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A spatial analysis of health care accessibility and utilization among rural households in Kogi State, Nigeria

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Abstract

This study was aimed at a Spatial Analysis of Health Care Accessibility and Utilization among Rural Households in Kogi State, Nigeria. Primary data employed in this study were obtained with the aid of well-structured questionnaires. A multi-stage sampling technique was employed in the selection of respondents. The analytical techniques used in this study included descriptive statistics and Healthcare Accessibility Index. Descriptive statistics such as frequencies and percentages were used to describe the sources and uses of healthcare facilities in relation to socio-economic characteristics as well as the level of utilization of health care services. Results obtained in this study revealed that 58% of the respondents had access to health care services while only 42.50% utilized these services. Findings in this study also revealed that 71% of the household heads were males while the remaining 29% were females. However, 41% of the male headed households have access to healthcare services compared to 17% of the female headed households. Furthermore, 71% of the respondents were in their economic active age (≤ 50 years). About 75.55% of the respondents within this age bracket accesses and utilizes healthcare service more than the elderly ones. Exactly 43.50% had no formal education while 6, 23.5, 11.5, and 15.5% had adult, primary, secondary and tertiary education respectively. Thirteen percent (13.0%) of those with primary education had access to health care services while 78.57% out of these utilized the healthcare services. Furthermore, 24.5% of those with no formal education had access to healthcare service while 69.23% of the respondents utilized healthcare services. Majority (40.5%) of the rural households lived 5 to 9 km to a public health center with 21% having access to healthcare facilities and 85.7% utilizing the facilities. Eleven percent of respondents living 4 km from the healthcare service provider have access to healthcare facilities while 90.09% of the respondents utilized it. About 13% of the respondent who lives 10 to 14 km from healthcare service had access while 61.11% utilized the services. Forty-three percent (43.75%) of respondents living more than 14 km to their healthcare providers makes use of the available healthcare facilities. The result, therefore, indicates that utilization of available health facilities increases with proximity to the health centers. Seven percent (7%) of respondents have family size of 1-4 members per household, whereas only 60% of the respondents within this group with access to healthcare facilities utilized it. Furthermore, those with household size above 14 members have the highest health service utilization with 85.71%. This study has shown that there is unequal distribution of health facilities as well as low level of accessibility of household to medical facilities in the study area. To this end, governments at all tiers should ensure equitable accessibility to health care delivery across the rural areas by deploying more medical and Para-medical staffs to the rural areas. Rural development policies should promote the creation of enabling environment to enhance participation in modern health care delivery in rural areas.

There is also a serious need for sensitization programme to create awareness about the importance of using modern healthcare facilities among the rural dwellers.

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1 Introduction

Accessibility is defined as the ease with which a specific location can be reached from a given point. It has physical (spatial), time, economic and social dimensions. The physical dimension deals with road conditions, whereas time dimensions refers to the time spent on a journey, the economic dimension deals with finance, i.e. money spent on a journey and the social dimension considers the norms and values of the people, as it determines the use of particular item or a point located facility [1].

Sound health on the other hand is a fundamental requirement for living a socially and economically productive life. Poor health inflicts great hardships on households, including debilitation, substantial monetary expenditures, loss of labour and sometimes death. The health status of adults affects their ability to work, and thus underpins the welfare of the household, including the children's development [2]. Poor health affects agricultural production as treatable conditions often go untreated because of lack of access to healthcare.

Access to healthcare services is a multidimensional process involving the quality of care, geographical accessibility, availability of the right type of care for those in need, financial accessibility, and acceptability of service [3]. The utilization of healthcare services is related to the availability, quality and cost of services, as well as social-economic structure, and personal characteristics of the users [4].

The total shares of public ownership in 2004 on health facilities were 14,607 while the private sector accounted for 9,029 in Nigeria [4]. Consequently, various Nigerian governments have made numerous great efforts toward the provision of healthcare facilities to its populace. Notable among these efforts were the expansion of medical education, improvement of public health care systems, provision of primary health care (PHC) in many rural areas.

However, overt attention has not been paid to equity in the planning and distribution of health care facilities over the years in the country. Public and private health care facilities are sparsely provided in many rural areas within the country. Such regions with difficult terrain and physical environment are often neglected [5]. This makes the distance between the rural dwellers and the healthcare center far apart, given the transportation problems experienced in these areas, and its attendant cost. Many rural areas do not have clinics; the sick must be carried on the backs of young men or on bicycles to the nearest clinic. Moreover, clinics in rural areas often lack adequate equipment or trained health personnel, and require payment before providing services. In the absence of health insurance, rural people are often unable to afford healthcare of any kind.

