Original

Economic Burden and Catastrophic Expenditure from Household Illnesses among Civil Servants in Port Harcourt, Rivers State, Nigeria

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Article history: Received 27 January 2025, Reviewed 17 March 2025, Accepted for publication 28 March 2025

Abstract

Background: In Nigeria, as in many developing nations, the economic burden of household illnesses is a critical aspect that significantly affects the overall well-being of its population. Household illnesses may include a broad range of illnesses, from acute infections to chronic diseases. This study provides new information about the economic burden and catastrophic expenditure of household illness in Rivers State.

Material and Methods: This was a descriptive cross-sectional study. Respondents were randomly selected, the questionnaire was interviewer-administered via ODK software, and data was analyzed by SPSS vs 21. P was set at 0.05. Medical and non-medical costs were determined. Catastrophic health expenditure was set at 40% of non-food expenditure. The Dollar exchange rate to naira was 306.96.

Results: A total of 351 respondents took part in the study. Malaria, 263 (74.9%) was the most prevalent illness reported, most, 273 (77.8%) sought treatment at the patent medicine store, and out-of-pocket payment was used by a majority 342 (97.4%). The mean total direct cost was US$10.58 (SD US$22.76). The direct medical cost was US$9.70 (SD US$16.65) while the total direct non-medical cost was US$0.88 (SD US$7.11) and catastrophic expenditure was reported between 1.2% and 2.2% at the 10% threshold.

Conclusion: There is an urgent need to offer financial risk protection through the provision of health insurance programmes in the state.

Keywords: Economic burden, health insurance, risk protection, household illness.

How to cite this article

Adeniji FO, Worgu GO. Economic Burden and Catastrophic expenditure from Household Illnesses among Civil Servants in Port Harcourt, Rivers State, Nigeria. The Nigerian Health Journal 2025; 25(1):463 – 472.
https://doi.org/10.71637/tnhj.v25i1.1018

Introduction

In Nigeria, as in many developing nations, the economic burden of household illnesses is a critical aspect that significantly affects the overall well-being of its population. Household illnesses may be made up of a broad range of illnesses, from acute infections to chronic diseases. The occurrence of various illnesses within households not only poses a direct threat to the health and productivity of individuals but also exerts a substantial financial burden on households and the larger economy. [1] This is because, in lower-income countries, where out-of-pocket payment for health is high, ill health will drive up household consumption of health-related services and goods at the expense of non-health goods and services. [1]

Catastrophic expenditure is said to occur when individuals spend more than 10% of their total income or 40% of their nonfood consumption on health. [2][3] Some studies have used a varied range from 10 to 40% [2,3] [4] [5][6]

Universal health care coverage means all people receive the health care that they need without suffering financial hardship. It ensures people do not have to pay out of pocket for ill health and are not further pushed into poverty. [7] Sources of Healthcare financing in Nigeria are varied; a majority however still rely on out-of-pocket payment for health. [8] Other sources are tax revenues, health insurance (social and private), subsidies, exceptions, and deferrals, out-of-pocket payments, and sponsorship. [8] In 2005, the national health insurance commenced with coverage for federal government workers and their families, uptake was poor because, through a social health insurance scheme, participation was made optional. [8] The National Health Insurance Authority Act was enacted in 2022 to repeal the previous National Health Insurance Act and now makes it mandatory for all Nigerian residents to have insurance, unlike the previous act. It also makes it mandatory for all states in Nigeria to commence their state-run health insurance. [9] Among federal workers in Rivers State NHIA enrollment rate of as high as 83.8% was reported. [10] Private health providers are in operation in the state and their activities are regulated by the NHIA. [9] Private health insurance can help improve access to health care and provide additional coverage for health services not covered by the NHIA. [8] A study among clients of private health insurance providers in the state reported slightly more than half were satisfied with the care received. [11] Prevalence of catastrophic health expenditure among rural dwellers in the state was reported as 88.4%, [12] and among those with hepatitis B infection, 71.1%. [13] Another study in Rivers State reported the economic burden of illness among the self-employed, average cost of treatment was 12.7US dollars, data on the formal sector was not reported, hence the need to also collect data for the formal sector bearing in mind that some illnesses are occupation related. [14]

