Spatio-Temporal Distribution of Health Facilities in Bauchi State: Healthcare in Africa, Health Financing, The Health Workforce and Pharmaceutical Companies.

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Abstract

This study aims at explaining the spatial distribution of health facilities in Bauchi State. This is driven by historical, socioeconomic potentials, landmass and the increasing population of the state. The pattern of locations of private and public health care services in the 20 LGAs of the State are presented against the background of the pattern of population. The study also examines the relationship between the facilities, manpower and the population. The findings show that Funding was poor in the public healthcare centers as what is budgeted is not what is, often, given. The facilities are concentrated largely in the state capital and resources in these facilities are found to be below standards set by the world health organization (WHO). It concludes by recommending a policy of improved funding, deliberate dispersal of health care services to other parts of the state or alternatively adopts the mobile healthcare system to encourage utilization and train the local workforce to provide the needed staffs in the primary health care centre's located in the remote area of the state etc.

Keywords: Health facilities, Population, Funding and Who Standards

Background to the Study

The Declaration of Human Right (UDHR) in Article25.states that States must provide its citizens with adequate standard of living, of which food, clothing, housing, social service and, above all, health care services. They are regarded as essential components of a standard of living adequate for health and wellbeing. The right to adequate health operates directly or indirectly as a prerequisite to all other human rights recognized in treaties. To deny someone health care is to infringe on his Fundamental Human rights. Without health, individuals are denied their right to be contributing members of the community. Individuals who lack adequate health care can thus lose some or all ability to exercise fully their civil, political, economic, social and cultural rights they possess (WHO 1978).

The need for healthcare varies in space. Neither population totals nor population characteristics such as age, sex, income, occupation fertility etc are uniform in space. Also the physical environment varies in characteristics from place to place and this invariably has implications for the pattern of demand for health care facilities. The spatial dimension is also important in utilization behavior because accessibility is a major determinant of the use of health care facilities (Onokerhoraye, 1976b).

The idea of spatio-temporal distribution of health facilities is very important given the increasing urbanization in the third world countries and its consequent advantages and disadvantages. Adamu (1996) highlighted these disadvantages to include difficulties in controlling urban growth, and with making available resources to cater for the increasing needs and demands for essential public services like health.

Therefore, this study aims at discussing the distribution of health facilities in Bauchi State. This is driven by historical, socioeconomic potentials, landmass and the increasing population of the state in recent years.

Aim and Objectives
Broadly, the aim of the study is to provide background information about the spatial distribution of health facilities in Bauchi State.
The objectives pursued to achieve the aim include:
(i)   Show the distribution of the facilities;
(ii)   Determination of population these facilities serve;
(iii)   Compare with world standards.

Literature Review
Onokarhoraye (1976b) emphasized the importance of health facilities as other social services provision from a fixed point to evenly distribute within the access of the population. He argued that in Nigerian context variations in terms of health care facilities exists in three major types including variations among states, within states and within local government areas.

Awaisu, (1988), in his studies of distribution of health facilities in Jigawa state confirmed Onokarhoraye's assertion. He explains the pattern of distribution to be uneven withsome zones having very few health facilities while others have more.Another pattern of the uneven distribution of health care facilities is reflected in the structure of hospital beds in relation to the population of each state (Onokarhoraye, 1976b).

Adam (1996) argued that the distribution of public health facilities in urban Kano is very uneven. Some residential areas are very well served while others are poorly served. Even though population densities vary, yet the facilities provided cannot satisfy the needs of such residential areas. The location of health facilities is known to have great influence in their utilization and efficiency, as proximity to them do influence the decision to seek for them. This implies that the distribution of health facilities, particularly public ones, which are more affordable and accessible, may influence the distribution of diseases in a given area (Adam, 1998).

Jones and Moon (1987), explained that studies of inequality of health care distribution at local level as very important as they allow us to understand humanized problems of having poor health care or health care location in less accessible places.

Iganga (2004), attempts to explain low patronage of public health facilities. He wrote that 'They only go to drug shops and private clinics due to lack of drugs in government facilities."

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Bushenyi (2008) wrote "People in this area ie Nigeria know where to go for health services, but the bad thing is to go there and you don't find services. No drugs, no laboratory services, so this discourages patients to go there for medical care."

