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Distribution and State of Functionality of Primary Healthcare Facilities in Port Harcourt Municipality, Rivers State, Nigeria

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ABSTRACT

The increasing rate of inaccessibility to public health services and the decay of the facilities in recent time have become worrisome most especially in the developing countries, thereby calling for an improved distribution and a functional primary health care facilities. This study therefore assessed the distribution and state of functionality of Modern Primary Health Care Facilities (MPHCF) in Port Harcourt municipality, Rivers State. The objectives of the study are to examine the distribution of MPHCF in the study area and also to examine its state of functionality. The study adopted the Mixed Method Research Design employing qualitative data collection and Geographic Information System (GIS) for spatial data analysis. 399 respondents were selected for this studywith the aid of Taro Yamane and questionnaire administered to them for data collection. Also, data on the spatial distribution of MPHCF was gathered using hand head GPS and analysed using GIS techniques. The data collected fromrespondents was analysed using descriptive statistics. The findings of the study revealed that MPHCF were located in places where there are available land spaces which made some of the MPHCF locations to fall short of 4km residential accessibility distance stipulated by WHO. The findings of the study also revealed that the MPHCF was functional and required an enhanced effort to improve its state functionality. The study thus recommended that the distributed and location of MPHCF should be done in line with WHO (1997) and planning standard of 4km residential accessibility and the state of functionality should be improved upon.

Keywords: Primary Healthcare, Healthcare Facilities, State of Functionality, Geographic Information System (GIS), Range, Threshold, Accessibility, Central Place.

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1. INTRODUCTION

The continuous increase in both urban and rural population has birthed the problem of inadequate availability medical service and lack of accessibility to healthcare facilities (Ogunlela, 2011). This is as a result of the rise in social disparity and unequal access to healthcare facility by people of the same population spectrum (Ikeji, 2020). The increase in global outbreak of disease epidemics, the rising spate of poverty among the larger population and the increase rate of vulnerability to various diseases has increased the demands for health needs and services among the people. According to Ikeji (2020), the world demography is estimated to be about 7.7 billion people living currently on the earth surface with less than 85% accessing medical and healthcare services. The World Health Organization (WHO) (2019) has observed that globally, more than 85% of the world population does not have access to good healthcare. The main issue is bothered on the fact that governments of nations of the world do not have the political will to provide the basic healthcare facilities and services needed to enable the populace to live in a good health condition (Ikeji, 2020). Access to medical services therefore has becomes an important issue that has top the policy agenda of nations of the world.

The state of functionality and quality primary healthcare available in an area depends on the health policy formulation and maintenance of health facilities (Delaney, 2018). This is an important tools that is use in achieving are effective healthcare delivery, andwhich can be used in designing adequate support, system, both for self-evaluation and external quality assurance activity (Delaney, 2018). The approach involves a review of policy framework that is tailored towards national consultation, feedback from key stakeholders and the

outcomes of a variety of testing exercises. The planning framework for health care delivery and facilities maintenance is broken down into the nine areas of focus called domains which could be applied for adequate primary health accessibility and delivery. They as follows: key organisational outcomes, impact on people experiencing care, careers and families, impact on staff, impact on the community, delivery of safe, effective, compassionate and person-centred care, policies, planning and governance, workforce management and support, andpartnerships and resources and quality improvement-focused leadership.Worthy of note is that under each domain (Delaney, 2018), the framework also outlines quality indicators such as; improvements in quality, outcomes and impact, public participation and the involvement of staff in healthcare delivery, assessment and management of people, policies and procedures, risk management and audit, etc., that can be used for both self-evaluation and for external assessment and quality assurance of service provision as well as themes related to each quality indicator that support the evaluation and delivery of healthcare services (Delaney, 2018).

