

Distribution Pattern of Healthcare Facilities in Osun State, Nigeria

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Abstract

Accessibility to healthcare facilities has generally been identified as a major indicator of development, and the existing spatial pattern of distribution of healthcare facilities play very prominent role in gauging the level of efficiency or otherwise of the existing level of provision of these facilities within any region. In this paper we employed the use of locational quotient, which is a measure of spatial pattern of services, to examine the distribution pattern of healthcare facilities in the thirty local government areas in Osun State, Nigeria. Twelve indices, representing the totality of healthcare delivery by State and local governments in the state were used for the analysis. Our findings indicated existence of gaps in access to healthcare facilities between local government areas in the state, though the observed gap could not easily be attributed to rural-urban dichotomy. We concluded that there was an urgent need for serious intervention on the part of the government in the provision of healthcare facilities in the state, focused on equitable distribution and accessibility to enhance regional development.

KEY WORDS: Healthcare facilities; location pattern; location quotient; development gap; Osun state.

Introduction

The importance of healthcare to human can never be over-emphasized. Ogundare (1982) likened health to food in importance to individual existence, and opined that the concern and attention that any government pays to health could well determine the well being of the people. Empirical studies in both developed and developing countries have linked inadequate access to healthcare facilities with increasing avoidable and preventable deaths (Law and Morries, 1998; W.H.O, 1998). In investigating the level of provision of central facilities (like healthcare), emphasis has shifted from mere provision to the degree of accessibility of people to these facilities. Barton and Tsourou (2000) echoed this emphasis in their observation that “human beings are the centre of concern for sustainable development and they are entitled to a healthy and productive life in harmony with nature”. It is in recognition of the importance of healthcare facilities to sustainable development that various levels of government in Nigeria (Federal, State and Local) always budget huge amount of money for the health sector. Often times, in planning for healthcare services at all levels of government in Nigeria, sectoral approaches are adopted, without giving much thought to the spatial dimension of the facilities provided. This often brings about lopsidedness in the spatial accessibility of these facilities, with one section of a State (or Local Government Area) experiencing glut, while other part(s) suffer lack. Since the goal of any development effort by the government is to improve the well-being of the generality

of the people it governs, making adequate planning for healthcare delivery will be a right step in the right direction. But adequate planning could only be based on adequate information on the existing condition in the planning region. The present study sets out to provide the required information on the existing condition of healthcare facilities in Osun State, Nigeria, to help in planning for adequate healthcare delivery system in the State. The study employs the technique of Locational Quotient, which is a measure of spatial pattern of services, to investigate the existing distribution pattern of healthcare facilities in the State, with the aim of highlighting its implication for regional development in the State. Although this research focused on Osun State in Nigeria, the findings and recommendations could be of much relevance in planning for healthcare distribution in any developing region experiencing similar inequalities in healthcare distribution.

Literature Review

The study of regional variations in the distribution of social services (like healthcare) has captured the interest of geographers, planners and other scientists because of their general interest in the spatial variation of phenomena on the earth's surface. In particular, the question of access to sources of human need or want satisfaction stresses the importance of location and distance. Traditional focus of empirical studies on facilities in general, is on the relationship between distance and patronage pattern of the

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facilities. General consensus among researchers investigating this relationship is that fewer people are willing to patronize a particular facility as the distance from it increases (see, for instance, Shanon and Dever, 1974; Ipinimo, 1978; Iyun, 1978; Knox, 1979; Olayiwola, 1990; Aloba, 1995; Olatubara, 1996; Ibikunle, 1997; Ajala et al. 2004).

Empirical investigations revealed the existence of other factors, in addition to distance, as influencing the patronage pattern of healthcare facilities. For instance, Adejuyigbe (1973) demonstrated that attendance at each medical centre in Ife region is a function of both type of service available there and the distance from other center providing similar services. Okafor (1977) analyzed the spatial distribution and efficiency of hospital facilities in the old Bendel (now Edo and Delta) State. He found that there were discrepancies between the population distribution and the distribution of hospital facilities. Olajuyin et al (1997) investigated the effect of location on the utilization of healthcare facilities in Irewole Local Government Area of Osun State, Nigeria. They found that healthcare facilities were unevenly distributed among the settlements and that the distance was a paramount factor.

Ajala, Sanni and Adeyinka (2005) studied accessibility to healthcare facilities as a panacea for sustainable rural development in Osun State, Nigeria. Based on data available on the year 2001, they employed the use of comparative values of three indices, viz: population ratio per medical officer; population ratio per nurse/mid-wife; and population ratio per hospital bed space. They noted that serious inequalities exist in the provision of healthcare facilities and services by both the public and private sectors, and that the existing distribution pattern is more in favour of urban areas.

Since 2001, a lot of changes have taken place in Nigeria in general, and Osun State in particular. For instance, the democratic process that started in 1999 have become more matured, and dividends of democracy are expected to have brought about noticeable changes in the quality of life of the citizens, a major determinant of which is access to healthcare facilities and personnel. Hence, the need for a study to capture these possible changes is the primary aim of the

present study. The study also seeks to contribute to the existing literature by using more variables (representing the totality of healthcare delivery by the State and Local Governments in the State) and regionalizing the local government areas in the State based on their level of being 'marginally advantaged' or 'marginally disadvantaged' in terms of distribution of healthcare facilities and personnel. This, we believe, will help policy makers to adequately address the challenges in spatial variations in access to healthcare facilities and personnel in the state.

