Accessibility of Health Facilities to Residents in Ibadan, Nigeria

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Abstract
Provision of health facilities is an essential service that government often try to provide for the well-being of its citizens. However, the spatial distribution of this service tends to determine how accessible it is to the residents. This study examined the accessibility of health facilities to residents in Ibadan, Nigeria. Systematic random sampling technique was used to choose 791 respondents for the study. Cumulative opportunity measure was employed to compute the total number of health facilities in the study area. The findings of the study revealed that majority (69.9%) of the residents patronized hospitals where general and specialized services are rendered. Also, more than 30% travelled 5km or less and others about 70% more than 5km for their medical needs. It took majority of the residents 2 hours and they paid an average of □356 ($2.23) per trip to health facilities. Furthermore, there was unequal distribution of the available 436 health facilities, with major ones situated in the modern areas of the city while the minor ones were concentrated in the older areas. This study concluded that residents have relatively low accessibility to health facilities. Hence, the need to address the lopsided arrangement of health facilities so as to improve residents' accessibility to them.
Keywords: Accessibility, health facilities, cumulative opportunity measure

1. Introduction

One of the main characteristics of metropolitan areas is that they provide for the citizenry a variety of services such as education, employment, health care, shopping among others. Accessibility of these facilities to the residents has been a central focus in most transport studies. Spatial accessibility to facilities generally refers to the ease with which qualitative and quantitative facilities can be reached (Handy and Niemeier, 1997). The possibility of residents having access to all available facilities within a city depends on how well they are located and the efficiency of transport system. As Weber (1993) argues the best city is one that maximizes access among its interdependent residents and establishments. This means that there must be spatial equity within urban environment so that residents can have access to more opportunities irrespective of their gender, status and where they live in the city.

The need for health facilities and access of city residents to them cannot be over-emphasized. It is an important component of the overall health system which has impact on the well-being of residents in a city. Yang, George, and Mullner (2006) remarked that equitable distribution of health care resources is one of the main goals of health facility planning. Accessibility to health facilities is concerned with the ability of a population to obtain a specified set of health care services. It is argued that the best location for public facilities must have a combination of convenient proximity, roadway access, transit service and walkability. This implies that the location of activities and destinations has a direct impact on accessibility. Hence, health facilities must be located in a manner that residents can have access to them within a minimum travel. Measuring accessibility of health facilities to residents therefore provide better understanding of the performance of health system which facilitates the development of health policies.

The foregoing suggests that the issue of access to health facilities by residents should be given adequate attention. Therefore, this study evaluates the accessibility of health facilities to residents in Ibadan, Nigeria. This is important because the health status of residents has implications on their productivity and the development of the city.

2. Literature Review

The existing literature revealed that several works have been conducted on accessibility of land use activities to residents within the urban space. For example, the study conducted by Nemet and Bailey (2000) revealed that elderly residents in rural Vermont who travel more than 10 miles to their physician visit them less frequently than those who travel shorter distance. Halden (2002) noted that improved coordination of rural transport services should be given a high priority to improve the level of accessibility to service provision in the rural areas of Scotland. Deogaonka (2004) reiterated that geographic distance affects accessibility to health care in India. It is further emphasized here that mothers with less education are most likely to have difficulties in accessing health care centre. Also, that those who live in obscure areas in town with poor transportation facilities are often removed from the reach of health systems. Bagheri, Benwell and Holt (2005) used the New Zealand

health policies and World Health Organisation (WHO) rules to determine acceptable level of minimum travel time and distance to the closest public health centre facilities via a road network. The result revealed that people living in central and northern part of Otago province have low accessibility. The study concluded that the region do not meet the WHO and New Zealand policies which stipulated that 95% of population should be able to access health care facilities within 30 minutes drive time during business day.

The study of Unal, Chen and Waldorf (2007) with the use of gravity model discovered that sharp disparities exist in access to health care facilities in Indiana, United States with the rural and peripheral areas having extensive poor accessibility to health facilities. The research concluded with a demonstration of how accessibility measures can be beneficially used to evaluate policy changes in provision of health facilities. Melhado (2007) examined the association between physical accessibility to health facilities using prenatal and delivery services among rural Haitian women. The findings of the study revealed that early receipt of prenatal care was less likely in neighbourhoods with poor road conditions than in those with paved roads. Also, delivery assistance by a trained health worker and delivery at a health facility were more likely among women living within 5km from a hospital than those living 30km or more from a hospital. The study recommended that investment should be focused in community infrastructure including road transportation networks to reduce barriers of accessibility of services and that resources should be focused on the most impoverished areas.

