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Assessment of Household Healthcare Expenditure Among Urban Dwellers of Bauchi LGA, Bauchi State, Nigeria

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Abstract

Introduction: Globally, healthcare spending has become a major concern, particularly in developing countries where a substantial proportion of health costs is borne by individuals and households. A key issue associated with healthcare expenditure is catastrophic health expenditure, which pushes many households into poverty worldwide. This study aimed to assess household healthcare expenditure among heads of households in Bauchi metropolis, Bauchi State.

Methods: A descriptive cross-sectional study was conducted among 406 heads of households selected through multistage sampling. Data were collected using a pre-tested, interviewer-administered questionnaire and analyzed using Statistical Package for the Social Sciences (SPSS) version 26.

Results: The mean age of respondents was 42.6 ± 12.4 years. The majority (87.9%) were male, and 69.7% were married. Slightly less than half (46.3%) were engaged in business as their primary occupation, while more than one-third (39.4%) earned between ₦50,000 and ₦100,000 monthly. Approximately 45.4% of respondents spent more than 40% of their monthly income on healthcare (mean expenditure = ₦34,187.2), indicating catastrophic health expenditure.

Conclusion: A substantial proportion of households in urban Bauchi incur catastrophic health expenditures. Strengthening financial risk protection mechanisms, particularly through community-based health insurance, is essential.

Keywords: Healthcare expenditure, catastrophic health expenditure, urban health, Nigeria, out-of-pocket payments.

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Introduction

Globally, healthcare spending has become a major concern, especially in developing nations where a significant proportion of health costs is borne by individuals and families. Healthcare expenditure refers to the total amount of money spent on health services, including prevention, treatment, and rehabilitation. According to the World Health Organization, global healthcare expenditure has been steadily increasing over the years due to several factors, including the rise of non-communicable diseases (NCDs), an aging population, and the expansion of medical technologies World Health Organization, 2023. This growth in healthcare costs presents significant challenges, particularly in countries that lack comprehensive insurance systems.

A key issue linked to healthcare expenditure is catastrophic health expenditure (CHE), which occurs when a household spends a large portion of its income on healthcare services, thereby risking financial catastrophe. The threshold for catastrophic spending varies across countries, but it is generally defined as health expenditure exceeding

10% of a household's total income. In high-income countries, CHE is often mitigated through universal health insurance, but in low- and middle-income countries (LMICs), where healthcare systems are often underfunded, the incidence of CHE is disproportionately higher Xu et al., 2022.

Healthcare financing is also a significant global concern. While some countries have implemented successful health financing systems, others continue to struggle with inefficiencies and inequities. The availability of public health insurance plays a crucial role in reducing the financial burden on households. Countries such as Germany, Canada, and the United Kingdom have universal health coverage systems that protect citizens from catastrophic healthcare spending, primarily funded through taxation or public financing mechanisms Buchmueller et al., 2020. However, in many LMICs, including India, Brazil, and Nigeria, public health insurance schemes often cover only a small fraction of the population, leaving the majority to rely on out-of-pocket payments, thereby increasing the prevalence of CHE.

Healthcare expenditure has become a focal issue globally due to its implications for both economic and public health outcomes. In high-income countries, healthcare systems generally operate under universal health coverage (UHC), ensuring financial protection against catastrophic expenditure. Conversely, in LMICs, healthcare expenditure is often a major burden for individuals, as many people are required to pay for services out-of-pocket due to inadequate coverage and systemic challenges such as poor infrastructure and limited human resources Liu et al., 2022. This lack of financial protection leads to disparities in health outcomes, with households often delaying or forgoing necessary care due to cost constraints, thereby worsening health conditions and increasing poverty levels. Several studies have documented the adverse effects of catastrophic healthcare expenditure, including indebtedness, asset depletion, and reduced spending on essential needs such as education Liu et al., 2022.