The state of healthcare system in Africa generally, and in Nigeria in particular over the years have been, and still remains less than desirable (Ikeji, 2020). Some worrisome statistics shows that although, Nigeria accounts for only two percent of the world's total population of 7.7 billion (Nigeria is equivalent to 2.04%, that is 200,963, 599 of 7.7 billion), she accounts for some ten percent of the world's infant and maternal mortality (Ogunlela, 2011). Consequently, the Federal Government of Nigeria has made attempts to build new healthcare centres and rehabilitate the health sector through a series of reforms. Deliberate efforts have been made to initiate and sustain health sector reforms over the past years. The reform of the health sector is predicated upon the fact that the sector is characterised by poor quality of public sector healthcare services, resulting in poor healthcare facility maintenance and poor healthcare outcomes when measured against basic health indicators (African Development Fund(ADF), 2002).

With the ever growing population of Nigerian rural settlements and urban centres, there is bound to be challenges in the provision and maintenance of healthcare service and facilities maintenance. With the inadequacy and inaccessibility problems in healthcare service provision, the issues of poor healthcare facility maintenance are increasing daily. Over the years, the Rivers State Government has continued to invest in health services. However, the continuous health challenges of the residents kept exacerbating ranging from inaccessibility, inaffordability and inadequacy, with the healthcare facilities decaying and becoming deplorable (National Urban Development Policy (NUDP), 2006). This prompted the NUDP in 2006 to give national concern to the health sector. The healthcare facility was sought as a socio-economic infrastructure, which the NUDP saw it as social welfare responsibility of the three tiers of the government in Nigeria.

The Rivers State Government (RSG) from the inception of democratic rule in 1999 under the stewardship of Sir (Dr.) Peter Odili through the tenure of Rt. Hon. Rotimi Amaechi from 2007-2015 invested so much in healthcare service provision to take care of the huge healthcare demand of the teeming population of the resident of Rivers State. The RSG therefore saw the need for cooperation and collaboration amongst the tiers of governments in the state to carry out primary healthcare services provision. The primary healthcare facilities and services provided were done with the assistance of the international organization such as World Health Organizations (WHO), United Nations International Children Emergency Fund (UNICEF) and private donors to meet healthcare service demand with more emphasis on the urban centers. Though, dilapidation and decay have visited the facilities, the issues have been that of poor distribution and poor planning and maintenance framework in terms of the maintenance culture (Tari, Brown & Chikagbum, 2015).

However, primary healthcare servicewas given premium under the Rt. Hon. Rotimi Amaechi from 2007-2015 where the policy framework of the government was designed to build at least one primary healthcare centre in every ward of the 23 Local Government Areas (LGAs) of Rivers State. This was in response to the tenet of the National Health Policy (NHP) developed in 1986, promulgated in 1988 and later reviewed in 1996, which set up a healthcare system, which defined much of what remained today (Ikeji, 2013) to achieve the aim and objectives of the primary healthcare as specified by WHO in 1987 as follows: make healthcare services accessible and available to all wherever they live and work, tackle those health problems causing the highest mortality and morbidity at a cost affordable to the community, ensure that whatever technology in used must be within the ability of the community to use effectively and maintain, and that in implementing health programmes and maintenance of healthcare facility, the community must be fully involved in the planning, delivery and evaluation of the services in the spirit of self-reliance.

The government of Rivers State therefore set the pace for the formulation of policy framework for the maintenance of primary healthcare facilities. The effective delivery of healthcare services is premised on the

implementation of the policy framework to achieve effective distribution and enhancement of state of functionality of primary healthcare facilities in Port Harcourt Municipality, Rivers State. This study therefore examines the distribution and state of functionality of primary healthcare facilities in Port Harcourt Municipality Rivers State, Nigeria.

2. LITERATURE REVIEW

Theoretical Framework: Central Place Theory

This theory was propounded by Christaller (1933).Central place theory is a geographical theory that seeks to explain the number, size and location of human settlements in a residential system. This theory was introduced in 1933 to explain the spatial distribution of cities across the landscape. This theory as used in this study and as articulated by the theorists is aimed to show the relationship between the presence of the Healthcare facility & service and the population needed to support it, the size of the area within which such population is contained and the size and the central place itself.