The available studies in the developing countries showed similar trend as developed countries. Okafor (1990) in a survey of spatial dimensions of accessibility to general hospitals in rural areas of Nigeria concluded that residents living at longer distances from health institutions utilise health facilities less than those who live closer to the hospital due to lack of adequate transport facilities. Barwell (1993) found that the average travel time to a dispensary was over one and half hours and five and half hours for a hospital in Makete district of Tanzania. Kwaku (2008) observed that uneven distribution of health care facilities and increasing distance of settlements to hospitals are the major cause of inaccessibility to health care facilities in Ajumako-Enyam-Essiam and Denkyira district in Central Ghana. As a result, most rural residents rely on the use of traditional medical practices, which have serious consequences on their health status. It is evident from the studies that the location of health facilities has a great impact on attendance by citizens. This suggests that for residents to enjoy the facilities it must be strategically located in such a way that it is accessible to them irrespective of their location within the city.

3. Research Method

This study was carried out in Ibadan, the capital of Oyo State, Nigeria. Ibadan metropolis has a population of 1,343,147 (National Population Commission, 2007). The five local government areas in the metropolis have 59 political wards from which 15 were randomly selected for this work. In essence, 3 political wards were randomly selected in each local government area. Systematic random technique was used for the selection of respondents as a result of poor numbering of houses in the study area. The first building sampled was selected randomly between the 1st and the 20th building and starting with that number every 20th building was subsequently selected following the line of accessibility. The total of 791 correctly filled questionnaires was used to analyze the accessibility of health facilities to residents in the study area. The structured questionnaire was administered on one household head in each of the sampled buildings. The respondents provided information on distance travelled, transport fare and travel time to health facilities in the study area.

The cumulative opportunity measure which is an activity-based measure was employed to calculate the number of health facilities residents have access to in the study area. This measure is appropriate for this study because it determines accessibility by computing total number of opportunity within a predefined travel time or distance from a certain location. It is based on the premise that accessibility increases if more opportunities can be reached within a certain time or distance. The mathematical equation of this measure can be expressed as:

$$P_{count}(i) = \sum_{J*} D_j \text{.................................} \qquad (1)$$

The equation can further be expressed as:

$$P_{count}(i) = \sum D_{j1} + D_{j2} + D_{j3} + ...D_{jn} \text{...........................}(2)$$

Where, J*– overall work opportunities such that distance, J< threshold distance

Dj – number of opportunities

Dji – number of opportunities in axis i

This study adopted distance as impedance because the distance from residence to health facilities can be easily determined. Beere in the core area of Ibadan is chosen as the centre point and all opportunities within 10km radius were cumulated using the local government areas as boundaries.

4. Result and Discussion

The result and analysis is discussed under three broad headings, namely proximity to the bus stop, accessibility of health facilities to the residents and cumulative opportunity measure of potential health facilities accessible to

residents.

4.1 Proximity to the bus stop

The travel pattern survey indicated that para-transit public transport mode such as mini-bus, taxi and motorcycle were commonly used in the study area. The three modes exhibit similar characteristics having no fixed bus stop along the road, which means that passengers can board or alight at any point along the route. The point each passenger wait to board public transport is then assumed to be the bus stop. Therefore, the proximity of the residents to the bus stop is the distance and time it takes to walk from their residence to the bus stop. This adds to distance and travel time and affects the accessibility of socio-economic facilities to residents in the study area. Halden , McGuigan, Nisbet, and McKinnon (2000) categorises the distance of 400m (5 minutes walk) as short, 800m (10 minutes walk) as normal and 1600m (20 minutes walk) as long from residences to the bus stop.

The result in Table 1 revealed that majority (67.3%) of the residents has access to the public transport within the threshold of normal walking distance (800m or less). About 22.2% walked between 800m and 1200m to the bus stop while 10.5% accessed bus stop walking 1200m and above. This result implies that sizeable percentage (32.7%) of the residents trekked long distance (801m and more) before they could get public transport. The public transport in Ibadan does not operate on time schedule, so the waiting time at the bus stop is determined by availability of vehicle and space in them. The findings as presented in Table 2 indicated that 63.4% of the residents spent 10 minutes or less at the bus stop waiting for public transport. It was further discovered that 31.9% waited for 11-20 minutes to get vehicle to their destinations and 4.7% spent more than 20 minutes at the bus stop waiting for a bus.

