

Accessibility Standards of Community Health Facilities in Southeast Nigeria: Urban-Rural Comparative Analysis

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Abstract

Access to healthcare remains a bothersome challenge, with stark inequalities between urban and hinterland settlements hindering the progress of the Universal Health Coverage. In light of this development, this study investigates the standards of accessibility of community healthcare facilities (CHFs) in Southeastern Nigeria through a detailed urban-rural comparison. A comparative cross-sectional research design was implemented, drawing on key informant interviews (KIIs), focus group discussions (FGDs), and structured questionnaires. Data were extracted from 40 CHFs across Anambra and Ebonyi states, which present extremes of urban and rural peculiarities. Access to healthcare facilities was assessed across the four dimensions: infrastructural, geographical, financial and cultural. Quantitative data were analysed using descriptive statistics, while qualitative perceptions were decoded thematically. Results showed pronounced imbalances between CHFs in urban and rural areas. Mean travel distances to urban and rural CHFs were recorded as 2.3km and 5.75km, respectively, underscoring significant geographic disparity. CHFs in rural areas showed notable infrastructural deficits and extended waiting periods, with an average delay of 59 minutes (≈ 1 hour). Conversely, facilities in urban locales presented non-reimbursable expenses that doubled rural expenditure, highlighting financial barriers for urban uCHFs. Despite these challenges, there is a higher cultural acceptability and contentment level observed in rural uCHFs. This shows a stronger communal cohesion, social bonding, and trust within rural social cohorts. Finally, the study affirms a region with multidimensionally unequal access to CHFs. While community members in urban locales grapple with fiscal constraints, their counterparts in rural areas contend with infrastructural rot and locational challenges. Enactment of enforceable benchmarks for accessibility and fair locational distribution of CHFs are some of the recommendations floated by the study. Others include revamped road networks and economic subsidies extended to users. This would help to curtail financial exclusion. Implementing these measures would encourage inclusive and fair delivery of healthcare across Nigeria's diverse regions.

Keywords: Community Healthcare Facilities, Communal Cohesion, Geographic Disparity, Infrastructural Decay, Universal Health Coverage.

Introduction

One of the focal points of the global health discussion is healthcare accessibility, especially in the low and middle-income countries (LMICs), where the distribution of resources and the development of infrastructure are uneven (Otieno, Wambiya, & Mohammed, 2020). In Nigeria, which is the most populous country in Africa, accessibility of people to quality

health services is defined by geographical, financial and systemic factors that indicate the existence of greater inequalities in the health sector. Nigeria has been blessed with human and natural resources, yet it is struggling to achieve health indicators that are below global standards (Sampson, Umar, & Obi-Jeff, 2024). As posited by Yanful, et al. (2023), the World Health Organisation (WHO) states that universal health coverage (UHC) should mean that anyone and everyone has access to the essential health services they need, such as prevention, promotion, treatment, rehabilitation and palliation of adequate quality without straining their purse. However, the healthcare system in Nigeria, which is organised into primary, secondary, and tertiary levels, has not been able to achieve such results fairly (Adomi, et al., 2024).

At the core of this struggle is the primary healthcare system, which is meant to be the core of the provision of health services to the community (Daniel, et al., 2016). Primary health care facilities are supposed to be the initial contact point of the citizens, particularly the rural and semi-urban citizens. Nevertheless, they are usually undermined due to the absence of good infrastructure, insufficient staff, unavailability of necessary medicine and long distances to reach them (Maidoki, 2017). This has led to high levels of preventable morbidity and mortality, especially in the case of vulnerable populations such as children, pregnant women, the elderly, and people living with disabilities. This is an assumption as there exists little information on the extent of the impact of such key performance indicators on the quality of health service delivery, especially in rural areas (Lorretta, et al., 2021); (Chukwuechefulam, et al., 2022).

In a situation where there could be a higher number of community health facilities in urban areas, these facilities might not be entirely accessible (Aregbesola, et al., 2017); (Adejare, et al., 2024). City dwellers have problems like inadequate and congested facilities, lengthy queues and hindrances from financial issues that could restrict access to early treatment (Fayehun, et al., 2022). The barriers in the rural setting are heightened by the lack of good transportation systems, inadequate medical staff, and specialised services (Awofeso, 2010). The longstanding inequity in urban and rural healthcare service provision informs the need to assess the accessibility criteria in an organised, evidence-based way. Such an assessment gives information on operational gaps that exist and how they can be improved upon by interventions towards an overall better performance of the system in Nigeria.

Although previous studies have raised awareness on accessibility and functionality of community health facilities (CHFs) in Nigeria, there are still limitations that hover around the dearth of comparative, region-specific empirical data, as seen in Fulus, (2025), excessive reliance on user reports and detached surveys by Munos et al., (2018), Bhattacharya, et al., (2020) and Oyekale, (2017), limited deployment of mixed methodology as seen in Agnese, et al., (2023) and Martin, et al., (2015) and Semeeh & Laurent, (2024) and very little data-based evidence that statistically compares major quality and access indicators like waiting time, out-of-pocket (OOP) expenditure, travel distance, cultural acceptability, infrastructural readiness and satisfaction evident in Sibeudu, et al., (2019) and Onyenoro, et al., (2016). This significant empirical gap brings to the fore the need to have robust, region-

specific, mixed-method, comparative data that measures the nuances of how urban versus rural CHF's play out in the southeastern geopolitical zone of Nigeria. Such a gap was addressed by this study by its urban vs. rural comparison to highlight intra-regional disparities, deployment of a mixed-methods design towards triangulating across systems, quantifying differences across multiple access and quality indicators and providing regionally contextualised, granular evidence that supports targeted health policy recommendations for Southeast Nigeria. This guides a better understanding of the performance of accessibility standards, infrastructure readiness, service quality and user satisfaction.

Accessibility standards refer to rules or principles that help provide healthcare services in an acceptable, affordable, and accessible way to every category of persons in the population, without any form of discrimination (Tina, 2019). These standards focus on equity, which underlines that healthcare must be administered according to demand and not according to socioeconomic or geographic privilege. In the case of Nigeria, where more than half of the population lives in rural settlements, the contribution made by community health facilities is of particular importance (Adepoju, Onafuye, Megbuwon, & Ogunseye, 2025).

The significance of accessibility standards is the fact that they can measure and ensure equity in health provision within diverse populations (Waters, 2000). There are four fundamental dimensions to such accessibility.

Figure 1

Accessibility: Fundamental dimensions.



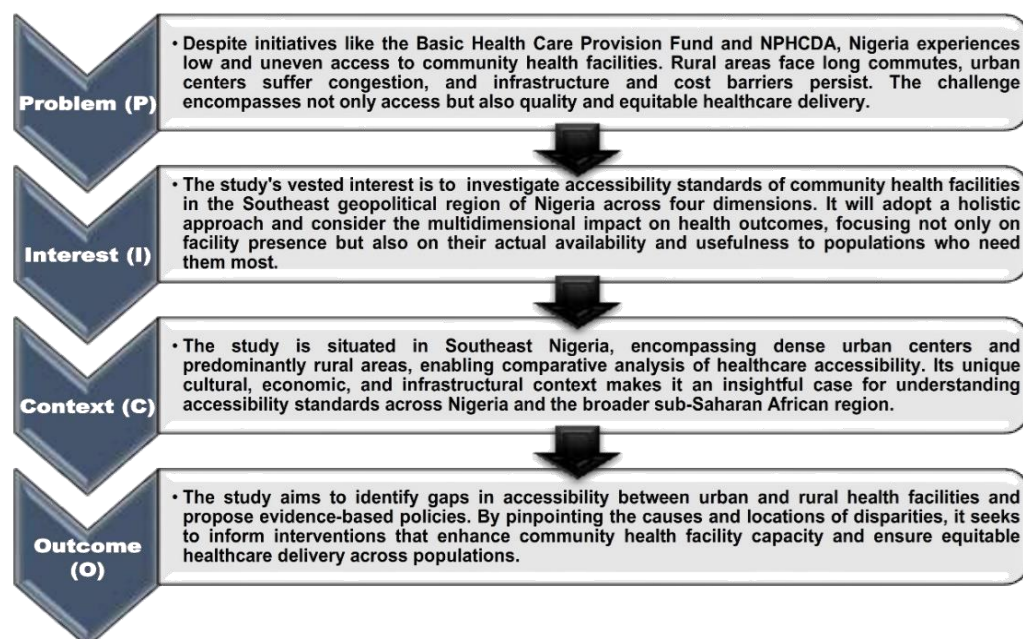
Note. This figure depicts the four fundamental dimensions of accessibility. These include infrastructural, geographical, financial and cultural dimensions. Source: Author's workstation.

- a. *Infrastructural Accessibility*: In this case, accessibility of health facilities is measured in terms of plausible travelling distance, and the inclusivity of such facilities in terms of being reachable by persons with disabilities and those that can be classified as vulnerable persons (Bright, Wallace, & Kuper, 2021).
- b. *Geographical Accessibility*: This focuses on the ease with which the facilities can be accessed in terms of the roads, transport facilities and natural barriers (Delamater, Messina, Shortridge, & Grady, 2012).
- c. *Financial Accessibility*- The cost of healthcare services, such as the cost of consultation, drugs, and other undisclosed costs, compared to the household income levels (Soltani & Sadeghi, 2019).
- d. *Cultural Accessibility*- This answers the question of how services that are sensitive to language, cultural customs, gender norms, and community values affect the behaviour of persons seeking healthcare (Saha, Beach, & Cooper, 2008). Enhancing these standards at the community level enhances both preventive and curative health care, decreases the burden on tertiary hospitals and builds trust in the health system. Lack of effective accessibility benchmarks will keep equity a mirage. This will disconnect the Nigerian state from meeting up with the UHC and Sustainable Development Goals (SDGs), especially the third goal 3 (McKing & Ifunanya, 2021).

