CHAPTER ONE

1 INTRODUCTION

In Nigeria, as in most other developing countries of the world, emphasis has been placed on curative rather than preventive medicine over the years. Curative medicine is often characterised by huge investment in hospital construction, purchase of expensive equipment and drugs. They are also run by doctors who had expensive training (Earthscan, 1978 cited in Timberlake and Thomas 1990). However, because of the realisation that this approach was not cost effective and has also proved to be grossly inadequate in reducing morbidity and mortality, emphasis has since shifted to disease prevention. This approach finds its expression in the Primary Health Care (PHC) programme. As defined by the Alma Ata conference in September 1978, and modified by WHO (Geneva 1984):

> *Primary Health Care (PHC) is essential health care made accessible at a cost the country and the community can afford, with methods that are practical, scientifically sound, and socially acceptable. Everyone in the community should have access to it …related sectors should also be involved. … At the very least it should include education of the community on the health problems prevalent and on methods of preventing … or of controlling them; adequate supplies of food and proper nutrition; sufficient safe water and basic sanitation; maternal and child health care … immunization against the main infectious diseases; … and the provision of essential drugs* (Last, 2001: P142-143).

The programme was adopted in 1986. Since then, the emphasis of the Nigerian government is that PHC shall provide general health services of preventive, curative and rehabilitative nature to the population as the entry point of the health care system. Emphasis shall be placed on preventive and promotive measures (FMOH, 1986). The nation has since then maintained the primary health care (PHC) programme in the hope that it will help achieve the goal of 'health for all' by the year 2000 AD (HFA/2000). But, as the programme failed to achieve its first target of health for all

by the year 2000 AD, a new mandate was set for the 21st century at 2015 (WHO, 2003). Therefore, as government and other stakeholders continue to pursue very vigorously the ideals of PHC, there is need to assess the extent to which the facilities already in place are accessed and utilised. Additionally, there is need to examine the spatial pattern of PHC facilities in relation to diseases occurrence. Furthermore, the influences of distance, socio-cultural health belief system, as well as, access to traditional health care impact on PHC utilisation needs to be examined.

1. 1 Research Problem

Regional inequalities in the distribution of health facilities and personnel have long been recognised. In different countries, the distribution of health care facilities has been observed to be highly skewed in favour of the urban centres to the near neglect of the rural areas where majority of the population resides (Hart, 1971; Okafor, 1987, 1989; Filani, 1992; Watt, 1992; Onokerhoraye, 1997). This trend is worse in less developed countries (Zaide, 1985), and in Nigeria although PHC centres are established in both rural and urban areas with the intention of equity and easy access, regrettably, the rural populations are seriously underserved when compared with their urban counterparts because the distribution of health facilities is 'lopsided in favour of the urban centres…' (FMNP, 1981; Abdulraheem et al, 2012). Municipal politics (Walter, 1972; Filani, 1992), economics and history (Logan, 1972, *cited in* Abumere, 1998) class, religion and ethnicity, (Kilby, 1979 *cited in* Abumere, 1998; Alberto *et al*. 1999) have all been cited as reasons why the 'provision of these services had been concentrated in the urban areas with diminishing access as one moves to the rural areas' (NPHCDA, 2001).

In taking a bold step at responding to the observed mal-distribution, and perhaps realising also that the common causes of morbidity and mortality in the country are still predominantly preventable and avoidable diseases, the Nigerian Government through its National Health Policy (NHP) opted for a system that would be preventive, promotive and rehabilitative, while being equally curative in nature (FRN, 1986). This initiative of course, is an offshoot of the WHO Alma Ata 1978 Conference that conceived Primary Health Care (PHC) as a system through which the world had aimed to achieve 'health for all' by the year 2000.

However, the move to address health care problems has resulted in a major shift from the orthodox curative, western medicine to the primary health care system that inculcates cultural orientations and community participation in health care provision. This view is supported by the fact that the major causes of morbidity and mortality in most developing countries of the world are essentially preventable and treatable diseases. Consequently, Nigeria's adoption of the people oriented *bottom-up* PHC model marked a major shift in approach to the nation's health care delivery. As a consequence therefore, it is expected that the communities would adjust to the implications of the new method of health care delivery in relation to their socio-cultural and traditional health care beliefs system, given that traditional health care options are widely available and accessible.

The PHC system is defined as a community oriented programme that would rely upon community resources and serve as the nerve-centre of Nigeria's National Health Policy (FRN, 1986). PHC is designed to address the immediate health problems at the grassroots level. There is the active community participation, by which the government aims at redressing the urban bias and bring PHC to all and sundry. However, primary health care utilisation is poorly understood in many parts of the developing world. This is especially true in the rural places ... where generally speaking, access to care is limited (Baker and Liu, 2006). The question of spatial equity in the provision of health services prompted the Federal government of Nigeria (FGN) to encourage all Local Government Areas (LGAs) to establish PHC in their communities (FRN, 1986). To ensure effective and smooth implementation of the PHC programme, management committees were formed at different levels. Some of which are the District Development Committees (DDCs) at the district level and Village Development Committees (VDCs) or the Community Development Committees (CDCs) at the village or community level. The success rate of committee formation ranges from 7% to 97% at the LGA level, 85% at the Districts and 78% at the village community levels (NPHCDA, 2001).