Table 1: Distance to the bus stop

Distance (m)	Frequency	Percentage
400 or below	281	34.7
401-800	264	32.6
801-1200	180	22.2
1201 and over	85	10.5
Total	**810**	**100.0**

Table 2: Waiting time at the bus stop

Time (mins)	Frequency	Percentage
5 or below	235	29.0
6-10	279	34.4
11-15	170	21.0
16-20	88	10.9
Above 20	38	4.7
Total	**810**	**100.0**

The mode of transport used to health facilities as presented in Table 3 revealed that 32.7% of the residents commuted in private vehicle. Furthermore, 14.5% commuted in taxi, 33.4% commuted in bus, 11.8% commuted on motorcycle, while the remaining 7.6% trekked to health facilities. It is deduced from the finding that about 60% of the residents rely on public transport to satisfy their transportation needs to health facilities. Also, the fact that less than 10% of the respondents trekked to the health facilities implied that the distance between residences and health facilities is relatively long in the study area.

Table 3: Mode of transport used to health facilities

Mode	Frequency	Percentage
Private car	259	32.7
Taxi	115	14.5
Bus	264	33.4
Motorcycle	93	11.8
Trekking	60	7.6
Total	**791**	**100.0**

4.2 Accessibility of health facilities to residents

Information on the health facilities visited by the residents for medical attention in Table 4 revealed that 69.9% patronized hospitals where general and specialized health services are rendered. Furthermore, the information indicated that 21.5% patronized clinics while the remaining 8.6% visited maternity centres. The information on distance travelled to health facilities by residents is recorded in Table 5. It revealed that 30.8% travelled 5km or below and 43.0% between 5.1-10km. These imply that more than 70% of the residents travelled not more than 10km from their homes to medical centres. This result indicated that residents use health facilities in a relative short distance to their homes for medical treatment. However, that 26.2% travelled above 10km to health facilities is a little worrying as it showed a relatively long distance for the purpose of health care patronage and delivery.

Table 4: Distance to the bus stop

Facilities	Frequency	Percentage
Maternity	68	8.6
Clinic	170	21.5
Hospital	553	69.9
Total	**791**	**100.0**

Table 5: Distance travelled to health facilities

Time (mins)	Frequency	Percentage
5 km or below	244	30.8
5.1-10 km	340	43.0
10.1-15.0 km	132	16.7
15.1-20.0km	64	8.1
Above 20 km	11	1.4
Total	**791**	**100.0**

The transport fare paid by residents to health facilities as shown in Table 6 indicated that 37.2% paid □200 or below while 28.3% between □201-□400 on a single trip. This indicated that majority (65.5%) of the residents paid not more than □400 per trip to medical centres. The result further showed that 12.9% paid between □401-□600, 10.6% between □601-□800, and 3.4% between □801-□1000 per trip to health facilities. The remaining 7.6% accounted for those who probably trek to health facilities in the study area. Majority of those that paid above □400 are possibly car owning residents who commute in their private vehicle while majority of those who paid less than □400 commute in public transport mode. The latter group accounted for largest percentage of the residents sampled in the study area. The fare paid justifies the relative short distance travelled by majority of residents to health facilities, although if compared with their income it is likely to be high especially for low income earners.

Table 6: Transport fare paid to health facilities

Transport fare	Frequency	Percentage
□200 or below	294	37.2
□201- □400	224	28.3
□401-□600	102	12.9
□601-□800	84	10.6
□801-□1000	27	3.4
No response	60	7.6
Total	**791**	**100.0**

□200 ~ $1.25

The time it took residents to travel from bus stop to health facilities is summarized in Table 7. The result revealed that 45.6% spent 1 hour or below to medical facilities. This is likely to comprise majorly of those that travelled not more than 5km or trek to the health facilities. Also, other result in the table showed that 38.1% spent 1-2 hours and 15.3% between 2-3 hours on a trip to health facilities. Most of the residents in this category travelled more than 5km to utilise the health facilities. Also, they are likely to patronize their choice of health centre which accounted for the long travel time. The remaining 1.0% that spent 3 or more hours is possibly those that travelled out of the study area to utilise health facilities. The findings indicated that majority (83.7%) of the residents spent not more than 2 hours on each journey made for medical needs.