The central place theory as used in this study provides a complementary tool for the explanation of healthcare facility provision and distribution. This theory is the most versatile theory for the analysis of the size, spacing and functions of central places based on the concepts of range and threshold. The threshold healthcare for a service or deliverables refers to the minimum population (market) needed to bring healthcare service into existence which determine the catchment's size and provides the basis for central place ordering either as high order or low order places. High order central places offer wider range of goods and services and require large threshold support level than low order central places (Christaller, 1933, Fadahunsi, 2016; Ayoade, 2014; Ahmed & Mohammed, 2013; Iyalomhe & Iyalomhe, 2012 & Njoku & Akpan, 2011).
On the other hand, the farthest distance people are willing to travel in order to enjoy a given healthcare facility and service refers to the market area for the goods or the distance traveled to obtain a good or service (Healthcare services) which is dependent on price, transportation cost, distance, necessity of the service and preferences (Aigbe, 2010).

Christaller's concepts of threshold and range and the ordering principle largely explain the ordering and distribution of healthcare facilities in Port Harcourt municipality (Gbakeji, 2014). At the primary level, the primary healthcare (PHC) centres exist, the comprehensive healthcare centre, general and state hospitals are at the secondary level while the teaching hospitals are at the tertiary level. The hierarchical order is largely a product of the interacting influence of threshold and range principles, determined by the nature of healthcare services rendered (Onokerhoraye, 1999). Therefore, the central place theory clearly provides an appropriate theoretical background for the understanding of the spatial distribution and configuration of primary healthcare facilities in Port Harcourt Municipality, Rivers State.This theoretical framework provides the underpinning for residential accessibility to healthcare service by resident without long distance and high transportation cost. The theory provides the understanding for easy accessibility of resident to medical services as stipulated by the WHO (1997) of 4km accessibility distance to medical service.

3. Methodology

Study Area

Port Harcourt City Local Government Area also called Port Harcourt Municipality is the study area for this research. The areahas a total of 100km^2 landmass out of which about 45% (17.3km^2) of it, is wetland area (Visigah, 2017). The area has a population of 546,789 Persons (National Population Commission, NPC 2006), and its headquarters is located at Old Port Harcourt Township (Ajie & Dienye, 2014). The study area has a tropical monsoon wet climate. It has two seasons, the raining season and the dry season with lengthy and heavy rainy seasons and very short dry seasons.Geographically, Port Harcourt City Local Government Area is bounded by Obio and Akpor to the North, Okrika to the South (See Fig. 1.1) and it is located approximately within latitudes $4^0$5'11" and 5^{o}15'45" North and longitudes 6^{o}22'25" and 8^{o}05'12" East (Ajie &Dienye, 2014). (Fig 1)

