

Assessment of Housing Characteristics and Crowding Index in Benue South Senatorial District, Nigeria

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ABSTRACT

Background: Housing is a fundamental component of human settlement and a key determinant of health and well-being. In Nigeria, despite numerous housing policies and reforms, implementation remains limited, leaving many citizens in substandard housing conditions. Recurrent insecurity and community displacement have further worsened the situation. This study assessed housing characteristics and the crowding index in the Benue South Senatorial District of Nigeria.

Methods: A community-based, cross-sectional study was conducted among 500 households selected through a multistage sampling technique across nine local government areas. Data were collected using structured interviewer-administered questionnaires and direct observation of housing conditions. Analyses were performed using SPSS version 25.0, with descriptive statistics summarised in frequency tables and Chi-square tests used to examine associations between sociodemographic factors and overcrowding, with a p-value set at 5%.

Results: A total of 423 respondents participated (response rate: 99.8%), aged 17–85 years (mean = 46.1 ± 15.5). Males constituted 66.7%, 94.3% had formal education, and 85.6% were gainfully employed. Overall, housing conditions were poor across most indicators. Accessibility (77.1%), thermal comfort (68.1%), and lighting (60.3%) were relatively adequate, while fewer households met standards for sanitation (39.7%), drainage (32.4%), potable water (23.4%), and ventilation (22.7%). Most houses were concrete structures with zinc roofing (60.3%), and 19.9% of households were overcrowded (mean household size = 7.4 ± 3.7). Settlement type and occupation were significantly associated with overcrowding (p = 0.000 and p = 0.001).

Conclusion: Housing in Benue South Senatorial District is moderately durable but marked by deficits in sanitation, ventilation, and water access. With one-fifth of households overcrowded, the findings underscore the need for evidence-based housing policies and integrated interventions to enhance living conditions and promote public health in line with the Sustainable Development Goals.

Keywords: Benue South, Crowding Index, Housing Characteristics, Nigeria.

INTRODUCTION

Housing is an essential component of human

settlement that satisfies one of the most fundamental needs of human existence. It provides not only physical protection from the elements but also serves as a critical

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determinant of individual and societal well-being.¹⁻⁴ Access to adequate and quality housing has a profound impact on the socio-economic status of individuals and communities, as well as on the overall quality of life, health, welfare, and productivity of populations. The importance of housing extends beyond the provision of shelter; it plays an instrumental role in integrated physical and economic development, environmental sustainability, natural disaster mitigation, job creation, and wealth generation.⁵⁻⁷

Adequate and affordable housing provides individuals and households with a sense of security, privacy, and dignity, and contributes to social stability and community cohesion.⁸ On the other hand, poor housing conditions expose inhabitants to various health risks, including slips and falls, allergic reactions, decreased resistance to emerging and re-emerging infectious diseases, respiratory and cardiovascular diseases, mental health challenges, and social isolation.^{7,10-12} Such inadequacies have broader implications for human security and sustainable development at international, national, and local levels. Therefore, improving housing standards remains central to achieving social equity, environmental resilience, and sustainable development goals.

In recognition of these multidimensional benefits, governments in developing nations have continued to design and implement housing policies, programs, and reforms aimed at providing safe, adequate, and affordable housing for their citizens. Nigeria, like many other developing countries, has embarked on numerous initiatives to tackle the persistent housing deficit.^{7,13-17} However, despite these efforts, a large proportion of both urban and rural areas continue to live in substandard housing that poses significant threats to their physical, mental, and social well-being. The situation has been further aggravated by the spread of informal settlements and slums, as well as by recurrent insurgencies and communal conflicts that have displaced thousands of people, thereby compounding the challenge of inadequate housing.¹⁸

