



Impact of Population Characteristics on Healthcare Services in Calabar Metropolis, Nigeria.

¹*Awhen, Vincent Otese (Ph. D),* ²*Ibiang, Eno Itobo (Ph. D),* ³*Bullem Simon Bullem*

^{1,2}Department of Geography Education, ³Physical and Health Education

^{1,2,3}Cross River State College of Education, Akamkpa

108120603005, 08055629322

ljemvatgroup@gmail.com

ABSTRACT

Population explosion has posed serious challenges to the provision and utilization of healthcare services in many cities in developing countries of the world. Healthcare dispersion and provisions has not met the demand of the various population components and attendant health challenges (illnesses /diseases), chief among them in many of these urban centres include; cholera, malaria, typhoid fever, cough and catarrh, diabetes, tuberculosis, HIV/AIDS, skins diseases and cerebrovascular accident (stroke). This study investigates the impact of population characteristics on healthcare services in Calabar metropolis, Nigeria. The objective is to determine the spatial distributions of healthcare facilities and services in Calabar metropolis,(as it affects education and development). Previous studies carried out by other scholars were explored. The study adopted the survey research designed and the cross-sectional survey research. Population sampling was achieved through a multi stage sampling procedure. The questionnaire instrument was employed in primary data collection, while other surrogate measures was achieved through biophysical data capturing. Data analysis was carried out through hypothesis testing using one-way analysis of variance (ANOVA). From the result, the F_{cal} ratio stood at 6.960 while the critical value f_{α} stood at 4.51 at 0.05 level of significance. Since $F_{cal} > f_{\alpha}$ the null hypothesis was rejected while the alternate hypothesis was accepted. This means there is a significant variation in spatial distributions of healthcare facilities and services; healthcare facilities are clustered and not evenly or randomly distributed in the study area. Healthcare redistribution should be evenly or randomly spread in favour of the spatial location of schools in the area. Population growth issues should be included in the curricula of educational institutions, especially in rural areas to create awareness on the implications of large and small family sizes.

Keywords: Population growth, Healthcare services, Healthcare distribution, Calabar.

Introduction

Population which is the total number of inhabitants within a given geographical area at a given time is a dynamic phenomenon, that has the potential to increase or decrease overtime. Birth rate, death rate and migration are among the factors responsible for this dynamism. However, the population of the world has been on steady increase. This growth in human population in the last fifty years has been staggering. The United Nations Estimate (2023) indicated that the global population has increase from 2.5 billion in 1960 to almost 8.1 billion (i.e. 8,045,311,447) at present, a 0.88% increase (70,206,291 people) from 2022, when the population was 7.9 billion people (7,975,105,156) (World Population Estimate, 2023). Nigeria on the other hand as a developing nation has witnessed a rapid but tremendous increase in her population over the years. For example, according to the 2006 population census, Nigeria had a total population of 140.4 million people (NPC, 2006). This figure according to the United Nations Estimate (2023) has increase to over 223.8 million (223,804,632) within a period of 17 years. This is equivalent to 2.78% of the total world population, ranking 6th in the list of counties (and dependencies) by population (United Nations Projection, 2023). This alarming increase of world population, according to Animashaun (2002), causes increased demand for food, shelter, clothing and other life-supporting needs, which are derived directly or indirectly from the natural environment. The astronomical growth in human population therefore has a number of environmental, social, economic, political and physical consequences.

Furthermore, as the population of the world increases, the demands upon the healthcare system are also increasing which is costing more money and resources. When the basic necessities of life- water, food, shelter and clothing are not met, as is likely the situation in most developing countries of the world including Nigeria, people are more likely to get sick, which according to Eni and Ukpong (2014) constitute a greater burden on the available facilities and social support system, including healthcare resources. Another way in which the population influences demand for healthcare is in terms of the aging population in the society. According to Mion (2013), elderly people tend to have far greater healthcare needs than young people thereby adding up more pressure and increasing the frequency of visits to medical facilities. Nevertheless, people use healthcare services for many reasons; to treat illness and health conditions, mend break and tears, prevent or delay future healthcare problems, reduce pains and increase quality of life, and sometimes merely to obtain information about their health status and prognosis.