As opined by Santhos, Pimenta, & Nobre (2007), the PICO model, shown in Figure 2, informed the framework that was used to describe and analyse the extent of the study.

Figure 2

The PICO model



Note. The study's PICO model shows the problem, interest, context and outcome. Source: Santhos, et al., 2007.

- a. *Problem (P)*: Despite the introduction of the Basic Health Care Provision Fund and the implementation of the National Primary Health Care Development Agency (NPHCDA), Nigeria still has low and uneven access to community health facilities. These constraints are seen in longer commute distances to health facilities in rural areas, congestion in the urban facilities, poor infrastructure and cost barriers. It is not just an issue of access, but also quality and equity in the delivery of healthcare (Omonona & Akinmoladun, 2015).
- b. *Interest (I)*: The current study is aimed at examining the accessibility standards of community health facilities in the aforementioned four dimensions. The study is holistic, and thus the multi-dimensionality of accessibility and its health outcome implications are taken into account. It is of interest to know not only their presence but also whether they are available to populations that need them (Titus & Akinmoladun, 2015).
- c. *Context (C)*: The study is place-based within the setting of Southeast Nigeria - a region with a combination of high-density urban centres and mostly rural populations. This provides the basis for a comparative analysis of the standards of accessibility of urban and rural areas. Southeast Nigeria is a special case in terms of cultural, economic, and infrastructural dynamics and is therefore a good case study for the wider Nigerian and sub-Saharan African setting (Onyeonoro & Okafor, 2016).
- d. *Outcome (O)*: It is hoped that the outcome will be the flotation of actionable knowledge on the existence of gaps in accessibility between urban and rural facilities, and the proposal of evidence-based policies and practices. The investigation will inform interventions that will help combat disparities. Determining the location and cause of such disparities will help increase the capacity of community health facilities to address the needs of the population (Nnadi, Ossai, & Nwokocha, 2024).

Aim and Objectives

The aim of this study is to evaluate and compare the accessibility standards of community health facilities in Southeast Nigeria, with a focus on identifying urban–rural disparities and recommending evidence-based strategies to enhance equitable healthcare access.

In particular, the research will aim to:

- a. To determine the existing degree of physical access to community health facilities in urban and rural localities of southeast Nigeria.
- b. To examine the extent of reaching community healthcare facilities based upon geographical dimensions of transportation networks and spatial distribution across urban and rural settings.
- c. To investigate the implications of cost in accessing community healthcare services through the evaluation of the cost of getting medical attention and personally incurred medical expenses in various socioeconomic backgrounds.

- d. To examine the level of acceptability based on social and cultural nuances that focus on gender, language, and attitudes that portray health-seeking trends in various community settings.
- e. To compare overall accessibility gaps between urban and rural community health facilities and propose targeted policy and practice recommendations for improved equity in healthcare delivery.

Research Questions

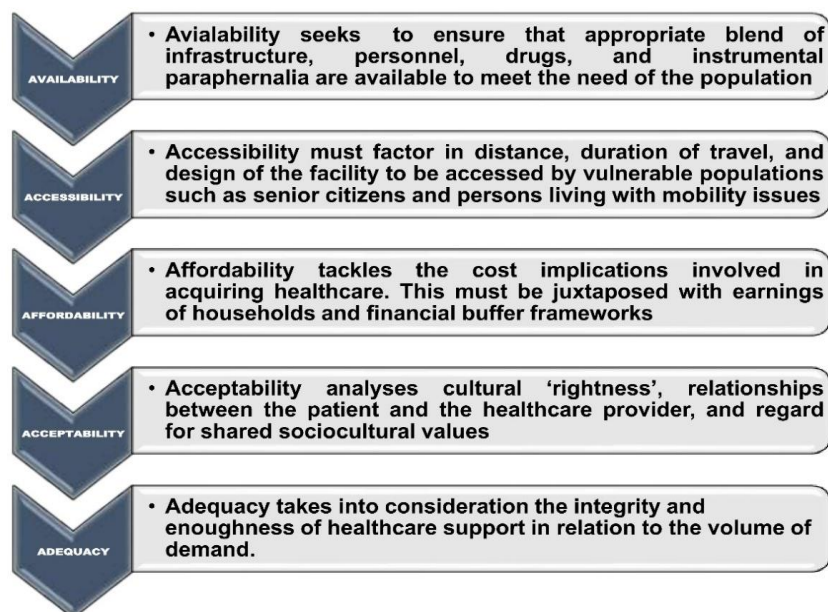
- a. With respect to levels of physical accessibility, how does it differ between urban and rural communities in Southeast Nigeria?
- b. Vis-à-vis transportation networks, spatial distribution and travel distance, what differences subsist in geographical accessibility between urban and rural community health facilities in Southeast Nigeria?
- c. Considering cost-related factors like transport expenses and out-of-pocket medical expenses, how do such factors affect access to CHF's within different socioeconomic cohorts in urban and rural communities of Southeast Nigeria?
- d. What is the influence of cultural and social factors on the acceptability of CHF's in urban and rural areas of Southeast Nigeria?
- e. Between urban and rural CHF's, what constitutes the key differences in multidimensional accessibility as shown in Figure 1 and what empirical-based approaches can improve fair access to healthcare?

Literature Review

Access to healthcare is much more than the physical presence of medical services. Gulliford (2002) stresses that access to healthcare services involves the processes, conditions and enabling supports that ensure that individuals obtain needed care. Roy et al., (1981) deepened this conversation by the conceptualisation of five interlinked dimensions which must harmonise the characteristics of the healthcare plexuses with the needs of healthcare users. These dimensions, like availability, accessibility, affordability, acceptability and adequacy, highlight sensitive issues such as appropriate infrastructure, travel distance, cost, cultural fit and system capacity. These dimensions of access, as shown in Figure 3, are the basis of a foundational lens for evaluating how far health systems meet the needs of the immediate population.

Figure 3

Dimensions of 'Access'



Note. Dimensions of 'Access'. Source: Roy & William, 1981.

This is particularly important in low-resource contexts. WHO's global reference frameworks, founded on access guidelines and the Universal Health Coverage standards, stress equitable access and financial protection of users (Kieny, 2017). Across countries with robust public health mechanisms, evidence abounds on the adherence to service catchment standards, equity-focused financing and personnel thresholds help to minimise disparities (Campbell, 2013). Such global benchmarks as practised in Brazil and Thailand serve as comparators for understanding Nigeria's access challenges, especially where divergence occurs.

Back home in Nigeria, community health facilities (CHFs) play pivotal roles in bridging rural-urban gulfs. In our clime, rural locales host the majority of its population (Abdulraheem, 2017). As compared to global norms, the nation's CHFs have consistently exhibited shortages in drug supply, poor staffing, poor referral systems and deficits in facility maintenance (Udochukwu, 2023). These challenges constitute severe limitations in availability and adequacy. There are also out-of-pocket (OOP) costs and expenditures, which erode affordability, thus widening inequalities. This negates the principles of UHC. Even with the National Primary Health Care Development Agency's (NPHCDA) regulatory framework, there is significant variance across states, which results in unfair access outcomes on a national scale (Uchenna, 2024).

Studies have consistently reported a deepening rural-urban dichotomy. In Lagos State, burghal locales have comparatively higher facility density and larger, well-qualified pools of health personnel (Obubu, 2023). Irrespective of this, users are still confronted with fiscal hiccups, long waiting times and overcrowding problems. These issues exist all over the

country. In rural areas, there are additional deadweights such as poor road networks and longer travel distances. As evidenced in the northern parts of the country, rural residents commute over 10 km to reach the nearest CHF (Lawan, 2021). This finding is likely to support emerging data from the southeast study cohort. Regional studies from the southeast zone, as cited by Nnamdi & Igwe (2025) in *'Analysis of Accessibility, Affordability, and Quality Concerns in Private Healthcare Delivery in Southeast Nigeria'*, similarly cite urban congestion, service shortages and rural neglect. These trends reinforce the need for a systematic and comparative analysis to note and track macro-regional patterns, micro-regional nuances and context-specific drivers.

As opined by Alkhawaldeh et al., (2023), Andersen's Behavioural Model of Health Services Use provides a foundational analytical template that connects individual predispositions that enabling resources, perceived needs and structural determinants. This framework supports a multi-layered interpretation of access that helps to explain why travel distance, satisfaction levels and affordability limitations differ, not only between urban and rural areas, but also between administrative geopolitical units with similar contexts vis-à-vis socioeconomic persuasions. The model is strongly in alignment with Roy and William's *'Dimensions of Access'*.

Averik, et al., (2024) opined in *'Spatial Analysis of Physical Accessibility to Public Primary Healthcare Centres in Kaduna State, Nigeria'* that recent regional studies have consistently revealed that one of the determinants of access, centrally located facilities, reduces travel issues, which in turn, improves reachability. Usman & Ibrahim (2020) posited in *'Analysis of Spatio-Physical Accessibility of Healthcare Facilities in Nangere Local Government Area of Yobe State, Nigeria'* that road quality and transport availability strongly mould locational accessibility nationwide. Obinna et al., (2010) in *'Investigating determinants of out-of-pocket spending and strategies for coping with payments for healthcare in southeast Nigeria'* submitted that high out-of-pocket (OOP) payments undermine nationwide affordability of healthcare services. In addition, sociocultural alignment affects acceptability across varied communities Yemi et al., (2022). Inasmuch as these contributions subsist and lend credence to this study, the reported magnitudes of this study vary across the nation's geopolitical zones. This is an indication of the fact that local infrastructure, administrative capacity and cultural composition could trigger divergence. To this end, the importance of this study's focus on the southeast comes to bear, where convergence with national trends (long travel distances and persistent OOP burdens) and divergence (state-level differences in policies and culturally specific satisfaction determinants) are expected.

In all, this review demonstrates strong thematic alignment with this study and in so doing, inherent gaps are exposed, especially the lack of comparative studies that systematically place side-by-side rural and urban settings with the southeast geopolitical zone. Through the integration of national and regional findings, and analysing convergence/divergence, this study aims to contribute empirical-based data to support equitable healthcare planning.