Jones and Moon (1998) argued that the relevance of all this health care inequality is that the provision of health care and the ability to consume it is one of the social benefits which exist within a social context.

McCoy et al (1998) in their report on the implementation of 18 Prevention of Mother to Child (HIV) Transmission (PMTCT) services in South Africa identify the lack of affordable transport and long distances between pregnant women's homes and health outlets to be a major challenge to continuity of care and monitoring of maternal and child health. This further highlights the crucial role of transport in the maintenance antiretroviral therapy and other drug regimens such as directly observed treatment short-course for tuberculosis (DOTS).

Chuma (2007) stated that the quality of services offered by public and selected private facilities has influenced the utilization of health facilities, and it bore close relationship to the health care-seeking behaviour of the people. The poor sought care from public facilities while the non-poor or rich went to private facilities irrespective of cost since they were considered to offer better quality services. This indicated that the poor opted for low cost or no cost health care unlike the non-poor who could afford costly medical care from well-established privately owned facilities.

Study Area
Bauchi state lies between latitudes $9^{0}3'$N and $12^{0}3'$N of the equator and between longitudes $8^{0}5'$E and 11^{0} East of the Greenwich meridian. It is bordered by seven states Kano and Jigawa to the North, Taraba and Plateau to the South, Gombe and Yobe to the East and Kaduna to the West. It occupies a total area of 49, 2490 square kilometers, representing about 5.3% of Nigeria's landmass

The state spans two vegetation belts, the Sudan and the Sahel vegetation; rainfall ranges between 600 1000 mm per annum in the Sahel and Sudan respectively. Effective raining season starts from mid-May and ends mid-October. The dry season starts in October and ends in May. This period is characterized by dryness. There is also a short period of the Harmatan winds or dust between December and March, rainfall is highest in August. Relative humidity ranges from about 12% in February to about 68% in August.

The state is endowed with large water bodies e.g. River Hadejia Jamaare, Gongola river e.t.c Dams include Gubi dam, Maladumba etc.

Methodology
The study adopted the Ex post facto descriptive research studies. This method is adopted because the researcher has no control over the variables to be used which is one of its characteristics. Here, the researcher used facts or information already available for analyses and evaluation.Tasks pursued include collection of facts/data, analyzing the facts and reaching certain conclusions.

Sources of Data
A healthcare facility is defined as all units owned by public and private authorities as well as voluntary organizations which provides healthcare services such as hospitals, health centers, maternity centers, dispensaries etc. Data was obtained from Secondary Sources: Information from State ministry of health, text books etc were obtained

Data Collection Method
Data collection methods are:
1.   The researcher visited the research and statistics department/unit of the   state ministry of health where information on health facilities ware obtained.
2.   Information collected include total number of health facilities in the state by local government areas, human resources for health, number of beds in General Hospitals in the State, Population Census of 2006 (containing projections, population densities etc) etc.
3.   A formal letter was written to the commissioner, State Ministry of Health before information was released. Beaurocratic bottlenecks were some of the major problems encountered in the course of the research. Sometimes, the relevant officer to release information is unavailable, information on private health facilities were largely unavailable. These and more were the bottlenecks.

Result/Distribution
Results discuss the major findings of the research. The results are presented in form of tables and charts for better interpretation.

Distribution of Health Facilities by LGA
The major component in the healthcare delivery system of Nigeria comprises the tertiary i.e. Teaching hospitals and federal medical centers, and the secondary which is made up of specialist hospital and general hospital. There is a third, lower cadre health facilities known as primary health facilities which include dispensaries, health clinics, maternities etc.

Table 1 illustrates the distribution of health facilities in Bauchi state by Local Government Areas. Majority of the public facilities, 954 out of a total of 979 are primary facilities. For example, Toro LGA has 123 Health Facilities of which 112 are all in the primary category. Similarly, in Ganjuwa LGA,   of   the 67 Health Facilities 66 are primary health facilities. In fact 97% of public Health Facilities in Bauchi state is primary, meaning health centers, health clinics, maternities, health posts or dispensaries. This primary Health Facilities are meant to serve as the 1st point of call whenever people fall ill especially in the rural communities, however, because they are poorly managed often with poor personnel and ill-equipped, most people resort to private hospitals or private drug sellers who have shops in these areas and who are mostly Ibos from the southern part of the country.

