

Housing Conditions and Health in Rural Nigeria: A Study of Akwa Ibom State

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Abstract

The study examined the relationship between housing conditions and ill health among households in Nigeria's neglected rural areas with specific focus on rural Akwa Ibom State. The study design was based on household cross-sectional survey. Housing and Health Questionnaire (HHQ) was used to obtain the required information on 540 randomly sampled households in 90 rural communities. Housing Conditions were measured using six broad variables: Safety/Security, indoor temperature controls/ventilation, hygiene/sanitation, building condition, environmental quality and crowding. While ill health was measured by the reporting of respiratory symptoms namely Asthma, Pneumonia, Cough and Bronchitis. A stepwise multiple regression model was used to analyze the relationship between ill-health and housing conditions, controlling for other covariates. Results showed that majority of households lived in "inadequate housing" lacking facilities necessary to promote occupants health and wellbeing. About 92.3% of sampled households reported the occurrence of at least one respiratory symptom. The indoor temperature controls/ventilation and building condition were found to contribute significantly to Asthma occurrence ($R^2 = .669$); building condition and environmental quality contributed 84.8% to the total variance in Pneumonia incidence ($R^2 = .848$). Crowding was identified as the major determinant of cough incidence ($R^2 = .648$) while building condition and crowding was found to jointly contribute 75.6% to the total variance in the occurrence of Bronchitis ($R^2 = .756$). These findings highlight the need for immediate action on housing intervention as they suggest that health among the rural people could be strengthened with improved housing conditions.

Keywords: Housing Conditions; Respiratory symptoms; Ill Health; Rural Areas; Akwa Ibom State.

1. Introduction

Among the diverse environmental concerns facing developing countries including Nigeria, the issue of housing is probably the most fundamental. Housing is not just a roof over one's head; it is the conjunction of the dwelling, the home, the immediate environment and the community (WHO, 2004). Housing is described as "inadequate" if it does not have basic facilities, infrastructure and services such as adequate space, ventilation, waste collection and disposal facility, sanitation, electricity, water supply and general environmental quality (Bashir, 2002; Kriger and Higgin, 2002; WHO, 2004).

Adequate housing therefore remains critical to human health, comfort and general well-being (Habib, et. al. 2008). As Astrolabe (2002) further noted, adequate housing satisfy a trinity of needs in an occupant. These are physical needs, emotional needs (comprising both aesthetic and psychological) and intellectual needs. There is a general consensus that the achievement of holistic health should transcend mere biomedical considerations and accommodate other factors such as housing (Marsh, 1999; Matte and Jacobs, 2000; Shaw, 2004). With this in mind researchers have turned their attention to housing impacts where they seek to understand the link between housing and health. Studies by Habib et al., (2009) have linked inadequate provision of water, electricity, sewage and waste facilities, drainage and ventilation in the home to increased incidence of chronic diseases. In the same vein, humidity, crowding, poor ventilation and insect/pests infestation have been associated with failing respiratory health (Man, 2005; Bonnefoy, 2007). Livebuga, Mukasa, Oryane and Wydro (2004) found that the presence of mould and pest proved to increase the risk of Asthma and Bronchitis. In another study by Polack, Kneseback and Siegrist (2004), overcrowding and poor neighbourhood environment were found to be critical to the health of renters group among sampled households. Furthermore, indoor air pollution, arising from cooking stove, mould and fungi growth, mosquito repellent burning, tobacco smoking and insecticide spray in the home showed significant effects on the respiratory symptoms (Cough, Wheezing, Pneumonia, Bronchitis and Asthma) among children (Burr, 1999; Godish, 2001).