In more depth, the PHC programme emphasizes the *bottom-up approach* to enable the coverage of all, but mostly for the disadvantaged or underprivileged grassroots. This

became necessary given the fact that the gap between the urban and rural areas, and the poor and the rich, in access to and affordability of health care services keeps widening (UNDP/HRD/ES No. 9, 1983; DPRS, FMOH 1994, 1995; FMOH, HRS/MTPA, 2000). In addition, it has been observed that even with health care facilities located close to the people, the patronage or utilisation rates in some communities was still far below expectation (Aregbeyen, 1992; NPHCDA, 2001). Furthermore, besides the wide information divide between the communities and PHC providers, there seems to be the problem of inequitable location of PHC facilities. Although PHC facilities are *low-order* facilities meant to serve small units of population, it could be argued that the present pattern of facility distribution and service delivery in the communities does not confer any special advantage on the rural areas.

In addition to the above observations, studies concerning PHC programme reveal many PHC facilities are poorly equipped and lack essential supplies and qualified staff. Also, distortions in geographic distribution of health infrastructure still leave certain communities with difficult physical access to health facilities (UNICEF, 2001). Furthermore, systemic difficulties in the health sector also appear to be the key reason for the non-use and in many cases the non-availability of key PHC services. According to an FOS study (1996b *cited in* UNICEF, 2001: 82), 'long waiting time, the negative attitudes and poor skills of health facility staff, the absence of drugs at many facilities and unfriendly opening hours have all contributed to the low utilisation of PHC services'. Besides these service quality factors, the introduction of cost recovery schemes, including user fees for antenatal and delivery services in most areas of the country, has adversely affected access to services. The impact of economic costs, physical and social resources on service utilisation is particularly severe among the poor and vulnerable groups, who have resorted to contacting traditional medical and spiritual healers as alternative providers of health care (FOS, 1996; Kale et al., 1996; Rebhan, 2008).

As stipulated by international standards 'every Nigerian should access basic health care within an easy reach of not more than four kilometres or an hour of walking distance from a health care facility for Nigeria to be regarded as a country with

adequate health care coverage' (Aregbeyen, 2001: 32). Many studies have indicated that the effect of distance is partly a function of type of facility or service (Joseph and Phillips, 1984) and that the friction of distance is usually greater for *lower-order* facilities such as PHC than for *higher-order* facilities such as the General or Specialist Hospitals. Accordingly, consumers would be less willing to travel long distances to utilise PHC services than they would for General or Specialist Hospitals.

The literature on the cardinal principles, structure, aims and objectives, and PHC relationship with the grassroots community, is by now, well documented since the inception of PHC in Nigeria in 1986. However, a void in the literature relates to examining the spatial pattern and distance threshold to access PHC facilities rather than the demographic and epidemiological variables, and maternal and child healthcare utilisation. Thus, few of the critical studies conducted so far are those of World Bank (1991), Mbanefoh et al., (1995; 1996), NPHCDA (2001), UNICEF (2001) and Aigbe (2004). Mbanefoh et al., (1996) did an econometric analysis on the demand for health care in Nigeria by looking at six states of the federation from the six geo-political zones. The study focused on demographic and epidemiological variables, while Aigbe's study focussed on maternal and child healthcare utilisation. All of these studies excluded the spatial pattern and distance thresholds travelled to health care facility, especially PHC facilities in Nigeria. It is on this basis that this study deviates from theirs as these variables are incorporated given that they are important determinants of health facility utilisation. Also the effects of the availability and use of traditional medicine on PHC utilisation are examined.

Therefore, given that this study is concerned with the facilities of the *lower-order* type (PHC), is the effect of distance the same in all places? If not, why? Furthermore, from the standpoint of policy, what is the implication of setting the same distance threshold of four kilometres for all places? These questions arise because it is necessary to know the average distances travelled to PHC facilities in Nigeria in order to ascertain whether the goal to attain the international standards has been achieved. There is no doubt that filling this gap will contribute to knowledge and to the explanation of variations in access to basic health care that lead to differential utilisation between the suburban/urban and rural communities in Edo State.

In the light of these problems, the present study, among other things, examined the spatial pattern of PHC facilities in the 18 Local Government Areas of Edo State. In addition, the level of consumers' accessibility to PHC was determined against the backdrop of the minimum and maximum travel distance (MTD) threshold of two and four kilometres. Finally, the influence of socio-cultural and traditional health care beliefs on the utilisation of PHC services was examined. To achieve these goals there is the need to study the PHC programme in relation to the utilisation of its component parts such as health education; provision of potable water supply and basic sanitation; maternal and child health, childhood immunisation and so on. However, as a first step, an examination of key health problems that warranted PHC services was undertaken. In this regard three key questions were examined amongst others: First, to what extent has the PHC programme enhanced access to, and utilisation of maternal and child health care facilities and childhood immunisation over time? Secondly, what impacts do belief in and availability of traditional health care have on the utilisation of PHC services? What is the maximum distance travelled to PHC centres by majority of respondents in the chosen communities in Edo State?