The healthcare delivery system in Cross River State and particularly Calabar has shown some level of improvement. But this has not reflected on the population growth rate, as there are more patients visiting the hospitals everyday which outnumber the available doctors, nurses and other healthcare service providers. This is a reflection of population growth, which is evident in the states annual/ monthly budgets/ subventions, showing increases in healthcare cost. Every year healthcare expenditures rise appreciably due to the increased number of

aging population, increase in birthrate, migration from rural to urban city centers, reduced infant mortality rate and so on. This study therefore examines the impact of population, characteristics on healthcare services in Calabar metropolis, Nigeria.

Statement of the problem

Population growth increases more rapidly than the provisions of resources especially among Africa and Asia, who are still backward in terms of industrial and technological advancement (development). The increase in population with reference to Nigeria and Calabar in particular results to increasing demand upon the healthcare system and other social support services/facilities. Effective healthcare delivery system is a key to population health and national economic development. However, as the population keeps growing without a corresponding increase in health services provisions, it renders the healthcare delivery system dysfunctional. This is common among the developing countries of the world including Nigeria which is characterized by poor funding, shortage of health facilities, low Doctors/ Nurses- patient ratio, insufficient services among others.

There is a phenomenal population growth rate of 2.83 percent as at 2005. Thus, with over 2.8 percent growth rate, the population of Calabar increased from 3228.879 in 1991 to 631,000 in 2022, a 4.36 percent increase from 2021. This growth rate according to Ojong (2010) portends greater challenges to medical and other social support system in the city.

Aside the increased impact of migration, high fertility rate, people's perception and aging population experienced in Calabar metropolis that might have affected healthcare services, researchers have identified other challenges of rapid population increases on healthcare services. Omotosh (2010) for example highlighted that population growth has led to shortage of physicians, nurses and trained health personnel that could treat the various types of illness brought to their facilities. This growth in our urban centres is a result of prevailing high fertility rates of over 6.2, early marriage and increase in fecundity as well as the high libido acquired by young men of the area. Baby boom thus is prevalent in cities/urban areas in Nigeria as seen in hospitals and maternity homes. Other factors are increase in rural urban migration, tourism drive, healthcare needs among others. This brings about over concentration of people as the carrying capacity of the urban centers in terms of space and available resources are outstripped. Thus giving rise to infrastructural deficit and failure of social support system like healthcare services to meet the needs of all components of the (booming but gloomy) population. Hence risk conditions such as overcrowding, pollution, malnutrition, waste discharge and sanitation problem/ poor hygiene, slums/ ghettos, low socio-economic status and high cost of living to mention but a few, that result to multiplicity of diseases, (communicable and non-communicable) are created in our urban centers.

However, low life/ poor quality population /sick population cannot bring about the desired economic development in a developing country like Nigeria. Addressing the rapid multiplicities in population characteristics through drastic measures and improvement in healthcare delivery system would improve the health of the people, enhance longevity as well as boosting economic growth and development in the country. This study would provide the basis for addressing these problems. As this study would identify urban population's characteristics health challenges and the variables affecting healthcare provisions, it would provide a platform for: improved affordability and accessibility of healthcare services; adoption of integrated approach to fertility control; create awareness on the dangers of self-medication and alternative medicine; strengthen measures aimed at tackling the major health issues (HIV/AIDS, tuberculosis, hepatitis, malaria and Covid -19, and identify measures for the smooth implementation of population control policies of the Federal Government of Nigeria.

The impact of population characteristics would help health reformers to redesign healthcare dispersion and services in such a regular pattern that would be more accessible in terms of physical distance and affordability or utilization, hence this would give funding agents/body the justification for improved funding. The study would therefore provide a framework for improving healthcare coverage in Calabar and Nigeria as a whole for the benefit of the various population characteristics like the vulnerable, aged, low income, children, pregnant women and many others.