Methodology

The Local Government Area constitutes the unit of data collection and analysis for this study. Data for this work were collected from two bodies in Osun State. These are the Osun State Ministry of Health, and the State's Hospital Management Board, for data on healthcare facilities amenities and personnel directly under the state's ministries or whose activities are subject to the monitoring of the ministry or local government councils in the state. Data were also obtained directly from these healthcare service-providing centers. Secondary data were also extracted from the 2009 approved budget estimates for Osun state government and the approved budget for the state's local governments for the same year. Since the existing three Teaching Hospitals in the state are located in only three of the thirty statutorily recognized local government areas, they are not included in the computation in this study, to reduce possible undue influence of these healthcare facilities managed by agencies responsible to either the Federal-Government or a combination of Osun and Oyo States. Hence, the medical doctors, and other personnel in these Teaching Hospitals are not included in this study. It is believed that their exclusion will help shed more lights on the locational pattern of healthcare facilities, amenities and personnel provided by the State and local governments in the State. The raw secondary data obtained from these sources were compared to validate them and to remove discrepancies in the data. The data were segregated based on the local government areas in the State. The segregation of the data generated the pattern of distribution of the healthcare facilities in the state, which revealed the extent of inequality among the local government areas in terms of the provision of

healthcare facilities by both the State and Local Government Authorities in the State. Paucity of reliable data on healthcare facilities and personnel in private organizations compelled the researchers to confine the study to healthcare facilities and personnel in government (state and local) owned institutions within the state.

The index of locational pattern of healthcare facilities in the state was investigated by scrutinizing the location of healthcare services within the local government areas of the state. This was accomplished by computing the locational quotient of each facility/personnel within the local government areas. Locational quotient relates the proportion of the facility within a local government council area to the proportion of the local government council area's population to the state's population. This is computed using the formula:

$$L.Q.(X, A) = \frac{\text{No of commodity X in LGA(A) / No of commodity X in the State}}{\text{Population of local government A / Population of the State}}$$

Where L.Q (X, A) = The locational quotient of commodity X in local government A

This method assumes that the State exhibits, throughout its jurisdiction, at least an average representation in the facility concerned, and each local government area's consumption per capita approximates to the state's average. In this wise, the locational quotient of each local government area is expected to be 1.0. Locational quotients with values less than 1.0 signify that the local government areas concerned are marginally disadvantaged in the location of the facility concerned, while locational quotients of values more than 1.0 signify that the local government areas concerned are marginally advantaged in the location of the facility concerned. The farther the value of locational quotient is from 1.0, the higher the degree of undue favouritism (or deprivation) bestowed on the local government council area in terms of location of the facility. It is important to note that other statistical measure of spatial distribution of facilities could easily have been used here. For instance, Nearest Neighbour Analysis (Clark and Evans, 1954; Aplin, 1983), Location-Allocation model (Wardrop, 1952; Sheffi, 1985) or any of their derivatives could also be

used. There is therefore no special reason for utilizing the locational quotient here other than ease of calculation and adequacy for the purpose on hand.

Healthcare facilities/personnel for which locational quotients were computed for the analysis in this research were: Primary Health Centres; Comprehensive Health Centres (including General Hospitals, State Hospitals, Dental Centres and Staff Clinics); Doctors; Nurses / Midwives; Pharmacists; Health Technologists / Health Technicians; Health Assistants (including Lab Assistants, Pharmacy Assistants; and Community Health Assistants); Health Attendants (including Lab. Attendants, Pharmacy Attendants, and Community Health Attendants); Radiographers; Medical / Health Records Personnel; Community Health Personnel; and Laboratory Scientists. The main reason for the choice of these variables is because they represent all the existing human and material components of healthcare provided by the state and local government area.

The Study Area

Osun State which was created on August on 27th 1991, is located within latitude 6.55⁰ and 8.10⁰ North and longitude 3.55⁰ and 5.05⁰ East. It covers total landmass of about 12,820 square kilometers. Politically, the state is divided into three Senatorial Districts and 30 Local government areas. It is situated within the cocoa belt of Southwestern Nigeria. Though there are patches of savannah in the Northern part of the state, much of the state areas are still under tropic rain forest vegetation type.

According to the 2006 National Population Census, Osun States has a population of 3,423,535 inhabitants, made up of 1,740,619 males and 1,682,916 females. Projecting these figures at an annual growth rate of 2.8 percent for the year 2009 yields an overall population of 3,719,328. Osun State may be classified as being largely 'a rural state', with 19 out the 30 local government areas being non-urban local government councils, accounting for 60 percent of the 1991 population. In the state, a rural local government area is defined as a LGA with only one or two small towns as the principal settlements while the remaining settlements are rural communities (see Table 1.)