1.2 Aim and Objectives of Study

Aim

The study investigated the spatial pattern and utilisation of PHC facilities in Edo State, in which the effect of distance and non-spatial factors (traditional health care beliefs system) on the utilisation of PHC services are examined.

Objectives

The specific objectives are to:

1. Identify and discuss the spatial distribution of key diseases in the study area.
2. Analyse the spatial pattern of PHC facilities in the study area with the view to determining level of accessibility.
3. Identify and discuss factors that affect utilisation of the facilities.
4. Assess the level of primary health care awareness and discuss its influence on the utilisation of PHC services.

5. Investigate the influence of socio-cultural and traditional health care beliefs on PHC utilisation, and
6. Identify and discuss major problems faced in PHC management and implementation.

1.3 Research Hypotheses

To realise the study's objectives five main hypotheses were tested.

1. There is a random distribution of PHC facilities in Edo State.
2. There is a positive correlation between sizes of rural population of LGAs and number of PHC facilities per LGA.
3. Access to PHC services decreases differentially with increasing distance from facilities in different communities.
4. Utilisation of PHC services is a function of socio-economic and behavioural characteristics of respondents.
5. PHC utilisation is significantly influenced by traditional health care belief systems in Edo State.

1.4 METHODOLOGY

1.4.1 Data Sources and Collection Techniques

Both primary and secondary techniques were used. Secondary data concerning the 18 LGAs of the State were obtained from the Department of Primary Health Care, Edo State Ministry of Health. Data collected include the staff-strength of health centres, map of the study area, number and type of *lower-order* and other public health care facilities in place, details of the trend and pattern of reported and treated cases of notifiable ailments and, data on general disease morbidity and mortality. Population figures of the LGAs in Edo State, as well as data on the demographic profile and health indicators of the population were obtained from the National Population Commission (NPC), Benin City. Administrative maps of the State were collected from the State Ministry of Land and Survey, Benin City. Data on reported cases of notifiable diseases with the incidence rates (per 100,000) from 1994-2002 and the number of deaths from notifiable diseases with the case fatality rates from 1994-2001 in Nigeria were collected from the National Primary Health Care Development Agency (NPHCDA), Federal Ministry of Health, PHC directorate, Abuja. Literature

on the study area was collected from Edo State Library, and Edo State House of Assembly Library, Benin City.

Primary data: Two sets of questionnaires were used for data collection. The first was designed to collect information regarding PHC users' demographic and socio-economic characteristics (Appendix A-1) while the other was designed to get information from the senior cadre PHC personnel on management and implementation problems affecting PHC programme (Appendix A-2). Among other factors, data on respondents' socio-economic and behavioural characteristics, such as, sex, age, occupation, income, place of residence, marital status, number of children per respondent and level of education, PHC awareness and mode of daily mobility are collected. In addition, information on traditional medicine preferences, its utilisation and influence of cultural practices on respondents' utilisation of PHC facilities were also collected. The PHC users' questionnaire is structured into three sections. Section A) examined respondents' demographic and socio-economic characteristics; B) the socio-cultural practices, beliefs and availability of traditional medicine options, and Section C) the peoples' knowledge of PHC programme and its benefits.

Sample/Sampling Method: A multi-stage sampling approach, in which the LGA forms the basic primary sampling unit, was adopted.

1. Out of the 18 LGAs of Edo State, 10 LGAs and their headquarters were randomly selected for questionnaire survey.
2. Twenty settlements stratified into ten rural and urban settlements were randomly selected from the ten LGAs.
3. Housing units along identified routes within each of the selected settlements were listed. Fifteen rural and twenty-five urban household heads comprising 400 household heads were randomly sampled at defined intervals and interviewed.
4. A breakdown of this gave a sample of 40 households/respondents per LGA for comparative purposes. To ensure at least 40% of the LGAs in each of the 3 senatorial districts are chosen, 10 LGAs were randomly selected.

1.5 Data Analysis

To accomplish the objectives of the study as well as validate the hypotheses, Quadrant Count Analysis (QCA) and variance/mean ratio (VMR) statistics, correlation analysis and contingency tables are used. In addition, simple regression model as well as binary logistic regression techniques were also used.

Quadrant Count Analysis (QCA): The first hypothesis that "There is a random distribution of PHC facilities in Edo State", was tested, using the quadrant count analysis. The Poisson distribution is a technique for obtaining predictions of events which are discrete, that is, isolated in time and space. In planning, this distribution is utilised in quadrant analysis not only to yield predictions, but also to determine the spatial pattern of a phenomenon (Abumere, 1987). Thus, in this study the QCA technique is used to determine the spatial pattern of PHC facilities. In quadrant analysis, the probability of finding K-point in a quadrant is given in a statistical term as:

$$P\ (X - x) = e^{-\lambda} \qquad \lambda x/x_{i,} \quad X = 0, 1, 2, 3 \ \ldots n \tag{1.1}$$

For operationalisation, this function becomes denoted as:

$$e^{-m};\ m.e^{-m};\ m^{2e-m}/2!;\ m^{3.e-m}/3!;\ m^{4e.-m}/4!\ \ldots n \tag{1.2}$$

for probabilities of finding 0, 1, 2, 3, 4… n points in a quadrant respectively.