On top of the above, the natural environmental conditions of the tropical world, which is the physical geogen offers the optimum conditions for rapid multiplication of diseases. Poverty, illiteracy, which results to lack of hygiene or sanitation, congestion/overcrowding in cities, living in squalid conditions among others are the human variables or the human geogen that tend to aid the occurrence of diseases and their diffusion in the society, especially in urban areas. The lack of hygiene or sanitation, living in squalid or demented conditions as a result of poverty, lifestyle and congestion/overcrowding in cities results in the rapid spread of various kinds of diseases/epidemics and illness (both pathogenic and non pathogenic). These diseases accompanying various population, components or characteristics include among others typhoid fever, malaria, cancer, tuberculosis, HIV/AIDS, hepatitis, chicken pox, whooping cough, monkey pox, yaws and the recently introduced covid-19. Nevertheless, other challenges of healthcare services (as populating grows) include the poor coverage of health services by providers across the city, affordability, inequality in service delivery (as services are offered in a pay-as-you-go basis), household size, income, clustered/irrational distribution of health facilities and so on. This work seeks to examine the impact of population characteristics (fertility rate, age structure, size, density, race religion, gender, occupation and the likes) on healthcare services with particular reference to Calabar, Cross River State, Nigeria.

Objectives of the Study

The main objective of this study is to examine the impact of population characteristics on the quality of modern healthcare services in Calabar metropolis, Cross River State, Nigeria. Specifically, the study objective is to:

1. Determine the spatial distributions of healthcare facilities and services in Calabar metropolis.

Research Hypothesis

1. Ho: There is no significant influence of spatial distributions of healthcare facilities and services on healthcare in Calabar metropolis.
2. Hi: there is a significant influence of spatial distributions of healthcare facilities and services on healthcare in Calabar metropolis.

Literature Review

Population growth and health services delivery

The population of Calabar has recorded a modest increase from 283,065 in 1991 to 375,196 in 2006, which was the census year for the country. In 2010, the projected increase was put at about 450,000 people, and 501,400 for 2019 (NPC, 2006). The current metro area population in 2023 is 657,000, a 4.12 percent increase from 2022. The metro area population in 2022 was 631,000, a 4.3 percent increase from 2021. That of 2021 was 605,000, a 4.49 percent increase from 2020, and in 2020 it was 579,000, a 4.32 percent increase from 2019 (www.macrotrends.net/cities/calabar/population 2023). The implication of the phenomenal population growth is the increasing areal expansion of the city, which stretches deep into its hinterlands. Eni and Ukpong (2014) stated that rapid population growth in Calabar as it is in other cities, means more people to feed, more infrastructural development, increase provision of facilities and amenities such as hospitals, schools, water, electricity, telecommunication among others.

In terms of health services delivery, Ajajumi et al (2013) stated that Nigeria is still lagging behind because of obstacles such as high cost ICT equipment, power failure and inadequate telecommunication facilities. They however, noted that the government, the missions, private individuals, communities, industrial and traditional practitioners provide health services in Nigeria as a whole, and Calabar is not an exception. They further reported that the private and other institutions provide most of the healthcare, while government provides less. The implication is that less privileged and low income earners in the society would be deprived of essential care, which depends on the individual's purchasing power (Ojajumi et al, (2013).

Population growth and improvement of health facilities in the healthcare sector have been at variance right from the colonial era. Population growth rate as observed is growing in geometrical progression and the improvement of healthcare facilities has progressed in arithmetical progression. Hence the demand for healthcare services has increased tremendously.

However, the healthcare system in Nigeria of which Calabar as a cosmopolitan city is not left out has a blend of private and public healthcare providers. In public sector, healthcare providers are under the three tiers of government, Federal (tertiary hospital and some hospitals in Federal Institution like universities), State (state specialist and general hospitals) and Local Government Areas (primary healthcare centres and health post). The choice of healthcare providing facility is based on six types of information: quality of service provided, access to providers (both hospital and physicians), out of pocket costs, health provider communication skills, courtesy and administrative burden. The patients' perception of the quality of services provided is a key factor (along with cost effectiveness) in developing the use of the healthcare facility (Rein, 2012).