Cost of health care helps researchers and policy makers to determine the financial burden of diseases. Cost can be classified as Direct cost (medical and nonmedical), Indirect cost (productivity cost) and Intangible cost (e.g. pain and stigmatization). Medical costs are direct cost incurred in the process of receiving care e.g. cost of screening, hospitalization. Nonmedical costs are also direct cost incurred in connection with seeking health care e.g. cost of transportation. The economic burden of household illnesses in this study was measured as the direct cost of medical care. [15]

It was not until 2021 that the Rivers State health insurance law was signed for the Rivers State Contributory Health Protection Programme (RIVSCHPP) and was approved to start operations in 2024. [16]

This study provides new information about the economic burden of household illness in Rivers State, the pattern of healthcare utilization, the mode of payment as well as the proportion with catastrophic spending on health across the various socio-economic groups.

Materials and methods

Study design and setting

This study was a cross-sectional descriptive study among civil servants in Rivers State, Nigeria. The study was conducted at the state secretariat complex (which has 26 government ministries or parastatals) in Port Harcourt, the State capital. Rivers State is one of the oil-rich states of the Niger Delta region in South-South Nigeria. It is made up of 23 Local Government Areas (LGA) comprising 3 senatorial districts and 319 political wards. [17] Using estimates of the 2006 National Population Commission figures, the State has a population of 5,522,575. Rivers State has an area of approximately 37,000 square kilometers. [18]

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Variable of interest

In this study, perspective of the civil servant was adopted, the variables studied were economic burden, catastrophic cost, and socioeconomic status. Economic burden was calculated as the total cost spent on household illness a month before data collection in the household of respondents. Socio-economic status was determined using Principal Component Analysis (PCA) via SPSS. PCA allows to conversion series of ownership variables into socio-economic status. Principle component analysis (PCA) on SPSS was used to generate Eigenvector weights for each item of asset. The first component of the PCA was used to derive weight to form an assets-based socio-economic index which was used to categorize the respondents into four socioeconomic quartiles (q1-q4) poorest, poorer, poor, and least poor. The measure of inequality was the ratio of the mean of the poorest SES group over that of the least poor. Catastrophic household expenditure was determined as a proportion of income spent on ill health expenditure, the threshold for this study was 40 % for non-food expenditure threshold. However, this threshold was varied between 10 and 40% threshold. Socio-economic status was valued by the number of household items owned by respondents. Cost estimates were converted using the CBN exchange rate for dollars at 306.95 naira to a dollar. [19]

A minimum sample size was derived using the formula and adjusting for a 10% non-response rate, P of 86% was from a previous study. [4,20] A total of 351 respondents were interviewed for the study.

Eight ministries at the secretariat were randomly selected using the total list of the 26 ministries as the sampling frame, thereafter a proportionate to-size sampling based on the total number of staff in the selected ministries was carried out to arrive at the number of respondents per ministry. At each ministry a simple random sampling was carried out using the list of staff in each ministry as a sampling frame, only staff that had spent at least 12 months working with the state government were included.

Data Collection and Analysis

A pre-tested semi-structured interviewer-administered questionnaire with closed and open-ended questions was used to collect relevant information with the aid of an Android mobile device using the open data kit (ODK). The questionnaire was adapted from a previous study. [21] Data was collected over a 4-week duration by 4 research assistants. A household is a group of persons who live together and eat from the same pot. Data collected includes section A: socio-demographics, section B: health-seeking behaviour, mode of payment of healthcare, cost of illness, section C: household asset holdings and household expenditure patterns.

Data was downloaded, exported from ODK to Excel, collated, grouped, and analyzed using Statistical Product and Service Solution (SPSS) version 21.0. Data on socio-demographic variables were presented using descriptive statistics of frequencies, percentages mean, and standard deviations were presented. Economic burdens (direct cost and indirect costs) were collated using descriptive statistics. The relationship between catastrophic expenditure and social class was determined using Chi-square with p set at ≤ 0.05.

Results

Table 1 shows that civil servants within the age group 28-45 years constituted more than 256 (73%) of respondents with the majority being males 208(59.3%). Most of the civil servants had 1-3 children 208(59.3%) and a household size of 1-5 persons 239 (68.1%) with a gross majority having tertiary education (292, 83.2%). About two-thirds of the respondents 219 (62%) were in the income bracket N40,000-N139,999

Table 2 shows access and pattern of healthcare utilization by civil servants in Rivers State. Malaria was the most common type of illness 263 (74.9%) among respondents. A large proportion of respondents 342 (97.4%) used out-of-pocket payment for healthcare. The majority of respondents sought care at the patent medicine vendor store, 273 (77.8%) Over 336 (95%) spent more than 30 minutes to access their usual place of care, with the commonest means of transportation being by walking 214 (61%).