The world today is witnessing an unprecedented rate of

urbanisation. The United Nations projects that by 2025, more than three-fifths of the world's population will reside in urban areas, with approximately 77% of that growth occurring in developing countries. This rapid urban expansion exerts immense pressure on existing housing stocks, infrastructure, and essential services, thereby intensifying problems of overcrowding, poor sanitation, and environmental degradation.¹⁹⁻²¹ Within this context, the Benue South Senatorial District in Nigeria presents a unique case. With an estimated population of 3,407,839 based on the 2006 census projections, the district is experiencing rapid demographic and infrastructural changes. The recent establishment of the Federal University of Health Sciences, Otukpo (FUHSO), has attracted an influx of people into the area, further intensifying the demand for adequate housing and basic amenities. Given these developments, this research seeks to examine the characteristics of housing in the Benue South Senatorial District, with particular attention to the prevalence of overcrowding and the socio-economic and environmental factors influencing it. The findings are expected to provide evidence-based insights that will inform future housing policy formulation, urban planning, and health interventions within the district and beyond.

METHODOLOGY

Study Area

Benue State is one of the 36 states in Nigeria, located in the North Central Zone. Its geographic coordinates are longitude 7° 47' and 10° 0' East. Latitude 6° 25' and 8° 8' North; and shares boundaries with five other states: Nasarawa State to the north, Taraba State to the east, Cross-River State to the south, Enugu State to the south-west, and Kogi State to the west. It also shares an international boundary with the Republic of Cameroon in the southeast. The state has a landmass of approximately 34,059 square kilometres, and consists of 23 Local Government Areas (LGAs) distributed across three senatorial districts. The Benue South senatorial district covers Agatu, Apa, Ohimini, Otukpo, Obi, Oju, Ado, Okpokwu, and Ogbadigbo LGAs. As of 2021, the Benue South senatorial zone had 102 political wards

with an estimated population of 3,407,839 (projected from the 2006 National Census). Among these, Otukpo LGA had the highest population (10.6%, n=359,600), followed by Ado (7.3%, n=248,900), Okpokwu (7.0%, n=237,000), Oju (6.7%, n=227,400), Ogbadigbo (5.2%, n=176,800), Agatu (4.6%, n=156,000), Obi (3.9%, n=133,200), Apa (3.8%, n=130,600), and Ohimini (2.8%, n=95,400). The people predominantly speak the dialect of the Idoma language. About 62.0% of the population of Benue South Senatorial district is within the age range of 0-24 years, with a median age of 17.9 years. Approximately 22.0% of the population comprises women of reproductive age (15-49 years). The inhabitants are largely agrarian, producing crops such as cassava, maize, yams, melons, and guinea corn.

Study Design

A community-based, cross-sectional descriptive study design was employed for the research.

Study Population

The study consisted of two components: geographical assessment of housing distribution and household assessment of housing conditions. The geographical assessment was conducted using a cluster approach. In contrast, the household assessment targeted heads of households in villages/settlements across the 100 political wards of the nine Local Government Areas (LGAs) in the senatorial district. For this study, a household was defined as a group of individuals who share a common cooking pot. The study population was the household head, who may be an adult of either gender. A single compound may contain multiple households. Individuals who did not provide consent were excluded from the study.

Sample Size Determination

The minimum sample size was determined using the formula: $[n = Z^2 P(1-p)/d^2]$.²²

With the estimated prevalence of 53.9% in a previous study³ at 95% confidence interval and 5% degree of precision, a minimum sample size of 381.8 was arrived at. Adjusting for a 10% non-response rate ($n^1 = n/(1-f)$) 424.25 was calculated. To enhance the study's statistical power, the minimum sample size was

increased to 500 respondents.

Sampling Technique

A multistage sampling technique, adapted from the World Health Organisation (WHO) Lot Quality Assurance Sampling (LQAS) methodology used in the 2011 Oral Polio Vaccine (OPV) coverage assessment in Nigeria, was adopted for this study.

Stage 1 (Selection of LGAs):

Five LGAs were selected. Otukpo LGA, having the highest population proportion, was purposively selected, while the remaining four LGAs were selected using a simple random sampling method from the list of all LGAs, which served as the sampling frame. These include Okpokwu, Obi. Apa and Agatu LGAs.

Stage 2 (selection of wards):

From each selected LGA, five political wards were chosen based on the estimated population obtained from the respective LGA headquarters. Wards with the highest population estimates were prioritised.