Accessibility and utilization of healthcare services

Sound health is a fundamental requirement for living a socially and economically productive life. Poor health implies great hardships on households, including debilitation, substantial monetary expenditure, 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 development (Asenso-Okyere, Chiang, Thangata and Andam, 2001). Access to healthcare services is a multidimensional process involving the quality of care, geographical accessibility, availability and acceptability of service (Peters, Targ and Boom, 2008). The utilization of healthcare service is related to the availability, quality and cost of service, as well as socio-economic structure and personal characteristic of the user (Onah, et al, 2009).

Household that live or trek longer distances to receive healthcare services are bound to develop evasion strategies which include patronizing quack medical stores, traditional native medical attendants and self mediation. Turner (1991) found out that in Nicaragua better access to healthcare facilities was the strongest determinant of healthcare spending by household.

Healthcare utilization is the use of healthcare facilities by a respondent with the aim of promoting good health (stock, 1983). It is expressed in terms of the number of visits a respondent makes to healthcare facility at a particular time (Oluwabamid and Inyang, 2006). In developing countries, the under-utilization of healthcare services in public sectors has been a universal phenomenon (Zwi, 2001). This is because the state of Nigeria healthcare system for example is dysfunctional and grossly under-funded with a per capita expenditure of US\$ 9.44 (World Bank, 2010).

Such regions with difficult terrain and physical environment are often neglected and healthcare facilities and services are often not utilized (Onokerhoreye, 1999). The utilization of health services is an important policy concern in most developing countries, reflecting both efforts to improve health outcomes and to make health services broadly accessible. However, many policies and research initiatives have focused on the need to improve physical

access (Okafor, 2007), not enough is understood about what services and quality indicators affect healthcare choices, and why low levels of utilization persists among certain socio-economic groups or geographic regions despite improved physical access (Ibor, Ojong and Eni, 2010). It is undoubtedly true that economic variables alone cannot explain healthcare utilization, as the type of health services provided in a particular medical establishment is a significant determinant in decision about outpatient visits. The type of health services available to a population is therefore an important factor in the choice of utilization.

Research methodology

Research design

The study adopted the *survey* research design. Cross sectional survey research was also used in the study for collection of data. This involved the collection of data on the phenomena with representative samples by the use of questionnaire, interview, focus group discussion and Participatory Rural Appraisal (PRA) approach. However, data was collected among other things based on the following: Population characteristics of the study area, data on spatial distributions of healthcare facilities and services in Calabar metropolis, data on inpatients and outpatients' roster in the various hospitals selected for the study, common health challenges reported in health centers, annual prevalent rate of diseases, availability of medical facilities and personnel, affordability and accessibility of healthcare services in Calabar, payment of bill by gender, residents perception of aspect of health facilities and services in the study area, demand implications on healthcare challenges (illness) in the study area, healthcare need of population, distributions of diseases, sexually transmitted diseases, status of medical need by age, cancerous diseases and diseases of children.

Area of the study

The area of the study is Calabar metropolis, made up of Calabar South and Calabar Municipality Local Government Areas. Calabar is located at the south eastern extreme of Nigeria. It lies approximately on latitude $04^{\circ}53'$ north of the equator and longitude $08^{\circ}15'$ east of the Greenwich meridian. The city is bounded in the north by Odukpa Local Government Area, south by Atlantic ocean and Bakassi Local Government Area, east by Akpabuyo Local Government Area and west also by Odukpani Local Government Area (all of Cross River State). To the southwest it is bordered by neighbouring Akwa Ibom state. Precisely the city is located 48km from the estuary where the Cross River meet before draining into the Atlantic ocean (see figure 1).

Today, Calabar is highly heterogeneous in terms of ethno-tribal composition of the inhabitants, which include among others, Efiks, Quas, Ibibios, Annangs, Hausas, Igbos, Yorubas, Asians and Europeans. Although three indigenous ethnic groups namely Efiks, Efuts and Quas dominate the area.

