ORIGINAL ARTICLE

e-ISSN: 2349-0659 p-ISSN: 2350-0964
doi: 10.21276/apjhs.2018.5.1.39

Housing features and household access to sanitation facilities in a rural Nigerian community

Alphonsus O. Aigbiremolen[1,2]*, A. E. Aigbiremolen-Alphonsus[3], I. Nwadike[3], E. Afogbon[4], I. A. Airefetalor[1,2], O. I. Oaikhena[1,2]

[1]Department of Community Medicine, Irrua Specialist Teaching Hospital, Irrua, Edo State, Nigeria, [2]Department of Community Research, Cedar Centre for Health and Development, Ekpoma, Nigeria, [3]Department of Nursing Science, College of Medical Sciences, Ambrose Alli University, Ekpoma, Edo State, Nigeria, [4]Department of Strategic Space Application, National Space Research and Development Agency, Abuja, Nigeria

ABSTRACT

Good housing and adequate sanitation are linked as both are important in disease prevention and the overall promotion of health and well-being of man including residents in rural communities. This study was carried out to examine household access to sanitation facilities in Usugbenu, a rural community in Edo State, Nigeria, and to determine what relationship exist between household characteristics and use of such facilities in the study area.

Cluster sampling technique was used to draw a sample of 399 households from the community, and interviewer-administered questionnaires were used to collect data. Data analysis was done using IBM SPSS with statistical significance level set at $P \leq 0.05$.

The most common family type was the nuclear family (62.7%); the most common housing unit type was flat/bungalow (57.1%); and the owner-occupier status was 73%. Block/brick wall houses were 63.4% while the common sources of water for household use were sachet water (30.1%), rainwater (28.8%), and borehole (20.1%). Pit toilets were used in 71.7% of households while sharing of toilet facilities occurred in 29.1% of households. Significant factors associated with the use of non-shared toilet facilities in this study were higher (secondary/tertiary) level of education, inherited or self-owned house, and brick/blockhouse wall type.

Factors that compromise sanitation such as poor access to domestic water supply and sharing of toilet facilities were prevalent in the community.

Key words: Household, housing features, rural community, sanitation, water supply

INTRODUCTION

Shelter is one of the man's most important needs. By extension, housing with adequate sanitation facilities is essential to the health and socioeconomic well-being of households, communities, and the entire society at large.[1,2] Good and adequate housing is a matter of human rights.[3] It provides shelter, comfort, and access to necessary household facilities including safe water supply, sewage disposal, and energy. Safe water supply is strategic to good nutrition, infection control, and general well-being at the individual household and community levels. Disease transmission and the proliferation of disease vectors such as house flies, cockroaches, and even rodents are related to poor sewage disposal as well as other waste management practices.[4,5]

Household characteristics and sociodemographic features of household members are associated with improved sanitation while access to adequate sanitation is worse in rural communities.[6,7] According to the 2013 Nigeria Demographic and Health Survey, only 28.2% of persons living in rural communities in Nigeria have access to improved toilet facilities compared to 42.7% for urban residents.[8] Improvement in the health indices of a community is closely tied to safe housing, access to clean water, and sanitary waste disposal. According to reports, a substantial part of global deaths and disease burdens are due to environmental factors which are preventable through environmental strategies such as adequate shelter, provision of safe water, adequate hygiene, and improved sanitation.[9,10] Rain harvesting, which is a traditional means of getting water in Nigeria, has been found to be inadequate for household water requirements in Edo State while water and sanitation-related diseases are widespread.[11,12]

This study sought to examine household access to sanitation facilities in a rural community in Edo State, Nigeria community and to determine what relationship exist between household characteristics and such facilities in the study area.