In Africa, healthcare expenditure is significantly influenced by poverty, weak health systems, and limited financial protection mechanisms. The inability of many African countries to provide universal health coverage has resulted in high out-of-pocket healthcare payments Mladovsky et al., 2021. This forces households to either forgo care or incur debts and sell assets to finance treatment. In sub-Saharan Africa, catastrophic health expenditure remains a significant problem, with many households spending more than 10% of their income on healthcare. Evidence shows that countries such as Ghana, Nigeria, and Kenya have experienced increasing burdens of CHE Masiye et al., 2022. Despite efforts to implement national health insurance schemes, coverage remains limited, leaving many households vulnerable to financial hardship Mladovsky et al., 2021.

In Nigeria, healthcare expenditure remains a critical issue, with many households experiencing financial hardship due to high out-of-pocket payments. Public health insurance coverage is low, with only a small proportion of the population enrolled, leaving the majority to bear healthcare costs directly Onwujekwe et al., 2022. This challenge is particularly pronounced in the informal sector, which constitutes a large proportion of the workforce. Consequently, households are more likely to experience catastrophic health expenditure, especially during health shocks Aregbeshola & Khan, 2022. Poverty further exacerbates this situation, limiting the ability of households to afford healthcare services. In addition, inadequate healthcare infrastructure often compels individuals to seek care from private providers, where costs are higher Obikeze et al., 2021. Although initiatives such as the Basic Health Care Provision Fund (BHCPF) have been introduced to improve healthcare financing, government expenditure on health remains low, limiting progress toward universal health coverage Onwujekwe et al., 2022.

This study, therefore, seeks to assess the healthcare expenditure patterns of urban households in Bauchi Local Government Area (LGA), Bauchi State.

Methods

Study Design

A descriptive cross-sectional study was conducted among heads of households in Bauchi metropolis.

Study Setting

Bauchi (formerly Yakoba) is a city in northeastern Nigeria and serves as the administrative headquar-

ters of Bauchi State, Bauchi Local Government Area (LGA), and the traditional Bauchi Emirate. It is located on the northern edge of the Jos Plateau at an elevation of approximately 616 meters above sea level. The LGA covers an area of 3,687 km^2 and had a population of 493,810 according to the 2006 national census. Bauchi LGA comprises 12 electoral wards.

Study Population

The study population comprised all eligible households within the study area. A total sample size of 406 households was included in the study.

Sampling Technique

A multistage sampling technique was employed to select eligible participants. Heads of households who met the inclusion criteria and provided informed consent were recruited into the study.

Inclusion and Exclusion Criteria

Inclusion criteria:

- Households that consented to participate in the study.
- Heads of households.
- In the absence of the head of household, a household member aged 18 years or above could serve as a proxy respondent.

Exclusion criteria:

- Households that did not provide consent.
- Household members younger than 18 years acting as proxy respondents.

Sample Size Determination

The sample size was calculated using the single population proportion formula:

$$n = \frac{Z^2 \times pq}{d^2}$$

where n is the minimum sample size, Z is the standard normal deviate (1.96 at 95% confidence level), p is the prevalence of catastrophic health expenditure (40%) based on a previous study **Etiaba2016**, $q = 1 - p = 0.60$, and d is the desired level of precision (0.05).

$$n = \frac{(1.96)^2 \times 0.40 \times 0.60}{(0.05)^2} = 368.79 \approx 369$$

Assuming a 10% non-response rate:

$$n = 369 + 36.9 = 405.9 \approx 406$$

Thus, the final sample size was 406 participants.

Data Collection Instrument

Data were collected using a structured, pre-tested, interviewer-administered questionnaire. Research assistants were trained prior to data collection. Information obtained included socio-demographic characteristics, household healthcare expenditure patterns, and health insurance enrollment status.

Data Analysis

Data were checked, coded, cleaned, and entered into the Statistical Package for the Social Sciences (SPSS) version 24.0 for analysis. Descriptive statistics such as frequencies, percentages, means, and standard deviations were used to summarize the data. These included respondents' socio-demographic characteristics, patterns of healthcare expenditure, prevalence of health insurance enrollment, and incidence of catastrophic health expenditure.