Results interpretation: For a random pattern, the value of variance/mean ratio (VMR) is a unit (1). A ratio greater than 1 indicates a clustered pattern, while a ratio less than 1 indicates regular pattern of distribution.

Correlation Analysis: The second hypothesis, which states that, "There is a positive correlation between the population size of rural communities per LGA and the number of PHC facilities," was tested, using correlation analysis. This technique is used to determine the relationship between rural/urban population size and spatial distribution of PHC facilities.

The simple regression model and correlation analysis were used to test the third hypothesis that "access to PHC services decreases differentially with increasing

distance from facilities in different communities". The regression model is used because it is a useful technique for assessing how changes in one variable, x, affect the other variable, y. In our case, it shows how *access* to PHC facilities decreases differentially with increasing *distance* from the facilities in different communities. Accessibility in this study is quantified by the number of patients who utilised PHC services.

Logistic Regression Model: Hypotheses four and five are both tested using logistic regression model. This technique is used because it is a powerful tool when assessing the extent of relationship between one dependent variable and a number of other independent variables. At the same time it is very useful in estimating the degree of change produced in dependent variable by an independent variable while holding constant all other variables. Furthermore, the logistic regression model is a very useful tool for the analysis of binary data (Abumere, 1986; Frankfort-Nachmias and Nachmias, 1996; Karp, 2001).

Consequently, the fourth hypothesis, which states that "The utilisation of PHC services is a function of socio-economic and behavioural characteristics of respondents", was tested using the logistic regression model. In this instance, PHC utilisation was the criterion variable. Patients' residential location – urban or rural – and their socio-economic characteristics such as income, number of children per respondent, sex (male or female), marital status (single, married or widow), age, education level and their behavioural characteristics such as PHC awareness, walking as a means of commuting etcetera, are the control or independent variables used in assessing the degree of PHC utilisation.

Hypothesis five that states "the utilisation of PHC services is significantly influenced by traditional health care belief system" was also tested using logistic regression analysis. Here, PHC utilisation is the criterion variable while the control variables are 'use of indigenous treatment', 'preference for traditional medicine' and 'customary constraints' on respondents' health care seeking behaviour. Meanwhile, besides the above standard statistical tests, the data analyses also involved some simple descriptive statistics that gave summations such as frequency counts, simple tables of

percentages and Chi-Square tests which aided the understanding and interpretation of data.

1.6 The Study Area – Edo State

The state is located in the heart of the tropical rain forest and lies between longitudes 5° and 6° $42'$ E and latitudes 5° $45'$ and 7° $35'$ N. The state is bounded in the north by Kogi State; to the east by Kogi and Anambra States; Delta State to the south and Ondo State to the west.