MATERIALS AND METHODS

This study was carried out from 2014 to 2016 in Usugbenu, a rural community in Esan Central LGA of Edo State, Nigeria. The maps of the study area are shown in Figure 1. The community is a largely agrarian one though many residents also engage in trading. The Cochran formula[13] was used to calculate the minimum sample size for this study: $n = Z^2pq/d^2$ where Z is the standard deviation at 95%, p is the prevalence of 28.2% for improved toilet facility

Address for correspondence:
Dr. Alphonsus O. Aigbiremolen, Department of Community Medicine, Irrua Specialist Teaching Hospital, P. M. B. 08, Irrua, Edo State, Nigeria.
E-mail: drphonsus@yahoo.com

Received: 30-01-2018 **Revised:** 19-02-2018 **Accepted:** 28-03-2018

from the 2013 Nigerian Demographic and Health Survey,[8] q is 1-p, and d is the precision level of 5%. Thus, a minimum sample size of 311 was calculated for the study.

Cluster sampling technique was used to select the participating households adopting the community quarters as clusters. Data collection was done with the use of interviewer-administered questionnaires. Analysis of data was done with SPSS version 21.[14] The level of statistical significance was set at $P \leq 0.05$. Ethical guidance was provided by the Department of Community Health and Primary Care, Ambrose Alli University, Ekpoma. In addition, verbal informed consent was obtained from every study participant and confidentiality was assured.

RESULTS

As shown in Table 1, married respondents were the largest group of respondents (45.3%) while the most common occupations were farming and trading (36.6% and 17.3%, respectively). More than half of them had either primary or secondary education. An overwhelming majority of the respondents were Christians and Esans. Table 2 summarizes that most household heads were fathers while 62.7% were nuclear families. More than half (57.1%) of the housing units were bungalows/flats while about one-third were passage ("face-to-face") houses. Majority of the houses were owner occupied.

About 86% of the houses were roofed with galvanized iron (zinc sheets) while 63.4% were built with blocks or bricks [Table 3]. Over three-quarters of the houses had cement or concrete floors. Table 4 summarizes that the main sources of water for household use were commercially sold sachet water (30.1%), rain (28.8%), and borehole (20.1%). Similarly, Figure 2, the main sources of drinking water were borehole (62.9%) and sachet water (25.6%).

Table 5 summarizes that pit latrines were the most commonly used (71.7%) toilet facilities in the community while 29.1% of household were sharing toilet facilities. As shown in Table 6, owner-occupied or inherited houses and mud/wood houses were significantly associated with not sharing toilet facilities ($\chi^2 = 32.427$, $P \leq 0.001$; and $\chi^2 = 6.112$, $P = 0.013$, respectively).

DISCUSSION

The high proportion of farmers among the study participants is indicative of the agrarian nature of the community. Farming together with small-scale trading (including trading in farm produce) is the main occupation of many rural communities in Nigeria. The size of households, in traditional settings, is commonly influenced by the need to have more family members who can provide labor for farming and related work.[15,16] It is, therefore, common to find households with extended family members as was the case in this study where more than one-third of the households consisted of extended families. Majority of households in this study lived in houses owned by them. This implies that there may be household autonomy with respect to the acquisition and use of sanitation facilities in most households in the community. Where sanitation facilities are within the control of a household, it can take responsibility for maintenance and sustainability of such facilities, thereby guaranteeing protection of health and well-being of household members.

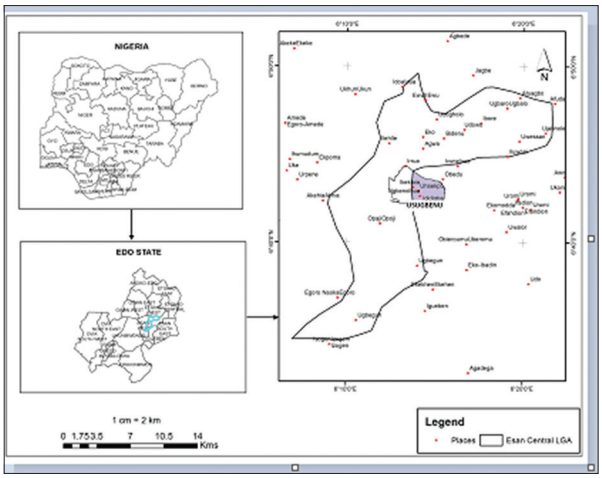

Figure 1: Map of Esan Central LGA, Edo State showing the Usugbenu area. Source: National Space Research and Development Agency, Abuja, Nigeria