Fig. 1: MAP OF NIGERIA SHOWING OSUN STATES

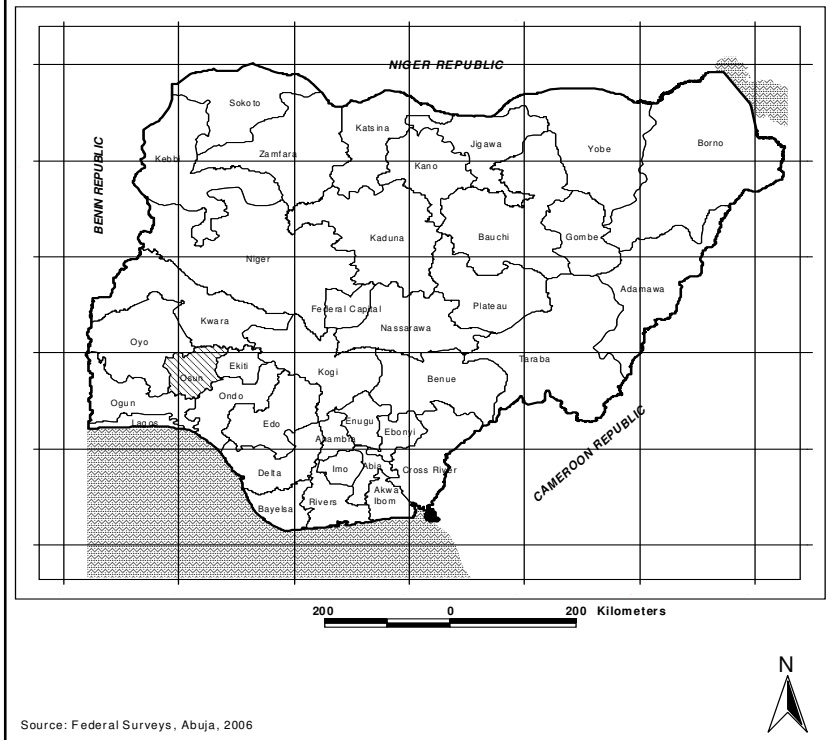
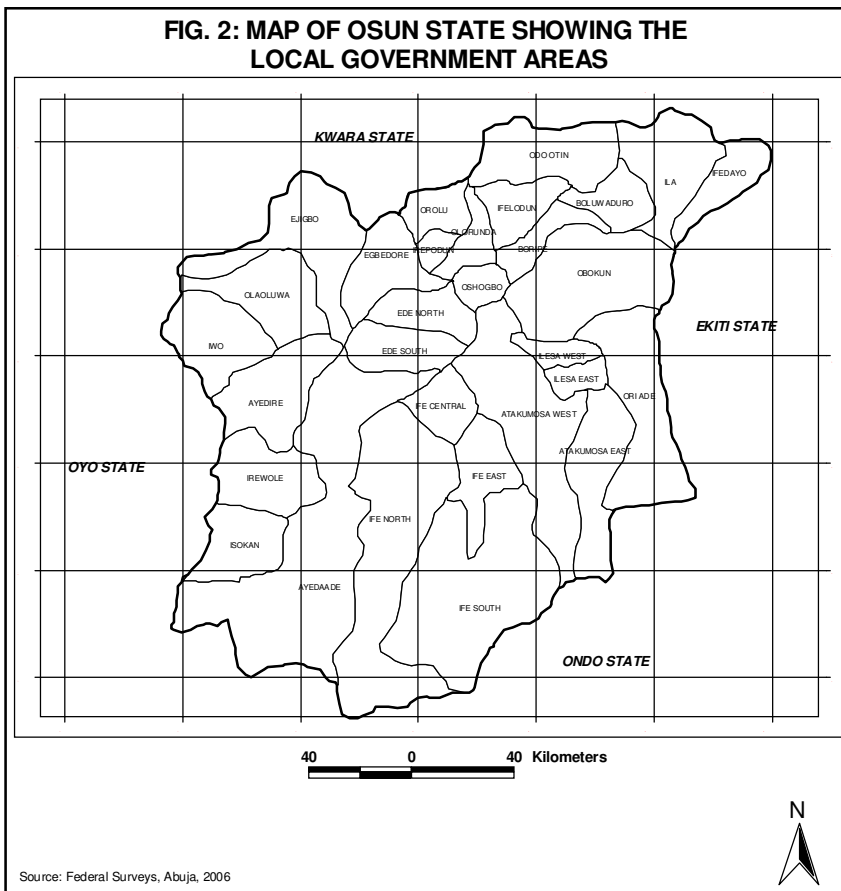


FIG. 2: MAP OF OSUN STATE SHOWING THE LOCAL GOVERNMENT AREAS



Results and Discussion

The breakdown of the distribution pattern of the existing healthcare facilities, and personnel in Osun is presented in Table 1. The Table, showed that variations exist in the distribution of the healthcare facilities and personnel in the State. For instance, while as high as 13 local government areas have no registered Pharmacist, and eight have no Laboratory Scientist, 82(29.1%) of the 282 Medical Doctors, 15(28.3%) of the 53 Pharmacists, and 29(40.3%) of the 72 Laboratory Scientists in the State are all located in Osogbo, the State capital. Though these happen to be the most unevenly distributed of the variables under study, the distribution pattern of other facilities, amenities and personnel is far from being encouraging.

Despite the example given above, it should be mentioned in the passing that mere aggregating the raw data on the population and healthcare facilities and personnel as is done in Table 1 cannot adequately portray the degree of spatial favouritism or deprivation as glaringly as we hope to do in this study.

To adequately do justice to the task at hand, locational quotient of each health care facility, amenity or personnel is computed for each local government council area (see Table 2).

Table 2, showed that some Local Government Areas are marginally advantaged in the distribution of healthcare facilities and amenities in the state. For instance, of the thirty local government areas in the state, eleven are marginally advantaged in terms of location of Comprehensive Health Centres, in that their locational quotients have values that are greater than 1.00. Prominent among these are Ifedayo (3.3), Ayedaade (2.7) and Boluwaduro (2.6) local government areas, each with a locational quotient greater than 2.0. Other local government areas in this category, together with the values of

their locational quotients are: Ayedire (1.6), Atakunmosa West (1.6), Ola-Oluwa (1.6), Osogbo (1.6) Olorunda (1.4), Odo-Otin (1.4), Boripe (1.3) and Obokun (1.1). Only Ila local government area has its just fair share, with a locational quotient value of 1.0. The remaining eighteen local government areas are marginally disadvantaged in terms of distribution of CHC facilities, and have locational quotients of less than 1.00.

In the case of Primary Health Centres (PHC), twelve local government areas are found to be marginally advantaged, in that the values of their locational quotients are greater than 1.00. Local government areas in this category are: Ifedayo (3.7), Odo-Otin (2.8) and Ila (2.7), each with a locational quotient greater than 2.0. Other local government areas in this category, together with the values of their locational quotients are: Ayedire (1.5), Atakunmosa East (1.5), Obokun (1.5), Oriade (1.4), Ife South (1.3), Egbedore (1.2), Atakunmosa West (1.2), Ejigbo (1.1) and Ola-Oluwa (1.1). Two local government areas, Boripe and Olorunda, have their just fair share in that locational quotient of each was 1.0. The remaining sixteen local government areas are marginally disadvantaged in terms of PHC facilities, and have locational quotients of less than 1.00.