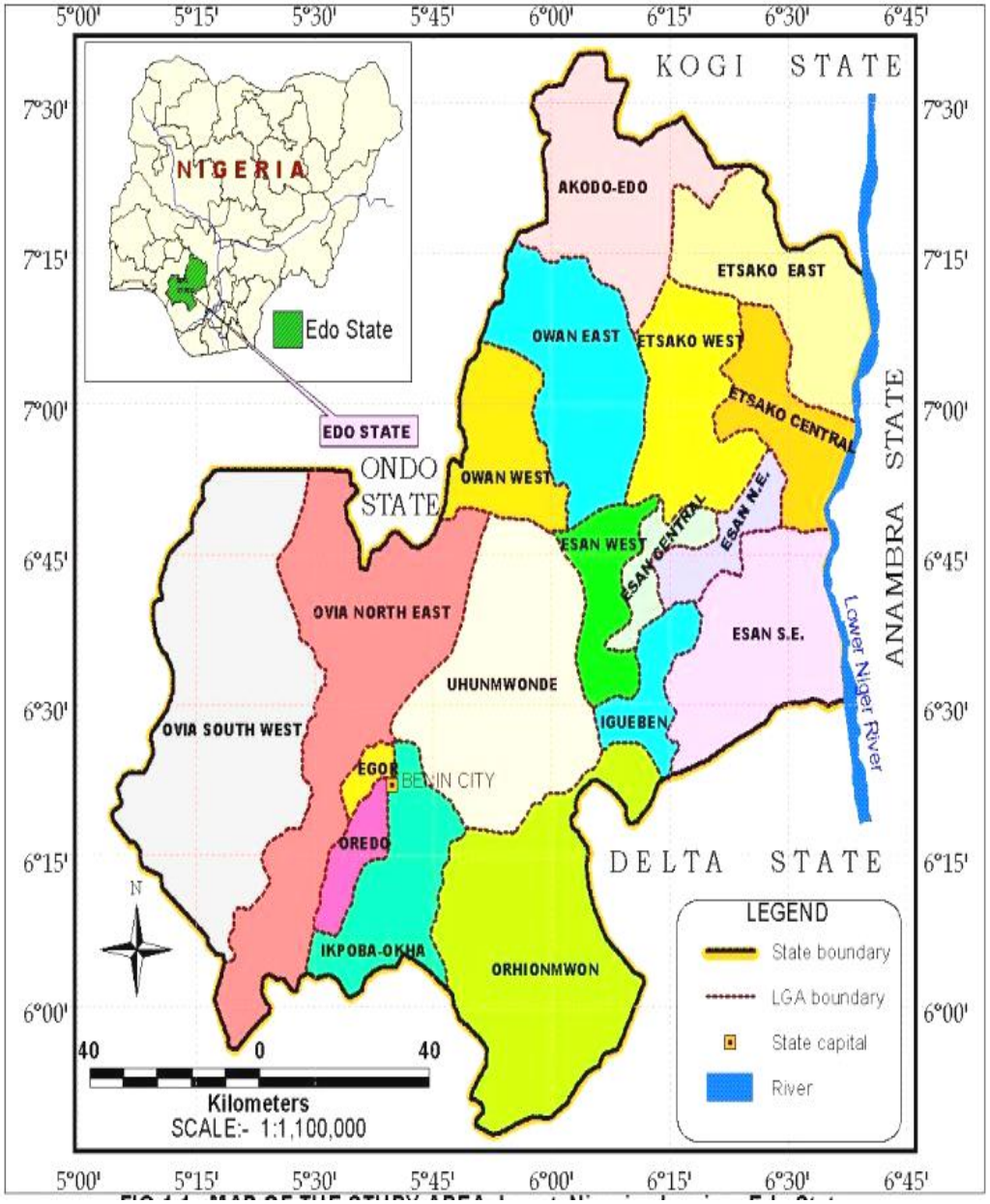

Figure 1: Map of the study area: inset Nigeria showing Edo State

Edo state was created on the 27th of August 1991 due to the partitioning of the defunct Bendel State into Edo and Delta States. The state is situated in a low lying area except

in the North Akoko-Edo area where it is characterised by undulating hills rising to peaks of about 572 metres above sea-level. Edo State has tropical climate with two distinct seasons – the wet and the dry seasons. While the wet season lasts from April to November, the dry season is usually between December and March. Rainfall duration and intensity decrease from the south to the north. Average annual rainfall in the south is between 152 and 254 cm (60″ - 100″) and between 127 and 152 cm (50″ - 60″) in the north. Almost all year round therefore, Edo State enjoys abundant rainfall except from December to March when the influence of the North East trade winds (Tropical Continental Air-mass) with its concomitant 'Harmattan' sets in; thereby, pushing the Inter Tropical Convergence Zone (ITCZ) to the south.

Edo State has a total population of 3,233,336 people (NPC, 2006 projected population figures). A fairly homogeneous population, it has its major ethnic groups as the Bini, Esan, Etsako, Igarra, Owan and Okpameri. They constitute the Edo speaking people of Nigeria. With a total land area of 19,281.93 square kilometres, Edo State has a population density of 169.3 persons per km^2. Politically the State is currently partitioned into eighteen (18) Local Government Areas (Fig. 1.1). Each of these political divisions comprises several clans and political wards.

In terms of gender, the male population of 1,633,946 (50.5%) was slightly higher than the female population of 1,599,420 (49.5%). The 2006 projected life expectancy for the state was 63.29 years for males and 57.76 years for females. With regard to structure, the population could be described as a youthful one, with 55.4% below 18 years of age. This was followed by the age cohort 18-44 (33.8%), 45-74 (9.9%) and those above 75 years that constitute only 0.9% of the population. Projected annual population growth rate was 2.78% from 2000-2005 (NPC, 1998). In terms of location, while 54.6% of the population lives in the rural areas, 45.4% resides in the urban areas. Edo people are linked by similar beliefs, customs and culture. The major religious practices are Christianity, Islam and African traditional religion. Edo State is one of the most peaceful minority states in Nigeria.

Benin City, the state capital, is directly linked by road and air to three of the major economic and political nerve-centres of Nigeria. By air Benin City is less than 40

minutes flight from Nigeria's foremost industrial/commercial city, Lagos, and four hours by road. Abuja (FCT), is less than one hour by air and about six hours by road. The commercial city of Onitsha in Eastern Nigeria is just about an hour and half by road from Benin. The state capital is one hour by road to one of the major seaports in Nigeria, the Warri port in Delta State. Benin airport provides regular flights (by Nigeria standard) to other major cities in the country. By road network, all the LGAs of the state are well linked both by federal (fewer in number), State and Local Government roads. Feeder roads also link the various communities, although most of these roads are in bad shape. Figure 1.2 shows the road network and some of the various communities in the state.