Methodology

Research Design

The study adopted Ugbaja et al.'s (2023) comparative cross-sectional research design combining quantitative and qualitative approaches. This was to allow for a simultaneous assessment of urban and rural healthcare facilities across the four dimensions of accessibility, as shown in Figure 1. Such a research design will also allow for the exploration of contextual and lived experiences that mould health-seeking behaviours.

Study Area

The study is domiciled in the five southeast states of Abia, Anambra, Ebonyi, Enugu and Imo. This region of the country features dense urban centres and concomitant rural enclaves, making it most appropriate for a comparative urban-rural analysis.

Population, Sampling and Sample Size

a. *Target population*: Target participants are

- i. healthcare professionals (nurses, doctors, community health officers and administrators).
- ii. users of community health facilities (uCHFs), and

A simple multiplicative formula (Konstantina, Julie, Susan, & Terry, 2018) was used to calculate the sample size of (i):

$$N_{total} = F \times R \times S \quad \text{Equation 1}$$

Where: N_{total} = Key Informant Interviews (KIIs)

F = total number of facilities documented per state = 20

R = healthcare respondents for each state = 4

S = number of states. = 2

Therefore, $N_{total} = 20 \times 4 \times 2 = 160$.

To this end, a total of one hundred and sixty (160) healthcare professionals were engaged in KIIs throughout the entire study.

Hilson, et al. (2015) multi-stage stratified sampling was used to calculate the sample size of (ii). The first stage, as shown in Figure 4, involved the selection of two states – one state that is majorly urbanised and one state that is predominantly rural-based (NBS, 2020). This is to allow for cross-comparison. The second stage involved stratified random selection of healthcare facilities in each state. These healthcare facilities were selected from urban and rural settings in each state. Table 1 shows a list of 40 documented healthcare facilities, 20 healthcare facilities per state. A total of 20 healthcare facilities were located in each state (10 each randomly located in urban and rural areas). Systematic random sampling of users formed the third stage. Cochran's formula was used to calculate the minimum number of uCHFs required for the study. Applying the formula:

$$n_o = \frac{Z^2 \cdot p(1-p)}{e^2} \quad \text{Equation 2}$$

Where Z = 1.96 for a 95% confidence level,

p = maximum variability. To this end, 0.51 is used.

This accounts for an estimated prevalence of the outcome.

$e = 0.05$ margin of error. Therefore, $n_o = \frac{1.96^2 \times 0.51 \times 0.51}{0.05^2} = \frac{3.8416 \times 0.2601}{0.0025} = 399.68 \approx 400$ uCHFs.

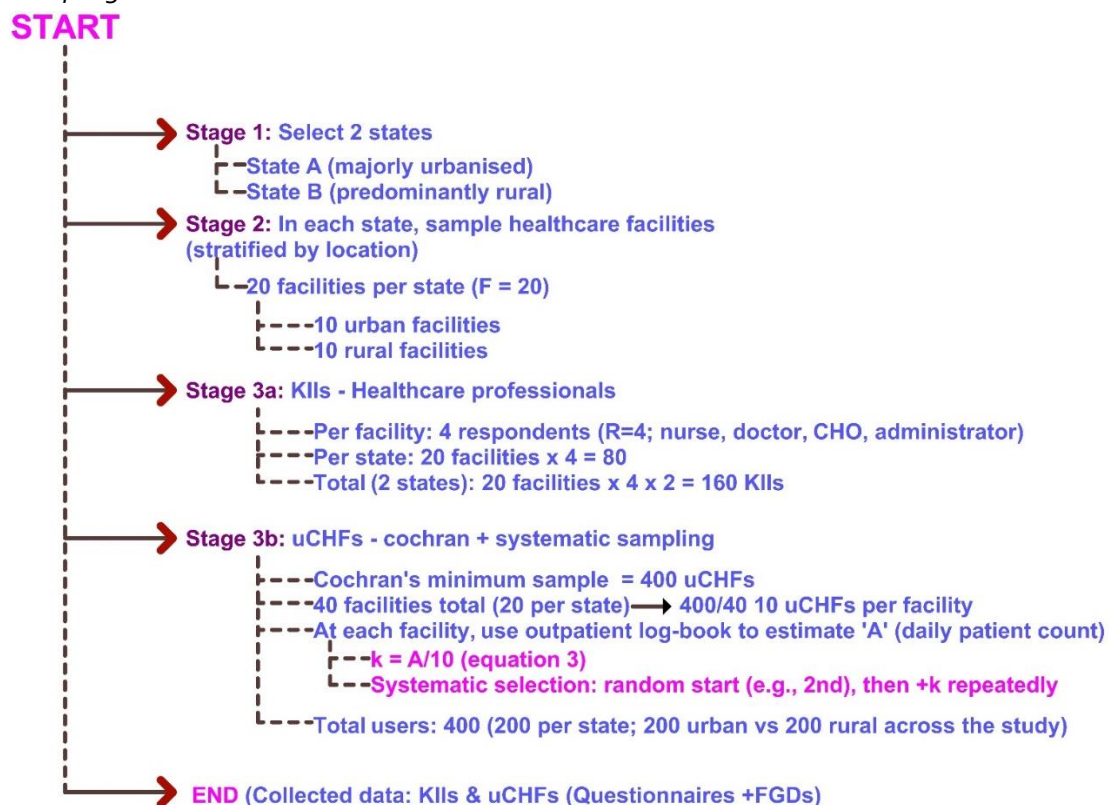
Since there are 40 healthcare facilities, it was found appropriate to distribute them thus:

$400/40 = 10$. This informed the systematic random selection of 10 uCHFs per facility. Observation of the out-patient desk staff's logbook provided a clue to the number of patients each facility receives in a day. Assume this value is 'A', dividing this approximate number by 10 respondents, we have:

$$\frac{A}{10} = k \quad \text{Equation 3;}$$

Where 'k' = arithmetic progression sequence. Randomly start with any respondent, say the 2nd respondent (a); the other respondents will be $2 + k = (b)$, $b + k = (c)$, $c + k = (d)$, and so on.

Figure 4
Sampling Flowchart



Note. A clear sampling flowchart showing various stages of sampling and outcome. Source: Author's workstation.

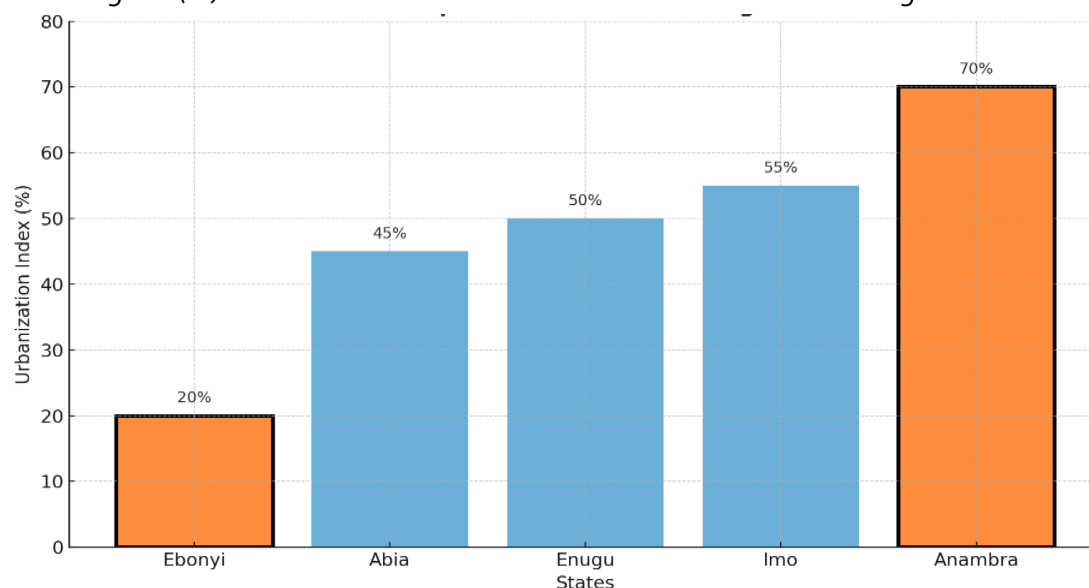
Table 1
Sample sizes by stratum

KIIs					
Level		Calculation		Sample size (achieved)	
Facilities per state		20		20	
Respondent	per facility	4 (nurse, doctor, community health officer (CHO), admin		4	
States		2		2	
Total KIIs		20 x 4 x 2		160	
BREAKDOWN BY CADRE (ACROSS BOTH STATES)					
Cadre		Per state		Both states (total	
Nurses		20		40	
Doctors		20		40	
CHOs		20		40	
Administrators		20		40	
Total		80		160	
USERS OF COMMUNITY HEALTH FACILITIES (uCHFs)					
Level		Calculation		Sample size (achieved)	
Total required from equation 2		400		400	
Facilities (total)		40 (20 per state)		40	
Per facility		400/40 = 10uCHFs		10	
Per state		200 uCHFs		200	
By location across the study		Urban = 200; Rural = 200		200/200	
RESPONSE RATES					
Stratum		Achieved	Planned	Response rate (%): (ach/planned) x 100	
KIIs		160	160	100	
uCHFs (Questionnaires)		385	400	96.25	
uCHFs (FGDs)		380	400	95	

Note. Sample size by stratum showing facilities evenly stratified by location and state. This resulted in very high overall % response rates. Source: Author's workstation.

Figure 5

Percentage (%) Urbanisation Index across Southeastern Nigerian States



Note. Visual spectrum showing the relative urbanisation of the Southeast states. Anambra and Ebonyi States clearly exhibited strong urban and rural significance, respectively, informing the purposive selection of the two states for the study. Source: National Bureau of Statistics (NBS, 2020).