In Nigeria, and Akwa Ibom State in particular ample studies have been conducted to examine the status of housing conditions at different times (Ogu, 1994; Omole, 2010; James and Essien, 2012; Udoh, 2012). However, to the author's knowledge very little has been done on the possible link housing factors may have with the people's health especially in rural areas. The Nigeria's rural areas harbours over seventy percent (70%) of her population (NPC, 2007) yet the rural areas are the most neglected in terms of social welfare and health services provision (Inyang, 1994; Atser, 2012). Essentially, the present study seeks to contribute to the housing-health

debate by examining the impact of housing conditions on the health of rural dwellers in Nigeria using Akwa Ibom State as a case study.

2. Health Care Services In Akwa Ibom State

Akwa Ibom State is one of the 36 states of Nigeria and was created in 1987. It is located on the Southeastern corner of Nigeria where it opens to the gulf of Guinea (Figure 1). Akwa Ibom lies between Latitudes $4^{\circ} 32'$ and $5^{\circ} 33'$ North of the Equator and Longitudes $7^{\circ} 25'$ and $8^{\circ} 25'$ East of Greenwich Meridian. The Continental and Maritime air masses controls and determines the states two climatic seasons-the wet and dry seasons. In the South and Central part of the state the rainy season lasts for about 10-11 months. This results in very heavy annual rainfall which varies from 3000mm along the coast to about 2000mm inland. Akwa Ibom State has a land mass of 8, 412 km² and a population of 3, 956, 112 persons (NPC, 2007). It remains one of the most densely populated areas in Nigeria with population density of 470 persons per square kilometre. Regarding Healthcare services, Akwa Ibom State operates a 3-tier level of healthcare delivery. These are the primary, secondary and tertiary; and of these three, the primary Healthcare (PHC) is the most spatially spread since it involves the majority grass root population (Inyang, 2010). Primary healthcare services are provided at Health Centres, Primary Health Centres, Comprehensive Health Centres, Health Posts and Clinics. Secondary healthcare services are provided in General and Cottage Hospitals while the Teaching Hospitals provide tertiary healthcare services. Within this hierarchical arrangement, higher-order centres are expected to receive referrals from the lower-order centres. On specific health indicators for the state as at 1999, Inyang (2010) reported that the crude death rate was 12 per 1000 population; Infant Mortality rate was 67 per 1000 live births; Under 5 years mortality rate was 30 per 1000 population; Maternity Mortality rate was 800 per 100, 000 births; the level of Maternal Malnutrition was 7%.

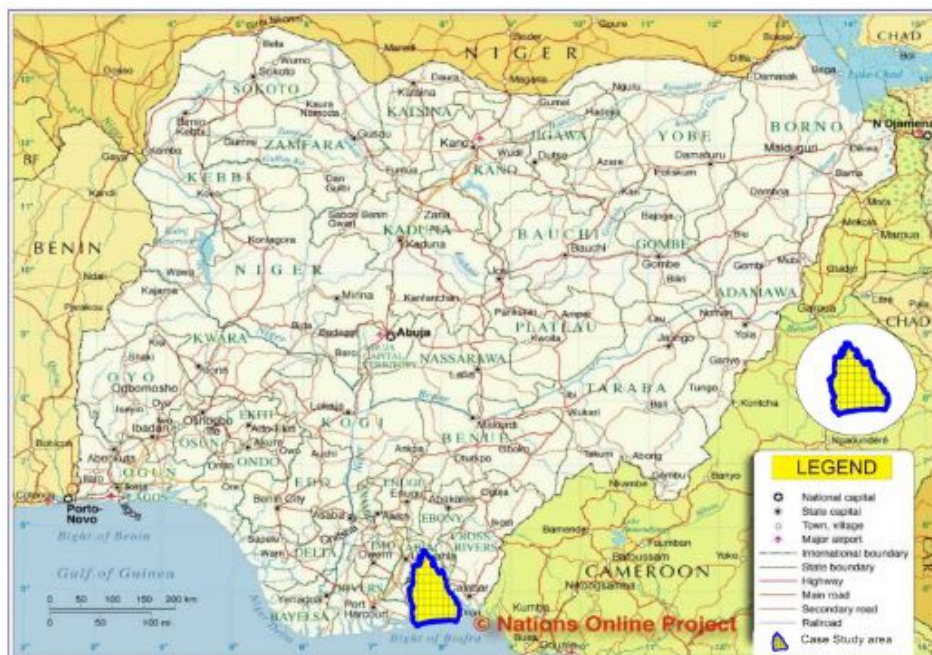


Figure 1: Akwa Ibom State on the Southeastern Corner of Nigeria.