Stage 3 (Selection of Villages/Settlements):

Within each selected ward, two villages or settlements were selected using the Probability Proportional to Size (PPS) sampling method. In each selected settlement, ten (10) household heads were interviewed.

Data Collection

Housing patterns of the selected settlement were assessed through physical observation, while data from household heads were collected using a pre-tested, structured, interviewer-administered questionnaire. Mapping of the selected community was carried out, and households were selected using a systematic random sampling technique. The first household was selected by using a table of random numbers, and subsequent households were then selected systematically. The survey collected information on various characteristics of the household's dwelling, including: the total number of household members (disaggregated by age and sex), nature of the building, number of habitable rooms, total occupants per sleeping room, source and total number of drinking water points, type and number of toilet facilities, and the materials used for flooring, external

walls, and roofing. Additionally, information was gathered regarding the ownership of durable goods and mosquito nets. Data were also collected on the history of respiratory and cardiovascular morbidity and mortality, depression, and domestic injuries, such as falls, burns, poisonings, ingestion of foreign objects, smoke inhalation, drowning, cuts, collisions with objects, crushing injuries, fractured bones, and structural collapses experienced by any household member within six weeks prior to the survey.

Information was also collected on the ownership of various durable goods and mosquito nets.

Procedure for Data Collection

Data collection was conducted by a research team consisting of three field supervisors and fifty data collectors. The data collectors were organized into five sub-teams, each responsible for covering the five LGAs. In each LGA, a sub-team comprised of two males and five females was supervised by the Co-Investigator and two research assistants. All data collectors were selected from their respective LGAs in collaboration with the LGA Supervisory Councillor for Health.

Data Analysis/Management

The data were analyzed using the Statistical Package for Social Sciences (SPSS) version 25.0. The findings were summarized and presented in exploratory formats, specifically as frequency tables. The Chi-square (χ^2) test was employed to assess the associations between sociodemographic variables and the crowding index. Additionally, a linear relationship between the significant predictor variables identified in the Chi-square analysis and the outcome (criterion variable) was examined using multiple logistic regression, while controlling for potential confounders. A p-value of less than 0.05 was considered statistically significant for the independent variables in the multivariate analysis.

Crowding Index:

The crowding index was calculated based on the total number of persons per living room. The World Health Organisation (WHO) recommends a limit of three persons per residential apartment, excluding toilets and bathrooms, which was applied in the survey.³

Ethical Consideration and Informed Consent

Ethical approval for the surveys was obtained from the Institutional Review Board of FUHSO, the Executive Chairman of the LGAs, and the heads of the political wards of the communities where the surveys were conducted, prior to data collection. Consent was obtained from the household heads before conducting the interviews.

Findings

Socio-demographic Characteristics and Characteristics of the household's dwelling

Socio-demographic Characteristics

Of the total, 423 responded, corresponding to a response rate of 99.8%. Table 1 presents the socio-demographic characteristics of the respondents. The ages of the participants ranged from 17 to 85, with a mean age of 46.1 (± 15.5) years. The largest proportion (25.5%) was in the 31–40-year age group, followed by those aged 41–50 years (22.0%). Respondents aged ≤ 20 years constituted the least proportion (3.3%). Males accounted for two-thirds of the respondents (66.7%), while females represented 33.3%. Regarding educational attainment, 45.2% had completed secondary education, 33.8% had attained tertiary education, 15.4% had primary education, and 5.7% reported no formal education. The majority of respondents were of Idoma ethnicity (74.9%), followed by Igede (19.4%), while Tiv (0.7%) and other ethnic groups (5.0%) constituted the minority. In terms of marital status, most respondents were married (76.4%), followed by 11.3% who were single, 8.7% who were widowed, 1.9% who were divorced, and 1.7% who were separated. Christianity was the predominant religion (95.0%), followed by Islam (4.7%), with other religions accounting for 0.2%. Most respondents (85.6%) were currently engaged in some form of work, while 14.4% were not. Among those currently working ($n=362$), farming was the most common occupation (50.3%), followed by petty trading (16.3%), business (11.3%), teaching (9.7%), artisan work (9.7%), and health-related occupations (2.8%).