The table indicates that the state capital has the largest concentration of available public health facilities especially the higher order Health facility e.g. it has the only teaching hospital, the only specialist hospital, 2 general hospitals and most private health centers i.e. 42 (61%). These

facilities are also far better equipped in terms of man power and social amenities and facilities compared to other health facilities in other local governments.

Trend in the Number of Available Doctors

Figure 1 shows the number of doctors in the state and its pattern of movement since 2005. A major factor that has contributed to such a pattern is the geographical and environmental characteristics of the state. The northern part of state shares borders with the Sahel type of vegetation and desert encroachment is through that axis into the state. Most Nigerian workers, doctors inclusive, do not want to work in the rural areas because of the inadequate resources there.

Distribution and Ratio of Doctors to Population

Table 2 illustrates the distribution of doctors, the percentage of all doctors and the ratio on one doctor per population in Bauchi State. The state has 61 public doctors in all, as at 2012, indicating a ratio of one doctor to 90160 people. This ratio is by far lower than the national average of one to 12549 and WHO's one to 600 patients. Bauchi state will need an additional 9105 Doctors to meet WHO"s requirements. Based on this result, Bauchi must be having one of the poorest doctor/patient ratio among the states in Nigeria which, itself, ranked 15th in Africa after Seychelles, Tunisia, Libya Algeria, Mauritania, South Africa, Egypt, Morocco, Gabon, Sao tome and principle, Botswana, equatorial guinea, Namibia, Gabon and Madagascar. Only 4 LGA (20%) have a ratio better than one doctor to 100,000 persons in the state.

Hospital Beds by LGA in the State

Before a hospital is set up, factors such as disease profile, demography, patient migration trend, competition from existing health units etc must be considered. However in Bauchi State it appears that hospitals are randomly set up or located and the capacity of each hospital does not match the number of people requiring the services of the hospital. For example, the bed/patient ratio is one bed to 2005 people as against WHO's recommendation of 3 beds to 1000 people. Table 3 illustrates the total number of beds per local government area between 2007 and 2012. Over the first four year period the total number of beds increased by only 16; ten at Alkaleri in 2009 and six in Bauchi in 2010. Yet the population of those who need hospital services increased through the years. However, there's a deviation in 2012 as some LGAs saw slight improvement of the situation.

Even then, the distribution of beds is uneven as 34% of the total number of beds in the state public health system is found in the state capital and the closest to it is Toro with 8%.

Trend in Health Financing

Tables 4 illustrate the budgetary allocation and actual release of funds for the Bauchi Ministry of Health between 2006 and 2012. WHO recommends that at least 15% of the budgets of countries and states should be allocated to the health sector and that $3400 per capita income be spent on health; but Nigeria spends only $944. Thus, Nigeria has a poor record. No wonder that its health system is ranked 197th of 200 countries by WHO.

In Bauchi state, the situation is the same. The closest to achieving the WHO standards was in2009 when 14.75 % of the state budget was allocated to the health sector but only 60% of it was released translating to 9% of the state's released budget allocations (N7, 277,291,937). The worst period was 2008 when only 4.14% was allocated to the sector.

These shortfalls in the budgetary allocation as written in the Bauchi state strategic health development plan 2010-2015 (page 70) has provided only one-third of the total financial requirements of the State Ministry of Health to carry out its activities, part of which is to expand accessibility and distribution of health facilities.

ACRONYMS USED IN THIS CHAPTER
WHO - WORLD HEALTH ORGANIZATION
SMOH - STATE MINISTRY OF HEALTH, BAUCHI

Conclusions
The problem of healthcare provision and distribution in Bauchi State, just as in other parts of Nigeria, is characterized by inadequate Healthcare Facilities. The findings from Bauchi show that there is an uneven distribution of Health Facilities. Most areas depend on primary Health Facilities. Records of private health centers is almost nonexistence e.g. number of doctors, nurses, bed capacities etc.