The national health policy aims to achieve health for all Nigerians based on the national philosophy of social justice and equity as clearly enunciated in the second National Development Plan of 1970-1974. These principles of social justice and equity and the ideals of freedom and opportunity have been affirmed in Nigeria's constitution. Thus, the national health policy was formulated in the context of these national objectives and philosophy. To this end, the primary health care is adopted as the means of achieving the national goal of social justice and equity. As defined in Alma-Ata Declaration of 1978, "primary health care... brings health care as close as possible to where people live and work [6].

From a study done by the Directorate of Food, Roads and Rural Infrastructure in 1987, Nigeria has about 100,000 villages and autonomous communities but there are about 10,711 health establishments at the primary health care level including health and maternity centers, health clinics and dispensaries [7]. This means that there is roughly one facility per every 10 villages/communities and this makes accessibility to health services very poor especially in rural areas. This is reinforced by the established fact that in health care services, patients are not prepared to travel more than 5km or a half-hour journey on foot to receive health care services [7].

Additionally, Mokgalaka [7] further stressed that for preventive services such as immunization and health education, the distance people want to travel to receive services is much less than 5kms or half hour journey. Against the background of a justified concern for distributive equity in modern health care facilities, it is expedient to examine the spatial pattern of distribution of health care facilities in Kogi State and make necessary recommendations that will make the policy makers to take necessary steps in enhancing increased access to health facilities by rural dwellers.

2 Methodology

2.1 Study Area

Kogi State which was created in 1991 is one of the thirty-six (36) states of the Federal Republic of Nigeria. Kogi State is located in the North Central part of Nigeria. The State lies between latitudes 7° 30'N and 8° 10'N and Longitudes 6° 01'E and 7° 50'E, covering an area of about 27,747 km². It shares common boundaries with Niger, Kwara, Nasarawa and The Federal Capital Territory to the north. In the East, the state is bounded by Benue and Enugu States; in the south by Enugu and Anambra States; and in the west by Ondo, Ekiti and Edo States. Lokoja, the Niger/Benue confluence town is the state capital [8]. The 1991 census in Nigeria puts the population of the state at 2,147,756 which spreads over 395,389 households. Politically, the state is divided into 3 senatorial districts – Kogi central, Kogi east and Kogi west. The state is further divided into 21 local government areas (LGA), with Kogi central, east and west having 5, 9 and 7 LGAs respectively (Fig. 1). The population of the state is mostly rural, as in most Nigerian rural communities, the economy of the area is largely agrarian [9, 10].