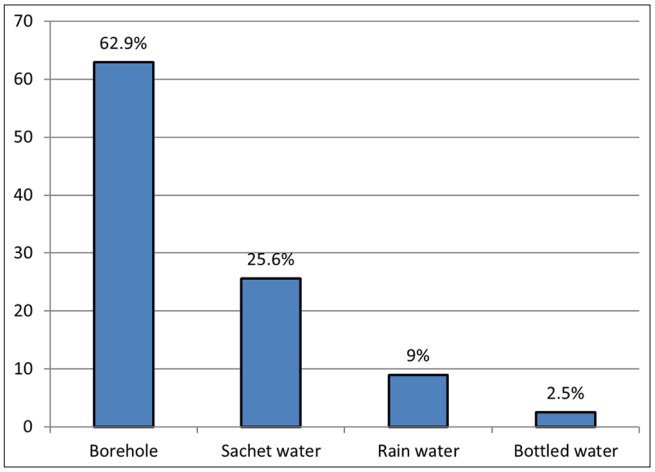

Figure 2: Main sources of drinking water

To a very large extent, access to safe housing was observed in the study community with most households living in houses with galvanized iron roofs, block/brick walls, and cement or stone floors. These materials provide general protection against weather elements and disease-causing agents. The high number of households with block or brick walls contrasts with the results of a research done in rural communities in Osun State, Nigeria, where more than 50% of the houses were mud built but compares with the high number of houses with corrugated roofing sheets.[17] An essential element of good housing is access to clean water both for drinking and other household uses. Commercial sachet water and rain were among the sources of water for domestic use reported by many respondents in this study, and they are froth with the problems of high cost and seasonal gaps, respectively. However, borehole and sachet water were the most commonly used forms of drinking water. Underground water sources such as borehole are preferable and sustainable water sources in the home. Perennial water shortage is a major challenge in the study area. In a study done in Akwa Ibom State, Nigeria, poor access to water supply was the case in 78% of households.[18]

Pit latrines, which were the most used means of sewage disposal in this study, are culturally acceptable in many developing

Table 1: Sociodemographic characteristics of respondents

Variable (*n*=399)	Frequency (%)
*Age group (years)	
18–24	52 (13.0)
25–34	85 (21.3)
35–44	80 (20.1)
45–54	74 (18.5)
55–64	49 (12.3)
65 and above	59 (14.8)
Sex	
Male	187 (46.9)
Female	212 (53.1)
Marital status	
Single	159 (39.8)
Married	181 (45.3)
Divorced/separated	17 (4.3)
Widowed	42 (10.5)
Occupation	
Farming	146 (36.6)
Trading	69 (17.3)
Students	55 (13.8)
Civil service	49 (12.3)
Retired	41 (10.3)
Artisanship	22 (5.5)
Unemployed	17 (4.3)
Level of education	
No formal education	75 (18.8)
Primary	118 (29.6)
Secondary	148 (37.1)
Tertiary	58 (14.5)
Religion	
Christianity	377 (94.5)
Traditional worship	17 (4.3)
Islam	5 (1.3)
Ethnicity	
Esan	365 (91.5)
Igbo	22 (5.5)
Edo	9 (2.3)
Others**	3 (0.8)

*Mean age: 43.7±17.2 years. **Others: Yoruba, Afemai, Urhobo

Table 2: Household characteristics

Characteristics (*n*=399)	Frequency (%)
Family position of household head	
Father	270 (67.7)
Mother	74 (18.5)
Son	29 (7.3)
Daughter	9 (2.3)
Extended family member	17 (4.3)
Family type	
Single	13 (3.3)
Nuclear	250 (62.7)
Extended	136 (34.1)
Type of housing unit	
Compound	34 (8.5)
Duplex	2 (0.5)
Bungalow/flat	228 (57.1)
Face-to-face/passage	135 (33.8)
Ownership of housing unit	
Family inheritance	20 (5.0)
Owner occupier	291 (73.0)
Rented apartment	82 (20.6)
Government	6 (1.5)