The case of healthcare personnel is quite of different pattern from those of the two healthcare facilities already presented in this study. For instance, in the case of distribution of Medical Doctors, only eight of the thirty local government areas are marginally advantaged in that each have locational quotient value of more than 1.0. Prominent in this category are: Osogbo (6.3) and Ede South (2.2), each with a locational quotient with a value more than 2.0. Other local government areas in this category, with their locational quotients are: Ila (2.0), Ilesa West (1.8), Ifedayo (1.3), Irewole (1.2), Atakunmosa East (1.1) and Ifelodun (1.1). Two local government areas, Ayedire and Boluwaduro, have their just fair share in that the locational quotient of each is 1.0. The remaining twenty local government areas are marginally (1.4), Ifelodun (1.3), Ilesa West (1.3), Ifelodun (1.3), Ayedire (1.2), Ila (1.2), and Ayedire (1.1). The remaining 17 local government areas are marginally disadvantaged in terms of distribution of Health Attendants, and have locational quotients of less than 1.0. Of the 30 LGAs in the State, only eleven have professional Radiographers, and each of these councils is marginally advantaged in the distribution of these personnel as they have locational quotients of more than 1.0.

These are: Osogbo (6.2), Ila (3.9), Ede South (3.2), Ifelodun (2.5), Ilesa West (2.4), Ejigbo (1.8), Irewole (1.7), Ife North (1.6), Oriade (1.6), Ife East (1.3), and Obokun (1.3). The remaining 19 local government areas are marginally disadvantaged in terms of distribution of Professional Radiographers, and have locational quotients of less than 1.0. Only 12 of the existing 30 local government areas in the state are marginally advantaged in the distribution of Health Records personnel, and have locational quotients of more than 1.0. These are: Ifedayo (3.6), Osogbo (2.9), Ede South (2.3), Atakunmosa West (2.1), Atakunmosa East (1.9), Ifelodun (1.7), Olorunda (1.6), Boluwaduro (1.3), Ilesa West (1.3), Ayedire (1.2), Ila (1.2), and Iwo (1.3). Three of the local government areas have just their fair share of Health Records personnel and have locational quotients of 1.0. These are: Egbedore, Irewole and Orolu. The remaining 15 local government areas are marginally disadvantaged in terms of distribution of Medical Records Personnel, and have locational quotients of less than 1.0

In terms of Community Health personnel, 14 of the 30 LGAs have locational quotients of more than 1.0. These are: Osogbo (8.0), Ifedayo (3.5), Ife South (3.3), Ilesa West (2.3), Egbedore (2.2), Ila (1.9), Ife North (1.8), Ede North (1.6), Orolu (1.5), Boluwaduro (1.3), Ayedire (1.2), Boripe (1.2), Ifelodun (1.2), and Isokan (1.1). Two local government areas, Ede South and Irepodun, have just their fair share of Community Health Personnel, each having locational quotient of 1.0. The remaining 14 local government areas are marginally disadvantaged in the distribution of Community Health Personnel, and have locational quotients of less than 1.0.

Only seven of the 30 local government areas in Osun state have professional Laboratory Scientist, and each of them is marginally advantaged in the distribution of these personnel, having locational quotient of more than 1.0. These are: Osogbo (8.8), Obokun (1.6), Ede South (1.3), Oriade (1.3), Iwo (1.2), Ejigbo (1.1) and Odo-Otin (1.1). Two local government areas, Ife East and Ifelodun, have their fair share of Laboratory Scientist, each having locational quotient of 1.0. The remaining 21 local government areas are marginally disadvantaged in the distribution of

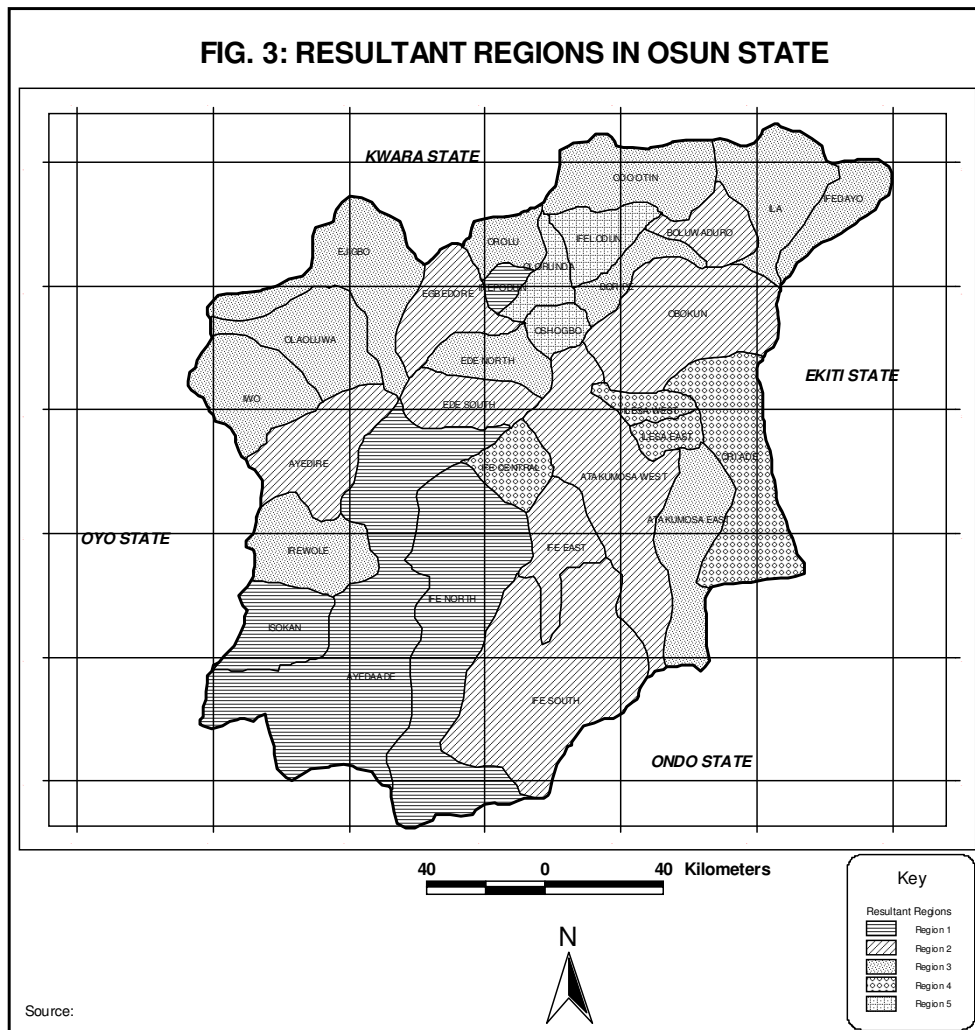
professional Laboratory Scientists, and have locational quotients of less than 1.0.