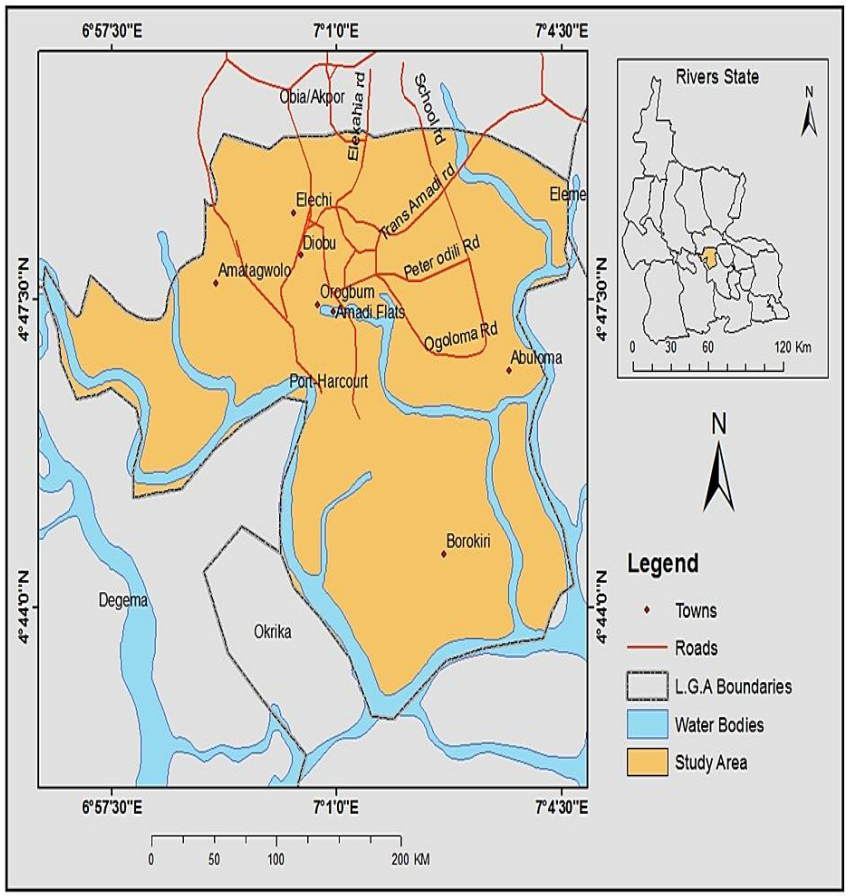

Fig. 1: Port Harcourt Municipality and Its Environs
Source: GIS Lab., Department of Geography and Environmental Management, University of Port Harcourt, 2022

4. Research Design

The study adopted the survey research design and employed 399 sample respondents for data collection. Geographic information system(GIS) was also used to carry out the spatial analysis of the distribution of primary healthcare facility location in the area were coordinates of the primary healthcare facility locations was collected using the handheld GPS and was imputed into the computer system and further exported to the GIS environment using the GIS software (ArcGIS 9.3). The coordinates were supper imposed on the map of Port Harcourt municipality and Geo-referenced to get their appropriate co-ordinates as it is on the ground. Shape file for both functional and non-functional primary healthcare facilities was created using the ArcGIS 9.3 version. Point maps showing the primary healthcare facilities were produced. The equi-distance tool available on the ArcGIS 9.3 extension was used to show the distance apart between each facility and the distribution of the primary healthcare facilities within the study area. A map of the distribution of the primary healthcare facilities was produced (Fig 2). Also data on the state functionality was collected using questionnaire and analyzed using descriptive statistics and presented using table and charts.

5. Results and Findings

The analysis of the distribution of primary healthcare facilities in the study area is shown in fig 2.

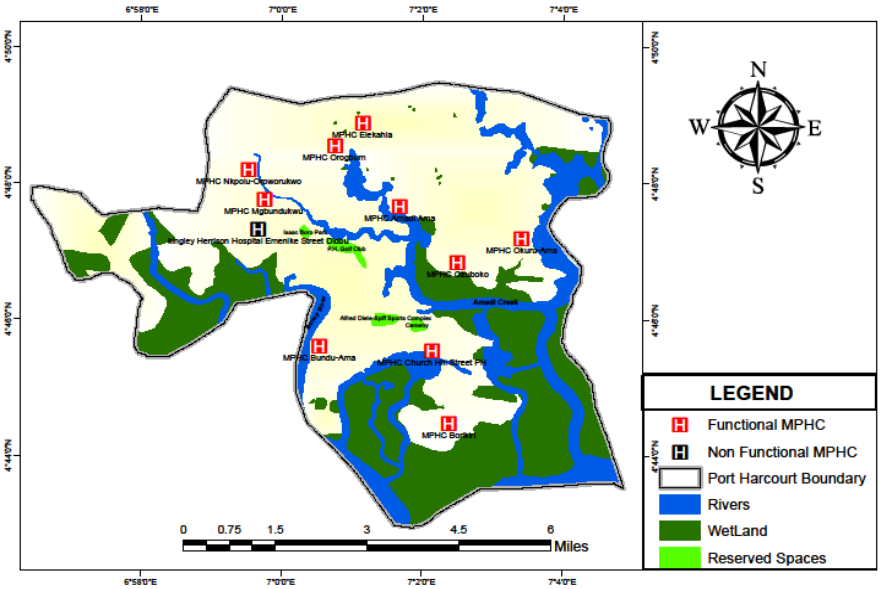

Fig 2. Distribution of Modern Primary Healthcare (MPHC) Facilities in Port Harcourt Municipality
Source: Researcher's Field Data, 2022