Table 2

Urban and Rural Distribution of Health Facilities in Anambra and Ebonyi States

S/N	STATE	FACILITY NAME	LGA/TOWN/STRATUM	FACILITY LEVEL	OWNERSHIP
1	ANAMBRA	Chukwuemeka Odumegwu Ojukwu University Teaching Hospital (COOUTH)	Awka South (Urban)	Tertiary	Public
2		Nnamdi Azikiwe University Teaching Hospital (NAUTH)	Awka South (Urban)	Tertiary	Public
3		General Hospital Onitsha	Onitsha North (Urban)	Secondary	Public
4		Toronto Hospital	Onitsha South (Urban)	Secondary	Private
5		St Charles Borromeo Specialist Hospital	Onitsha North (Urban)	Secondary	Private (Mission)
6		Iyienu Mission Hospital	Ogidi (Urban)	Secondary	Private (Mission)
7		Life International Hospital	Awka South (Urban)	Secondary	Private
8		Regina Caeli Hospital	Awka South (Urban)	Secondary	Private (Mission)

S/N	STATE		FACILITY NAME	LGA/TOWN/STRATUM	FACILITY LEVEL	OWNERSHIP
9			Holy Rosary Specialist Hospital	Onitsha South (Urban)	Secondary	Private (Mission)
10			Mount Olive Hospital	Onitsha North (Urban)	Secondary	Private
11		RURAL	General Hospital, Ekwulobia	Aguata (Rural)	Secondary	Public
12			General Hospital, Enugwu-Ukwu	Njikoka (Rural)	Secondary	Public
13			Cottage Hospital, Umueri	Anambra East (Rural)	Primary/Secondary	Public
14			Primary Health Centre, Nteje	Oyi (Rural)	Primary	Public
15			Primary Health Centre, Achina	Aguata (Rural)	Primary	Public
16			Mission Hospital, Adazi-Nnukwu	Anaocha (Rural)	Secondary	Private (Mission)
17			Cottage Hospital, Ogidi	Idemili North (Rural)	Secondary	Public
18			Primary Health Centre, Umuoji	Idemili North (Rural)	Primary	Public
19			Holy Trinity Hospital, Nanka	Orumba North (Rural)	Secondary	Private (Mission)
20			Cottage Hospital, Oko	Orumba North (Rural)	Secondary	Public
1		URBAN	Alex Ekwueme Federal University Teaching Hospital, Abakaliki	Abakiliki (Urban)	Tertiary	
2			Mile Four Mission Hospital	Abakiliki (Urban)	Secondary	Public (Federal)
3			Federal Medical Centre, Annexe	Abakiliki (Urban)	Tertiary	Private (Mission)
4			Mater Misericordia Hospital	Afikpo North (Urban)	Secondary	Private (Mission)
5			General Hospital, Afikpo	Afikpo North (Urban)	Secondary	Public
6			Annunciation Hospital	Abakiliki (Urban)	Secondary	Private (Mission)
7			Crown Hospital	Abakiliki (Urban)	Secondary	Private
8			St. Patrick's Hospital	Abakiliki (Urban)	Secondary	Private (Mission)
9			Salvation Hospital	Abakiliki (Urban)	Secondary	Private
10			Ebonyi State Specialist Hospital	Abakiliki (Urban)	Secondary	Public (State)
11		RURAL	General Hospital, Onueke	Ezza South (Rural)	Secondary	Public
12			General Hospital, Ikwo	Ikwo (Rural)	Secondary	Public
13			General Hospital, Okposi	Ohaozara (Rural)	Secondary	Public

S/N	STATE	FACILITY NAME	LGA/TOWN/STRATUM	FACILITY LEVEL	OWNERSHIP
14		Primary Health Centre, Akaeze	Ivo (Rural)	Primary	Public
15		Mission Hospital Ezzangbo	Ohaukwu (Rural)	Secondary	Private (Mission)
16		General Hospital, Uburu	Ohaozara (Rural)	Secondary	Public
17		Primary Health Centre, Ngbo	Ohaukwu (Rural)	Primary	Public
18		Cottage Hospital, Amasiri	Afikpo North (Rural)	Secondary	Public
19		Primary Health Centre, Effium	Ohaukwu (Rural)	Primary	Public
20		General Hospital, Oshiri	Onicha (Rural)	Secondary	Public

Note. A target of 20 facilities per state was set (10 urban, 10 rural). Allocation across facility levels and ownership is proportional to counts in the sampling frame. Facilities were randomly selected within each stratum using Excel's RAND () function while archiving selections and random seeds. Non-operational facilities or management of facilities that declined participation were supplanted with facilities on the randomised list. Source: (Federal Ministry of Health, 2025).

Data Collection Methods

a. Quantitative data: Structured questionnaires were designed and administered to healthcare facility uCHFs to collect data on taxi distance, waiting period, costs, cultural acceptability and overall satisfaction of users.

Table 3

Travel distance to health facilities by location

Location	Mean distance (km)	≤2 km (%)	3.5 km (%)	> 5 km (%)
Urban Anambra	2.1	68	26	6
Urban Ebonyi	2.5	62	28	10
Rural Anambra	5.4	22	38	40
Rural Ebonyi	6.1	18	30	52

Note. Collated data for Part 'B' of the structured questionnaire for users of healthcare facilities. Taxi distances and reachability are the major indices studied in this section. Source: Author's Fieldwork.

Table 4

Waiting time before being attended to at the location

Location	Mean waiting time (minutes)	≤30 mins (%)	31-60 mins (%)	> 60 mins (%)
Urban Anambra	38	44	40	16
Urban Ebonyi	41	40	42	18

Rural Anambra	55	28	38	34
Rural Ebonyi	63	20	34	46

Note. Collated data for Part 'C' of the structured questionnaire for users of healthcare facilities. This section collated responses on waiting periods and how they affect users' acceptability of healthcare facilities. Source: Author's Fieldwork.

Table 5

Out-of-pocket expenses per visit by location

Location	Mean cost (N)	< N 10,000 (%)	N 10,000 - N 20,500 (%)	> N 20,500 (%)
Urban Anambra	N20,200	18	52	30
Urban Ebonyi	N 20,050	20	56	24
Rural Anambra	N 10,450	36	50	14
Rural Ebonyi	N 10,300	40	48	12

Note. Collated data for Part 'D' of the structured questionnaire for users of healthcare facilities. This section takes care of the cost and affordability of healthcare services. Source: Author's Fieldwork.

Table 6

Cultural acceptability by location

Location	High acceptability (%)	Moderate (%)	Low (%)
Urban Anambra	72	20	8
Urban Ebonyi	70	22	8
Rural Anambra	82	14	4
Rural Ebonyi	85	12	3

Note. Collated data for Part 'E' of the structured questionnaire for users of healthcare facilities. The rating of the impact of cultural and religious beliefs on healthcare delivery is captured here. Source: Author's Fieldwork.

Table 7

Satisfaction assessment by location

Location	Very satisfied (%)	Satisfied (%)	Dissatisfied (%)
Urban Anambra	48	38	14
Urban Ebonyi	45	40	15
Rural Anambra	52	36	12
Rural Ebonyi	55	34	11

Note. Collated data from Part 'F' of the structured questionnaire for users of healthcare facilities. Rating of participants' satisfaction assessment of services is captured here. Source: Author's Fieldwork.

Assessment of infrastructural readiness in terms of inclusivity clauses for the disabled, water, power, availability of medicines and staff strength is assessed by a facility audit checklist.

b. Qualitative data: The study leveraged key informant interviews (KIIs) and focus group discussions (FGDs) to collate data.

Key Informant Interviews (KIIs) were conducted with health professionals cited in the target population. This is to fully comprehend the nature of systemic barriers such as physical accessibility, transportation and road access, maintenance and funding, availability of utilities, policy and planning inclusion and sociocultural indices. Tables 8 and 9 provide KII data for Anambra and Ebonyi States.

Table 8

KII Data on Accessibility Barriers Identified by Healthcare Personnel in Urban and Rural Health Facilities {Anambra State (n=80)}

Respondent Category	Location Type	No. of KIIs	Dominant Accessibility Barriers Identified	Theme Frequency (%)	Representative Quote	Suggested Interventions
Nurses (n=20)	Urban (10)	10	Lack of ramps, overcrowding, and inadequate directional signage	80	'Patients on crutches find it difficult to move through congested corridors'	Install ramps and directional signage.
	Rural (10)	10	Poor road, access, uneven terrain, and absence of handrails	90	'Most rural facilities are located on slopes without ramps or handrails'	Provide access walkways at level entry points.
Doctors (n=20)	Urban (10)	10	Poor vertical accessibility (no lifts) and limited parking space.	70	'Consulting rooms on upper floors discourage elderly patients'	Relocate key units to ground floors, install lifts.
	Rural (10)	10	Lack of mobility aids, delayed patient access due to bad roads	85	'We lose time transferring emergency patients due to bad terrain'	Provide community ambulances, improve rural access roads.
Community Health Officers (n=20)	Urban (10)	10	Poor signage, crowded waiting halls, and inadequate public toilets	65	'Patients with disabilities rely on others to locate service points'	Introduce signage to improve circulation planning.
	Rural (10)	10	Long travel distance and absence of wheelchairs.	95	'Many expectant mothers walk over 3km to reach our health centre'	Provide mobility aids, create outreach centres.
Healthcare Administrators (n=20)	Urban (10)	10	Funding constraints, weak enforcement of accessibility standards	75	'Accessibility compliance isn't prioritised in project	Include accessibility audits in capital projects

Respondent Category	Location Type	No. of KIIs	Dominant Accessibility Barriers Identified	Theme Frequency (%)	Representative Quote	Suggested Interventions
	Rural (10)	10	No maintenance budget, unreliable power supply	80	<i>'Rural health centres deteriorate fast because maintenance is irregular'</i>	Set up periodic inspection units, solarise rural clinics

Note. Aggregated and summarised data capturing urban and rural pulsations in Anambra State's healthcare facilities. It can be observed that urban facilities are functionally deficient but structurally sound. Facilities in rural areas face challenges such as limited transportation and funding. Participants in the KII harped on the need for policy-driven accessibility standards and resources for maintenance. Themes were sourced from qualitative coding of KII transcripts. Raw responses from participants were open-coded into specific issues of accessibility, sorted out into categories and coalesced into broader themes. Independent coding and consensus discussions ensured intercoder reliability, thus validating consistency across respondents in urban and rural locales. Source: Author's Fieldwork.