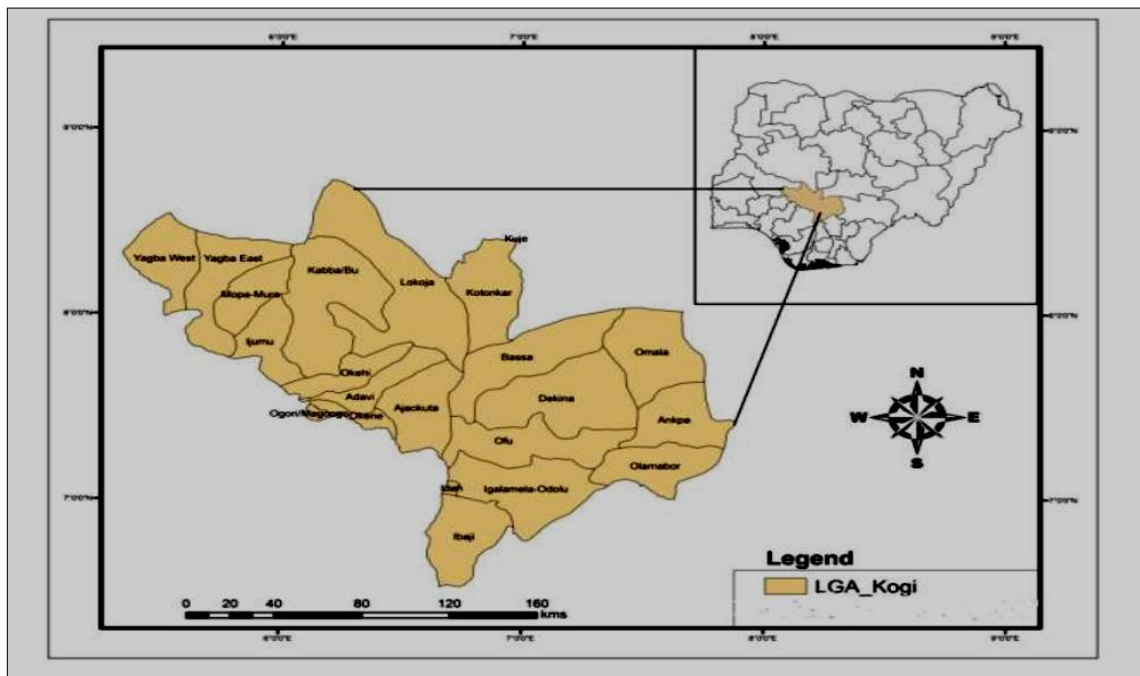


Figure 1 Map of Kogi State showing all the Local Government Areas

2.2 Data Collection and Analysis

Primary data employed in this study were obtained with the aid of well-structured questionnaires. A multi-stage sampling technique was employed in the selection of respondents. The first stage involved the selection of the entire three Senatorial zones while the second stage involved the random selection of two Blocks (LGA) from the zones. In the third stage, five cells (Villages) each were randomly selected from the blocks (LGA) amounting to 10 cells across the zones. The fourth stage was the random selection of 210 households proportionate to size of the selected cells. However, a total of 200 questionnaires with consistent reports were used for analysis.

The analytical techniques used in this study included descriptive statistics and Healthcare Accessibility Index. Descriptive statistics such as frequencies, means and percentages were used to describe the sources and uses of healthcare facilities in relation to socio-economic characteristics as well as the level of utilization of health care services.

Healthcare Accessibility Index was used to analyze the second objective which is to determine the level of accessibility of the rural households to healthcare facilities. The data set was segregated based on the wards in the selected local government areas in the state. The segregation of the data generated the pattern of distribution of the health care facilities in the study area. The pattern evolved revealed the extent of inequality among the local government in terms of the provision of the health care facility by both government and private sector in the area. The index of accessibility to health care services was computed using three variables from the data set. The variables used are population ratio to

bed space in each LGA, population ratio to medical doctor and population ratio to nurses/ mid-wife. The choice of these three variables is based on the fact that doctors and nurses are directly involved in providing health care services to the people and bed space is a basic requirement in health care delivery. The indices are household size per medical officer (I.A1); Household size per nurse (I.A2); number of people in households per community health workers (I.A3); and household size per hospital bed space (I.A4). These indices are expressed as:

$$N_p \text{ I.A1} = N_d \text{ (1)}$$

Where

I.A1 = index of accessibility for number of persons per doctor
 N_p = number of persons in the households
 N_d = number of doctors
 $N_p \text{ I.A2} = N_s \text{ (2)}$

Where

I.A2 = index of accessibility for number of persons per nurse
 N_p = number of persons in the households
 N_s = Number of nurses
 $N_p \text{ I.A3} = N_c \text{ (3)}$

Where

I.A3 = index of accessibility for number of persons per community health worker
 N_p = number of persons in the households
 N_c = number of community health workers
 $N_p \text{ I.A4} = N_b \text{ (4)}$

Where

I.A4 = index of accessibility for number of persons per hospital bed
 N_p = number of persons in the households
 N_b = number of hospital beds

3 Results

3.1 Gender of household head in respect to healthcare service

Results obtained in this study showed that 58% of the respondents have access to health care services while only 42.50% utilized these services. Findings in this study also revealed that 71% of the household heads were males while the remaining 29% were females. However, 41% of the male headed households have access to healthcare services compared to 17% of the female headed households. Out of these, about 78 and 61.76% of the male and female respectively, utilized healthcare service. This shows that the majority of the respondents were males. Male headed households have more access to healthcare services than female headed households which in turn makes them utilize healthcare services more in the study area (Table 1).

Table 1 Distribution of Respondents Biodata based on gender of household heads in Respect to Healthcare Services

Gender	Respondents	Frequency of access/Percentage	Frequency of utilization/Percentage
Male	142/71.0	82/41.0	64/78.05
Female	58/29.0	34/17.0	21/61.76
Total	200/100	116/58.0	85/42.50

3.2 Age of household head in respect to healthcare services

Table 2 reveals that 71% of the respondents are in their economic active age (≤ 50 years). About 75.55% of the respondents within this age bracket accesses and utilizes healthcare service more than the elderly ones because they still have more energy to travel a wide distance to access the healthcare facilities. The mean age is 46 years. Majority (34.4%) of the respondents are within ages of 41-50 years, 20% have access to healthcare services while 77.5% with access utilized the health care services.