It was noted that Osogbo,LGA being the state capital had the highest number of healthcare personnel in the state, having the highest locational quotients for eight out of the ten cadres of healthcare personnel covered by this study.To make the resultant distribution pattern of healthcare facilities and personnel in the state more glaring, an attempt was made to summarize the locational quotients obtained in Table 2. This was done with the aim of emphasizing the local government areas that were marginally advantaged in terms of each healthcare facility/personnel.

Table 3 revealed the spatial disparity of locational quotient scores distribution across the thirty LGAs ranges from zero for Ife Central, Ilesa East and Irepodun local government areas, to eleven for Osogbo local government council area. This results was also used to regionalize the local government areas in terms of their relative advantage in the distribution of healthcare facilities and personnel. Based on these scores, the local government areas are classified into five groups, indicating their level of undue advantage or disadvantage in the distribution of healthcare facilities and personnel in the state.

Table 4 and Figure 3 show the grouping of the local government areas based on locational quotient scores measured by the number of healthcare facilities and personnel found in each LGA. All the LGAs are disadvantaged in the distribution of medical doctors and each has locational quotient less than 1.0.

Only nine of the thirty local government areas are found to be marginally advantaged in terms of distribution of professional nurses, in that the values of their locational quotients are greater than 1.00. These are: Osogbo (3.7), Ede South (2.6), Ila (1.8), Boluwaduro (1.5), Ilesa West (1.5), Ifelodun (1.4), Atakunmosa East (1.3), Ayedire (1.2) and Ifedayo (1.2). Four of the remaining local government areas: Egbedore, Isokan, Iwo and Oriade have just their fair share of the nurses, with locational quotient of 1.0. The remaining seventeen local government areas are marginally disadvantaged in terms of distribution of professional nurses, and have locational quotients of less than 1.00.



In the case of distribution of Pharmacists, only ten of the thirty local government areas are found to be marginally advantaged, in that the values of their locational quotients are greater than 1.0. These are: Osogbo (6.2), Ede South (4.2), Ifelodun (3.3), Ila (2.1), Ife East (1.7), Ola-Oluwa (1.7), Olorunda (1.5), Iwo (1.3), Oriade (1.3) and Obokun (1.1). The remaining twenty local government areas are marginally disadvantaged in terms of distribution of Pharmacists, and have locational quotients of less than 1.00.

Eleven of the thirty local government areas in the State are found to be marginally advantaged in distribution of Health Technologists / Health Technicians, and have locational quotients higher than 1.0. These are: Atakunmosa East (3.6), Ola-Oluwa (3.2), Ayedire (2.6), Atakunmosa West (2.3), Ede South (2.1), Isokan (2.0), Osogbo (1.7), Egbedore (1.4), Obokun (1.1), and Odo-Otin

(1.1). Two of the local government areas, Ejigbo and Olorunda, have just their fair share of Health Technologists / Health Technicians, with locational quotients of 1.0. The remaining seventeen local government areas are marginally disadvantaged in terms of distribution of Health Technologists / Health Technicians, and have locational quotients of less than 1.0.

Of the health personnel being covered by this study, the most evenly distributed are Health Assistants, with fifteen of the thirty local government areas being marginally advantaged, with locational quotients of more than 1.0. These are: Osogbo (7.1), Ifedayo (3.8), Atakunmosa West (3.7), Ifelodun (3.3), Ola-Oluwa (3.3), Egbedore (2.5), Atakunmosa East (2.2), Boluwaduro (2.2), Ede North (2.0), Ede South (1.6), Irewole (1.6), Ila (1.5), Obokun (1.3), Olorunda (1.3), and Ilesa West (1.2). The remaining 15 local government areas are marginally disadvantaged in terms of

distribution of Health Assistants, and have locational quotients of less than 1.0.

In the case of distribution of Health Attendants, only thirteen of the thirty local government areas are marginally advantaged and have locational quotients of more than 1.0. These are: Atakunmosa East (2.7), Ifedayo (2.5), Osogbo (2.5), Ife East (2.3), Ede South (1.8), Iwo (1.5), Odo-Otin (1.4), Olorunda Five groups are obtained. Table 4 revealed that the first group constitutes the most marginally disadvantaged local government areas in the state in terms of distribution of healthcare facilities and personnel. None of these local government areas recorded locational quotient of value up to 1.00 in more than one of the twelve healthcare facility, amenity and personnel investigated. The local government areas in this category are Ayedaade, Ife Central, Ilesa East, Irepodun, Isokan, and Orolu. Two of these local government areas, Ife Central and Ilesa East are both predominantly urban and has a very functional arm of the Obafemi Awolowo University's Teaching Hospital Complex within their jurisdiction, which might explain why less of the State's health resources are assigned to them. The other four local government areas are predominantly rural, and might owe much of their poor ratings to this factor.