Table 3: Features of house structure

Structure	Frequency *n*=399 (%)
Type of roof	
Galvanized iron	343 (86.0)
Asbestos	53 (13.3)
Slate	3 (0.8)
Wall materials	
Cement blocks/ bricks	253 (63.4)
Mud/reed	137 (34.3)
Stones	6 (1.5)
Wood/bamboo	3 (0.8)
Type of floor	
Cement/concrete	302 (75.7)
Earth/mud/brick	54 (13.5)
Ceramic/marble	33 (8.3)
Vinyl/terrazzo tiles	7 (1.8)
Wood/bamboo	3 (0.8)

Table 4: Main sources of water for domestic use

Main source*	Frequency *n*=399 (%)
Sachet water	120 (30.1)
Rainwater	115 (28.8)
Borehole	80 (20.1)
Pipe-borne water	50 (12.5)
Tanker supply/water vendor	43 (10.8)
Bottled water	5 (1.3)
River/stream	0 (0.0)

*Multiple responses apply

countries. However, poor constructions, proximity to water sources, and short distances from the house are some of the problems associated with them. The majority found to have pit latrines in this study differs from the results in some other studies.[1,6,17] In more than a quarter of the households, toilet facilities were shared by households. This finding was lower than that found in an Ethiopian study which indicated that only about 35% of households had improved toilet facilities,[6] but much lower than the national survey result which indicate that about 75% of rural households share toilet facilities in Nigeria.[8] Sharing of toilet facilities increases the pressure on the facilities, increases the risk of cross-contamination between members of different households, and may inhibit adequate maintenance due to conflict of responsibilities in sanitation. Furthermore, the resultant compromise in the sewage process increases the risk of disease transmission both at the household and community levels. The relationship between poor sewage disposal and disease proliferation has been established by other authors.[19-21]

Significant factors associated with the use of improved toilet facilities in this study were higher (secondary/tertiary) level of education, house ownership, and house wall type. House ownership or inheritance, which may be used as a proxy indicator

Table 5: Type and use of toilet facilities

Type of toilet facility	Frequency *n*=399 (%)
Pit latrine	286 (71.7)
Water closet	113 (28.3)
Toilet facility shared with other households	
No	283 (70.9)
Yes	116 (29.1)

Table 6: Factors associated with sharing toilet facilities

Variable	Shared toilet facility		χ^2	*P* value
	Yes (%)	No (%)		
*Level of education				
No formal/primary	65 (33.7)	128 (62.3)	3.837	0.050
Secondary/tertiary	51 (24.8)	155 (75.2)		
Apartment type				
Passage/compound	49 (29.0)	120 (71.0)	0.001	0.976
Flat/duplex	67 (29.1)	163 (70.9)		
House ownership				
Inherited/self-owned	69 (22.2)	242 (77.8)	32.427	<0.001
Rented/government	47 (53.4)	41 (46.6)		
House type (walls)				
Block/brick	86 (33.2)	173 (66.8)	6.112	0.013
Mud/wood	30 (21.4)	110 (78.6)		

*Level of education of household head

of socioeconomic status, was significantly associated with not sharing toilet facilities. Educational status has been found to be a significant predictor of the use of toilet facilities.[1]

CONCLUSION/RECOMMENDATION

A large proportion of households in this study live in houses that have features that make for safe housing. However, factors that compromise sanitation such poor access to domestic water supply and sharing of toilet facilities were prevalent in the community. House ownership and level of education which approximates socioeconomic status were associated with access to sanitation facilities. Efforts to enhance socioeconomic empowerment of rural dwellers should be sustained by government at all levels so as to improve housing quality and sanitation in rural communities in Nigeria.

ACKNOWLEDGMENT

We acknowledge the cooperation of community leaders who provided the enabling environment for the study.