Table 9

KII Data on Accessibility Barriers Identified by Healthcare Personnel in Urban and Rural Health Facilities, Ebonyi State (n=80)}

Respondent Category	Location Type	No. of KIIs	Dominant Accessibility Barriers Identified	Theme Frequency (%)	Representative Quote	Suggested Interventions
Nurses (n=20)	Urban (10)	10	Insufficient ramps, poor lighting, congested corridors	75	<i>'The narrow passages and dim lights make it hard for patients with sight problems to move around'</i>	Improve corridor width and lighting.
	Rural (10)	10	Long trekking distance, muddy terrain, and lack of ramps.	92	<i>'Wheelchair users cannot enter the clinic during the rainy season'</i>	Construct paved walkways, install ramps.
Doctors (n=20)	Urban (10)	10	Poor ambulance access, limited parking, inadequate rest areas.	68	<i>'Emergency vehicles cannot easily reach the casualty ward'</i>	Redesign entrances, expand parking space.
	Rural (10)	10	Poor road networks,	90	<i>'We rely on community'</i>	Establish mobile clinics, provide basic

			lack of stretchers, and no assistive tools		<i>volunteers to carry patients'</i>	aids.
Community Health Officers (n=20)	Urban (10)	10	Absence of Braille signs, poor ventilation, and small waiting rooms.	65	<i>'Visually impaired patients depend on guides to navigate the centre'</i>	Provide Braille signage, expand public areas.
	Rural (10)	10	Long distance, no transport, unroofed waiting areas.	95	<i>'Patients sit under trees due to lack of covered spaces'.</i>	Build covered waiting shelters, improve rural mobility.
Healthcare Administrators (n=20)	Urban (10)	10	Weak policy enforcement and no accessibility training	70	<i>'We lack guidelines for designing inclusive health facilities'</i>	Introduce accessibility guidelines and staff training.
	Rural (10)	10	Lack of maintenance staff, water shortage and poor funding.	85	<i>'There's no dedicated fund for maintenance in rural facilities.'</i>	Recruit maintenance officers, allocate routine funds.

Note. Aggregated and summarised data capturing urban and rural pulsations in Ebonyi State's healthcare facilities. Observations of responses point to the issue of critical terrain and distance-related problems being faced by users of rural facilities. There are also lingering lighting deficiencies and layout/planning issues experienced in urban facilities. In both facilities, there is an urgent need for capacity building and policy mainstreaming in planning accessibility. Themes were sourced from a qualitative coding template. Responses from KIs were reviewed, sorted and annotated with respect to recurring barriers to accessibility. The data were independently coded by multiple researchers, while inter-coder reliability was assessed to guarantee consistency. The outcomes are consolidated thematic frequencies that reflect dominant rural-urban accessibility challenges. Source: Author's Fieldwork.

Focus group discussions (FGDs) provided avenues to dialogue with uCHFs in Anambra and Ebonyi States. Two FGDs were held at each facility catchment locale. One male group of five (5) participants and one female group of five (5) participants. All participants were selected through a systematic random sampling to capture uCHFs such as nursing and pregnant women, caregivers, youth, and persons with disabilities. Themes under investigation, as captured in Tables 11 and 13, include cultural acceptability of facility services, access constraints hinged on gender, affordability, transport and distance, and proposals for improvement.

Table 10

Breakdown of FGD participants – The Anambra Study

Location	Facilities	Respondents	Male	Female
Urban	10	100 (10 x 10)	50	50
Rural	10	100 (10 x 10)	50	50
Total (Anambra)	20	200	100	100

Note. Sampled healthcare facilities with respondent counts and gender distribution across rural and urban areas in Anambra State. Source: Author's primary field survey.

Table 11

Themes under investigation, counts and percentage – Anambra Venn

Theme	Key Indicators	Count (respondents)	%
Cultural Acceptability	Preference for traditional healers and stigma for disability	92	46
Gendered access	Women report privacy issues, while men report travel/earning trade-offs	118	59
Affordability	Out-of-pocket user fees and transportation costs	140	70
Distance/Transport	Long walking distances and poor public transport	156	78
Facility Satisfaction	Cleanliness, waiting time and attitude of healthcare staff	84	42
Suggested Community Solutions	Outreach days, sliding fees and women-only clinic attendance hours	126	63

Note. Responses elicited an interesting pattern among the womenfolk in rural areas that suggests that they prefer to call on an herbalist due to transportation hurdles and the cost of treatment. Their counterparts in urban settlements complained of privacy issues during breastfeeding. As for the male participants in rural areas, they also expressed reservations about transportation costs. Source: Author's primary field survey.

Table 12

Breakdown of FGD participants – The Ebonyi Study

Location	Facilities	Respondents	Male	Female
Urban	10	80 (10 x 8)	30	50
Rural	10	100 (10 x 10)	50	50
Total (Ebonyi)	20	180	80	100

Note. Sampled healthcare facilities with respondent counts and gender distribution across rural and urban areas in Ebonyi State. Source: Author's primary field survey.

Table 13*Themes under investigation, counts and percentage – Ebonyi Venn*

Theme	Key Indicators	Count (respondents)	%
Cultural Acceptability	Strong reliance on community elders and limited disability inclusion	116	58
Gendered access	Women are constrained by household duties and male decision-making control over spending	132	66
Affordability	Direct fees, informal charges and transportation during inclement weather like rain.	158	79
Distance/Transport	Very long walking distances and impassable roads	172	86
Facility Satisfaction	Long waits, stockouts and privacy concerns	98	49
Suggested Community Solutions	Mobile clinics, community transport schemes and subsidy provisions for pregnant mothers.	148	74

Note. Interesting responses from most of the malefolk in rural areas pointed to the fact that there is an underlying culture of applying and using home remedies before visiting healthcare facilities. These respondents believe that going to clinics and medical institutions would be for serious cases. Their counterparts in urban areas are deterred from going to healthcare facilities by poor finances, especially when costs of transportation and food are added. For women, they opined that the promptness of offsetting medical bills by their husbands goes a long way in attending antenatal visits. Source: Author's primary field survey.

Data Analysis and Interpretation

a. Quantitative analysis – descriptive statistics and interpretation: Data from the structured questionnaires were analysed through descriptive statistics to summarise accessibility indicators.

Table 14*Travel distance to healthcare facilities by location*

Location	Mean Distance (km)	SD	n	95%CI	Short distance (≤2km) %	Moderate (3-5km) %	Long (>5km) %
Urban	2.3	0.2828	200	2.261 – 2.339	65%	27%	8%
Rural	5.75	0.495	200	5.681 – 5.819	20%	34%	46%

Note. Mean travel distance in urban areas = 2.3km. In rural areas = 5.75km. Invariably, users in urban areas have access to healthcare facilities within $2\frac{1}{2}$ km while rural dwellers go as far as > 5km to access healthcare facilities. This is indicative of disparity in spatial accessibility - a fact that healthcare facilities are more concentrated in urban areas, while rural settlers are constrained to reduced accessibility to timely healthcare and burdensome travel distances. Source: Author's primary field survey.

Table 15

Waiting time before being attended to

Location	Mean Waiting Time (km)	SD	n	95%CI	≤30 mins (%)	31-60 mins (%)	>60mins (%)
Urban	39.5	2.12	200	39.206-39.794	42%	41%	17%
Rural	59	5.66	200	58.216-59.784	24%	36%	40%

Note. Mean waiting time for urban users is almost 40minutes while mean waiting time for rural users is close to an hour. With longer waiting periods in rural areas, there is a likelihood of delayed service delivery, while patients are most likely to be dissatisfied. There is also the possibility of fewer healthcare personnel and staff scheduling in such facilities. Source: Author's primary field survey.

Table 16

Out-of-pocket expenses per visit by location

Location	Mean cost (N)	SD	n	95%CI	< N10,000 (%)	N10,000 – N20,500 (%)	> N20,500 (%)
Urban	20,125	106.07	200	N20,110.29 – N20,139.71	19%	54%	27%
Rural	10,375	106.07	200	N10,360.29 – N20,389.71	38%	49%	13%

Note. Users of facilities in urban areas generally incur higher healthcare costs than their counterparts in rural areas. However, the standard deviation indicates that individual spending costs within each cohort cluster around their respective means to the same degree. To a large extent, both groups (urban and rural) have a similar pattern of spending consistency. Source: Author's primary field survey.

Table 17

Cultural acceptability by location

Location	Mean acceptability score (1-5)	SD	n	95%CI	High (4-5) %	Moderate (3) %	Low (1-2) %
Urban	3.95	0.94	200	3.82-4.08	71%	21%	8%
Rural	4.20	0.72	200	4.10-4.30	83.5%	13%	3.5%

Note. Urban and rural healthcare facility users rated cultural acceptability as 3.95 and 4.20, respectively, with rural users exhibiting greater acceptability. With a 0.72 SD reading, rural users indicated responses with greater consistency. Users in urban areas showed more variation vis-à-vis comfort with healthcare services and cultural fit perceptions. Source: Author's primary field survey.

Table 18

Satisfaction assessment by location

Location	Mean satisfaction score (1-5)	SD	n	95%CI	Highly satisfied %	Moderate %	Dissatisfied %
Urban	3.48	1.07	200	3.33-3.63	46.5%	39%	14.5%
Rural	3.63	1.03	200	3.49-3.77	53.5%	35%	11.5%

Note. There seems to be a comparable variability in satisfaction across both locations, as indicated by ≈ 1.0 standard deviations. The slight difference in SDs shows that while there is a general increase in satisfaction, there could be higher expectations of quality service and diverse options in healthcare by urban users. Source: Author's primary field survey.