Table 2 Distribution of Respondents Biodata based on gender in Respect to Healthcare Services

Age	Respondent Frequency/Percentage	Frequency of Access/Percentage	Frequency of Utilization/Percentage
20 – 30	27 /13.50	17/8.50	12/70.58
31 – 40	46 /23.00	28/14.00	22/78.57
41 – 50	69 /34.50	40/20.00	31/77.50
51- 60	41 /20.50	21/10.50	14/66.67
>60	17 /8.50	10/5.00	6/60.00
Total	200 /100	116/58.00	85/73.28

3.3 Marital status of household head

Table 3 indicates that 69% of the respondents were married while 31% were unmarried/divorced. Out of the married, 40% had access to healthcare services while 77.5% of those with access utilized healthcare services provided in the rural area. Since most of the respondents were married, additional cost is incurred to maintain health of the wife during child birth as well as the upkeep of the children which may increase the participation of the respondents in health care use.

Table 3 Distribution of Respondents by Marital Status of household head in Respect Healthcare Services

Marital status	Respondent Frequency/Percentage	Frequency of Access/Percentage	Frequency of Utilization/Percentage
Single	45/22.50	25/12.50	18/72.00
Married	138/69.00	80/40.00	62/77.50
Divorced	13/6.50	8/4.00	4/50.00
Widowed	4/2.00	3/1.50	1/3.33
Total	100.00	116/58.00	85/73.28

3.4 Educational status of household head

Table 4 Distribution of Respondents by Educational Status in Respect to Healthcare Services

Educational Status	Frequency of Access/Percentage	Frequency of Access/Percentage
No formal education	87/43.50	36/69.23
Adult education	12/6.00	6/75.00
Primary education	47/23.50	22/78.57
Secondary education	23/11.50	12/75.00
Tertiary education	31/15.50	9/75.00
Total	200/100.00	85/45.50

As shown in Table 4, 43.50% had no formal education while 6, 23.5, 11.5, and 15.5% had adult, primary, secondary and tertiary education respectively. Thirteen percent (13.0%) of those with primary education had access to health care services while 78.57% out of these, utilized the healthcare services. Furthermore, 24.5% of those with no formal education had access to healthcare service while 69.23% of the respondents utilized healthcare services. Hence, the level of education and literacy of a household head will determine the kind of choices he takes especially in healthcare use. Most of the respondents in the study area were educated and this would have informed their healthcare choices.

3.5 Primary occupation of household head

Table 5 shows that 37% of the respondents are engaged in farming as their primary occupation while 7.5, 21.5, 23, 4% and 7% are artisans, traders, salary earners, wage earners and other forms of employment. This shows that farming is the predominant occupation in the study area. More so, farmers have the highest (26%) access to healthcare service with the lowest proportional (63.46%) uses of healthcare service. This is as a result of the fact that most households in the rural area depend mainly on agriculture, as their primary source of livelihood and cannot afford to pay for the high cost of healthcare services.

Table 5 Distribution of Respondents by Primary Occupation in Respect to Healthcare Services

Primary Occupation (Frequency/Percentage)	Frequency of Access/Percentage	Frequency of Access/Percentage
Farming 74/37.00	52/26.00	38/63.46
Artisan 15/7.50	9/4.50	7/77.77
Trading 43/21.50	22/11.00	18/81.81
Salary earner 46/23.00	24/12.00	20/83.33
Wage earner 8/4.00	5/2.50	4/80.00
Others 14/7.00	4/2.00	3/75.00
Total 200/100	116/58.00	85/73.72

3.6 Distance of respondents to healthcare facilities

Table 6 shows that majority (40.5%) of the rural households lived 5 to 9 km to a public health center with 21% having access to healthcare facilities and 85.7% utilizing the facilities. Eleven percent of respondents living 4 km from the healthcare service provider have access to healthcare facilities while 90.09% of the respondents utilized it. About 13% of the respondent who lives 10 to 14 km from healthcare service had access while 61.11% utilized the services. Forty-three percent (43.75%) of respondents living more than 14 km to their healthcare providers makes use of the available healthcare facilities. The result, therefore, indicates that utilization of available health facilities increases with proximity to the health centers.

Table 6 Distribution of Respondents by Distance to Healthcare Facilities

Distance (home- hospital)km Frequency/Percentage	Frequency of Access/Percentage	Frequency of Access/Percentage
≤ 4 39/19.50	22 /11.00	20/90.09
5 – 9 81/40.50	42/21.00	36 /85.71
10 – 14 56/28.00	36 /13.00	22 /61.11
>14 24/12.00	16 /8.00	7 /43.75
Total	200/100.00	116 /58.00

3.7 Household size

Table 7 reveals that 7% of respondents have family size of 1-4 members per household, whereas only 60% of the respondents within this group with access to healthcare facilities utilized it. Furthermore, those with household size above 14 members have the highest health service utilization with 85.71%.

