

# Characteristics of Housing in a Rural Community: A Case Study of Chanso Village in Plateau State, Nigeria

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**Abstract:** *Housing is an important determinant of health and has been linked to certain disease conditions. This study examined the characteristics of housing in a rural community and its implications for health. It was a cross-sectional study in which the community was purposively selected. Total population sampling was applied and data was obtained with the use of a checklist. A total of 199 household data were analysed with the use of Epi-Info 3.5.1 software. Most (80%) of the houses were made of mud bricks, 63% were found to be in good condition though mould was detected in 4% of the walls of the houses. Sanitary amenities identified in the community included, wells and pit latrines and waste disposal was mostly by open dumping. Most environments were found to be filthy (85%) with a resultant finding of several types of vectors and vermin. Interventions are required in this community to improve basic sanitation.*

**Keywords:** housing, rural, characteristics, sanitation

## 1. Introduction

Housing is one of the most complex components of environmental health and its public health importance cannot be over emphasized. In modern concepts, it includes not only the physical structure providing shelter but also the immediate surroundings and the related community facilities and services. (WHO<sup>a</sup>, 2010) The intended use of the physical structure is for human habitation and protection from various hazards. While the streets, shops, places of worship, recreational and green areas constitute the neighbourhood or immediate surroundings. The community comprises those living, working and providing services in the neighbourhood. Proper housing should provide basic physiological and psychological needs and protect individuals and families from infections and accidents.(Obionu, 2007)

All these aspects of housing are important determinants of health and quality of life. In the words of Florence Nightingale, "The connection between the health and the dwelling of the population is one of the most important that exists."(Frumkin H) In recent decades, scientific evidence on links between housing and health has tremendously increased.(WHO<sup>a</sup>, 2010)Compared to other buildings, the home is where people most spend time, more so in rural areas. Studies have shown that people spend on the average 15-16 hours per day at home.(Udoh et al, 2013; WHO<sup>b</sup>, 2010;Brasche, 2005; Farrow et al, 1997)

Thus, staying at home, which is inevitable, can lead to conditions such as indoor air pollution, physical injuries, infestation and infection. WHO estimates that nearly 2 million people in developing countries die from indoor pollution caused by the burning of biomass and coal in leaky and inefficient household stoves.(Bruce et al, 2000)Studies have also established links between injuries and housing.(Shai, 2006; Sengoelge et al 2013; Keall et al, 2011)

Housing conditions affect the health status of individuals and families but it is not well acknowledged as a major health determinant especially in a developing country like Nigeria where there is insufficient data and research on the health implications of unhealthy housing especially in rural Sub-Saharan Africa.(Udoh et al, 2013)

Despite recent efforts by WHO to bring to light this matter, less attention is given in developing countries where majority of the inhabitants are living in rural areas, (Olojede et al, 2013; World Bank, 2015)and where traditional methods of construction and maintenance of house is still predominantly in use. Governments who are to ensure that policies that will be technologically appropriate for sustainable development and continuity in line with the spirit of Alma Ata (Primary Health Care) are not adopting or implementing while still relying on donor funds for research to direct policies and programmes.

Housing policies and programmes of Government have been documented as not meeting the goals and standards that were set out.(Waziri et al, 2013; Ibem et al, 2011; Olotuah et al, 2009) Lack of good quality designs and adherence to building codes and standards may consequently have a negative implication on the health of the public. Where implementation has taken place it has been mostly in urban areas. The objective of this study is to examine the characteristics of housing in a rural community and its implications for health thereby adding to the existing body of knowledge regarding rural housing in Nigeria.

## 2. Data Collection and Analyses

This study was conducted in Chanso community of Gindiri district of Mangu Local Government Area (LGA) of Plateau State. Chanso community is about 10km from the Jos University Teaching Hospital Comprehensive Health Centre (JUTH CHC) which is the rural practice centre of the

Department of Community Medicine, University of Jos, Nigeria. Chanso community has an access road, a Primary Health care centre (PHC), a government owned primary and secondary school, electricity and telecommunication network. It is predominantly an agrarian community, the indigenous people being the Pyem people.

This was a descriptive cross sectional study. Chanso community had been purposively selected as an area for community diagnosis for medical students. The data was collected as part of the community diagnosis. Total population sampling was carried out following household census in the community where a total of 200 households were obtained. A household was defined as a group of persons living together under the same roof and eating from the same pot. Shops, offices and workshops were excluded. Data was collected with the use of a checklist that obtained information on the physical structure of the house, waste disposal methods and general environmental state of the house. One hundred and ninety nine (199) were analyzed as 1 checklist was discarded for incompleteness. Data was entered and analyzed with the use of the statistical software Epi-Info 3.5.1. Data was presented in the form of frequency tables. Written permission was sought and obtained from the Chairman of the LGA, traditional ruler of the ward and the village head of Chanso. Verbal informed consent was obtained from the head of each household before the checklist was filled.