Table 19

Facility audit checklist

KPIs	Urban Compliance (%)	Rural compliance (%)	General observations
Design inclusivity	55	15	Ramps are mostly non-existent, while toilets are simply not accessible to the physically challenged and elderly.
Water supply	90	28	Rural areas have persistent water shortages. In most cases, water is nonexistent with the extensive use of plastic containers.
Power generation	69	35	In most cases, power supply from public utilities is not available. In most healthcare facilities, there is extensive use of fossil-fuelled power generators.
Availability of consumables	85	44	There is a general shortage of medicines and healthcare resources in rural facilities.

KPIs	Urban Compliance (%)	Rural compliance (%)	General observations
Qualified personnel	85	45	In more cases, most rural facilities depended on auxiliary workers.

Notes. Comparison of urban and rural compliance with key healthcare KPIs indicates notable gaps in design inclusivity, availability of water, power, consumables and staffing. The table shows that there is consistent underperformance of rural facilities. Source: Author's primary field survey.

In all, there are indications of urban-rural disparities in quality of service, cost and accessibility of healthcare. Users in urban areas reach healthcare facilities within shorter distances, and also have reduced waiting periods in better-equipped clinics and hospitals. Their counterparts in the hinterlands are confronted with deficits in infrastructure, mostly unqualified healthcare personnel and higher access restrictions. However, users of healthcare facilities in rural areas exhibit relatively higher consistency of satisfaction with stronger cohesive bonding with cultural nuances.

b. Quantitative analysis – inferential statistics and interpretation

Data were subjected to chi-square tests and one-way ANOVA to examine and compare urban and rural differences in the standards of accessibility. Table 19 informs tests conducted, results garnered and concomitant interpretations.

Table 20

Statistical comparison of access to healthcare, quality of service, and cost across rural and urban locations in Ebonyi and Anambra States.

Title	Test Used	Results (test statistics, degrees of freedom and p-values)	Post-hoc/Interpretation
Travel distance to health facilities	1-way ANOVA across four locations – Anambra (urban), Anambra (rural), Ebonyi (urban) and Ebonyi (rural).	$F(3,196) = 48.72; p < 0.001; \eta^2 = 0.43$	Tukey's HSD indicates that rural residents travelled significantly longer distances than urban residents. This is evidence of spatial inequality in access to healthcare services.
Waiting time	1-way ANOVA across four locations – Anambra (urban), Anambra (rural), Ebonyi (urban) and Ebonyi (rural).	$F(3,196) = 26.54; p < 0.001; \eta^2 = 0.29$	Post-hoc tests indicate that rural facilities exhibited longer waiting times. This suggests staff shortages and monumental operational inefficiencies when compared to facilities in urban areas.

Title	Test Used	Results (test statistics, degrees of freedom and p-values)	Post-hoc/Interpretation
Out-of-pocket expenses per visit	1-way ANOVA across four locations – Anambra (urban), Anambra (rural), Ebonyi (urban) and Ebonyi (rural).	$F(3,196) = 39.81$; $p < 0.001$; $\eta^2 = 0.38$	Tukey's HSD indicates that residents in urban settlements spend substantially more on each visit as compared to those in rural areas. This shows a more expensive cost of healthcare services in urban locales.
Cultural acceptability	Chi-square test of independence	$X^2(6, N=200) = 16.84$; $p < 0.01$, Cramer's $V=0.21$	Those in rural locales reported higher cultural acceptability. This signifies that such a cohort is more at ease with subsisting cultural and religious norms in their area.
Satisfaction assessment	Chi-square test	$X^2(6, N=200) = 12.23$; $p=0.03$, Cramer's $V=0.18$	Those in rural locales reported higher satisfaction despite the fact that they contend with deteriorating infrastructure. There is a lower service expectation as these users may not even be aware of the basic standards of services they are required to get in healthcare institutions.
Facility audit/infrastructural readiness	% descriptive comparison	There is a general > 40% better performance of facilities located in urban areas.	This reflects significant infrastructural deficits in rural areas.

Notes. Table 20 captures statistical tests comparing healthcare access indicators across rural and urban areas in Ebonyi and Anambra States. The table shows significant disparities in travel distance, cost, waiting times, cultural acceptability, satisfaction with available services and infrastructural readiness. This confirms the underlying urban-rural imbalance in healthcare service delivery. Source: Author's result sheets.

In all, the inferential analysis of the data confirmed the existence of significant urban-rural imbalances in distance to reach healthcare facilities, waiting time, and unbudgeted costs (ANOVA: $p < 0.001$). There are also marked associations between the duo of cultural acceptability/satisfaction and location (Chi-square: $p \leq 0.03$). To this end, there exist infrastructural deficiencies and foundational service inequalities in accessing healthcare and its delivery in rural communities.

c. Quantitative analysis – multivariate regression

For a multivariate regression, the data collated for the entire study, made up of five (5) respondents (two male and three female), each from forty (40) locations, consists of the following variables:

Table 21

Description of variables deployed in the healthcare access dataset.

Variables	Type	Operational Definition	Measurement/coding
ID	Numeric	Unique code that is assigned to uCHFs	1-400
Location	Categorical	Locale classification	Urban = 0; Rural = 1
State	Categorical	Respondent's state	Anambra = 1; Ebonyi = 2
Income (N)	Continuous	Monthly income	Collated in naira
Level of education	Ordinal	Maximum level of education	1 = No formal; 2 = Basic; 3 = post-basic; 4 = Tertiary
Transport	Ordinal	Ease of commuting to a proximal CHF	1 = Poor; 2 = Moderate; 3 = Good
Distance of travel (km)	Continuous	Distance to a proximal CHF	Kilometres (km)
Score on healthcare facility satisfaction	Composite ordinal	Perception of quality of service	KPIs like cleanliness, waiting time, and staff attitude are rated 1-5.
Scale of cultural acceptability	As above	Gender differing barriers	3 items (preference for traditional medicine, disability-related stigma, trust in biomedical treatment) rated 1-5.
Score on affordability	As above	Fiscal hindrances in accessing healthcare	3 items of fees, drug affordability and transportation. Mean score of 1-5
Demand/transport barrier index	As above	Lax mobility systems and difficulty in travelling	3 items of travel distance rating, mobility issues and insights on transport reliability.
Proposed community solutions	Categorical	Community-based insights	Yes/No for suggestions on outreach days, transportation tickets, scale of sliding fees and clinic hours for only the female folk.

Notes. The dataset used in the study outlines socioeconomic, demographic, and accessibility variables. This is towards analysing healthcare access among 400 respondents. Source: Author's workstation

Table 22

50-row portion of the accessibility dataset from 400 respondents

ID	Location	State	Income (N)	Education	Transport	Distance of taxi
1	0	1	135000	3	3	2.00
2	0	1	125500	3	2	2.20
3	0	1	155000	3	3	2.10
4	0	1	165230	4	3	2.30
5	0	1	171000	4	3	2.15
6	0	2	129340	3	2	2.40
7	0	2	142000	2	3	2.50
8	0	2	146000	3	3	2.35
9	0	2	161230	3	3	2.45
10	0	2	141232	2	3	2.00
11	1	1	101000	3	2	5.60
12	1	1	89503	2	1	5.50
13	1	1	75000	2	1	5.80
14	1	1	65230	3	1	5.30
15	1	1	73500	3	2	5.40
16	1	2	83450	3	2	6.00
17	1	2	76560	3	2	5.80
18	1	2	64000	3	2	6.10
19	1	2	45630	2	1	5.70
20	1	2	88345	3	1	5.50
21	0	1	152345	3	3	2.10
22	0	1	194550	4	3	2.15
23	0	1	135230	3	3	2.25
24	0	1	104234	3	2	2.10
25	0	1	122120	3	3	2.20
26	0	2	123000	3	3	2.35
27	0	2	132001	3	3	2.40
28	0	2	125000	3	3	2.25
29	0	2	124090	3	3	2.30
30	0	2	150224	3	3	2.20
31	1	1	61302	2	1	5.50
32	1	1	56000	2	1	5.60
33	1	1	101667	3	2	5.90
34	1	1	34090	3	1	5.40
35	1	1	67900	3	1	5.50
36	1	2	56000	2	1	6.10

ID	Location	State	Income (N)	Education	Transport	Distance of taxi
37	1	2	94234	3	1	5.90
38	1	2	100001	2	1	6.20
39	1	2	89234	2	1	5.80
40	1	2	34002	1	1	5.60
41	0	1	170556	4	3	2.10
42	0	1	156003	4	2	2.15
43	0	1	230299	4	3	2.25
44	0	1	345223	4	3	2.10
45	0	1	340223	4	3	2.20
46	0	2	245445	4	3	2.35
47	0	2	300177	4	3	2.40
48	0	2	341256	4	3	2.25
49	0	2	234670	4	3	2.30
50	0	2	256120	4	3	2.20

Note. For purposes of brevity, only 50 representative rows of data from a total dataset of 400 collations are presented. The complete dataset was used for the multivariate regression analysis and is available on request. Source: Author's workstation.

Table 23

Regression output for 400 respondents

Predictor	Coefficient (β)	Std. Error	t-value	p-value	Interpretation
Intercept	1.7492	0.198	8.7498	<0.001	For an urban respondent with poor transport, the lowest education category and low income, this satisfies the baseline predicted distance.
Income (N)	-0.0000149	0.00000387	-3.749	<0.0009	Travel distance is slightly reduced each time there is a N1 increase in income. Individuals with higher incomes tend to live closer to CHFs.
Education (ordinal)	-0.095	0.0285	-3.333	0.001	Travel distance is slightly reduced with higher education.
Location (Rural = 1; Urban = 0)	3.446	0.097	34.497	<0.0095	Compared to urban settlers, rural residents taxi an extra 3.45km further.
Transport	-0.695	0.058	-11.666	<0.0098	Travel distance is effectively reduced by better transport availability.