Complementing the road network are telecommunication facilities provided by NITEL Plc and other private business centres rendering mobile telephone, telex, fax, Internet service and express postal services. There is electricity supply connecting several towns to the national grid, though the problem remains that of irregular power supply to the people by the Power Holding Company of Nigeria (PHCN).

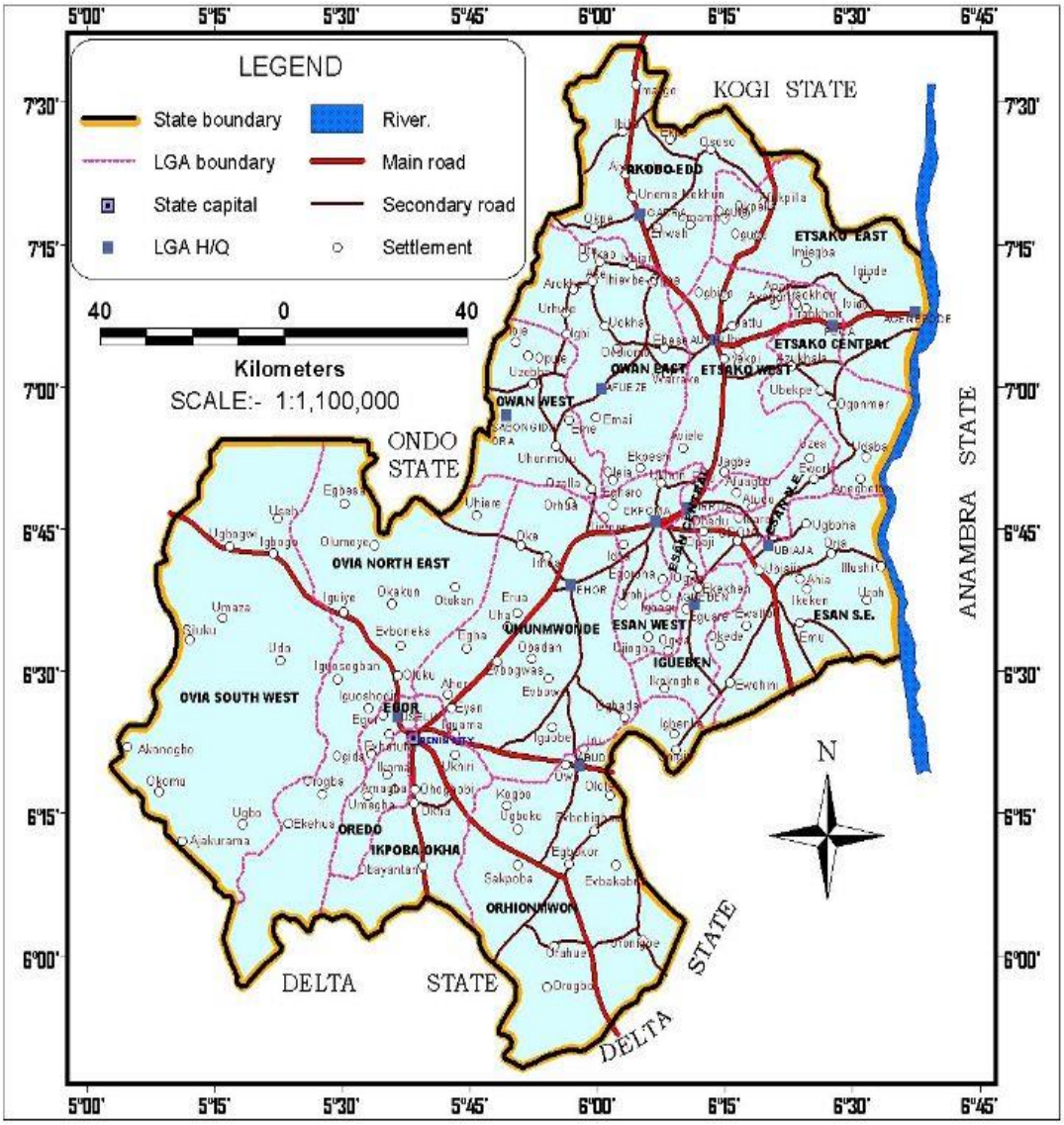

Figure 1.1: Road Network and some communities in Edo state

Without doubt agriculture is the mainstay of the state's economy. Edo people are essentially farmers. Both food and cash crops, such as, cocoa, rubber, palm produce and cotton, (pineapple, banana, plantain, vegetables, rice, cassava, yam) etcetera are produced. To a large extent, both private investment and the general level of mechanization are still low. There are numerous water bodies and rivers for fresh water products like fish and other aquatic foods. Virtually all species of tropical hard and high quality wood can be found in most of the LGAs such as Oredo, Ovia North East and South West, Esan South East, Esan West, Orhionmwon and so on. A significant proportion of the country's rubber and crepe resources are also produced in the State. Other natural resources include limestone, marble, clay, crude oil, lignite, kaolin, granite and gold.