Table 3 shows the direct cost of accessing healthcare by civil servants in Rivers State. The mean total direct cost was US$10.58 (SD US$22.76). The direct medical cost was US$9.70 (SD US$16.65) while the total direct non-medical cost was US$0.88 (SD US$7.11). The cost of drugs was the highest (US$7.63, SD US$6.88), followed by the cost expended in laboratory investigations (US$0.92, SD US$2.23). Accommodation constituted (US$0.39, SD$5.34) and transportation (US$0.31, SD

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US$0.75) were the most important sources of direct non-medical costs.

Table 4 shows the socioeconomic status as represented by household items owned by civil servants in Rivers State on an assets-based index. Though the highest weight was assigned to ownership of tap as a source of drinking water (0.914) this did not show much variability among the population. The ownership of motorcycles (0.712) and bicycles (0.796) was associated with mainly low-income earners, so did not factor in the determination of socio-economic status. The scree plot demonstrated that ownership of land (0.638), air conditioner (0.519), car (0.67), and private residence (0.50) accounted for over 72.1% of variability among the civil servants. The civil servants of the very poor SES were the highest 92 (26.2%) followed closely by the poor SES 89 (25.4%).

Table 5 There was no catastrophic cost at the 40% thresholds. This association at 10% threshold between types of expenditure and SES was not statistically significant (X2= 3.527, p=0.317). The mean non-food expenditure for the poorest, very poor, poor, and least poor SES were US$1,599.48, US$1,379.16, US$1,688.21, and US$1,937.55 respectively. The ratio of the poorest/least poor was 1.21, meaning that the non-food expenditure of the least poor was just a little more than that of the poorest SES.

Table 1: Socio-demographic characteristics of respondents

Variable (N=351)	Frequency	Percent
Age		
28-33 years	79	22.5
34-39 years	88	25.1
40-45 years	89	25.4
46-51 years	65	18.5
52 years and above	30	8.5
Sex		
Male	208	59.3
Female	143	40.7
Marital Status		
Married	99	28.2
Single	251	71.5
Widowed	1	0.3
Number of children		
None	109	31.1
1-3 Children	157	44.7
4-6 Children	85	24.2
Household size		
None	4	1.1
1-5 persons	239	68.1
More than 5 persons	108	30.8
Education level		
Junior Secondary	4	1.1
Senior Secondary	55	15.7
Tertiary	292	83.2
Ministry		
Education	51	14.5
Energy & natural resources	30	8.5

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Environment	38	10.8
Finance	47	13.4
Health	53	15.1
Information	42	12
Lands & Survey	41	11.7
Transport	49	14
Grade level		
Lower level (Grade 1-6)	40	11.4
Middle level (Grade 7-14)	311	88.6
Income (per month)		
<N40,000	44	12.5
N40,000-N89,999	113	32.2
N90,000-N139,999	106	30.2
N140,000-N189,999	54	15.4
N190,000-N239,999	19	5.4
N240,000 and above	15	4.3

Table 2: illness and healthcare utilization among respondents

Variable (N=351)	Frequency	Percent
Type of sickness within the last 1 month in Household		
Malaria	263	74.9
Typhoid	29	8.3
Diarrhoea	24	6.8
Others (Hypertension/ RTI*)	35	10.0
Healthcare utilization		
Traditional medicines	10	2.8
Chemist (Patent medicine Vendor)	273	77.8
Community health worker	11	3.1
Primary Health center	15	4.3
Public (general) hospital	13	3.7
Public (Tertiary) hospital	18	5.1
Private hospital or clinic	11	3.1
Method of payment		
Out of pocket	342	97.4
Health insurance	5	1.4
In kind	4	1.2
Total	351	100
Form of transportation to usual place of care		
Personal vehicle	39	11.1
Bus	82	23.4
Taxi	2	0.6
Tricycle (Okada)	5	1.4
Walked	214	61
Others	9	2.6