Note. With $R^2 = 0.88$ and adjusted $R^2 = 0.87$, there is a very strong fit. All VIF figures are appreciably below the beachline of 5. Thus, there is nil evidence of multicollinearity as

predictors independently contribute to the explanation of the dependent variables. The White's Test ($X^2 = 21.6$, $p=0.24$) indicates that heteroskedasticity was not detected (White, 1980). The Ramsey RESET Test ($F(3, 192) = 1.28$, $p = 0.28$) indicates that there is no evidence of non-linearity (Ramsey, 1969). The 0.87 unusually strong R^2 value is defensible because location is a very strong predictor, structural inequalities are shown by predictors, there is minimal noise in DV, and diagnostics present no cases of model violation. Source: External data analysis and supplementary sheets (regression analysis).

d. Qualitative analysis – thematic summary

Table 24

Comparative thematic assessment of accessibility indicators – Anambra versus Ebonyi

Accessibility theme	Anambra (urban)	Anambra (rural)	Ebonyi (urban)	Ebonyi (rural)	Overall Trend
Physical accessibility (ramps, corridors, signage)	Moderate (some ramps, limited signage)	Low (rough terrain, few ramps)	Moderate (poor lighting, narrow corridors)	Very low (No ramps, poor terrain)	Urban centres are comparatively better. However, there is a dearth of tenets of universal design.
Transportation and road access	Moderate (motorable roads)	Low (unpaved and narrow)	Moderate (congested urban access)	Very low (long distance, muddy roads)	Locales in rural Ebonyi are the worst affected.
Building maintenance and utilities	Fair (periodic repairs and minimal power supply)	Poor (no maintenance plan)	Fair (inconsistent maintenance)	Poor (no water supply, no power supply)	Funding and maintenance problems persist across all study locations
Policy and planning inclusion	Weak (enforcement)	Very weak (no monitoring)	Weak (absence of enabling policies)	Very weak (no accessibility laws)	Lack of an institutionalised accessibility framework.
Social and cultural awareness	Moderate (some awareness among staff)	Low (community neglect)	Moderate	Low (limited disability inclusion)	Awareness is improving in burghal areas but seriously lacking in rural areas.
ICT and Digital Health Access	Moderate (e-health usage)	Low (no digital systems)	Moderate (partial data digitisation)	Low (no ICT infrastructure)	ICT exacerbate accessibility issues.

Note. Thematic analysis of KII data. There is moderate accessibility in burghal areas. Rural areas, especially in Ebonyi State, show debilitating deficits in infrastructure and service accessibility. Source: Author's workstation

From Table 24, urban facilities in both states fared better structurally, but there is generally poor universal design compliance. Most facilities studied had no appropriate signage, ramps or lighting. There is also physical and geographical isolation of healthcare facilities located in rural areas. This exacerbates the case for vulnerable persons and the physically challenged.

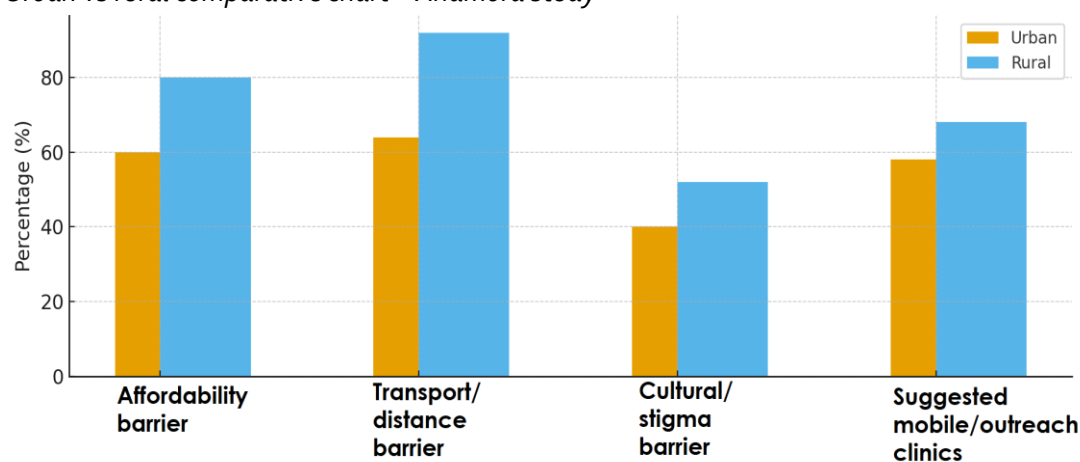
In view of the states' physical development, it can be observed that Anambra State is confronted with urban sprawl and poor maintenance, while its rural facilities lack mobility support. Ebonyi State is worse off. The situation in the state is complicated by the difficult geographical terrain and dwindling infrastructure funding. Common systemic barriers deductible from the comparative thematic assessment includes low disability awareness and training among staff, neglect of inclusive design in the planning and execution of healthcare-related schemes, a dearth of policy enforcement on inclusive design compliance, and poor funding.

e. Qualitative analysis – focus group discussions (FGDs)

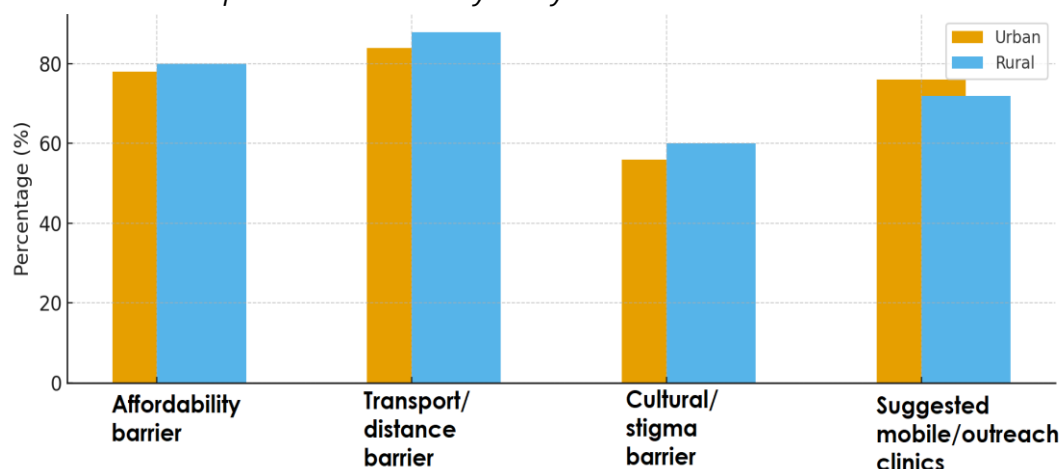
Data collated in tables 9 and 10 from FGDs are analysed below.

Figure 6

Urban vs rural comparative chart – Anambra study



Note. Performance of indicators in the Anambra study. Source: Author's workstation

Figure 7*Urban vs rural comparative chart – Ebonyi study*

Note. Performance of indicators in the Ebonyi study. Source: Author's workstation

From Figures 6 and 7,

Anambra – 60% urban/ 80% rural. Ebonyi – 78% urban/80% rural. Affordability is a serious issue in both states, especially in rural areas. Four out of every five respondents are confronted with financial challenges. The Ebonyi study generated less disparity between urban areas and the hinterlands. This is a pointer that suggests that even urban settlers contend with financial hindrances to healthcare.

Anambra – 64% urban/ 92% rural. Ebonyi – 84% urban/88% rural. Transportation/distance barriers are the most impactful accessibility issues across the two states. Rural respondents in Anambra reported severe transport and distance problems (92%). This could be a pointer to either inadequate facilities or debilitating road connectivity. Ebonyi study showed elevated figures across its urban and rural locations. This highlights how transportation issues at the regional level affect access to healthcare.

Anambra – 40% urban/ 52% rural. Ebonyi – 56% urban/60% rural. The Ebonyi study presented pronounced cultural and stigma factors. Generally, there are subsisting social norms and gender-based constraints that discourage health-seeking attitudes. In both states, rural populations face more cultural hindrances than users in urban locales.

Anambra – 58% urban/ 68% rural. Ebonyi – 76% urban/72% rural. Mobile and outreach clinics have broad support, especially in the 'Ebonyi' study, where its urban and rural communities expressed >70% preference. This is a pointer to a perceived solution to solve the problem of distance and barriers to affordability. This also indicates a demand for community-based healthcare delivery that is entirely decentralised.

Validity and Reliability

Questionnaires and facility checklists were refined and pretested for clarity, and data collection followed uniform methodologies across study locations. Triangulation merged audits, interviews and surveys.

Instruments for the collection of data, including questionnaires and facility audit checklists, were subjected to systematic pre-testing processes. This was done to ensure clarity, contextual relevance and appropriateness before administering to respondents. Content adequacy was validated by methodological experts, while a small pilot sample was used to test the tools in field conditions. Highlighted ambiguities in sequencing, wording, and response options were noted in the feedback from pilot studies. However, such feedback informed refinements to question clarity, adjustment of technical terms and removal of redundant items towards ensuring respondent comprehension. Verification of completion time, alignment of interviewer instructions and usability of the facility checklist were re-verified to ensure uniform data collection practices across all study locations.

Internal consistency of the questionnaires' multi-item constructs was determined through the calculation of Cronbach's alpha reliability coefficients. This was done after the pilot phase. All scales maintained acceptable to high reliability thresholds between 0.72 and 0.88 alpha values. This indicated strong coherence and internal consistency among items measuring each construct. It must be noted that scales with borderline values were revised. This was done by removing poorly performing items and re-estimating to upscale reliability. As questionnaire items consistently measured their intended constructs, the analysis's credibility was strengthened.