Variables	Frequency	Percent
Age Group (years)		
≤20	14	3.3
21 -30	61	14.4
31 -40	108	25.5
41 -50	93	22.0
51 -60	65	15.4
61 -70	56	13.2
≥71	26	6.1
Mean	46.1(±15.5)	
Sex		
Male	282	66.7
Female	141	33.3
Highest level of Education		
No Formal Education	24	5.7
Primary	65	15.4
Secondary	191	45.2
Tertiary	143	33.8
Tribe		
Idoma	317	74.9
Igede	82	19.4
Tiv	3	0.7
Others*	21	5.0
Marital Status		
Married	323	76.4
Single	48	11.3
Widowed	37	8.7
Divorced	8	1.9
Separated	7	1.7
Religion		
Christianity	402	95.0
Islam	20	4.7
Others*	1	0.2
Currently Working		
Yes	362	85.6
No	61	14.4
Working (n=362)		
Farming	182	50.3
Petty Trading	59	16.3
Businessman	41	11.3
Teacher	35	9.7
Artisan	35	9.7
Health Worker	10	2.8

*Other Tribes =Ibos, Religion= Free Thinker

Characteristics of the Household's Dwelling Nature of Settlement

The majority, 226(53.4%), were clustered settlements,

while 197 (46.6%) were dispersed settlements (Figure 2).

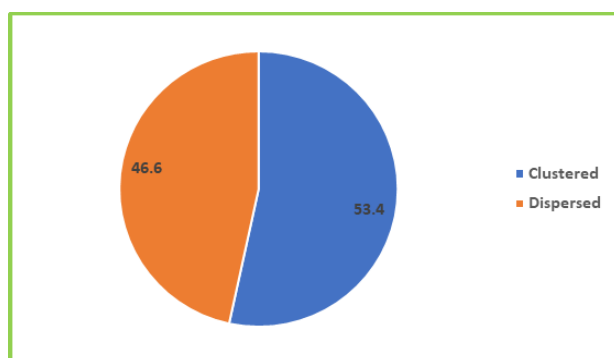


Fig. 1: Nature of Settlement

Housing Characteristics

The evaluation of housing conditions based on selected quality criteria is presented in Table 2. Accessibility emerged as the most frequently met criterion, with 326 (77.1%) households providing easy access for all, including persons with disabilities and the elderly, while 97 (22.9%) lacked this provision. Thermal comfort, defined as protection from heat, cold, humidity, and the presence of leak-proof roofs and walls, was reported in 288 (68.1%) households, compared to 135 (31.9%) without it.

Adequate lighting, encompassing sufficient natural illumination and safe artificial lighting, was present in 255 (60.3%) households, while 168 (39.7%) fell short. Structural quality (houses constructed with durable materials and compliant with safety regulations) was met in 214 (50.6%) households, with an almost equal proportion, 209 (49.4%), not meeting this standard. The majority of the houses were concrete structures with zinc roofing (60.3%), followed by mud houses with zinc roofing (31.9%). A smaller proportion of houses were concrete structures with thatch roofs (4.7%) or mud houses with thatch roofs (2.1%). Very few houses were concrete structures roofed with corrugated metal sheets (0.7%) or asbestos (0.2%).

Adequate space, defined by the minimum floor area per person and separate rooms for sleeping, cooking, and living, was observed in 186 (44.0%) households, while 237 (56.0%) lacked such arrangements. Sanitation facilities, including hygienic toilets and proper sewage

or wastewater disposal systems, were available in 168 (39.7%) households, while 255 (60.3%) lacked them. Adequate drainage to prevent flooding or stagnation was present in 137 (32.4%) households, with 286 (67.6%) lacking it. Environmental health conditions (clean surroundings, proper waste disposal, and freedom from pollutants) were reported in 133 (31.4%) households, while the majority, 290 (68.6%), did not meet this standard.

Regarding location, only 127 (30.0%) households were situated away from hazards and close to essential services, while 296 (70.0%) were not. Safety and security measures, such as secure doors and windows, fire safety features, and safe electrical wiring, were reported in just 102 (24.1%) households, compared to 321 (75.9%) without such safeguards.