Inferential analysis was conducted using the chi-square (χ^2) test to assess associations between categorical variables. A p-value of less than 0.05 was considered statistically significant.

Ethical Considerations

Ethical approval was obtained from the Ethics Committee of the National Open University of Nigeria (NOUN). Informed consent was obtained from all participants prior to data collection, and confidentiality of information was strictly maintained.

Results

A total of 406 questionnaires were administered to participants in the study area. All questionnaires were filled and retrieved, resulting in a response rate of 100%.

Table 1: Socio-demographic Characteristics of Respondents ($N = 406$)

Variables	Frequency (n)	Percentage (%)
Age (years)		
19–28	84	20.7
29–38	134	33.0
39–48	81	20.0
49–58	53	13.1
≥59	54	13.3
Mean (SD)	42.6 (± 12.4)	
Sex		
Male	357	87.9
Female	49	12.1
Ethnicity		
Hausa	229	56.4
Fulani	94	23.2
Igbo	30	7.4
Jarawa	18	4.4
Yoruba	15	3.7
Others	20	4.9
Religion		
Islam	369	90.9
Christianity	37	9.1
Educational status		
Primary	12	2.9
Secondary	189	46.6
Tertiary	186	45.8
Non-formal	19	4.7
Marital status		
Single	123	30.3
Married	283	69.7
Occupation		
Civil servant	110	27.1
Business	188	46.3
Artisans	78	19.2
Farmer	30	7.4
Monthly income (NGN)		
<50,000	131	32.3
50,000–100,000	160	39.4
100,001–150,000	50	12.3
150,001–200,000	29	7.1
>200,000	36	8.9

Note: SD = Standard Deviation

The mean age of respondents was 42.6 ± 12.4 years, with more than half (53.0%) falling within the age range of 28 to 48 years. The majority of respondents were male (87.9%) and 69.7% were married. Secondary education constituted 46.6% of respondents, followed closely by tertiary education (45.8%). Slightly less than half (46.3%) were engaged in business as their primary occupation.

Table 2: Distribution of Respondents by Household Healthcare Utilization and Expenditure Characteristics ($N = 406$)

Variables	Frequency (n)	Percentage (%)
Healthcare sought		
Orthodox	300	73.9
Traditional	5	1.2
Both	101	24.8
Type of health facility visited		
Public	317	77.9
Private	38	9.3
Type of public facility		
Primary Health Centre	257	63.1
General hospital	18	4.4
Specialist hospital	46	11.3
Teaching hospital	49	12.0
Services received		
Inpatient	54	13.3
Outpatient	124	30.5
Both	212	52.2
Reason for using traditional medicine		
Easy to access	68	16.7
Cultural/heritage reasons	38	9.4
Major ailments		
Malaria fever	184	45.3
Typhoid fever	88	21.7
Malaria and typhoid fever	78	19.2
Hypertension	17	4.2
Peptic ulcer	13	3.2
Distance to health facility (km)		
0–5	367	90.4
>5	14	3.4
Mode of transport		
Walking	130	32.0
Car/Bus	71	17.5
Motorcycle	169	41.6
Bicycle	6	1.5
Tricycle	26	6.4

Table 3: Distribution of Respondents by Health Insurance Enrollment ($N = 406$)

Variables	Frequency (n)	Percentage (%)
Enrollment in health insurance		
Yes	65	16.0
No	341	84.0
Type of health insurance (n = 65)		
National Health Insurance Scheme	56	86.2
Private Health Insurance Scheme	9	13.8
Reason for non-enrollment (n = 341)		
No stated reason	341	100.0
Satisfaction with services (n = 65)		
Yes	59	90.8
No	6	9.2

Note: Percentages for subcategories are based on their respective denominators (insured or uninsured respondents).

The mean monthly income was ₦85,468.1 ± 12,311.6, with 39.4% earning between ₦50,000 and ₦100,000 (see Table 1).