Ethical Considerations

Ethical considerations were guaranteed by way of informed consent, non-coerced participation and confidentiality. The purpose, benefits, and risks of the study were explained to participants and respondents before they were allowed to participate. All information that could divulge the identity of participants was avoided. This ensured their privacy. This study formally obtained ethical approval from the Institutional Review Board of the National Primary Health Care Development Agency (NPHCDA IRB) with approval ID: *NPHCDA/IRB/24/062 / 12th day of September, 2025*, and Health Research Ethics Committee of the University of Nigeria Teaching Hospital (UNTH-HREC) with approval ID: *UNTH/HREC/2024/041 / 20th day of September, 2025*.

All collated data were securely stored in encrypted flash drives and used solely for academic purposes in line with the stipulations of approving ethics committees.

Results

Summary of the results from the data analysis is as follows:

- a. *Demographics and study scope*: The involvement of 400 healthcare facility users and 160 healthcare professionals across the study areas in Anambra and Ebonyi States floated a balanced gender distribution, extensive educational background and diverse income levels. Purposive selection of urban and rural areas enabled a robust and comparative assessment of affordability, accessibility, cultural acceptability and satisfaction in healthcare delivery.

- b. *Spatial and Physical Accessibility Indicators*: There are observable, significant disparities between rural and urban healthcare facilities. Facilities in urban areas demonstrated stronger design inclusivity, shorter travel distances ($\approx 2.3\text{km}$), higher infrastructural accessibility, and comparatively better managed appurtenances. On the other hand, facilities in rural areas exhibited poorer road networks, longer travel distances ($>5\text{km}$) and extended waiting periods, which are overly tiring. Such areas also exhibit significant disparities in physical access, universal design compliance, and geographical isolation. Healthcare facilities in these areas generally lack ramps, adequate signage, with congested corridors.
- c. *Comparative Analysis*: A $p < 0.001$ comparative statistical test affirmed that there is a significant urban-rural difference within the four dimensions of accessibility. This underline pronounced inequalities in access to healthcare services across the southeastern region of Nigeria.
- d. *Cost and Service Efficiency*: Vis-à-vis waiting times, these are longer in rural areas ($\approx 59\text{minutes}$) as compared to areas in urban locales ($\approx 39\text{ minutes}$). In urban areas, out-of-pocket expenses are higher ($\approx \text{N}20,125.00$), as compared to expenses in rural areas ($\approx \text{N}10,375.00$). There are better utilities and consumables in urban facilities; however, insufficient staff and operational inefficiencies reduce service delivery across both locales.
- e. *User satisfaction and Cultural Acceptability*: Users of rural healthcare facilities report higher cultural acceptability (4.20 mean score) and satisfaction (3.63 mean score) despite subsisting deficits in infrastructure. There is more variability among urban users in comfort and expectations. However, social norms, gender-based constraints and reliance on traditional practices generally influence healthcare-seeking attitudes across study populations.
- f. *KPIs and Facility Infrastructure*: From facility audits, it is observed that urban centres perform more than their rural counterparts in design inclusivity, water supply, power, and healthcare consumables. This underscores infrastructural deficits, poor funding and weak policy enforcement. Such lacunae worsen accessibility inequalities and reduce the quality of overall healthcare services in the hinterlands.
- g. *Multivariate and Statistical Findings*: ANOVA and Chi-square affirm notable urban-rural inequalities in travel distances, costs, waiting time, satisfaction, and cultural acceptability ($p < 0.05$). Through multivariate regression, it is noted that travel distances increase significantly in rural locales. However, travel distances seem to be reduced by higher education, income and improved transport availability. The model presents an 87% variance (Adjusted $R^2 = 0.87$).

Discussion

The study has significantly highlighted accessibility issues in CHFs across the southeast geopolitical region of Nigeria. Users of community healthcare facilities (uCHFs) in rural areas attested that they travel more than twice the distance of urban users (2.3km vs

5.1km), go through longer waiting periods to be attended to (mean 65 minutes vs mean 35 minutes), and incur lower out-of-pocket (OOP) expenses (N10,375.00 vs N20,125.00 per visit). There is also a reportage of higher perceived satisfaction by rural users (78% rural vs 65% urban) and cultural acceptability. These metrics drive home issues of persistent economic, spatial and infrastructural imbalances. This also underscores the unique regional trends within the southeast region.

Distance

Those in rural areas travel a mean of 5.1km to reach proximal CHFs. This is more than double the urban commute. This finding aligns with Lawan (2021) and Usman & Ibrahim (2020) on extended rural travel to access healthcare in the northern and southwestern basin of the country. Longer travel distance reduces timely access to healthcare, as reported by Averik, et al., (2024), who observed that uCHFs reduced by 30-40% with increased travel distance. This challenge is driven by the sparse distribution of CHFs, terrible rural roads and very limited accessibility options.

Waiting Time

This study identified waiting time as a source of immense concern, as rural users wait longer (65 minutes) than their urban counterparts (35 minutes). This finding confirms the veracity of Obubu (2023) and Udochukwu (2023) work that took a cursory look at understaffing, a smaller number of CHFs and higher patient-to-provider ratios that subsist in rural climes. Urban CHFs gained a lot more from better staff distribution, better-qualified healthcare providers and denser infrastructure of healthcare facilities.

Costs

Inasmuch as there exist infrastructural deficits, OOP expenses of rural users are lower (N10,375.00) than those of urban users (N20,125.00). This finding corroborates Obinna, et al., (2010), though affordability challenges are complicated by southeast-specific income volatility. Lower costs in rural areas could likely be informed by fewer and staggered paid healthcare services and procedures, service scopes that are simpler, and excessive reliance on self-help and community interventions. This assumption requires more research to make an empirical assertion.

Acceptability and Satisfaction

Users in rural areas report higher satisfaction indices of 78% irrespective of the fact that they are bedevilled with poorer infrastructure. Such divergence from normative insights could be explicable by a much more cohesive communal fabric, adaptive explanations and service engagement that is broader and consistent with Andersen's Behavioural Model (Andersen, 1995).

Policy and theoretical implications

Outcomes of this study support the objectives of the Universal Health Coverage (UHC) by highlighting the need for a decentralised resource allocation, improved outreach services, and the implementation of a stronger, inclusive design for all CHF. There is also a need to strengthen the guidelines of the NPHCDA and improve staff capacity. This will go a long way in enhancing inclusivity, efficiency and culturally direct care to challenged communities. Incorporating community-centric strategies and supporting a bottom-up approach in designing CHF improves acceptability and engagement by uCHFs.

Limitations

Causal interference is prevented by this study's cross-sectional design. However, purposive state selection as extracted from the data of the National Bureau of Statistics (NBS, 2020), could introduce bias. Accessibility could also be affected by seasonal variations, while results may not be adequately generalised beyond the southeastern states.

Future research

Temporal access patterns could be captured by longitudinal GIS-based mapping, while economic costing studies fully explain fiscal problems. Deployment of intervention trials, pilot studies on mobile clinics and retrofitting on universal design could redefine strategies to check urban-rural disparities towards improving fair healthcare access.

Conclusion

The evaluation of the standards of accessibility of community healthcare facilities in Southeast Nigeria was carried out by this study through an urban-rural comparative framework and guided by the PICO model. In the course of the study, there were revelations of significant service and spatial disparities between urban and rural locales. Numeric results show that residents in rural areas taxi twice the distance (5.76km vs 2.31km) and contend with longer waiting periods (59 minutes vs 39.54minutes) to reach healthcare institutions. Rural dwellers were also faced with limited facility infrastructure, greater dependence on non-commissioned and auxiliary staff, and fewer qualified medical personnel, irrespective of concomitant lower costs of medical service. On the other hand, urban users gained from the availability of medical resources and consumables, proximity of healthcare institutions to individual take-off points, and better-equipped facilities, even as they reported varied levels of satisfaction.

Regression and inferential statistics affirmed a marked urban-rural imbalance ($p < 0.001$) across indicators of accessibility, transport variables, education and income. Non-numeric findings also backed themes of policy gaps, infrastructural neglect, and cultural restrictions in the delivery of healthcare in rural settings. The study also effectively deployed the PICO framework to structure the inquiry towards deriving viable outcomes on health equity. The injury includes the definition of the population (urban and rural users), the initiatives (aspects of accessibility) and comparison (differences based on location).

In all, equitable and unbiased access to community healthcare facilities is ensured through inclusive planning, reinforced universal design compliance and infrastructural investment. This goes a long way in bridging the urban-rural gulf while also promoting the right to health for all persons in the Southeast geopolitical zone of Nigeria.

Recommendations

The study came up with findings that revealed significant disparities in the standards of accessing community healthcare facilities in Southeast Nigeria. To this end, the following recommendations suffice:

- a. Efforts should be made by the government at all levels to entrench an equitable healthcare resource allocation blueprint. This should be done through the National Primary Health Care Development Agency towards ensuring that compliance with inclusive design principles and accessibility standards is upheld. There is also a need for the collaboration of community-based agencies and NGOs for the purpose of funding projects that are inclusive. Monitoring frameworks instituted by local authorities will also advance and ensure the sustainability of accessibility benchmarks.
- b. A lot of attention should be paid to the rehabilitation of roads, improvement of power and water supply and the incorporation of inclusive design elements such as accessibility of conveniences, signage and ramps. Upgrades and maintenance schedules must be in alignment with WHO Universal Health Coverage objectives. This will ensure sustainability and inclusivity.
- c. Healthcare professionals posted to rural areas should be encouraged to stay put in such places through the advancement of housing and hazard allowances and continuous professional development. Proper professional supervision should be cultivated and implemented, while task-shifting policies need to be encouraged to train and re-train auxiliary medical personnel.
- d. There is a need to leverage GIS-enabled spatial analysis to track gaps in accessibility, the accessibility impact of policy reforms on healthcare equity, and investigate determinants of patient satisfaction with the use of longitudinal data. By so doing, evidence-based planning will be strengthened towards the achievement of fair access to healthcare and health justice across the nation's urban and rural settlements.

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