### 3. Results

A total of 199 households were observed in the study and majority (96.5%) of the households in the community were personal residential accommodation. While, only 3.5% of the houses were rented. The houses in good condition were 126 (63.3%) with 51 (25.6%) in need of major repairs and 22 (11.1%) found to be old and dilapidated. (Table 1). The roofs on most houses (74.9%) were found to be in good condition. Almost half (43.2%) of the houses had plastered walls while mould was identified on the walls of 8 (4.0%) of the houses. About half (52.0%) of houses were found to be fenced and were surrounded by crops, grass, trees, shrubs and flowers. It was found to be a generally quiet environment as 68.3% was found to be quiet with a moderate level of noise in 31.7%.

Most (79.9%) of the houses were built from mud blocks and the roofing material predominantly in use was the zinc/corrugated iron (75.4%). Most (87.4%) of the houses were not painted. The average number of rooms per house hold was  $3.4 \pm 2.1$  and the average number of persons per room was found to be  $6.1 \pm 5.0$  in the community. The through type of ventilation was found in 95% of the houses in the community. Most (81.4%) of the houses had no screens on the doors and windows. Most of the houses had outdoor kitchens (79.9%) and stores (54.8%) available. The sources of power available were public power supply and generators, however most (52.8%) houses had neither of these available. The most common audio-visual equipment available was the radio (57.5) while a lower percentage owned televisions (28.5%) and computers (1%). The main source of cooking fuel was firewood (88.4%). (Table 2)

The main source of water supply for the households was by wells (69.6%) though most of the wells were poorly constructed. Other sources were boreholes, stream/river and pipe-borne water as seen in Table 3. Most (59.8%) of the sources of water supply were less than 50m from the houses. The commonest type of toilet facility in use was the simple pit latrine (83.4%). Bathroom facilities were available to 98% of the houses. Open dumping (74.9%) was the major form of waste disposal. About half of the houses were found to be tidy (50.3%). Different types of vermin/vectors were detected in and around the house including mosquitoes, cockroaches, rats, bugs, scorpions and snakes.

### 4. Discussion

This study was conducted in a rural setting where it was found that most of the houses were personal residential homes. This is not surprising as most of the residents are indigenes of the community and likely to have built on land owned by families; land that is used for agricultural purposes and for the provision of shelter. The noise level in the community was found to be moderate which is usual for rural settings. Hence, effects such as hearing impairment, stress reaction, irritability, fatigue and other disturbances that are associated with very noisy environments will be eliminated if not absent among the communities. (Ising, 2004; Stanfeld, 2003)

The lack of fencing in almost half of the houses is a typical characteristic of rural communities as was also demonstrated by Udoh in Akwa Ibom of Nigeria. (Udoh et al, 2013) The fencing found was mostly made of mud. The same material that was used in the building of almost all the houses in this study. The use of mud for building is a common traditional practice in rural areas and is based on the use of locally available materials. (Ordinoha, 2010) A study by Shrestha et al. in Nepal showed that prevalence of respiratory symptoms and disease is higher in those living in mud brick houses as compared with concrete bricks. (Shrestha et al, 2005) In contrast, a study by Yé et al. showed that living in a completed mud brick house with plastered walls and roof has a high reduction in risk of malaria. (Yé et al, 2006) However, this study did not relate specific housing characteristics to specific health conditions.

The lack of electricity supply is a persistent problem in Nigeria and this is reflected in this study where more than half of the houses have no connection to electricity power. This may be the reason why the use of audio-visual equipment that rely on electricity were not prevalent and there was heavy reliance on fossil fuels for cooking.

Fire wood was the predominant cooking fuel used in this community. The use of solid fuels has been associated with negative socio-economic, environmental, and health effects worldwide but is found to be more prevalent in communities that lack electricity as was found in this study. (WHO, 2016) Most of the kitchen were outdoors which may provide a limited amount of protection from the effects associated with the use of biomass for energy production.

The use of zinc/ corrugated iron for roofing of mud houses by the majority shows a departure from the use of straw for

roofing. Possibly because it lasts longer and offers better protection against dampness than straw roofing.(Yéet al, 2006) The availability of zinc roofing and affordability by the community may also indicate a gradual change in the socioeconomic status of the rural area that is predominantly agrarian.

Most houses were overcrowded with through-type ventilation which has implications for the transmission of diseases such as meningitis, pulmonary tuberculosis, upper and lower respiratory tract infections, skin infections and general mental health. The study conducted in Akwa Ibom, Nigeria(Udoh, 2013) found a prevalence of respiratory illnesses among rural residents which positively correlated with overcrowding and poor ventilation. Overcrowding which is generally perceived to be an urban problem is demonstrated here to be a problem that also needs to be tackled in rural settings.