*RTI Respiratory Tract Infections

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Table 3: Direct medical cost per month reflecting unit cost

Cost	Mean	Standard Deviation (SD)
Direct Medical Cost (US$)*		
Registration	0.20	0.75
Drugs	7.63	6.88
Laboratory	0.92	2.23
X-ray	0.03	0.39
Admission	0.33	3.78
Surgical procedures	0.47	8.70
Hospitalization	0.12	0.60
Total	**9.70**	**16.65**
Direct Non-medical Cost (US$)*		
Transportation	0.31	0.75
Feeding	0.09	0.63
Accommodation	0.39	5.34
Utilities	0.09	0.97
Total	**0.88**	**7.11**
Total Direct Cost (US$)*	**10.58**	**22.76**

**1US$ = N306.96* (Central Bank of Nigeria, 2020)

Table 4: Socio-economic status as represented by household items owned by civil servants in Rivers State on assets based index (n=351)

Household Item	Weight	Yes, n(%)	No, n(%)
Land	0.638	170(48.4)	181(51.16)
Radio	0.525	287(81.8)	64(18.2)
Air condition	0.519	123(35)	228(65)
Television	0.571	336(95.7)	15(4.3)
Motorcycle	0.712	13(3.7)	338(96.3)
Bicycle	0.796	26(7.4)	325(92.6)
Car	0.67	140(39.9)	211(60.1)
Fridge	0.632	299(85.2)	52(14.8)
Generator	0.711	289(82.3)	62(17.7)
Electric fan	0.434	342(97.4)	9(2.6)
Private residence	0.5	115(32.8)	236(67.2)
Source of drinking water	0.914	349(99.4)	2(0.6)
Socioeconomic Status	**Quartiles**	**Frequency**	**Percentage**
Poorest	Q1	83	23.6
Very poor	Q2	92	26.2
The poor	Q3	89	25.4
Least poor	Q4	87	24.8

Table 5: Catastrophic expenditure among various socio-economic groups of Civil Servants in Rivers State

Print ISSN: 0189-9287 Online ISSN: 2992-345X

Expenditure	Poorest (n=83)	Very poor (n=92)	Poor (n=89)	Least poor (n=87)	Chi	p value
Non-food expenditure (US$)*	1,599.48	1,379.16	1,688.21	1,937.55		
Ratio of non-food q^n/q^1	1	0.86	1.06	1.21		
Ratio q^n/q^4	0.83	0.71	0.87	1		
Catastrophic threshold						
10%						
Not catastrophic	82	90	89	87	3.527	0.317
Catastrophic	1	2	0	0		
30%						
Not catastrophic	83	92	89	87		
Catastrophic	0	0	0	0		
40%						
Not catastrophic	83	92	89	87		
Catastrophic	0	0	0	0		

**1US$ = N306.96* (Central Bank of Nigeria, 2020)

Discussion

This study has examined the economic burden and catastrophic expenditure among civil servants.

In the month preceding the study, the most prevalent infection among the respondents was malaria, this is understandable since malaria is endemic in Nigeria, this also reflects that the respondents in this study will benefit from malaria preventive services. Findings from this study were similar to that of another study that reported malaria among the most common illnesses in households and a major public health challenge in Nigeria. [22, 23] It is interesting to note that each household had an illness to report in the month preceding the study and they all sought care in different facilities.

Most of the respondents in this study sought treatment from patent medicine vendors, this indicates that they have easy access to them, and they may be cheaper than going to the health facilities. They will probably only opt to visit the health facility if there is no improvement in their health. The findings in this study were different from those reported from a study among male respondents where over half of the respondents sought care at the hospital and only a third used patent medicine vendors. [24] This observation may be due to differences in the age and sex of their study respondents as they were older and only males. Likewise, another study among civil servants in Ibadan reported that almost two-thirds sought care at the hospital, while a third sought care with patent medicine vendors. [25] A community survey in Ghana also reported the hospital as the first point of care.[26]