Life expectancy at birth was 54 years; HIV prevalence rate stood at 8% while access to the safe water was 23%. In terms of health care facilities, there are 33 General hospitals, 192 Health Centres, 173 Private Clinics, 29 Maternity Health Clinics, 46 Leprosariums and a University Teaching Hospital (Udoh, 2012). Furthermore, there are 3, 107 nurses and midwives, 250 doctors and 5, 420 hospitals beds in all the medical establishments in the state by 2012. The doctor/population ratio is 1:14, 554 as against WHO's minimum standard of 1:400; a nurse/population ratio of 1:3709 as against 1:4 WHO's recommended standard. Apart from the modern healthcare system, there is also the existence of the traditional (orthodox) system of healthcare in the state. The traditional system can be seen in all spheres of healthcare delivery including specialists in mental cases, orthopedic, pregnancy cases, as well as the general practitioners.

3. Methodology

The data used in this analysis were collected as an integral part of Housing and Health Survey by the author. A cross-sectional survey in Akwa Ibom State, Nigeria was based on a multi-stage probability sample of 540

households in 90 rural communities. The selection of sample communities was facilitated by obtaining a base map of Akwa Ibom State on a scale of 1cm to 2.5km, and divided same into quadrates of 1.6km² which was clearly and serially numbered. A total of 480 quadrates were produced. However, 90 quadrates representing 18.75% were selected using a table of random numbers. The grid map contained the names of communities in each quadrate. In Nigeria, rural communities are defined numerically by a population below 20, 000 people (NPC, 2007). With this in mind, communities with population 20, 000 and above were excluded. Furthermore, where a quadrate contain two or more rural communities, only one was randomly selected from such quadrate and six (6) households were systematically selected from each community to yield a total of 540 households. The study used a structured questionnaire designated as “the Housing and Health Questionnaire” (HHQ) that was administered during a face-to-face interview with heads of household or a proxy respondent for the household. The questionnaire comprised sections on household demographic/socio-economic characteristics, housing conditions and Health Profile. The overall response rate was 96.3%.

Six separate indicators - safety/security, indoor temperature/ventilation, building condition, crowding, sanitation/hygiene and environmental quality were used to assess housing conditions. The presence or absence of fire extinguisher, first-aid box, mosquito net, fence wall and security dogs were the components of safety/security indicator. The indoor temperature/ventilation index was captured by three items: presence or absence of fan, ceiling and windows on two walls for cross-ventilation. The condition of the roof (whether leaked or unleased), wall (whether cracked or uncracked), windows (whether broken or not), ceilings (cracked or not) and floor (broken or not) were the items that measured building condition. The hygiene/sanitation index comprised four items: presence or absence of toilet, bathroom, potable water and waste disposal facility. The environmental quality index consisted of three items including rainwater floods, mice/rat infestation and proximity of building to bush. Finally, crowding was measured by the number of persons occupying a room; rooms with more than 2 persons were considered crowded. All the items were dichotomized and assigned scores; such that zero denoted a negative situation and one denoted a positive situation. With this arrangement, index scores was calculated for each housing indicator by summing the total scores and dividing same by the number of items considered. Index score tending towards one depicted an enhanced situation for a given housing indicator.