The present level of industrialisation in Edo State is very low. Few manufacturing industries of note include Bendel Breweries and Guinness Nigeria Plc, the Coca Cola plant at Aduwawa, Benin City, Okomu palm-oil processing mill, Ewu flower mills, few sawmills and rubber processing units. In addition, there are few private granite quarries, especially in Akoko-Edo LGA, of the northern part of the State. There are also crafts centres such as carving and furniture making. Otherwise, there is no major industrial undertaking in the state.

There are three public and four private universities in Edo State. These are the Universities of Benin, Benin City; National Open University, Benin City (both federal), and Ambrose Ali University, Ekpoma; (state owned). The private universities include Igbinedion University, Okada; Benson Idahosa University, Benin City; Wellspring University, Benin City and Samuel Adegboyega University, Ogwa. There is also a Federal Polytechnic, Auchi; College of Education at Ekiadolor, Institute of Management Technology, Usen; College of Agriculture, Iguoriakhi; schools of Nursing and Midwifery and College of Health Technology besides the primary and secondary level educational institutions in the state.

Besides the *lower-order* PHC facilities, there are 28 *higher-order* government healthcare facilities, ranging from District, and General Hospitals to Government Specialist Hospitals distributed in the various LGAs. Of these, there are five Federal

Government Hospitals. These are University of Benin Teaching Hospital (UBTH); Air Force Hospital, Benin; Psychiatric Hospital, Benin; Military Base Hospital, Benin and the Irrua Specialist Hospital (ISH) Irrua. Complementing these are numerous private healthcare facilities, such as, chemists and pharmacies, drug stores and hospitals. These are complemented by both registered and unregistered traditional health care centres.

1.7 The Plan of the Thesis

This *thesis* comprises eight chapters. Chapter One, the introductory chapter also examined and discussed the study area. Chapter Two discusses the conceptual and theoretical frameworks and presents a review of relevant literature. Chapter Three is on health problems in Edo State that warrant the emphasis on primary health care (PHC). Chapter Four examines the spatial pattern of PHC facilities and of personnel that tackle the major health problems of the State. The impact of spatial factors (mode of daily mobility, transport cost, distance, accessibility to and utilisation of PHC services) is discussed in Chapter Five. In Chapter Six, the non-spatial factors (PHC awareness, demographic and socio-economic characteristics of the respondents and their effects on the utilisation of PHC services) are discussed. Chapter Seven analyses respondents' traditional health care belief systems and their impact on the utilisation of orthodox health care. An assessment of PHC management, and the problems and prospects of the programme in different communities in the study area are discussed. The concluding chapter, Chapter Eight, summarises the major findings as well as their theoretical and policy implications for health care planning in Nigeria.

CHAPTER TWO

CONCEPTUAL FRAMEWORK AND LITERATURE REVIEW

2.1 Conceptual and Theoretical Framework

The chapter presents the conceptual framework for the study. It examined the main tenets of the relevant theories and concepts used in the study of location and utilisation of health care facilities. The theories and concepts reviewed cuts across geography, economics, sociology and demography. The rationale for this inter-disciplinary approach is to provide the study with a robust framework that would adequately address the multi-dimensional nature of health care system. According to Bismal (1985), the major approaches applied to the study of medical geography range from ecological and accessibility models to the socio-economic approach. Clearly most of the problems and needs of rural healthcare system are multifactoral in origin and require multidisciplinary approach (Abiodun et al. 2010). Therefore, the set of theories, models and approaches applied in this study is informed by the need to understand the following: (1) The phenomenon of study, PHC system; (2) its spatial pattern and variation in the study area, and (3) the impact of socio-cultural belief system and other non-spatial factors on utilisation.

2.1.1 The Central Place Theory

The Central Place Theory (CPT) is a classical theory concerning the location of central places (Walter Christaller, 1933). As a theory of the location of cities, it states that central places (cities) exist to provide goods and services for the consumption of people both within and outside of the city boundaries (Ayeni, 1979). In this light, it is

contended that goods and services are of different orders and that each good or service commands a trade area or range from which people travel to the central place to acquire it. It is further argued (Berry, 1968 cited in Ayeni, 1979) that the trade area has two limits, the upper and the lower limits. The lower limit is the threshold as it encompasses the population that assures the viability of the good or service. The upper limit is the maximum distance above which nobody travels to the central place to purchase the good or service. However, the order of a good or service determines its range in the hierarchy of city functions. Consequently, higher-order goods or services such as specialist hospital would have longer ranges than goods and services of lower-order, such as, the PHC facilities. Although Central Place Theory deals with the location of cities, over the years, the theory has found its application in the location of services (Ayeni, 1979) and also reflects the most prominent aspect of spatial behaviour – travel threshold (Wang, 2007).

Given that the location of primary health care (PHC) facilities requires the considerations of range and threshold, central place theory becomes handy. Central Place Theory is useful for examining both the location and the utilisation of facilities. The location of PHC facilities, no doubt, depends on some sort of thresholds, in that the provision of a particular type of facility, such as, health post or dispensary, a clinic, a maternity centre, or a health centre would require a sufficient population to determine the appropriateness of its location. The utilisation of or demand for the services, on the other hand, may vary according to distance, the nature and prevalence of disease, age structure of the population and so on. To the extent that PHC services are welfare goods, population size, age and disease pattern could serve as appropriate measures of the threshold required. Therefore, the provision of a health care facility requires a threshold of a sufficient population of patients for a certain category of health facility to locate within an area. In an event where this criterion is not met the facility cannot be located.