It is also observed through interactions with the typical rural inhabitant in Ningi area that a number of factors such as the nature of illness, socio-economic statue, their location to Health Facilities and their attitude towards it etc were found to influence the choice of healthcare by the people and that is why they mostly resort to traditional health practitioners usually after self-medication has failed. Where they are available, the current economic conditions in the country including high cost of treatment, attitude of health personnel and inadequate personnel are a barrier to maximum usage of these facilities.

Recommendations
1. There is the need to improve the contribution of Primary Health facilities to the standard expected of modern healthcare because they are the closest to the rural areas. Training and retraining of community staff is important to carry out the basic functions by the nurses, midwives and other Health educators to reduce the problem of rural-urban drift.
2. Planning policies in Nigeria over the years has focused attention on urban areas at the expanse of rural communities. Therefore, emphasis should be on the overall improvement in the life of the people in the rural communities. Apart from provision of tertiary and secondary Health Facilities, basic social amenities like roads, electricity etc is also essential for full utilization of these Health Facilities. Above tasks should involve the participation of the local people, the local government councils, the private sector, Non-Governmental Organizations and the federal and state governments.
3. Health geography is built on the premise that illness and health are unequally distributed across space and time. Spatial patterns of illness have been associated with many factors, including climate, microbes, exposures, culture, race/ethnicity, geography, and distribution

of healthcare services. Understanding spatial relationships of health and illness is important. Based on above. I recommend the adoption of Geographical information system (GIS) in future studies

4. A GIS is a "computer-based system for integrating and analyzing spatially referenced data. GISs have the ability to capture, store, retrieve, analyze, and display spatial data. GISs can be used to display the spatial distribution of health data. Mapping of health data can be instrumental in visualizing patterns and generating questions that may have not otherwise occurred to

Researchers

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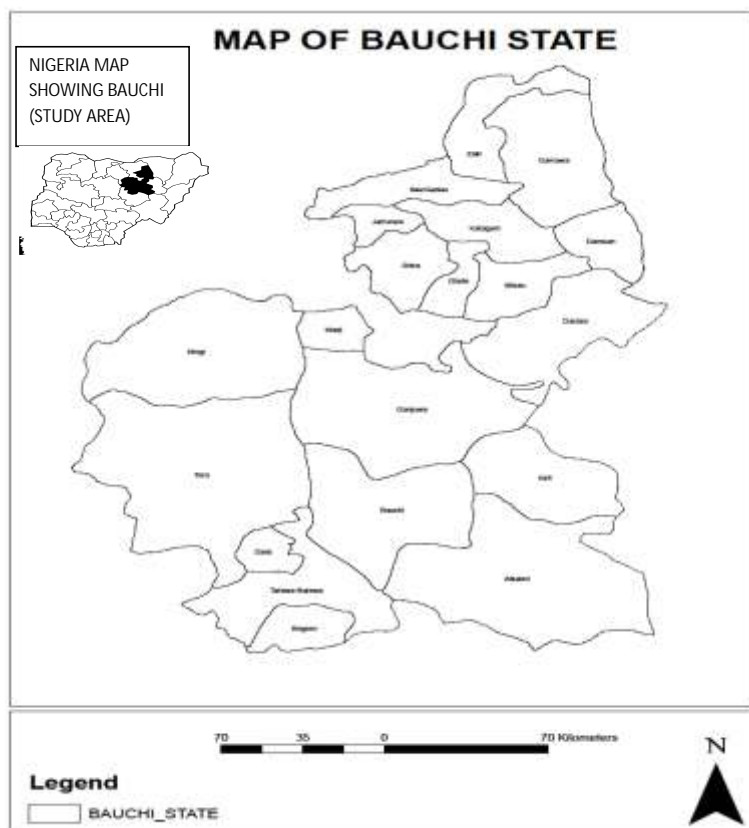
Table 1: Distribution of Health Facilities by LGA