Water supplies were mainly by wells whether properly or poorly constructed, similar to what was found by the Nigeria Demographic and Health Survey (NDHS).(NPC Nigeria, 2014)The dominant toilet type was the pit latrine similar to a study in Osogbo, Osun State.(Ayoola et al, 2012) Open dumping was also the main method of waste disposal, a method that has been repeatedly documented in studies conducted in Nigeria.(Ojo, 2014 ; Aderemi et al, 2012; Ukpong et al, 2011) It is therefore not surprising that with this combination of findings, most of the homes were found to be filthy with the presence of vectors and vermin. Vectors and vermin that are attracted by the filth would also easily get access into the homes as most were lacking screens on the doors and windows. These patterns of sanitation practices combine to pose a health risk to the inhabitants as many environmentally related diseases are mainly due to poor sanitary conditions. Inadequate sanitation is estimated by the World Health Organization (WHO) to cause 280,000 diarrhoeal deaths annually and is a major factor in several neglected tropical diseases such as intestinal worms, schistosomiasis, trachoma and contributes to malnutrition.(WHO, 2016)

## 5. Conclusion

This community would benefit from an increased awareness of basic sanitation and the importance of keeping the environment clean. The widespread availability of radios in the community suggests that health education messages through this medium would be feasible in this community. However, interventions that would improve water supply, toilet facilities and waste disposal methods are also recommended for this community.

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**Table 1:** General condition of the houses in Chanso community

Variable	Frequency	Percentage (%)
<b>Condition of house</b>		
Physically sound	126	63.3
Needing major repair	51	25.6
Dilapidated and old	22	11.1
<b>Condition of roof</b>		
Good	149	74.9
Leaking	34	17.1
Patched	16	8.0
<b>Condition of walls</b>		
Plastered	86	43.2
Cracked	52	26.1
Mouldy	8	4.0

**Table 2:** Physical structure and facilities of houses in Chanso community

Variable	Frequency N = 199	Percentage (%)
<b>Building material</b>		
Mud/mud blocks	159	79.9
Cement blocks	35	17.6
Thatch	3	1.5
Zinc	2	1.0
<b>Roofing material</b>		
Zinc/corrugated iron	150	75.4
Straw	47	23.6
Asbestos	2	1.0
<b>Source of power</b>		
Public power supply only	43	21.6
Generator only	26	13.1
Public power supply and generator	25	12.6
None	105	52.8
<b>Number of rooms per household</b>		
1	15	7.5
2	62	31.2
3	52	26.1
4	29	14.6
≥5	41	20.5
<b>No of persons per room</b>		
1	13	6.5
2	33	16.6
3	26	13.1
4	22	11.1
Mean 6.1 ± 5	105	52.8
<b>Type of ventilation in rooms</b>		
Through	189	95.0
Cross	10	5.0
<b>Presence of a store</b>		
Yes	109	54.8
No	90	45.2
<b>Kitchen type</b>		
Outdoor	159	79.9
Indoor	30	15.1
Not available	10	5.0
<b>Screening of doors and windows</b>		
Screened doors only	10	5.0
Screened windows only	16	8.0
Both windows and doors screened	11	5.5
None screened	162	81.4
<b>Vegetation surrounding house</b>		
Crops	95	47.7
Bushes	75	37.7
Grass	74	37.2
Trees	40	20.1
Shrubs	31	15.6
Flowers	6	3.0
<b>Main source of cooking fuel</b>		
Firewood	176	88.4
Kerosene stove	21	10.6
Gas	2	1.0
<b>Audio-visual equipment available</b>		
Television	57	28.5
Radio	115	57.5
Computers	2	1.0
None	65	32.7

**Table 3: Sanitary amenities in households**

Variable	Frequency (n=199)	Percentage (%)
<b>Main source of water supply</b>		
Poorly constructed well	103	51.8
Borehole	58	29.1
Well (sanitary)	35	17.8
Stream/river	2	1.0
Pipe-borne	1	0.5
<b>Distance of water supply from house</b>		
Indoors	25	12.6
Less than 50m	119	59.8
More than 50m	55	27.6
<b>Toilet facilities (type)</b>		
Pit latrine	166	83.4
Open defaecation	16	8.0
Water closet with septic tank	12	6.5
Ventilated Improved Pit (VIP) latrine	2	1.0
Aqua privy	2	1.0
<b>Toilet facilities (location)</b>		
Outdoor	165	82.9
Indoor	18	9.0
Not available	16	8.0
<b>Bathroom facilities (location)</b>		
Outdoor	161	80.9
Indoor	34	17.1
Not available	4	2.0
<b>Solid waste disposal method</b>		
Open dumping	149	74.9
Open burning	48	24.1
Collection and transportation for off-site disposal	2	1.0
<b>General sanitary condition of household environment</b>		
Tidy	100	50.3
Untidy	99	49.7
Clean	30	15.1
Filthy	169	84.9
<b>Vectors/vermin sited</b>		
Bugs	14	13.3
Cockroaches	17	16.2
Mosquitoes	48	45.7
Rats	15	14.3
Scorpions	7	6.7
Snakes	4	3.8