REFERENCES

1. Abubakar IR. Access to sanitation facilities among Nigerian households: Determinants and sustainability implications. Sustain 2017;9:1-17.
2. Omole KF. An assessment of housing condition and socio-economic life styles of slum dwellers in Akure, Nigeria. Contemp Manag Res 2010;6:273-90.
3. Thiele B. The human right to adequate housing: A tool for promoting and protecting individual and community health. Am J Public Health 2002;92:712-5.
4. Gbakeji JO, Aigbiremolen AO, Rilwani ML. Housing quality and vector control: Utilizing an effective strategy against common disease vectors. Int J Environ Stud Saf Res 2016;1:81-8.
5. Mmom PC, Mmom CF. Environmental sanitation and public health challenges in a rapidly growing city of the third world: The case of domestic waste and diarrhoea incidence in greater Port Harcourt Metropolis, Nigeria. Asian J Med Sci 2011;3:115-20.
6. Yohannes T, Workicho A, Asefa H. A cross sectional study: Availability of improved sanitation facilities and associated factors among rural communities in Lemo Woreda, Hadiya Zone, Southern Ethiopia. Open Access Libr J 2014;1:1-10.
7. Nkwocha EE, Pat-Mbano EC, Okeoma IO. Sanitation indicators in the rural communities of the South-Eastern Nigeria: Additional evidence of policy failure in rural development. Afr Res Rev 2012;6:155-70.
8. National Population Commission (NPopC) [Nigeria] and ICF International. Nigeria Demographic and Health Survey 2013. Abuja, Nigeria, and Rockville, Maryland, USA: NPC and ICF International; 2014.
9. World Bank/World Health Organization. Poverty, Health and Environment: Placing Environmental Health on Countries' Development Agendas. Geneva: World Bank/WHO; 2008.
10. Prüss-Üstün A, Corvalán C. Preventing disease through healthy environments: Towards an Estimate of the Environmental Burden of Disease. Geneva: WHO; 2006.
11. Ojeifo MO. Assessment of rain water harvesting facilities in Esanland of Edo State, Nigeria. J Hum Ecol 2011;34:7–16.
12. Idogho PO, Yahaya O, Dagona AG. Modelling water-sanitation relationship in Edo State, Nigeria. Adv Sci Eng Res 2014;2:10-7.
13. Cochran GW. Sampling Techniques. 3rd ed. New York: John Wiley and Sons; 1977.
14. International Business Machines. Statistical Package for Social Sciences (SPSS). Illinois: IBM; 2014.
15. Adeoti AI, Coster AS, Gbolagun AO. Child farm labour in rural households of South-West Nigeria. Int J Afr Asian Stud 2013;1:47-56.
16. Bhakar R, Banafar KN, Singh NP, Gauraha K. Income and employment pattern in rural area of Chhattisgarh: A micro view. Agric Econ Res Rev 2007;20:395-406.
17. Ogundahunsi DS, Adejuwon SA. Housing condition and health relationships in ijeda-ijesa and iloko-ijesa, Osun State, Nigeria. Environ Disaster Manag 2014;14:1-8.
18. Udoh U, Uyanga J. Housing conditions and health in rural Nigeria: A study of Akwa Ibom State. Res Humanit Soc Sci 2013;3:34-41.
19. Carr R. Excreta-related infections and the role of sanitation in the control of transmission. In: Water Quality: Standards and Health. Geneva: WHO; 2001. p. 89-113.
20. Isara AR, Aigbokhaode AQ. Sewage disposal methods in a sub-urban community in Edo State, Nigeria. J Med Biomed Res 2014;13:99-105.
21. Mukhtar MD, Indabawa II, Imam TS. Public health implications of sewage ponds in Kano metropolis, Nigeria. J Food Agric Environ 2010;8:25-31.

How to cite this Article: Aigbiremolen AO, Aigbiremolen-Alphonsus AE, Nwadike I, Afogbon E, Airefetalor IA, Oaikhena OI. Housing features and household access to sanitation facilities in a rural Nigerian community. Asian Pac. J. Health Sci., 2018; 5(1):171-174.

Source of Support: Nil, **Conflict of Interest:** None declared.