As the capital of Cross River State, Calabar has both public and private healthcare service providers. In addition there are many tertiary institutions and secondary schools in the area. There also exist high level of religious activities, trade and other commercial ventures as well as industrial and government establishments and hotels that boost tourism and population growth. The present population estimate is around 657,000, a 4.12 percent increase from 2022. This has implication on healthcare delivery.

Population of the study

The population of the study was drawn from among the healthcare users in government and private healthcare facilities/providers within Calabar metropolis. Among them are the University of Calabar Teaching Hospital (UCTH), General Hospital Calabar (GHC), Nigeria Police Hospital, Nigerian Navy Reference Hospital Calabar (NNRHC), Psychiatric Hospitals Calabar, St. Nicholas Medical Center, Primary Healthcare centers, etc. Figure 1 shows map of spatial distribution of health facilities in Calabar metropolis.

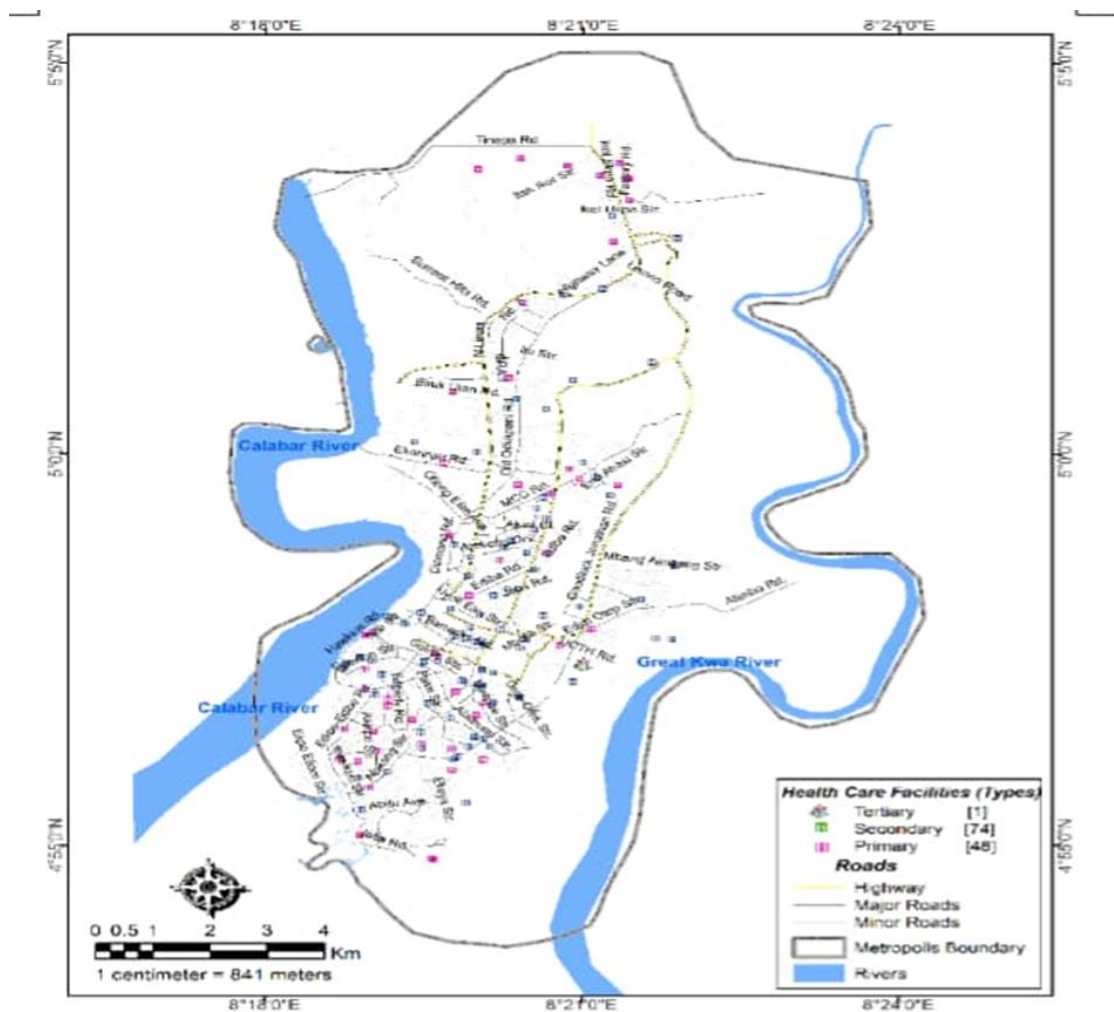


FIG. 2: Map of Calabar Metropolis showing major healthcare providers
Source: Ministry of Health Calabar, Cross River State

Figure 1

Sample and sampling techniques

All the health facilities were considered during mapping of the area. A total of 10 major health centers and 200 respondents constituted sample size for the study. Simple random

sampling techniques was employed in the selection of the sample.

Instruments for data collection

The major instrument for data collection included designed questionnaire to capture information on demographic characteristics, health challenges, health status/patronage of health facilities, educational background, family size, occupation, inpatients and outpatients among others.

Method of data collection and data analysis

Reconnaissance survey of the study area was carried out to delineate and identify major health centres and population characteristics therein, as shown in figure 1. Questionnaire administration and oral interview was also conducted in selected compounds. Data collected was analysed using statistical technique of Analysis of Variance.

The ANOVA technique was based on hypothesis earlier stated in the null form.