S/N	LGA	NO OF HEALTH FACILITIES	NO OF PRIVATE FACILITIES	TOTAL	PERCENTAGE (%)
1	AL KALERI	41	2	43	4
2	BAUCHI	76	42	117	11.2
3	BOGORO	25	1	26	2.5
4	DAMBAM	37		37	3.5
5	DARAZO	51		51	4.8
6	DASS	34		34	3.3
7	GAMAWA	54		54	5.2
8	GANJUWA	67	2	69	6.6
9	GIADE	37	1	38	3.5
10	ITAS GADAU	35		35	3.3
11	JAMA'A RE	25	1	26	2.5
12	KATAGUM	39	6	45	4.3
13	KIRFI -	41		41	3.9
14	MISAU	52		52	5
15	NINGI	54	3	57	5.5
16	SHIRA	45		45	4.3
17	T/BALEWA	52		52	5
18	TORO	113	10	123	11.8
19	WARJI	41		41	4.2
20	ZAKI	60		60	6
	TOTAL	979	68	1046	100

Source: SMOH Planning, Research and Statistics Department

FIGURE 1: Trend in the Number of Available Doctors
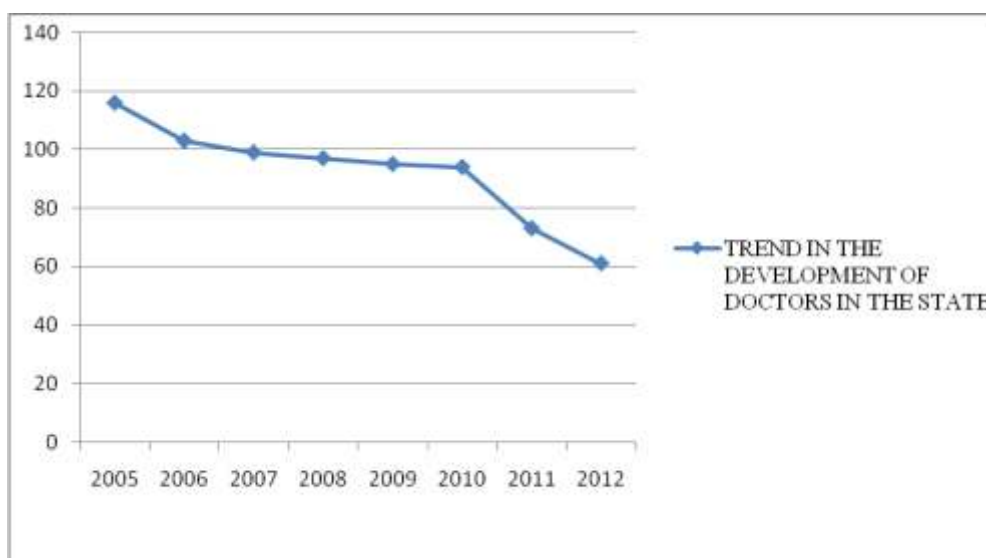
Source: SMOH Planning, Research and Statistics Department

TABLE 2:   Ratio of Public Doctors to Population by LGA

| S/N	LGA	DOCTORS		LGA POPULATION	RATIO/ DOCTOR
		NO	%		
1	ALKALERI	3	5	388018	1:129339
2	BAUCHI	29	48	583569	1:20123
3	BOGORO	1	2	99059	1:99059
4	DAMBAM	1	2	177545	1:177545
5	DARAZO	2	3	295426	1:147713
6	DASS	2	3	106511	1:53256
7	GAMAWA	2	3	336162	1:168081
8	GANJUWA	2	3	329142	1:164571
9	GIADE	1	2	184412	1:184412
10	ITAS GADAU	1	2	270110	1:270110
11	JAMA'ARE	1	2	138859	1:138859
12	KATAGUM	3	5	346338	1:115446
13	KIRFI	1	2	172136	1 :172136
14	MISAU	3	5	308976	1:102992
15	NINGI	2	3	456233	1:228117
16	SHIRA	1	2	276577	1:276577
17	T/BALEWA	1	2	261580	1:261580
18	TORO	3	5	408958	1:136319
19	WARJI	1	2	135905	1:135905
20	ZAKI	1	2	224221	1:224221
	TOTAL	6 1	100	5499737	1:75339

