	X^2	p-value
Age group in years				
≤30	74 (30.1)	42 (16.9)	23.64	*0.0001
31 – 64	160 (65.0)	167 (67.3)		
≥65	12 (4.9)	39 (15.7)		
Sex				
Male	113 (45.9)	126 (50.6)	1.080	0.299
Female	133 (54.1)	123 (49.4)		
Ethnicity				
Esan	182 (74.0)	236 (94.8)	44.963	*0.0001
Bini	46 (18.7)	6 (2.4)		
Etsako	12 (4.9)	2 (0.8)		
**Others	6 (2.4)	5 (2.0)		
Religion				
Christianity	236 (95.9)	244 (98.0)	8.315	*0.016
Islam	9 (3.7)	1 (0.4)		
***ATR	1 (0.4)	4 (1.6)		
Marital status				
Married	193 (78.5)	206 (82.7)	29.24	*0.0001
Single	47 (19.1)	20 (8.0)		
Separated	4 (1.6)	5 (2.0)		
Divorced	0 (0.0)	1 (0.4)		
Widow(er)	2 (0.8)	17 (6.8)		
Level of Education				
None	9 (3.7)	43 (17.3)	1.030	*0.0001
Primary	48 (19.5)	109 (43.8)		
Secondary	73 (29.7)	71 (28.5)		
Tertiary	116 (47.2)	26 (10.4)		

**Statistically significant **Others =Yoruba, Ibo, Etuno, Ebira, Ora. ***ATR = African Traditional religion. The mean age of the respondents was 43.91(SD±16.1).*

Table II. shows that out-of-pocket payment accounted for the largest form of payment for healthcare services for both rural and urban dwellers but higher amongst the rural dwellers with a mean±SD (163±91.1) than the urban dwellers with a mean±SD (135±88.2). The use of health insurance was reported more by households in the urban than rural area and this difference was statistically significant (p=. 0.002).

Table II: Comparison of level of OOPE between urban and rural communities in Edo state

Variables	Area			χ^2	p-value
	Urban	Rural	Total		
Payment made out of pocket					
Yes	135(88.2)	163(91.1)	298(89.8)	0.717	0.397
No	18(11.8)	16(8.9)	34(10.2)		
Payment made by health insurance					
Yes	16(10.5)	4(2.2)	20(6.0)	9.852	0.002
No	137(89.5)	175(97.5)	312(94.0)		
Payment made by installment					
Yes	9(5.9)	3(1.7)	12(3.6)	4.190	0.041
No	144(94.1)	176(98.3)	320(96.4)		
Payment made by others					
Yes	10(6.5)	10(5.6)	20(6.0)	0.131	0.717
No	143(93.5)	169(94.4)	312(94.0)		

Table III. shows that drugs accounted for the largest proportion (71.9%) of the total expenditure on healthcare services, this was followed by admission fees (9.2%), expenditure on Laboratory investigations (8.0%) and transport (5.5%).

Table III: Components of the total health expenditure of households per month in Naira

Variable	Total cost (₦)	Total cost ($)*	Frequency (%)
Drugs	4,230,000.00	13,857.49	71.9
Laboratory investigations	471,000.00	1543.00	8.0
Radiological investigations	199,983.33	655.15	3.4
Consultation fees	117000.00	383.29	1.9
Admission fees	541,604.97	1774.30	9.2
Transport	320,411.70	1049.67	5.5
Total	5,880,000.00	19,262.90	100

*$1= ₦305.25[26]

Table IV. shows that the mean amount paid for drugs accounted for the largest share of expenditure on healthcare services in both geographical locations and across the socioeconomic groups. Households in the rural area spent more on almost all the different aspects of healthcare services compared to households in the urban location. There was a statistically significant difference in the mean amount spent on drugs p=0.002 and transportation p=0.007 between households in the urban and rural locations with households in the rural area paying more. In the urban area, the mean amount spent on drug was ₦9118.70 (₦18,099) while in the rural area, this was ₦15844 (₦21500). In the case of transportation cost, the mean amount spent by the rural dwellers was ₦1538.94(₦2650.20) while the mean amount spent by the urban dwellers ₦824.28 (₦1216.33).

Table IV: Geographic differences in the means (SD) of the different components of healthcare cost in Naira

Treatment component	Urban (Mean cost & SD)	Rural (Mean cost & SD)	t-test	p-value
Drugs	9,118.70(18,099)	15,844(21,500)	9.321	*0.002
Laboratory investigation	2,241.70(2,755.8)	3,751.7(11,469)	1.279	0.260
Radiological investigations	3,023.53(1,981.33)	7,429.17(9,038.35)	3.865	0.057
Registration	613.40(338.74)	529.65(524.00)	1.834	0.177
hospital bed	5,483.33(6,124.70)	6,248.69(8,108.52)	0.200	0.177
Transportation	824.28(1216.33)	1,538.94(2650.20)	7.322	*0.007

**$1= ₦305.25*[26]

Table V. shows that the mean amount for treatment per month was higher in the rural area (₦13,306.91, approx. $43.6) than the urban area (₦10,948.78, approx. $35.87) while the mean amount for out-patient treatment was higher in the urban area (₦6,272.97, approx. $20.55) than the rural area (₦4,374.48, approx. $14.33). Rural households (₦14,218.88, approx. $46.58) incurred twice the cost of hospitalization of urban households (₦7,088.56, approx. $23.22) though this difference was not statistically significant (p=0.0072).