Access to safe and potable water within or near the premises was among the least met criteria, recorded in 99 (23.4%) households, while 324 (76.6%) lacked this provision. Ventilation was the lowest-performing indicator, with only 96 (22.7%) households having adequate natural airflow to prevent dampness and mould, leaving a substantial majority, 327 (77.3%), without proper ventilation.

Table 2: Summary of Housing Characteristics

Criteria	Description	Yes		No	
		Freq.	%	Freq.	%
Accessibility	Easy access for all, including persons with disabilities and the elderly	326	77.1	97	22.9
Thermal Comfort	Protection from heat, cold, humidity; leak-proof roof and walls	288	68.1	135	31.9
Lighting	Sufficient natural light and safe artificial lighting	255	60.3	168	39.7
Structural Quality	Durable materials, walls, and roof, compliant with safety regulations	214	50.6	209	49.4
Adequate Space	Meets minimum floor area per person; separate rooms for sleeping, cooking, and living	186	44.0	237	56.0
Sanitation Facilities	Hygienic toilets; proper sewage/wastewater disposal	168	39.7	255	60.3
Drainage	Effective rainwater and wastewater drainage to prevent flooding/stagnation	137	32.4	286	67.6
Environmental Health	Clean surroundings; proper waste disposal; free from pollutants	133	31.4	290	68.6
Location	Situated away from hazards, close to essential services	127	30.0	296	70.0
Safety and Security	Secure doors/windows; fire safety measures; safe electrical wiring	102	24.1	321	75.9
Water Supply	Access to safe and potable water within or near the premises	99	23.4	324	76.6
Ventilation	Adequate natural airflow via windows and vents prevents dampness and mould	96	22.7	327	77.3

Number of Habitable Rooms

Figure 2 presents the Household numbers, ranging from 1 to 21, with a mean of 7.4 (± 3.7 members). Overall, 84 households had more than three persons sleeping per room, corresponding to an overcrowding rate of 19.9%, while 80.1% had three or fewer persons sleeping per room at night.

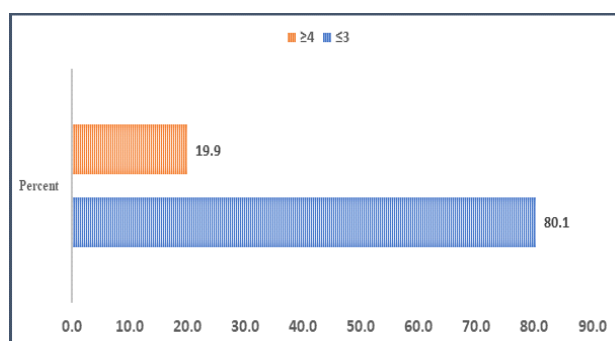


Figure 3: Number of Persons who Sleep Per Room

Association between Sociodemographic Variables and Crowding Index

Among households where ≥ 4 persons shared a room, the majority were from dispersed settlements (78.6%), those living in personal houses (71.6%), households

headed by males (70.2%), individuals aged 31–40 years (32.1%) and 21–30 years (20.2%), those with secondary education as their highest qualification (51.6%), married persons (79.8%), farmers (46.4%), and Christians (97.6%). Overall, the associations between settlement type and occupation and the crowding index were statistically significant ($p = 0.000$ and $p = 0.001$, respectively). In contrast, the relationships with house ownership ($p = 0.792$), age group ($p = 0.056$), sex ($p = 0.438$), education ($p = 0.258$), tribe ($p = 0.262$), marital status ($p = 0.080$), and religion ($p = 0.378$) were not statistically significant.