Table 7: Travel time to health facilities

Travel time	Frequency	Percentage
1hour or below	361	45.6
1-2 hours	301	38.1
2-3 hours	121	15.3
3 hours or more	8	1.0
Total	**791**	**100.0**

4.3 Cumulative opportunity measure of potential health facilities accessible to residents
The result of cumulated health facilities accessible to residents within 10km radius in Table 8 revealed that there are 436 medical facilities in the study area. This comprised of 8 Federal, 19 State and 79 Local Government and 330 privately owned health facilities. Further analysis showed the types of health facilities available as following: teaching hospital (1), hospital (140), clinic (131) maternity (60), dental centre (5), health post (18), tuberculosis centre (4), laboratory (24) and primary health centre (53). This distribution indicated a relatively high presence of different types of health facilities which is capable of facilitating residents' access to medical care in the study area. Generally, the available 436 medical facilities give a ratio of one to three thousand and eighty (1:3080)

when shared among the population of Ibadan metropolis. This implies that one health facility provides medical services to an average of three thousand and eighty residents. Likewise, when the available health facilities which render special services such as teaching hospital, hospital, dental centre and laboratory were shared among the population, it gives a ratio of 1:7900. These figures are quite large for a single health facility to handle considering the available equipment and manpower which raise a query as to the quality of services rendered and how accessible the facilities are to residents.

The distribution of health facilities as shown in Table 8 indicated alarming disparity in the number and types of facilities across the study area. For instance, Ibadan North (153) and Ibadan South-West (160) Local Government Areas do not only accommodate most of the government health facilities in Ibadan metropolis but have about five times the number of health facilities in Ibadan South-East (36) and Ibadan North-West (37) Local Government Areas. Apart from this, there is high concentration of the major health facilities such as general and specialized hospital, clinic, maternity and laboratory within these two Local Government Areas while minor health facilities such as primary health centre and health post were provided in Ibadan South-East, Ibadan North-East and Ibadan North-West Local Government Areas. This finding implies that residents of the Ibadan South-East, Ibadan North-East and Ibadan North-West Local Government Areas who are provided with minor health facilities will have to travel longer distance, spend more time and pay higher fare to enjoy specialized health services. The probable reason for the lopsided arrangement of health facilities is that many residents of Ibadan North and Ibadan South-West Local Government Areas are elites and among the policy makers.

Table 8: Cumulated opportunities of health facilities accessible to residents

Local government areas	Teaching Hospital	Hospital	Health Clinic	Maternity	Dental Centre	Health Post	TB Centre	Lab	Primary Health Centre	Total
North	1	42	62	19	-	1	-	19	9	**153**
North-East	-	18	4	6	1	10	2	-	9	**50**
North-West	-	15	8	3	3	-	-	-	8	**37**
South-East	-	7	5	12	-	5	-	-	7	**36**
South-West	-	58	52	20	1	2	2	5	20	**160**
Total	**1**	**140**	**131**	**60**	**5**	**18**	**4**	**24**	**53**	**436**

TB – Tuberculosis Centre, Lab - Laboratory

5. Conclusion

This study on accessibility of health facilities to residents in Ibadan metropolis showed that there is need for adequate urban planning in terms of location of major health facilities so that residents can have access to these facilities and services within a minimum distance. Findings from the study revealed that majority of the residents travel more than 5km to benefits from the health facilities available in the study area. Also, majority of them pay more than □200 as transport fare and spend about 2 hours on a trip to the health facilities. Furthermore, majority of the residents commute in public transport to the health facilities. This situation is even worse in Ibadan North-West, Ibadan South-East and Ibadan North-East Local Government Areas. The result of cumulative opportunity measure indicated that there were 436 health facilities comprising of teaching hospital, hospital, clinic, maternity, dental centre, health post, tuberculosis centre, laboratory and primary health centre in the study area and there is lopsidedness in their location. The major health facilities such as teaching hospital, hospital, clinic and laboratory are concentrated in Ibadan North and Ibadan South-West Local Government Areas in the modern part of the city. The minor health facilities such as dental centre and health post are located in Ibadan South-East, Ibadan North-East and Ibadan North-West Local Government Areas which forms largely the traditional core areas of the city. This situation necessitates the residents living in Ibadan South-East, Ibadan North-East and Ibadan North-West Local Government Areas to travel longer distance to utilize specialized health facilities.

The study concluded that generally there is low accessibility to health facilities among residents in the study area. This is more pronounced in the type of health facilities residents have access to in different areas of the city especially residents of Ibadan North-West, Ibadan South-East and Ibadan North-East Local Government Areas. This situation calls for policy action that will balance the distribution of the health facilities among different areas within the city, so as to improve accessibility to health facilities and well-being of the people of Ibadan. This can be achieved through deliberate provision of some specialized health facilities in the traditional core where they are lacking.

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