Table V: Mean household cost of treatment by geographic location

Variables	Cost of treatment per month Mean (SD)	Cost of out-patient treatment per month Mean (SD)	Cost of in-patient treatment per year. Mean (SD)
Geographic residence			
Urban	10,948.78 (19506.76)	6272.97 (13056.17)	7088.56 (24985.88)
Rural	13,306.91 (24634.75)	4374.48 (9871.99)	14218.88 (42994.27)
t-test	0.913	2.268	3.265
p-value	0.340	0.133	0.072

$ 1 = ₦305.25

DISCUSSION

The findings of this study elucidate the disparities in healthcare expenditure between rural and urban households in Nigeria, with a particular emphasis on Edo State. By disaggregating the population based on geographic residence, this research offers a more granular understanding of the healthcare challenges encountered by distinct communities. The novelty of this investigation lies in its comprehensive approach to analyzing out-of-pocket healthcare expenditures and the socio-demographic determinants influencing these costs. By examining both rural and urban households, the study illuminates the differential burdens of healthcare expenses and their implications for policy formulation.

The authors observed that the majority of respondents in both rural and urban households were within the age group of 31 to 64 years. This observation is similar to findings in a study in South-West Nigeria, where about the same proportion of respondents were in this age group.[17] Similarly, a study done in Brazil also found that 62% of the respondents were in a similar age group.[18] This finding in this study may be because, after the age of 30 years, the majority of adults are likely to be married or live alone with or without dependents and, as such, are household heads. There were more female respondents in the urban area and more male respondents in the rural area. This observation is similar to that found in a study in South-East Nigeria, where more of the respondents in the urban area were female (56.1%) compared to 91.3% males in the rural area.[19] This finding in this study could be due to the fact that the time of interviews (usually just after midday) may have coincided with the time male household heads in the urban area were still at work. Hence, their spouses were interviewed, whereas in the rural community, the household heads (who are mainly farmers) return from the farm before midday and, as such, get to be interviewed. The proportion of residents without any formal education was higher among those who reside in rural areas. The major source of income for households in rural areas was farming. This is similar to the findings of a study done in Uganda, which found that 97% of those in rural communities had farming as their major source of income.[20]

In this study, out-of-pocket expenditure accounted for the largest form of payment methods in both urban and rural communities. This is similar to the findings in other studies across the country. [17,21] These findings reveal the burden of treatment costs on households because they lack financial risk protection mechanisms. In our study, we also found that, only 2% of those in rural communities paid for their medication through health insurance. This was disproportionately higher in urban communities, where one in ten persons paid for treatment using a form of health insurance. This situation has been shown to predispose households to catastrophic healthcare expenditure and inadvertently push families into poverty.[22] The public health implication of this study is that the government needs to expedite effort to expand universal coverage to the people of Edo state, regardless of their geographic residence.

In our research, drug costs accounted for the largest share of the total healthcare expenditure. The disaggregated data by geographic residence also showed that households in rural areas spent more on almost all aspects of healthcare services compared to households in urban locations. There was a statistically significant difference in the mean amount spent on drugs between households in urban and rural locations, with households in rural areas paying more. These findings are similar to those of a study conducted in South-East Nigeria, which found that drugs accounted for 90% of the total treatment cost, and another study in South-East Nigeria, in which drug costs accounted for more than 70% of the total treatment cost for each individual. [23-24] This finding may be because, at all places where treatment was sought, the common denominator was the procurement of drugs. The importance of this finding is that the removal or at least subsidy of the cost of drugs for common illnesses like malaria in all government hospitals can go a long way to reduce the burden of out-of-pocket payments (OOP) as well as improve the healthcare-seeking behavior of households.

Usually, the set amount to be spent on treatment depends on the type of care sought and the level of the health facility utilized. We found that, the mean OPP for in-patient and out-patient healthcare services was higher for those in rural communities

than those in urban communities. Similarly, in a survey conducted in Uganda, which detailed the costs of various healthcare services, it was found that urban households incurred more than twice the expenses compared to their rural counterparts.[20] Also, in research carried out in Japan, there was a statistically significant difference in the mean cost for urban and rural households. The study in Japan, showed that the mean cost of out-patient health services was US $419 in urban areas and US $79 in rural areas, while the mean expenditure for in-patient services per year was US $807 in urban areas and US $216 in rural areas.[25] The difference in the results of this study and those outlined above could be due to the fact that rural households in this study rarely sought formal care when ill. They only did so when they perceived the illness to be very serious and in most cases, complications may have set in, leading to higher medical expenditure.

Conclusion

This study highlights the significant differences in out-of-pocket healthcare expenses between urban and rural households in Edo State, Nigeria. Notably, rural households bear a disproportionately higher burden of healthcare costs, with drug expenses emerging as a significant component of their total healthcare expenditure. Moreover, the mean out-of-pocket costs for both in-patient and out-patient healthcare services are notably higher among rural communities compared to their urban counterparts.Moving forward, further research and concerted efforts are required to devise sustainable solutions that promote equitable healthcare financing and access for all the people.

Study limitation

The urban communities used in this study may not be comparable to those in some states in Nigeria and other parts of the world. Hence, caution is required when comparing the findings of this study to those of other states in Nigeria and other countries. However, this study still provides very useful evidence and information for policy makers to prioritize the provision of financial risk protection mechanisms in rural areas.

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