The dependent variable (i.e. the outcome measures) in this study was the presence of respiratory symptoms namely: Asthma, Pneumonia, Cough and Bronchitis. A dichotomous indicator with zero denoting the absence of illness and one indicating its presence was adopted for measuring the incidence of illness among households and sampled communities. Respondents were required to report illnesses from which household members suffered from the list of respiratory illnesses provided on the questionnaire and to provide additional information where necessary. Data analysis was done using descriptive and multivariate statistics mainly the mean, standard deviation, frequency distribution and the Stepwise Multiple Regression Model. The Stepwise Model was considered most appropriate for selecting fewer independent variables (Predictors) which could explain the dependent variables. The housing indicators namely safety/security, indoor temperature/ventilation, building conditions, sanitation/hygiene, crowding, and environmental quality were the independent variables which interacted either singly or jointly to explain the incidence of Asthma, Pneumonia, Cough and Bronchitis (dependent variables) among households. The multiple correlation co-efficient (R), co-efficient of determinant (R²) and the P-value (significance level) were reported.

4. Results

4.1 Housing Conditions in Rural Akwa Ibom State

In general, the study shows that rural household in Akwa Ibom State suffer marked deficiency virtually in all the five indicators of housing conditions examined. The safety and security apparatus of the households indicated that 92% of the households lacked fire extinguisher in their homes, 73% had no first aid box, and 92% had no security dogs while 78% lived in fenceless houses (Table 2). Regarding indoor temperature/ ventilation, 96% of the household reported absence of fan in their homes, 66% reported having no ceilings in their rooms while 41% lived in homes with bedrooms lacking windows on two walls. Results for building conditions showed that 60% of the households live in houses with leaked roof, cracked wall (56%) and broken windows (54%). Also 75% of the household lived in houses with broken floor condition. Regarding crowding, 64% of the households had more than two persons occupying a room.

Table 1: Frequency Distribution of the Housing Conditions indicators in Rural Akwa Ibom State, Nigeria (n = 520)

Indicators of Housing Conditions	No. of Households Giving Negative Response	(%)
Safety/Security		
Absence of Fire Extinguisher	478	92
Absence of First Aid Box	380	73
Absence of Mosquito Net	100	19
Absence of Security Dogs	477	92
Absence of Fence Wall	409	78
Indoor Temperature/Ventilation		
Absence of Fan	499	96
Absence of Ceiling in all Rooms	344	66
Absence of Windows in two walls of Room	215	41
Building Condition		
Leaked Roof	314	60
Cracked Wall	294	56
Broken Windows	284	54
Cracks in Ceiling	244	47
Broken Floor	391	75
Hygiene/Sanitation		
Absence of Toilet	258	49
Absence of Bathroom (within)	254	48
Lack of Access to Water Supply	406	78
Absence of Waste Disposal Facility	313	60
Quality of Residential Environment		
Rainwater Floods	270	52
Mice/Rat Infestation	473	91
Bushy Surrounding	396	76
Crowding		
≥2 persons/room	330	64

For hygiene/sanitation index, result revealed that 49% of the households had no toilet at all, 48% had no bathroom within the house while 78% had no access to water supply for domestic use. Also, 60% of households reported absence of waste collection and disposal facility. The environmental quality index showed that 50% of the households suffer from rain flood/stagnant water, 76% lived in bushy surrounding while 91% experienced mice/rat infestation.

4.2 Household's Health Profile

Regarding the health profile of the people, an illness was reported for 92.3% of households with 69.2% reporting two or more types of illnesses (Table 3). The distribution of disease occurrence indicated that Pneumonia occurred in 35.4% of households; 31.3% of households reported cough occurrence: 20.8% of households had members who suffered from Bronchitis while Asthma occurrence was found in 12.5% of households.