From fig 2 above, the distances of Modern primary healthcare (MPHC) in space and time from one another and from residential buildings was calculated. The GIS analysis shows that as the crow fly; the distance in kilometers from one Modern Primary Healthcare Centres (MPHC) and the other calculated using the GIS software(ArcGIS 9.3 version). This was done by takingthe distance apart in meters and converted into kilometers as shown in Table 1.

Table 1: GIS Analysis of Distance between One MPHC and the Other

S/N	Modern Primary Healthcare Centres (MPHC)	Distance (Km)
1	Elekahia to Orogbum	0.964km
2	Orogbum to Nkpolu Oroworukwo	2.43km
3	Nkpolu Oroworukwo to Mgbundukwu	6.427km
4	Mgbundukwu to Amadi-Ama	5.693km
5	Amadi-Ama to Okuru-Ama	5.876km
6	Okuru-Ama to Ozuboko	4.363km
7	Ozuboko to Bundu-Ama	9.177km
8	Bundu-Ama to Churchill Street	5.092km
9	Churchill Street to Borikiri	5.047km

Source: Researchers' Computation, 2022

Also, it was noted that the distance of health facilities from residential accessibility were between 1-2 kilometers, accounting for 36% of the distribution (Fig.3). However, 46.3% of health facilities were located within 1km radius to respondents' residence. This was not in consonance with WHO 4km residential accessibility standard while 53.2% were located more than 1 kilometer from respondents' homes. Respondents' were asked if they were satisfied with the distance of health facilities to their residences. The modal response was "No", representing 82.8%. The main reasons given by respondents for their dissatisfaction was "Facility is too far", accounting for 63.6% of the respondents (Fig.3).

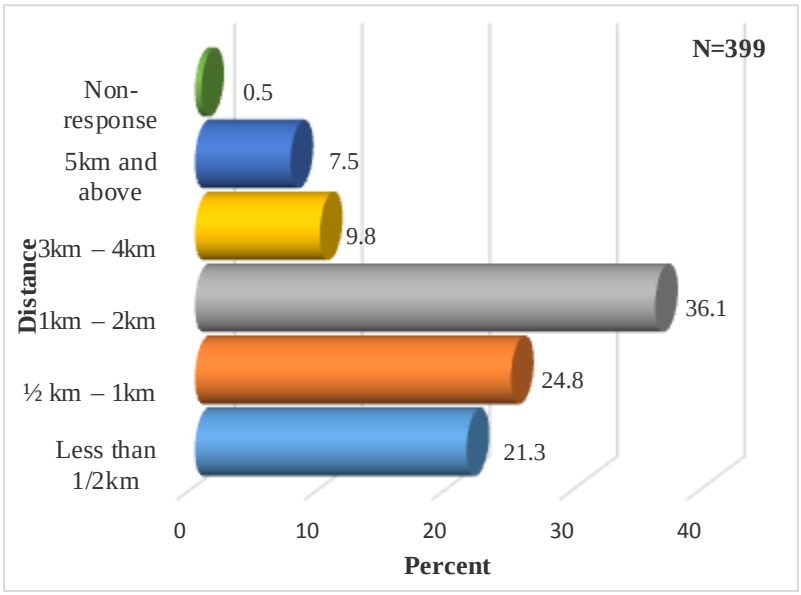

Fig.3: Distance from Respondents' Home to Health Facility
Source: Researcher's Field Data, 2022

Also, the state of functionality of MPHC is as shown in fig 4. Fig 4 revealedshows the assessment of functionality of primary healthcare facilities in the study area based on the responses of the respondents. From the chart as indicated in Fig 4, 51% of the respondents rate the functionality of the primary healthcare facilities as "functional", followed by those that rate the functionality as "very functional" while "non-functional" and "undecided" and "non-response" accounted for 33%, 4% and 3% respectively while 9% accounts for non-response (Fig. 4).