Table 4: Sociodemographic Characteristics by Crowding Index

Variables	Number of Persons Sleeping Per Room		Statistical Values
	≤3 (n=339)	≥4 (n=84)	
Settlement Type			X ² =43.133
Dispersed	131(38.6)	66(78.6)	df=1
Clustered	208(61.4)	18(21.4)	p-value = 0.000
House Ownership			X ² =0.069
Personal House	247(72.9)	60(71.4)	df=1
Rented House	92(27.1)	24(28.6)	p-value = 0.792
Age Group (years)			X ² =12.266
≤20	13(3.8)	1(1.2)	df=6
21-30	44(13.0)	17(20.2)	p-value = 0.056
31-40	81(23.9)	27(32.1)	
41-50	77(22.7)	16(19.0)	
51-60	57(16.8)	8(9.5)	
61-70	49(14.5)	7(8.3)	
≥71	18(5.3)	8(9.5)	
Sex			X ² =0.602
Male	223(65.8)	59(70.2)	df=1
Female	116(34.2)	25(29.8)	p-value = 0.438
Highest level of Education			X ² =4.031
No Formal Education	17(5.0)	7(8.3)	df=4
Primary	53(15.6)	12(14.3)	p-value = 0.258
Secondary	148(43.7)	43(51.2)	
Tertiary	121(35.7)	22(26.2)	
Tribe			Likelihood Ratio= 3.995
Idoma	248(73.2)	69(82.1)	df= 3
Igede	70(20.6)	12(14.3)	p-value =0.262
Tiv	3(0.9)	0(0.0)	
Others*	18(5.3)	3(3.6)	
Marital Status			X ² =8.226
Married	256(75.5)	67(79.8)	df=4
Single	36(10.6)	12(14.3)	p-value = 0.080
Widowed	36(10.6)	1(1.2)	
Divorced	6(1.8)	2(2.4)	
Separated	5(1.5)	2(2.4)	
Religion			Likelihood Ratio=1.948
Christianity	320(94.4)	82(97.6)	df=2
Islam	18(5.3)	2(2.4)	p-value =0.378
Others*	1(0.3)	0(0.0)	
Working (n=362)			X ² =22.643
Farming	143(42.2)	39(46.4)	df=6
Petty Trading	37(10.9)	22(26.2)	p-value = 0.001
Businessman	36(10.6)	5(6.0)	
Teacher	32(9.4)	3(3.6)	
Artisan	26(7.7)	9(10.7)	
Health Worker	9(2.7)	1(1.2)	
Not Working	56(16.5)	5(6.0)	

DISCUSSION

This study examined housing characteristics and crowding in the Benue South Senatorial District, providing important insights into the demographic composition and living conditions.

Socio-Demographic Characteristics

The sociodemographic characteristics of the

respondents indicated a predominance of the economically active age group, with the most significant proportions aged 31–40 years (25.5%) and 41–50 years (22.0%). This finding is consistent with other demographic surveys in Nigeria, which have shown that adults in their productive years often head households and make housing-related decisions.^{14-18,23-26} In these studies, males predominate, a trend that also reflects the

cultural norms in which men are often recognised as household heads, aligning with observations from similar studies in Nigeria and sub-Saharan Africa.

Educational attainment was relatively high, with nearly four-fifths of respondents having at least secondary education, suggesting gradual improvements in educational access in the region. However, the 5.7% without formal education underscores persisting inequalities that may limit health literacy and housing quality. The occupational profile, dominated by farming (50.3%), reinforces the agrarian nature of the local economy, a pattern documented across rural Nigeria.²⁷ Such dependence on subsistence agriculture may constrain disposable income available for housing improvements.

Nature of Settlement and Housing Characteristics

The United Nations estimates that by the end of 2025, more than three-fifths of the world's population will live in urban areas, with 77% of this in developing countries. Our study reveals a nearly even distribution between clustered (53.4%) and dispersed (46.6%) settlements.²⁰ However, the high proportion of dispersed households suggests that rural settlement patterns remain prevalent, which may perpetuate inequalities in housing quality and access to essential services, which has implications for service provision. Clustered settlements facilitate access to shared infrastructure such as water, sanitation, and electricity, whereas dispersed settlements make service delivery more difficult and costly (United Nations Human Settlements Programme).²¹