Table 7 Distribution of Respondents by Household Size

Household size Frequency/Percentage	Frequency of Access/Percentage	Frequency of Access/Percentage
1 – 4/14/7.00	10/5.00	6/60.00
5 – 9/128/64.00	88/45.00	64/72.72
10 – 14/44/22.00	11/5.50	9/81.81
>14/14/7.00	7/2.50	6/85.71
Total 200/100.00	116/58.00	85/73.72

4 Discussion

The highest proportion of male-headed households (33.90%) utilized traditional health care facilities while 41.38% of female-headed households used self-medication (Table 10). However, a higher proportion of male-headed households (30.99%) seek modern health care services than female-headed households (27.59%). This implies that the level of utilization of modern health facilities is lower among female-headed households than among their male counterparts. This is consistent with the findings of Omonona *et al.* [4]. This might be as a result of low level of access to productive assets among rural female-headed households.

Age is expected to be positively related to utilization of health facilities [11]. However, as depicted in Table 9, majority of household heads in their active and economic age seek health care from government hospitals with a few of them utilizing self-care and traditional care. Private hospitals are least utilized across the various age groups probably because of the high cost associated with their services since private health providers are out to maximize profit. The table further shows that a higher proportion of the household heads within the age brackets of 20 to 30 years (40.74%) and 31 to 40 years (43.48%) utilized government hospitals, while those in age groups of 41 to 50 years (39.13%) sought healthcare from traditional sources. However, self-medication and traditional care are mostly utilized among household heads above 50 years of age.

From the result, 11.50, 17.05, 5.50 and 24.0% have access to self-care, government, private and traditional healthcare provider respectively. Traditional healthcare was the most frequently utilized by the respondents, followed by self-care while private healthcare was the least. Out of those with access to traditional health care, 83.33% utilized it while 78.26, 61.76 and 54% utilized self-medication, government and private hospitals respectively. Traditional healthcare is mostly utilized because of its easy accessibility and low cost of treatment compared with the other forms of healthcare providers.

Education has an important effect on utilization of health care facilities. The results obtained in this study shows that the highest proportion (24%) of the rural household heads had primary education. The result also reveals that a larger percentage (67.69%) of households whose heads have tertiary education utilized modern health care facilities (government and private hospitals) while a higher percentage (68.96%) of households heads with no formal education do not utilize modern healthcare facilities. Likewise, 75% of households whose heads undergo adult literacy education do not utilize modern healthcare facilities. The result follows the findings of Awoyemi *et al.* [11] that utilization of modern health care facilities increases with educational attainment.

Results obtained in this study shows that only 39 households which represent 19.5% of the rural households live close (≤ 4 km) to a public health centre. Majority (35.9%) of the rural households within this distance seek healthcare services from government hospitals while a higher proportion (41.67%) of rural households living farther than 14 km utilized the traditional health centers. This is an indication that distance to health facilities enhances the rate of patronage. This might be due to cost of transportation and access roads.

The result shows that while utilization of modern health facilities decreases with household size, utilization of traditional health care facilities increases with household size (Table 11). Most of the households with 1 to 4 members utilized government hospitals while 28.57 and 35.71% of households with more than 14 members' utilized self-care and traditional care respectively. The result further shows that private hospitals are least utilized in the rural area probably because of high cost of consultation. It can be deduced that larger sized households may not be able to afford modern health facilities and thus turn to the utilization of self-medication and traditional health care services, which they consider relatively cheaper as a larger share of household expenditure will be spent on food.

The result, therefore, indicates that utilization of available public health facilities increases with proximity to the health centers, thus, rural households utilize self-medication and traditional care closer to their residence. This is expected to reduce their cost of transportation and rigour of accessibility to distant modern healthcare services.

5 Conclusion

This study has shown that there is unequal distribution of health facilities as well as low level of accessibility of household to medical facilities in the study area. To this end, governments at all tiers should ensure equitable accessibility to health care delivery across the rural areas by deploying more medical and Para-medical staffs to the rural areas. Rural development policies should promote the creation of enabling environment to enhance participation in modern health care delivery. Household heads should be encouraged to utilize modern healthcare facilities by organizing a sensitization programme to create awareness about the importance of using modern healthcare facilities. There should be establishment of public health centers in the core rural areas. This will increase the proximity and accessibility of rural people to public health facilities.

Compliance with ethical standards

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Disclosure of conflict of interest

The authors declare no conflicts of interest.

Statement of informed consent

Informed consent was obtained from all individual participants included in this study.

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