In line with the hypothesis, ten sensitivity parameters were carefully selected and utilized in construction of questionnaire for data collection. The results of which are represented in table 1 below

The four points likerts rating scales were explored for respondents responses as follows: A –Agree, SA- Strongly Agree, D- Disagree and SD- Strongly Disagree

Table 1

Analysis of spatial distributions of healthcare facilities and services in Calabar.

S/N	Parameters of response	Rating scales				
		A	SA	D	SD	TOTAL
1.	Malaria, typhoid fever, hepatitis, HIV/AIDs, covid-19, skin diseases, cough and catarrh, tuberculosis, etc are among the health challenges you have experienced in the last 1-3 years	120	40	25	14	199
2.	There is close proximity of health facilities to residential areas/schools in Calabar city	68	54	38	9	199
3.	Distance to a health post is relatively far from your place of abode	96	68	14	2	200
4.	There are many primary healthcare centres in my area	124	64	7	4	199
5.	The health facilities in my area are sited close to each other.	74	68	33	21	200
6.	The distribution of primary healthcare centres in my area is closely related to the distribution of public primary and private schools in the area	20	22	64	92	198
7.	Reasons for utilization/patronage of a health facility include accessibility factors such as affordability, close proximity, availability of services, and acceptability.	62	74	23	21	200
8.	There are adequate physicians and nurses in various areas in the hospitals/health posts nearer to my residence.	68	72	31	8	199
9.	Bed spaces, x-ray equipment, dialysis equipment and others are inadequate in the hospitals and medical centres.	65	77	33	5	200
10.	Native doctors, delivery homes and self medication are more preferable to orthodox/westernized healthcare services	46	48	67	38	199

The table represents the diverse responses of the respondents to distributions of healthcare facilities and services in Calabar. This informed the problem identification of this study

Two hundred (200) respondents were selected through multistage sampling.

The choice of the subjects focused on impact of population characteristics on healthcare services. From the table statistical analysis based on the technique of one way Analysis of Variance was computed as in the process below.

Data analysis

Ho; there is no significant influence of spatial distributions of healthcare facilities and services on healthcare in Calabar metropolis.