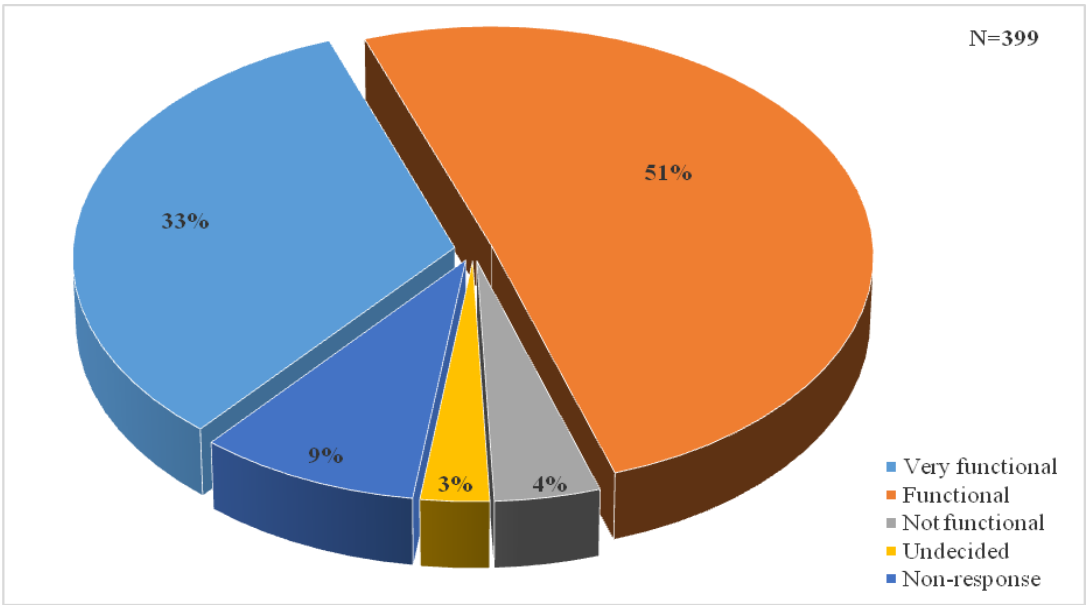

Fig. 4: Respondents' Assessment of Functionality of Healthcare Facility
Source: Researcher's Field Data, 2022

6. Discussion of Findings

Spatial Distribution of Primary Healthcare Facility

The findings of the study revealed that the distances between one primary healthcare facilities and the other differs and varies (Fig 2). It was revealed that the distance between the modern primary Healthcare (MPHC) Elekahia and the modern primary healthcare Orogbum is 964m (0.964km) apart, from MPHC Orogbum –

MPHC Nkpolu Oroworukwo is 2403m (2.43km) apart. From MPHC Nkpolu-Oroworukwo – MPHC Mgbundukwu is 6472 (6.472km) apart, from MPHC Mgbundukwu – MPHC Amadi-Ama is 5693m (5.693km) apart, from MPHC Amadi-Ama – MPHC Okuru Ama is 5,876m (5.876km) apart and MPHC Okuru Ama – MPHC Ozuboko is 4,363m (4.363km) apart. Also, from MPHC Ozuboko – MPHC Bundu – Amadi is 9,177m (9.177km) apart and from MPHC Bundu – Ama – MPHC Churchill Street is 5,092m (5.092km) apart while from MPHC Churchill street - MPHC Borikiri is 5,047m (5.047km) apart (see Table 1).

Thus, the distances between some modern primary healthcare facilities and residential accessibility in the study area as shown from the GIS analysis (Fig 2) is not within the World Health Organization (WHO, 1997) standard, which stipulates an approved distance of not more than 4km from residential accessibility to the nearest PHC facilities. However, it is within the provision of the Nigeria National Health Policy, which stipulates that healthcare facilities can be located at the convenience of the community with the provision that the facilities will be accessible.