Table 2: Types of Reported illness among Households

Variables	No. of Household	%
Reporting an illness		
Yes	480	92.3
No	40	7.7
No. of reported illness by household		
0	40	7.7
1	120	23.1
≥2	360	69.2
Types of reported illness		
Asthma	60	12.5
Pneumonia	170	35.4
Cough	150	31.3
Bronchitis	100	20.8

4.3 Relationship between Housing Conditions and ill Health

It was necessary to test if the housing indicators namely safety/security, indoor temperature/ventilation, sanitation/hygiene, building condition, environmental quality and crowding operating singly or jointly contribute significantly to variance in ill health among the sampled households. The stepwise multiple regression analysis was applied and the results are presented on Table 4.

Table 3: Stepwise Regression of ill health on housing indicators

Variables	R	R ²	R ² Change	F	Sig.
Asthma(Predictors)					
Indoor temperature/Ventilation	.812	.659	.659	143.720	.000
Building Condition	.836	.669	.040	3.100	.000
Pneumonia(Predictors)					
Building Condition	.822	.676	.676	183.522	.000
Environmental Quality	.921	.848	.172	83.100	.000
Cough(Predictors)					
Crowding	.805	.648	.648	127.627	.000
Bronchitis(Predictors)					
Building Condition	.740	.547	.547	97.112	.000
Crowding	.870	.756	.209	88.741	.000

The variables were entered into the model in descending order of the value of their R² change (*R² change* indicates the relative contribution of a variable to variance on the dependent variable). The R² indicates the contribution of the variables while the F-value and sig. value are indicators of the validity of the model.

Viewed in this light, indoor temperature/ventilation and building condition were identified as major predictors of Asthma occurrence. These variables made a joint contribution of 69.9% of total variance on Asthma occurrence and is significant (*R² change* = .699; *P* > 0.05). Considered singly, indoor temperature/ventilation contributed 65.9% (*R² change* = .659) while building condition contributed 4.0% (*R² change* = .040). For Pneumonia occurrence, the major predictors were: building condition and environmental quality. These variables jointly contributed 84.8% of total variance on Pneumonia occurrence (*R²* = .848). Relatively, building condition was found to make the strongest influence on Pneumonia incidence (*R² Change* = .676). Regarding cough occurrence, the major predictor was crowding (*R* = .805; *R²* = .648; *P*>0.05). Crowding accounted for 64.8% of total variance in cough incidence (Table 4). Finally, the results showed that building condition and crowding accounted for 75.6% of total variance on incidence of Bronchitis (*R²* = .756; *P*>0.05).

5. Discussions

The housing conditions in Rural Akwa Ibom State are similar to those reported in a number of rural communities in other parts of Nigeria and African countries such as Kenya (Sterkenburg, Gosselink and Huizenga, 1984; Sterkenburg, 1990; Muller and Job, 2006), Imo state (Ogu, 1994) and Ghana (Adarkwa, 1983). Housing conditions in this study was assessed through direct observation and by asking respondents to indicate the state

of their housing on twenty key items classified into five major indicators of housing conditions namely: safety/security indicator; indoor temperature/ventilation indicator; building condition indicator; hygiene/sanitation indicator, crowding and environmental quality indicator. The result indicates that rural Akwa Ibom State as a region suffers gross inadequacy in housing conditions. The safety and security condition of the dwelling leaves nothing to be desired. With nearly all the households reporting absence of fire extinguisher, the houses are therefore vulnerable to utter destruction in case of fire outbreak. Worse still, the Fire Service Department in most Nigerian states are urban based and have no sphere of influence in rural areas. However, WHO (2004) recommends that adequate housing include facilities that could ensure safety and security in the home. Such items as first aid box, security dogs and fence wall are lacking in most households in rural Nigeria. Most households rely on makeshift fence and crude methods of fighting fire outbreak (Esin, 2013).