Table 2

One-Way (ANOVA) analysis of variance of variation in the spatial distributions of healthcare facilities and services in Calabar

Variable SOURCE	Df	SS	MS	F-ratio
Treatment	3	18,841.35	6280.45	
Error	36	32482.75	902.299	6.960
Total	39	51324.1		

*Significant at .05

Reject Ho if $F_{cal-ratio} > F_{\alpha}$ otherwise do not reject

Comparing both value reject Ho because $F_{cal-ratio} = 6.960 > F_{(3,36)} = 4.51$ at 0.05 level of significance and it was concluded that the spatial distributions of healthcare facilities and services in Calabar are not randomly spread. Hence health facilities in the study area are clustered.

Results/findings

From the result of the hypothesis testing the f ratio calculated stood at 6.960 at 0.05 level of significance while the critical or table value stood at 4.51 at 0.05 level of significance. This means that $F_{cal} > F_{table}$ (ie the calculated values is greater than the table value. This leads to the decision rule that there is a significant influence of spatial distributions of healthcare facilities and services in Calabar. It follows that the null hypotheses is rejected while the alternative hypothesis is upheld.

This result therefore is in conformity with the findings of previous studies carried out in the study. There is therefore a close corroboration with the works of Peters, Targ and Boom (2008), who affirmed that access to healthcare services is a multi-dimensional process involving the quality of care, geographical accessibility, availability and acceptability of service. Ajajunietal (2013) also stated that Nigeria is still lagging behind because of obstacles such as high cost ICT equipment, power failure and inadequate telecommunication facilities. Rein, (2012) agrees that the choice of healthcare providing facility is based on six types of information: quality of service provided, access to providers (both hospital and physicians), out of put costs, health provider communication skills, courtesy and administrative burden. The patients' perceptions of the quality of services provided is a key factor (along with cost effectiveness) in developing the use of the healthcare facility.

Asenso-Okyere, Chiang, Thangata and Andam, (2001) focussed on the links between utilization and healthcare services, these variables are determinants of choice of healthcare services; cost of consultation and proximity of health facility. Poor health implies great hardships on households, including debilitation, substantial monetary expenditure, 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 development. (Asenso-Okyere, Chiang, Thangate and Andam, 2001).

Along the objectives of this study Turner (1991) found out that in Nicaragua better access to healthcare facilities was the strongest determinant of healthcare spending by household. Healthcare utilization is the use of healthcare facilities by a respondent with the aim of promoting good health (Stock, 1983). Ibor, Ojongand Eni, (2010) are of the opinion that it is undoubtedly true that economic variables alone cannot explain healthcare utilization, as the type of health services provided in a particular medical establishment is a significant determinant in decision about outpatient visits. The type of health services available to a population is therefore an important factor in the choice of utilization.

Recommendations

1. Nigeria needs urgent, credible, coherent and achievable reforms in healthcare sector. In this regards there must be an enhanced, adequate, effective, workable and utilizable monthly or yearly budgetary allocations to the health sector.
2. Locational characteristics of healthcare facilities must in any circumstance adhere to the spatial distributions of educational institutions in the city/state.
3. The Universal Basic Education Health Programme of the present Federal Government of Nigeria should be strictly implemented with emphasis at the local government level for the benefits of all and sundry
4. Government should improve its plan on how to tackle the major public health issues in the city /state (i.e HIV/AIDS, tuberculosis, malaria and covid 19 which remain the major health issues in Nigeria).
5. Population growth issues should be included in the curriculum of educational institutions, especially in rural areas to create awareness on the implications of large and small family sizes.

Conclusion

Healthcare utilization in any given area is a continuous, but unrelenting, irresistible and monotonous drive by a people or population with low health status, with a view to obtain good health or regain normal health status. Access to health is complex and extend beyond service availability to include wider dimensions such as utilization of services and barriers to access, the relevance and effectiveness of services and the equity of these dimensions. This must tackle the problem of access across its three dimensions – availability, affordability and acceptability. The assessment of functionality or otherwise of the infrastructure indicates the availability level of the facilities.

The study concluded that there exist variations on healthcare facilities and also presence of health challenges, as well as inadequacy of facilities and personnel. The study further concluded that various population characteristics uses healthcare facilities which however are not randomly spread. Hence health facilities in the study area are clustered.

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