Our assessment of housing conditions highlighted substantial deficits in relation to international and national standards. The World Health Organization (WHO) identifies key housing attributes—such as structural integrity, space, ventilation, sanitation, water supply, and safety—as determinants of health.³ In our study, only accessibility and thermal comfort indicators of standard housing were found to be adequate, while the other key indicators were markedly deficient. More than two-thirds of the households reported inadequate ventilation, limited access to safe water, and a lack of

functional sanitation facilities (Table 2). Similar patterns of inadequate ventilation, sanitation, and access to potable water have been documented in studies in Lagos, Abuja, and Northern Nigeria.²⁸⁻²⁹ However, the findings from our study fall below the benchmark set by the Nigerian National Housing Policy, which emphasises adequate water supply, sanitation, and structural safety as minimum standards for habitable housing.^{13, 14} These deficits indicate that policy implementation remains weak at the community level. By implication, various health risks— including respiratory diseases due to poor ventilation, diarrheal diseases from unsafe water and inadequate sanitation, as well as injuries stemming from structurally unsafe houses—are prevalent in the zone due to poor housing policy implementation.

The predominance of concrete houses with zinc roofing (60.3%) indicates progress toward more durable housing; however, the persistence of mud houses (31.9%) and structures roofed with thatch or asbestos highlights underlying socioeconomic disparities and reliance on low-cost or unsafe materials. Additionally, poor drainage (reported in 67.6% of households) and inadequate environmental sanitation (68.6%) remain critical challenges requiring urgent policy attention, as they expose communities to vector-borne and water-related diseases, consistent with findings from similar studies in Nigerian rural contexts.^{6,28}

The observed lack of adequate space in more than half of households (56.0%) is concerning, given WHO recommendations that overcrowding should not exceed three persons per habitable room.³ Inadequate space compromises privacy, increases the risk of communicable diseases, and adversely affects mental well-being. The low prevalence of safety measures (24.1%) also indicates vulnerability to accidents, fire hazards, and insecurity.

Crowding Index

The mean household size of 7.4 persons, along with the finding that 19.9% of households had four or more persons sleeping in one room, underscores the burden of overcrowding in the district. WHO identifies

overcrowding as a significant health risk factor, increasing susceptibility to tuberculosis, meningitis, and acute respiratory infections.³ Although the reported levels of overcrowding are lower than those seen in certain urban slums (e.g., Lagos and Port Harcourt), they still represent a public health concern for semi-rural areas.

The relationship between crowding and settlement type, as well as occupation, is noteworthy. Overcrowding was more prevalent in dispersed settlements and among farming households. This may reflect larger household sizes in agrarian families and the limited resources available for investment in spacious housing. The absence of statistically significant associations with education, marital status, and religion suggests that crowding is more strongly influenced by settlement structure and economic conditions than by individual demographic factors, aligning with observations in other Nigerian housing studies.^{29,30}

Interventions should adopt a multi-sectoral approach, combining public health initiatives with urban planning and community development. Priority actions include:

1. Expansion of rural water supply schemes to address the critical gap in potable water.
2. Subsidized housing improvement programs, targeting households living in mud and thatch houses.
3. Enforcement of building standards to improve ventilation, safety, and fire resilience.
4. Community-based sanitation and drainage projects, reducing environmental health risks.
5. Awareness and behavioural change campaigns to promote household hygiene, waste disposal, and reduced crowding.

These measures align with Sustainable Development Goal (SDG) 11, which aims to ensure access to adequate, safe, and affordable housing and basic services, as well as to upgrade slums by 2030.³¹

CONCLUSION

Despite moderate adequacy in structural quality and accessibility, overall housing conditions in the Benue

South Senatorial District were largely substandard. Deficiencies in ventilation, potable water supply, sanitation, and safety were prevalent, and nearly one-fifth of households experienced overcrowding, significantly influenced by settlement type and occupation. These findings underscore persistent inequalities in housing quality and highlight the intersection between housing, socio-economic status, and public health in the region. To address these challenges, policy interventions should prioritise the provision of essential housing amenities and the enforcement of minimum housing standards, particularly in underserved areas. Integrating housing improvements with broader public health and urban planning initiatives could help reduce overcrowding and associated health risks. Further research is recommended to explore causal pathways and evaluate the effectiveness of targeted housing interventions across different settlement types

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Conflicts of Interest

There was no conflict of interest among the authors.

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