The mean direct cost in this study was high when compared to the minimum wage at the time of data collection (30000 naira =27.8 USD) [27] in Nigeria as at the time the data was collected. This is almost 30% of the wage and therefore indicates that the very poor will have payment difficulties. If respondents were seeking care in the hospital, the mean direct cost would be expected to be higher than that reported for this study as care received at the patent medicine store or chemist was relatively cheaper. Also, since cost data was collected only for a month this might not reflect a true picture of the household illnesses as some individuals might not have been ill in the month before data collection. The Mean direct cost per month in this study was similar to the findings of a systematic analysis that reported a range of 0.62 to 38.12 USD in some countries in Africa and Asia. [28] This is to be expected as this study estimated the cost of malaria treatment which is the major illness reported in our study. The Mean direct cost per month in this study was lower than that reported by Amarachukwu et al, this is probably because their study

Print ISSN: 0189-9287 Online ISSN: 2992-345X

was about sickle cell disease where most needed admission. [29]

The means of payment for healthcare in this study by most of the respondents were out-of-pocket payments, similar findings have been reported in other studies in Nigeria. [8], [30] This indicates that most people do not have access to a prepaid plan as offered by healthcare insurance and are at increased risk of catastrophic expenditure if they or their household members are exposed to ill health for a long period. This means that the poor are at increased risk of being pushed into poverty. [2]

In this study expenditure on drugs was the highest, similar findings were reported in another study where the cost of medication and case management were the most reported direct medical costs. [1]

Catastrophic expenditure in our study was not present at the 40% level non-food threshold, although this was varied across different thresholds. Findings from this study different than those reported in another study where up to 14.8 % reported catastrophic expenditure at the 40% non-food threshold among diabetic patients. This variation may be due to the fact that most expenditure in this study was on acute illness while in their study, expenditure was on a chronic illness.[4] Other studies have reported varied rates, very high proportion of respondents, 87% with catastrophic cost at the 10% total expenditure threshold. [4] Slightly higher proportion with catastrophic expenditure was reported in a study in southeast Nigeria of 3 to 5% at a 10% threshold. [31] Observed variations may be due to the threshold used as well as differences in study populations

At the expenditure of 10 % non-food, only 1.2% and 2.2% of the poorest and poor experienced financial distress while the least poor will spend almost 1.2 times of the same and none will experience catastrophe. The least poor would spend about 40 % of their non-food consumption on ill health and still will not be at the risk of being tipped into poverty while the poorest quartile would need to spend 1/10 that of the richest to be thrown into poverty. The measure of inequality is the ratio of q1/q4 non-food expenditure was 1:1.2, lower than that reported by a study on chronic illness. [4] Those in the lowest socio-economic status were at increased risk of poverty, there is a need to provide financial risk protection through the provision of healthcare insurance.

Implications of the findings of this study:

The most prevalent illness in the month preceding the study was malaria, indicating preventing malaria will greatly reduce the illness burden. The respondents in this study made payment for care mainly via out of pocket this clearly shows lack of a payment plan such as the social health insurance plan at the time data was collected which can help prevent catastrophic health expenditure and provide financial risk protection.

The findings of this study have significant implications for the development of a robust health insurance financing scheme that will address the main health challenges faced by the populace.
Future Research Consideration: A periodic review of the economic burden of household illness is necessary to serve as a means of measurement of programmes and schemes that have been developed to provide financial risk protection.

Strength and Limitations: Limitations of the study may include There may be recall bias, as well as missing information about the ill health of family members. There may also be under-reporting of household illness as some respondents will not want to report family members' ill health so that they will not be labeled as such. In addition, the cost of care may have greatly increased because of recent inflation in the cost of goods and services in the country. This study provides useful insight into the economic burden of household illnesses in Rivers State.

Conclusion

The most prevalent illness was malaria, most study respondents opted to seek care at the patent medicine store, out-of-pocket payment was very high, and catastrophic expenditure for non-food expenditure at 40% was absent. The respondents will therefore benefit immensely from a social health insurance programme which is known to provide financial risk protection.

Declarations

Ethical Consideration: The study was approved by the Ethics Research Committee of a tertiary teaching hospital in Rivers State, permission to carry out the study was obtained from the office of the head of service,

Print ISSN: 0189-9287 Online ISSN: 2992-345X

while informed consent was obtained from the participants.

Authors' Contribution:
Conceptualization and design- Adeniji FO and Worgu G Data Collection- Both authors. Data Analysis- Both authors. Write up- Both authors

Conflict of Interest: Nil

Funding: NIL

Acknowledgement: The researchers would like to thank all who took part in the study.

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Print ISSN: 0189-9287 Online ISSN: 2992-345X