The second group comprises local government areas that were advantaged in the distribution of only two or three healthcare facilities and personnel. Local government areas in this category are Boripe, Ede North, Ejigbo, Ife East, Ife North, Ife South, and Irewole. Two of these local government areas, Ejigbo and Ede North, are predominantly urban while the remaining five are predominantly rural. As such, reasons for their poor ratings are not easily forthcoming, though rural nature of the five predominantly rural local government areas might be significant in explaining their observed status.

The third group comprises local government areas that are marginally advantaged in the distribution of only four or five of the healthcare facilities, amenities or personnel, utilized for investigations in this study. Local government areas in this group are: Boluwaduro, Egbedore, Odo-Otin, Ola-Oluwa, Olorunda, and Oriade. Two of these local government areas, Oriade and Olorunda, are predominantly urban while the remaining four are predominantly rural. The reasons for

the observed status of the local government areas are not easily forthcoming, though the rural nature of the four predominantly rural ones might be significant.

The fourth group comprises local government areas that are marginally advantaged in the distribution of six to eight of the twelve healthcare facilities, amenities or personnel utilized in this investigation. Local government areas in this category are: Ayedire, Egbedore, Ifedayo, Atakunmosa West, Ifelodun, Ilesa West, Iwo, and Obokun. Of these local government areas, three, Ifelodun, Ilesa West and Iwo, are predominantly urban while the remaining five are predominantly rural. Reasons for the observed status are thus not easily forthcoming.

The fifth, and the last group, comprises local government areas that are marginally advantaged in the distribution of at least nine of the twelve healthcare facilities, amenities and personnel utilized in this investigation. Ede South, one of the local government areas, is predominantly rural while the remaining two, Ila and Osogbo, are predominantly urban.

Conclusion

From the analyses above, it is observed that, though spatial polarization still exist in the distribution of healthcare facilities and personnel in Osun State, rural/urban dichotomy earlier observed by Ajala, Sanni and Adeyinka (2005) appear not to be of much significance in explaining the observed pattern of distribution of these facilities, amenities and personnel. This might be a clear indication that the new wave of democratization that started in the country in 1999 has succeeded in achieving a wider spread of healthcare facilities and personnel in the state, thus contributing to the quality of life of the citizenry, especially those in the rural areas.

Though the observed pattern of distribution of healthcare facilities and personnel in the state appeared to be significantly better than what obtained in 2001, spatial gaps are still observed that need to be adequately addressed to enable the state achieve the Millennium Development Goals on healthcare delivery. To this end, two major steps are hereby recommended, one for short term, and the other, for long term. Although this research was based on Osun State in Nigeria, the two recommendations offered here could be of much relevance in planning for

healthcare distribution in any developing region experiencing similar inequalities in healthcare distribution.

The long-term strategy for healthcare facilities planning should not be done in isolation but will require an holistic and comprehensive regional planning that will incorporate other major sectors of social services in the State. This must deviate from the existing practice of taking sectoral approach to planning, and the skills of professional regional planners should be utilized to the full. Adequate provision of basic facilities and amenities like health, education etc must be ensured such that lopsidedness in access to these facilities and amenities are eradicated. To this end, each

local government council area could be constituted into a planning region, and public participation should be encouraged right from the onset. Efforts should be on encouraging the development of the full potentials of each planning region. The State government should coordinate the preparation of the comprehensive regional plan, incorporating inputs from the local government areas.

The short-term strategy involves providing the existing shortfalls in the locational pattern of healthcare facilities and personnel in the state. To this end it is recommended that concerted efforts should be made to recruit healthcare personnel and ensure their equitable distribution throughout the state.

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Table 1: Distribution of Healthcare Personnel and Facilities in Osun State (OSS) in the year 2009

LGA	Pop*	CHC	PHC	A	B	C	D	E	F	G	H	I	J
1Ayedaade	163386	2	23	5	42	0	26	42	28	0	9	36	2
2 Ayedire	82399	2	20	6	29	0	27	20	23	0	6	35	1
3 Atakumosa East	74574	3	20	6	28	0	34	61	50	0	9	3	1
4 Atakumosa West	82780	2	16	5	20	0	24	111	25	0	11	1	1
5Boluwaduro	76890	3	08	6	34	1	6	63	11	0	6	37	1
6 Boripe	151399	3	25	4	12	1	4	41	6	0	3	63	1
7 EdeNorth	91074	1	12	2	6	1	7	65	20	0	2	51	0
8 Ede South	82604	0	08	14	64	5	22	47	38	1	12	31	2
9 Egbedore	80866	1	16	3	25	0	14	75	11	0	5	63	0
10 Ejigbo	144069	1	27	10	30	1	19	36	18	1	3	21	3
11Ife Central	181705	2	15	7	24	0	8	4	4	0	2	35	2
12 Ife East	204338	2	19	14	44	5	12	28	118	1	8	36	4
13 Ife North	166973	2	20	5	23	1	7	54	38	1	8	109	1
14 Ife South	147031	2	33	5	21	0	4	0	6	0	3	172	1
15 Ifedayo	40560	2	25	4	14	0	3	56	25	0	9	51	0
16 Ifelodun	105107	1	14	9	45	5	11	33	36	1	11	47	2
17 Ila	67410	1	30	10	36	2	5	37	20	1	5	47	0
18 Ilesa East	115795	1	12	4	17	0	6	6	13	0	2	39	0
19 Ilesa West	112502	1	08	15	49	0	11	53	37	1	9	93	0
20 Irepodun	129822	0	14	2	20	0	4	22	27	0	3	45	0
21 Irewole	156006	1	15	14	23	0	7	89	10	1	10	35	2
22 Isokan	112091	1	05	4	32	1	5	22	2	0	4	44	1
23 Iwo	207912	1	22	11	64	4	54	30	79	1	15	18	5
24 Obokun	126577	2	31	4	23	2	17	58	28	0	3	2	4
25 Odo-Otin	145690	3	68	7	32	1	21	17	50	0	8	41	3
26Ola-Oluwa	83211	2	16	4	18	2	34	100	18	0	0	15	0
27Olorunda	143145	3	25	6	40	3	19	69	50	0	8	19	1
28 Oriade	161457	5	37	11	49	3	19	51	25	1	16	35	4
29 Orolu	111938	1	14	3	28	0	7	22	14	0	7	61	1
30 Osogbo	170232	4	13	82	189	15	36	44	105	4	31	49	29
State Total	3719328	55	621	282	1101	53	473	1356	935	14	232	1334	72