Also, from Fig. 2, the distances of the MPHC from the residential buildings of respondents interviewed revealed the various locations of the MPHC facilities in relation to the respondents' residences. Thus, from Table2, most of the facilities are located within a minimum distance of 4km from residential accessibility. Healthcare facilities located between 1-2 kilometers, accounted for 36% of the sampled respondents, less than ½ km from the respondents residence accounted for 21.5% of the sampled respondents, ½ km – 1km accounted for approximately 24.8% of the respondents, from 3km – 4km accounted for approximately 9.8% of the respondents, while from 5km and above accounted for 7.5% of the respondents.

Thus, access to healthcare services with ease depends on the locations of the individuals in Port Harcourt in relation to the location of PHCF. The distribution pattern and spatial location of some of these PHCF are not in line with the standards set by WHO (1977), thus, the level of patronage, and the 'demand–need' syndrome was defective. Also, the factors of population, distance threshold and the centrality and accessibility of the PHCF were not totally considered in the location of the facilities as the population of each community in the study area is far more than the WHO required standard population of 10,000 to 20,000 persons per a health centre. Hence, the spatial distribution of the facilities in the study does not consider population factor and demand in term of convenience of location. These findings is in line with the findings of Fadahunsi, Kufoniyi& Babatimehin (2017) who noted that the uneven distribution brings about inappropriate delivery of healthcare services to the residents around the area of location.

State of Functionality of Primary Healthcare Facilities

Again, from Fig. 4, the level of functionality of the MPHC facilities was revealed. Thus, from Fig. 4, it was revealed that the respondents' responses on the state of functionality of MPHC facilities in the study area showed that the MPHC facilities are very functional as the modal response of 'functional' accounted for 50.5% for followed by "very functional" (33.6%) of the distribution, respectively. The finding shows that the PHC are very functional and its state of functionality should be improved up to enhance the delivery of healthcare services to the residents of the area.
From this discussion above, it thus followed that the MPHC facilities in the study area were located where there are available land spaces. This means that it does not follow planning standards and WHO requirements.

7. Conclusion and Recommendations

This study focused on distribution and state of functionality of primary healthcare facilities in Port Harcourt Municipality, Rivers State, Nigeria.
However, this study is anchored on the central place theory which stipulates for the location-efficiency of the Primary Healthcare Facilities in terms of its centrality and accessibility by healthcare seekers as defined by the range and threshold concepts encapsulated in the central place theory by Walter Christaller (1933). This provides the basis for the planning, location and distribution as well as the management of the functional healthcare facilities.
Nevertheless, the study findings revealed that the distribution and location of MPHC facilities in the study area are in eleven (11) communities in Port Harcourt municipality out of which ten (10) are functional, while one (1) is non-functional.
Thus, it is evident from this study that the state of functionality of the PHC facilities is well above average as over 50% of the respondents affirmed that the PHC facilities are functional.Thus, it can be concluded that there is the need for Government to take serious, matters of public health concern and its related issues so as to

enhance the delivery of quality healthcare services to the people of the area. This is important since effective distribution and functional states of primary healthcare facilities are very necessary for the delivery of healthcare services to the people. Based on the findings and conclusions, the study recommend that the distribution and location of MPHC facilities should be done in line with WHO (1997) and planning standard of 4km residential accessibility as well as in relation to the spatial population distribution and human settlement hierarchy to ensure that the issue of locational challenge and accessibility are dealt with. This will help for easy accessibility to Healthcare services without stress by the communities and the people. This can be implemented by ensuring that primary healthcare facilities are located within 4km accessibility distance in each residential neighbourhoods. Also, the available MPHC facilities in existence should be made to perform and function optimally to ensure that healthcare services are provided and delivered to healthcare seekers at the least minimum cost by the communities and people through routine and regular maintenance of the healthcare facilities, involvement of well-meaning individuals and renowned persons in the society. This can be implemented by integrating all stakeholders in the maintenance and delivery healthcare.