Majority of households reported negative conditions in terms of indoor temperature and ventilation index. The presence of fan can augment for natural ventilation; but most households lacked fans, ceilings and window on two walls necessary for maintaining acceptable room temperature and adequate ventilation. With a typical tropical climate of the state, households are bound to face severe discomfort in terms of indoor temperature. The building condition with reference to the roof condition, the state of the wall, windows, ceilings and floor depicted a dereliction largely due to the age of the building and lack of regular maintenance. About sixty percent (60%) of households suffer roof leakage, cracked walls and broken floors with increased risk of pneumonia due to mould and damp development (Koskinen, Husman, Meklen and Nevalainen, 1999). The absence of toilets encourages unsanitary behaviour and passage of excrement in unauthorized places such as nearby bush and tracks and footpaths. Most households depended on communal bathroom in the absence of private bathroom. By far, the most serious housing difficulty among rural households is the absence of potable water and inadequate supply of water. Potable water refers to safe drinking water. This is not provided in rural areas. However, households reported not having enough supplies from available sources such as streams and rivers due to distance, nature of terrain and seasonality of some streams. The minimum daily water requirement per person is 30 litres by Nigerian standard. Results of this study showed that 78% of households fell below the minimum requirement for water access. Inadequate water supply sounds ironical in an area with enormous water resource endowment. However, impact of regional water schemes and the World Bank assisted water projects are yet to be felt by many rural dwellers in Nigeria (James and Essien, 2012).

This study also found that 60% of households lacked waste collection and disposal facility. Essentially majority of the households rely on communal dumpsites near the compound while some dispose directly into nearby bush or river (Udoh, 2012). The quality of residential environment as reported by households is threatened by rainwater floods, bushy surroundings and mice/rat infestation (91%). Floods and stagnant water provides breeding ground for mosquitoes and increases malaria burden for rural households. Mice/rat acts as disease vector and attract other predators such as snakes - a situation inimical to the health of occupants. The result of stepwise regression of ill health on housing conditions (Table 3) indicated that the housing indicators: building condition, indoor temperature controls, environmental quality and crowding significantly influenced the occurrence of Asthma, Pneumonia, Cough and Bronchitis among household members ($P < 0.05$). This finding has therefore identified housing conditions as an important determinant of ill health. The study confirmed an already established history of research into the impact of poor housing on health as conducted in developed nations. Prominent among these studies is the work of Chadwick (2010) which attempted to establish a link between "appalling living conditions of the poor and their ill health" in Victorian Britain. This finding has also buttressed the need to address housing as a major public health issue. The importance of housing to health is driven by the prolonged exposure people have to the home environment; an average of close to 16 hours daily (Baker, 2007). The indoor temperature controls of a home along with the condition of the building determine the efficiency with which a house can generate and retain heat for the occupants as well as affecting mould growth and dampness all of which could influence Asthma attack. The fact that "sick buildings" beget sick occupants need no dispute. Buildings with cracked walls, leaked roof, broken windows and broken floor are bound to increase the risk of Asthma and Pneumonia due to moisture and mould growth. Furthermore, the poor quality of residential environment as defined by presence of floods, mice/pest infestation and bushy surrounding has been linked with Bronchitis. This finding has practically demonstrated the need to strengthen community environmental sanitation and provide drainage facility in rural areas. It is now evident that the promotion of community health would require a deliberate and conscious effort at improving housing conditions.

6. Conclusion and Recommendations

In this study, the relationship between ill health and housing conditions in rural Akwa Ibom State has been clearly demonstrated. The housing condition of the people is found to be "inadequate" and failed to guarantee the health of its occupants. Majority of households were bedeviled by disease burden related to respiratory symptoms. The study highlighted dilapidated building condition; inadequate indoor temperature control, poor

environmental quality and crowding as the major predictor of incidence of Asthma, Pneumonia, Cough and Bronchitis among households. In as much as rural dwellers in Nigeria have suffered perennial neglect by the Urban-based ruling elites, the findings of this study serves as a “wake-up call” to the Nigerian Government to exhibit an active interest in rural housing and health by promoting healthy housing that could alienate the negative health impacts. The World Bank rural interventions should be directed at strengthening the community’s health programme, raising housing health awareness and encouraging good self-help environmental sanitation among rural households.

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