*Pop = 2009 population of Osun State based on projection of the 2006's National Census Figures at annual growth rate of 2.8%. (Source: *Federal Republic of Nigeria's Official Gazette No 24, Vol. 94* of 15th May, 2007).
Sources: i. Author's Field Work, April 2010 ii Osun State Government (2009a &b)

Key to healthcare facilities

PHC = Primary Health Centres CHC = Comprehensive Health Centres (General Hospitals, State Hospitals, Dental Centres and Staff Clinics).

A = Doctors B = Nurses / Midwives C = Pharmacists D = Health Technologists / Health Technicians

E = Health Assistants (Lab Assistants, Pharmacy Assistants, and Community Health Assistants).

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G = Radiographers. H = Medical / Health Records Personnel. I = Community Health Personnel.

J = Laboratory Scientists

Table 2: Locational Quotient of Healthcare Facilities in Osun State

LGA	CHC	PHC	A	B	C	D	E	F	G	H	I	J	No of L.Q > 1.00
1Ayedaade	0.8	0.8	0.4	0.9	0.0	1.3	0.7	0.7	0.0	0.9	0.0	0.3	1
2 Ayedire	1.6	1.5	1.0	1.2	0.0	2.6	0.7	1.1	0.0	1.2	1.2	0.6	7
Atakumosa East	2.7	1.5	1.1	1.3	0.0	3.6	2.2	2.7	0.0	1.9	0.1	0.7	8
4Atakumosa West	1.6	1.2	0.8	0.8	0.0	2.3	3.7	1.2	0.0	2.1	0.0	0.6	6
5Boluwaduro	2.6	0.6	1.0	1.5	0.9	0.6	2.2	0.6	0.0	1.3	1.3	0.7	5
6Boripe	1.3	1.0	0.3	0.3	0.5	0.2	0.7	0.2	0.0	0.3	1.2	0.3	2
7EdeNorth	0.7	0.8	0.3	0.2	0.8	0.6	2.0	0.9	0.0	0.3	1.6	0.0	2
8Ede South	0.0	0.6	2.2	2.6	4.2	2.1	1.6	1.8	3.2	2.3	1.0	1.3	9
9Egbedore	0.8	1.2	0.5	1.0	0.0	1.4	2.5	0.5	0.0	1.0	2.2	0.0	4
10Ejigbo	0.5	1.1	0.9	0.7	0.5	1.0	0.7	0.5	1.8	0.3	0.4	1.1	3
11Ife Central	0.7	0.5	0.5	0.4	0.0	0.3	0.1	0.1	0.0	0.2	0.5	0.6	0
12 Ife East	0.7	0.6	0.9	0.7	1.7	0.5	0.4	2.3	1.3	0.6	0.5	1.0	3
13 Ife North	0.8	0.7	0.4	0.5	0.4	0.3	0.9	0.9	1.6	0.8	1.8	0.3	2
14 Ife South	0.9	1.3	0.4	0.5	0.0	0.2	0.0	0.2	0.0	0.3	3.3	0.3	2
15 Ifedayo	3.3	3.7	1.3	1.2	0.0	0.6	3.8	2.5	0.0	3.6	3.5	0.0	8
16 Ifelodun	0.6	0.8	1.1	1.4	3.3	0.8	3.3	1.3	2.5	1.7	1.2	1.0	8
17 Ila	1.0	2.7	2.0	1.8	2.1	0.6	1.5	1.2	3.9	1.2	1.9	0.0	9
18 Ilesa East	0.6	0.6	0.4	0.5	0.0	0.4	0.1	0.4	0.0	0.3	0.9	0.0	0
19 Ilesa West	0.6	0.4	1.8	1.5	0.0	0.8	1.2	1.3	2.4	1.3	2.3	0.0	7
20 Irepodun	0.0	0.6	0.2	0.5	0.0	0.2	0.5	0.8	0.0	0.4	1.0	0.0	0
21 Irewole	0.4	0.6	1.2	0.9	0.0	0.3	1.6	0.3	1.7	1.0	0.6	0.7	3
22 Isokan	0.6	0.3	0.9	1.0	0.6	0.3	0.5	0.7	0.0	0.6	1.1	0.5	1
23 Iwo	0.3	0.6	0.7	1.0	1.3	2.0	0.4	1.5	1.3	1.2	0.2	1.2	6
24 Obokun	1.1	1.5	0.4	0.6	1.1	1.1	1.3	0.9	0.0	0.4	0.0	1.6	6
25 Odo-Otin	1.4	2.8	0.6	0.7	0.5	1.1	0.3	1.4	0.0	0.9	0.8	1.1	5
26Ola-Oluwa	1.6	1.1	0.6	0.7	1.7	3.2	3.3	0.9	0.0	0.8	0.5	0.0	5
27Olorunda	1.4	1.0	0.5	0.9	1.5	1.0	1.3	1.4	0.0	0.9	0.4	0.4	4
28 Oriade	0.4	1.4	0.9	1.0	1.3	0.9	0.9	0.6	1.6	1.6	0.6	1.3	5
29 Orolu	0.6	0.7	0.3	0.8	0.0	0.5	0.5	0.5	0.0	1.0	1.5	0.5	1
30 Osogbo	1.6	0.5	6.3	3.7	6.2	1.7	7.1	2.5	6.2	2.9	8.0	8.8	11
LGAs with L.Q >1.00	11	12	8	9	10	11	15	13	11	12	14	7	

Source: Author's computations from Table 1.