References

[1]. Ahmed, A. & Mohammad, A., (2013). GIS for Health Services, Journal of Engineering Sciences, Assiut University, Facility of Engineering, 41(3), 12-23.

[2]. Aigbe, G.O. (2010). Utilization of Maternal and Child Healthcare Facilities in Lagos State, Nigeria.Ife Research Publications in Geography, 9(1), 208-220.

[3]. Ajie, U.E. & Dienye, A. (2014).Spatial Data Analysis of Solid Waste Management System in Port Harcourt Metropolis after 100 years of its Existence. Retrieved 8th July 2020 from www.fig.net and pub and fig2014 and papers and ts67h and TS07H_ujie_dienye_7163-pdf

[4]. Ayoade, M.A., (2014). Spatial Accessibility to Public Maternal Healthcare Facilities in Ibadan, Nigeria.International Journal of Social Sciences, 26(1), 13-28.

[5]. Christaller, W. (1933).The Central Places of Southern Germany.New Jersey, USA:Prentice Hall.

[6]. African Development Fund (ADF) (2002).African Development Fund Approach.Report of Health System Development Project. Abidjan, Ivory Coast, .51

[7]. Delaney, A. (2018). Quality of care approach: The quality framework Evaluating and improving healthcare (1sted.). Scotland: Healthcare Improvement.

[8]. Fadahunsi, J.T. (2016). Spatial Analysis of Accessibility and Utilization of Healthcare Facilities in Osun State, Nigeria. Unpublished PhD Thesis in Geography submitted to the Department of Geography, ObafemiAwolowo University, Ile-Ife, Nigeria.

[9]. Gbakeji, J.O. (2014). Location Theory and Public Facilities: A Case Study of Healthcare Facilities in Ughelli-South Local Government Area of Delta State, Nigeria, Civil and Environmental Research (6)6, pp.92-97.

[10]. Ikeji, C.C. (2013). A Policy Analysis of the Primary Healthcare Delivery Programme in Calabar South Local Government Area, Cross River State, Nigeria. Journal of Humanities and Social Sciences, 14(3), 52-59.

[11]. Ikeji, C.C. (2020). Policy Framework and Analysis of Primary Health Service Delivery in Calabar Municipality, Cross River State, Nigeria.Global Journal of Tropical Medicine and Healthcare Services, 3(2), 66-73.

[12]. Iyalombe, G.B.S. and Iyalombe, S.I., (2012). Health-Seeking Behavior of Rural Dwellers in Southern Nigeria: Implications for Healthcare Professionals. International Journal of Tropical Disease and Health, 2(2), 62-67.

[13]. Njoku, E. & Akpan, P.E. (2011). Locational Efficiency of Healthcare Facilities in IkotEkpene Local Government of Akwa-Ibom State: The Role of Geographical Information System (GIS). Journal of Educational and Social Research, 3(9), 93-98.

[14]. National Population Commission (NPC) (2006).National Population Commission Statistical Report for Rivers State. Abuja, Nigeria: National Population Commission.

[15]. National Urban Development Policy (NUDP) (2006).National Urban Development Policy, 2006. Abuja, Nigeria: Federal Government Press.

[16]. Ogunlela, Y.I. (2011). An Appraisal of Nigeria's Health Sector and Its Healthcare Delivery System. Journal of Food, Agriculture and Environment, 9(3x4), 81-84.

[17]. Onokerhoraye, A.G. (1999). Access and Utilization of Modern Healthcare Facilities in the Petroleum-producing Region of Nigeria: The Case of Bayelsa State.Boston, USA: Take-in Program in International Health Harvard School of Public Health.

[18]. Visigah, K.P. (2017). Peri–Urban Settlements and Sustainable Land Management in Port Harcourt, Nigeria.Journal of Oil and Gas Technology. 3(2), 121–135.

[19]. World Health Organization (WHO) (1997).World health report: Conquering suffering, enriching humanity. World Health Organization.

[20]. World Health Organization (WHO) (2019).World Health Organization Reform on the State of the World Health Condition. New York, USA: New York Report Bulletin.