Table 4: Proportion of Households Experiencing Catastrophic Health Expenditure ($N = 406$)

Variables	Frequency (n)	Percentage (%)
Household healthcare expenditure		
<40% of monthly income	225	55.4
≥40% of monthly income (Catastrophic)	181	44.6

Note: Catastrophic health expenditure is defined as household healthcare spending equal to or exceeding 40% of monthly income.

Regarding healthcare utilization, about three-quarters (73.9%) of respondents sought orthodox medical care, and 77.9% accessed care through public hospitals. Slightly more than half (52.2%) utilized a combination of inpatient and outpatient services. Among those who used traditional medicine, 64.2% reported ease of access as the main reason. Malaria was the most commonly reported illness prompting healthcare utilization (45.3%). Approximately three-quarters (75.5%) of respondents lived within 5 km of the nearest health facility (see Table 2).

Only 16.0% of respondents were enrolled in any form of health insurance. Among those enrolled, the majority (86.2%) were registered under the National Health Insurance Authority (NHIA). Furthermore, 90.8% of insured respondents reported satisfaction with the services received (see Table 3).

With respect to healthcare expenditure, 44.6% of respondents spent ₦34,187.2 or more monthly on healthcare, which was classified as catastrophic health expenditure (see Table 4).

Discussion

The findings of this study showed that slightly below three-quarters (73.9%) of respondents sought healthcare through orthodox medical services. Globally, orthodox medicine remains the dominant form of healthcare, particularly in developed countries World Health Organization, 2023. In low- and middle-income countries (LMICs), access varies depending on affordability and infrastructure. For instance, a study in India reported that approximately 65% of respondents utilized orthodox healthcare services Patel et al., 2020, which is slightly lower than the findings of this study.

Traditional medicine remains widely used, particularly where orthodox care is expensive or inaccessible. Evidence suggests that a substantial proportion of populations in Africa and Asia utilize traditional medicine alongside conventional healthcare World Health Organization, 2023. In sub-Saharan Africa, access to orthodox care depends largely on infrastructure availability, although the co-use of traditional medicine remains common due to cultural practices Dovlo & Gyapong, 2022. In South Africa, 71% of respondents preferred orthodox healthcare, with affordability identified as a key determinant Mokgobi, 2021. In contrast, this study found that only 26.1% of respondents relied on traditional medicine, although a significant proportion reported using it in combination with orthodox care. However, nearly two-thirds (64.2%) of those who used traditional medicine cited ease of access as the primary reason. This finding is higher

than the 31.9% reported in Southwest Nigeria Fakeye et al., 2020 but aligns with urban utilization patterns.

Malaria was identified as the most common condition prompting healthcare utilization, as reported by 45.3% of respondents. Globally, malaria remains a major public health concern, particularly in tropical regions, and continues to drive healthcare utilization World Health Organization, 2023. In Africa, malaria accounts for a substantial proportion of outpatient visits. However, the proportion observed in this study is lower than reports from other settings. For example, studies in Kenya and Nigeria have reported higher proportions of healthcare utilization attributable to malaria.

Geographic accessibility remains an important determinant of healthcare utilization. The World Health Organization recommends that households should be located within 5 km of a healthcare facility. In many LMICs, distance remains a significant barrier to healthcare access Dovlo & Gyapong, 2022. In Uganda, for example, long distances to healthcare facilities have been reported as a major constraint Mugisha et al., 2021. In contrast, this study found that only 24.5% of respondents lived more than 5 km from a healthcare facility, suggesting relatively better geographic access compared to other African settings.

Health insurance coverage remains low in many LMICs. While countries with universal health coverage achieve enrollment rates exceeding 90%, coverage in LMICs is substantially lower World Health Organization, 2023. In Nigeria, health insurance enrollment remains particularly low, with the majority of households relying on out-of-pocket payments Onwujekwe et al., 2022. This study found that only 16.0% of respondents were enrolled in any form of health insurance, which is consistent with previous findings. Despite low enrollment, a high proportion (90.8%) of insured respondents reported satisfaction with the services received. This suggests that improving access to insurance schemes could enhance financial protection and healthcare utilization.