Key to healthcare facilities

PHC = Primary Health Centres CHC = Comprehensive Health Centres (General Hospitals, State Hospitals, Dental Centres and Staff Clinics).

A = Doctors B = Nurses / Midwives C = Pharmacists D = Health Technologists / Health Technicians

E = Health Assistants (Lab Assistants, Pharmacy Assistants, and Community Health Assistants).

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G = Radiographers. H = Medical / Health Records Personnel. I = Community Health Personnel.

J = Laboratory Scientists

Table 3: Distribution of Local government Areas with Locational Quotient of Healthcare Facilities above 1.00

LGA	CHC	PHC	A	B	C	D	E	F	G	H	I	J	No of L.Q > 1.00
1Ayedaade	-	-	-	-	-	1.3	-	-	-	-	-	-	1
2 Ayedire	1.6	1.5	-	1.2	-	2.6	-	1.1	-	1.2	1.2	-	8
3Atakumosa East	2.7	1.5	1.1	1.3	-	3.6	2.2	2.7	-	1.9	-	-	8
4Atakumosa West	1.6	1.2	-	-	-	2.3	3.7	1.2	-	2.1	-	-	6
5Boluwaduro	2.6	-	-	1.5	-	-	2.2	-	-	1.3	1.3	-	5
6Boripe	1.3	-	-	-	-	-	-	-	-	-	1.2	-	2
7EdeNorth	-	-	-	-	-	-	2.0	-	-	-	1.6	-	2
8Ede South	-	-	2.2	2.6	4.2	2.1	1.6	1.8	3.2	2.3	-	1.3	9
9Egbedore	-	1.2	-	-	-	1.4	2.5	-	-	-	2.2	-	4
10Ejigbo	-	1.1	-	-	-	-	-	-	1.8	-	-	1.1	3
11Ife Central	-	-	-	-	-	-	-	-	-	-	-	-	0
12 Ife East	-	-	-	-	1.7	-	-	-	1.3	-	-	1.0	3
13 Ife North	-	-	-	-	-	-	-	-	1.6	-	1.8	-	2
14 Ife South	-	1.3	-	-	-	-	-	-	-	-	3.3	-	2
15 Ifedayo	3.3	3.7	1.3	1.2	-	-	3.8	2.5	-	3.6	3.5	-	8
16 Ifelodun	-	-	1.1	1.4	3.3	-	3.3	1.3	2.5	1.7	1.2	-	8
17 Ila	-	2.7	2.0	1.8	2.1	-	1.5	1.2	3.9	1.2	1.9	-	9
18 Ilesa East	-	-	-	-	-	-	-	-	-	-	-	-	0
19 Ilesa West	-	-	1.8	1.5	-	-	1.2	1.3	2.4	1.3	2.3	-	7
20 Irepodun	-	-	-	-	-	-	-	-	-	-	-	-	0
21 Irewole	-	-	1.2	-	-	-	1.6	-	1.7	-	-	-	3
22 Isokan	-	-	-	-	-	-	-	-	-	-	1.1	-	1
23 Iwo	-	-	-	-	1.3	2.0	-	1.5	1.3	1.2	-	1.2	6
24 Obokun	1.1	1.5	-	-	1.1	1.1	1.3	-	-	-	-	1.6	6
25 Odo-Otin	1.4	2.8	-	-	-	1.1	-	1.4	-	-	-	1.1	5
26Ola-Oluwa	1.6	1.1	-	-	1.7	3.2	3.3	-	-	-	-	-	5
27Olorunda	1.4	-	-	-	1.5	-	1.3	1.4	-	-	-	-	4
28 Oriade	-	1.4	-	-	1.3	-	-	-	1.6	1.6	-	1.3	5
29 Orolu	-	-	-	-	-	-	-	-	-	-	1.5	-	1
30 Osogbo	1.6	-	6.3	3.7	6.2	1.7	7.1	2.5	6.2	2.9	8.0	8.8	11
LGAs with L.Q >1.00	11	12	8	9	10	11	15	12	11	12	14	8	

Source: Summary extracted from Table 2 by the Author.

Key to healthcare facilities

PHC = Primary Health Centres CHC = Comprehensive Health Centres (General Hospitals, State Hospitals, Dental Centres and Staff Clinics).

A = Doctors B = Nurses / Midwives C = Pharmacists D = Health Technologists / Health Technicians

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G = Radiographers. H = Medical / Health Records Personnel. I = Community Health Personnel. J = Laboratory Scientists

Table 4: Distribution of the Local government areas based on their L.Q Scores

S/N	No. of facilities for which L.Q > 1.00	No. of LGAs	Names of Local government areas.
1	< 2	6	Ayedaade; Ife Central; Ilesa East; Irepodun; Isokan; Orolu.
2	2 -3	7	Boripe; Ede North; Ejigbo; Ife East; Ife North; Ife South; Irewole.
3	4 - 5	6	Boluwaduro; Egbedore; Odo-Otin; Ola-Oluwa; Olorunda; Oriade.
4	6 - 8	8	Ayedire; Atakunmosa East; Atakunmosa West; Ifedayo; Ifelodun; Ilesa West; Iwo; Obokun.
5	> 8	3	Ede South; Ila; Osogbo