Source: SMOH Planning, Research and Statistics Department

Table 3: Bed Distribution in General Hospitals by LGA

S/NO	LOCAL GOV'T	2007	2008	2009	2010	2011	2012
1	ALKALERI	110	110	120	120	120	120
2	.BAUCHI	894	894	894	900	900	966
3	BOGORO	45	45	45	45	45	45
4	DAMBAM	45	45	45	45	45	45
5	DARAZO	110	110	110	110	110	110
6	DASS	110	110	110	110	110	110
7	GAMAWA	120	120	120	120	120	120
8	GANJUWA	73	73	73	73	73	75
9	GIADE	45	45	45	45	45	45
10	ITAS GADAU	100	100	100	100	100	110
11	JAMA'ARE	120	120	120	120	120	150
12	KATAGUM	120	120	120	120	120	130
13	KIRFI	40	40	40	40	40	45
14	MISAU	120	120	120	120	120	150
15	NINGI	165	165	165	165	165	120
16	SHIRA	110	110	110	110	110	110
17	T/ BALEWA	170	170	170	170	170	120
18	TORO	110	110	110	110	110	210
19	WARJI	45	45	45	45	45	45
20	ZAKI	75	75	75	75	75	75
	Total:	2,727	2,727	2,737	2,743	2737	2901

Source: SMOH Planning, Research and Statistics Department

Figure 3: Hospital Bed Distribution by Percent of all per LGA
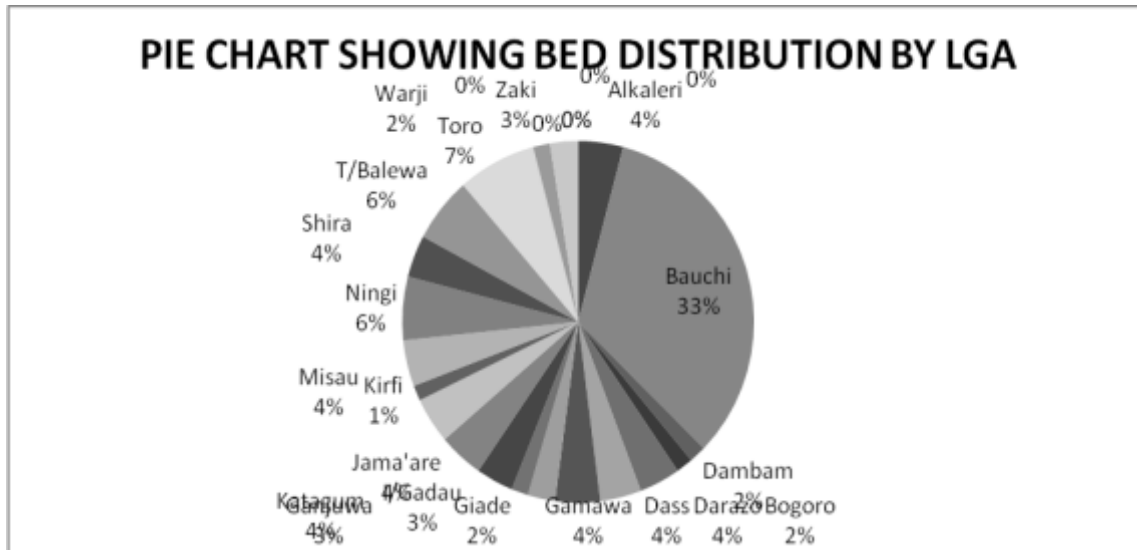
Table 4:Trend in Health Financing

S/N	Year	State Budget	SMOH Budget	SMOH as % of Total Budget	Actual Release
1	2006	59,931,854,092	3,823,323,529	6.38	2,328,042,6 08(60.9%)
2	2007	79,308,013,000	6,037,173,575	7.62	4,118,800,794(68%)
3	2008	95,670,326,424	10,943,046,530	4.44	7,336,980,346(67%)
4	2009	80,421,989,524	11,861,173,266	14.75	7,277,291,937(61%)
5	2010	84,475371,731	8,910,229,032	10.55	663861179807 3(74.5)
6	2011	114,295,894,968	11,612,228,087	10.16	6,586,513,035(56.7%)
7	2012	138,718,201,798	13,315,722,678	9.6	6,916,452,031(51.9%)

Source: SMOH Planning, Research and Statistics Department