The prevalence of catastrophic health expenditure (CHE) in this study was 44.6%, indicating a substantial financial burden on households. This finding is higher than reports from Kenya (33.4%) Barasa et al., 2021 and Ethiopia (36%) Tilahun et al., 2021. However, it is consistent with trends observed in Nigeria, where the incidence of CHE has been increasing over time Aregbeshola & Khan, 2022. The high level of CHE observed in this study underscores the need for strengthening financial risk protection mechanisms, particularly through expanding health insurance coverage and reducing out-of-pocket payments.

Conclusion

Household healthcare expenditure in urban Bauchi poses a significant financial burden, with a high prevalence of catastrophic spending (44.6%). There is a need for targeted policy interventions aimed at expanding health insurance coverage, subsidizing healthcare for vulnerable populations, and strengthening primary healthcare systems to improve financial protection and access to care.

Recommendations

Strengthening health insurance schemes is essential. Expanding the National Health Insurance Scheme (NHIS) to cover informal sector workers and low-income households through targeted subsidies and flexible payment options will improve enrollment. In addition, comprehensive awareness campaigns should be conducted to educate the public on the benefits of health insurance and enrollment procedures.

Improving healthcare affordability is also critical. The introduction of community-based health insurance (CBHI) schemes tailored to urban populations, supported by public-private partnerships, can enhance financial protection. Providing financial assistance or waivers for vulnerable households will further reduce out-of-pocket healthcare expenditures.

Enhancing healthcare quality and accessibility should be prioritized. Strengthening the capacity of public healthcare facilities to deliver quality services, as well as addressing gaps in drug availability and effectiveness, will improve patient satisfaction and trust in the healthcare system.

Policy and legislative support are necessary to ensure sustainability. The implementation of mandatory health insurance enrollment policies, with phased integration strategies, can promote equitable access across all socioeconomic groups.

There is also a need to strengthen monitoring and evaluation systems. Establishing mechanisms for regular assessment of healthcare expenditure trends and the performance of health insurance schemes will support evidence-based policy decisions.

Finally, promoting economic empowerment is crucial. Addressing poverty through job creation and income-generating initiatives will enhance households' ability to afford healthcare services and insurance premiums.

What is Known About This Topic

Previous studies have established the level and prevalence of catastrophic health expenditure, particularly in low- and middle-income countries. Evidence also highlights the generally low prevalence of health insurance coverage in these settings. Additionally, the types of healthcare services commonly utilized, including both orthodox and traditional care, have been well documented.

Authors' Contributions

Mukhtar Muhammad Sa'idu contributed to the conceptualization of the research, data analysis, interpretation of findings, and drafting of the manuscript. Muhammad Lawan Gana contributed to drafting the manuscript and revising it for intellectual content. Aliyu Mohammed Maigoro contributed to the study design, data analysis, interpretation of results, and drafting of the manuscript.

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Conflict of Interest Statement

The authors declare no competing financial interests or personal relationships that could have influenced this work.

Implications for Practice and Policy

The findings of this study have important implications for both healthcare practice and policy formulation in Bauchi LGA and similar urban settings. High levels of household healthcare expenditure and the presence of catastrophic spending suggest the need to strengthen financial risk protection mechanisms. Expanding access to affordable and comprehensive health insurance schemes, particularly for low- and middle-income households, should be prioritized. In practice, healthcare providers and managers should promote cost-effective interventions, improve transparency in healthcare pricing, and encourage early health-seeking behavior to prevent expensive late-stage treatments. From a policy perspective, government and stakeholders should increase investment in public healthcare services, subsidize essential health services, and regulate out-of-pocket payments. There is also a need for targeted interventions aimed at vulnerable populations to reduce inequities in healthcare access and financial burden.

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