But PHC facilities are low-order services with low ranges and thresholds, and are provided mainly from low-order central places, such as, the village or ward level in the rural and urban communities. However, these categories of health care services are also provided in higher-order central places most especially within higher-order

facilities. Generally, there are more lower-order central places (and they are closely located in space) than higher-order central places. As such, lower-order facilities like the PHC facilities often serve smaller units of population and are more numerous than other health care facilities (secondary and tertiary). The service areas of lower-order health care facilities are often small and extend only a few kilometres, indicating a relatively large friction of distance (Meade et al., 1988) as patients are not willing to travel long distances to utilise their services.

Thus, the lower range called 'threshold' population by Christaller (1933) is defined as the minimum population required for offering of a certain good or service. It is the minimum population that can sustain a facility such as PHC services at the grassroots level. The upper range of a service, on the other hand, is the maximum distance beyond which patient or health seeker will consider it rationally uneconomical to attend the health care centre – except for a peculiar health problem such as surgery (Morrell et al., 1979; Parkin, 1979 cited in Joseph &. Phillips 1984). Specifically, low-order goods and services are those with low ranges and thresholds and are provided from both low-order central places as well as in higher-order central places (Pounds, 1981) such as the village or ward level communities and in major urban centres respectively. Conversely, high-order goods and services have high ranges and thresholds and are provided from high-order central places. Higher-order central places are fewer and are farther apart and serve larger populations (service areas) than low-order central places. They offer all the goods and services provided by lower-order centres and more, because they are larger than the lower-order central places (Pounds, 1981). Different orders of central places can be identified depending upon the characteristic services they offer the surrounding population.

However, some social researchers (Meade, et al., 1988: P 290) contend that central place theory should not be used as an ideal at all. They criticise the theory's claim that market forces dictate thresholds and ranges for each level of service and show that social welfare issues override issues of economic efficiency. 'Thus for the good of a population's health, a government might have to locate facilities with lower thresholds and smaller ranges than central place theory justifies' (Meade, et al, 1988). This is because, "under a social welfare scheme, providing levels of services in

overlapping spatial units is valid and, in fact, is used in several countries. The number of levels and their corresponding thresholds and ranges, however, will vary according to the type of system" (Meade, et al., 1988: pg 290). To this extent therefore, Central Place Theory is used as an explanatory rather than as a prescriptive model in the context of this study.

2.1.2 Gravity Model

Gravity model is one of the most frequently used models in geography. The model defines the ways in which people and human activities are attracted to each other, in a manner superficially analogous to the gravitational forces that exist between all bodies (Pounds, 1981). As such, the gravity model has become very popular in the social sciences for analysing and predicting flows of all kinds (Abumere, 1982). In economics, the gravity model is widely used to explain the pattern of bilateral trade between nations and its formulation is based on the idea that trade is positively influenced by economic mass of the trading countries and negatively affected by the geographical distance between them (Aiello and Demaria, 2009: 19; ArtNet-CBWTR, 2008).

With particular regard to this study, people journey from their homes to patronize different categories of lower-order health care facilities (PHC), such as health post, health centre, clinic, maternity centres or a referral district hospital. These varied health care facilities draw people to them from nearby places. In this regard, empirical evidence shows that the number of people or patients making the journey to a particular health care centre declines as distance increases, but that this decline is not usually a uniform one. Instead, the fall-off, or decay, is at first steep and then increasingly gentle. The attractive force of a health care facility to a person living one kilometre away from it is a great deal more than that to another living two kilometres away. Moreover, the larger the centre the greater the attractive force it exerts (Pounds, 1981). Hence, in the case of primary health care (PHC) facilities, a health centre or maternity is expected to exert more attractive force than a village health post. The model is given as:

$$Iij = kpipj / Dij^{b}$$

Where:

Iij is the volume of interaction between places i and j, (which are the community i and the facility j); Pi and pj are measures of "mass", usually interpreted as the population sizes of places i and capacity of the health facility j; Dij is some measure of distance between i and j; and, k and b are empirically derived constants. George Zipfs' pipj/ Dij hypothesis is probably the most widely accepted form of the gravity model. It states that interaction between two places, community i and a health facility j, is proportional to the product of the two places' population and inversely proportional to the intervening distance. That is, the attraction between two objects is directly proportional to their masses and inversely proportional to the square of the distance between them (Meade, et al., 1988; Aiello and Demaria, 2009). What this means with regard to PHC facilities is that the interaction of a community i with facility j is proportional to the community's population and inversely proportional to the distance separating it from the health care facility.

According to the model, the farther the distance from lower-order health facilities the less the volume of patients to the facilities and the less the distance the greater the volume of flow or utilization. Applied to primary health care (PHC) facilities, friction of distance could be measured by the size of the distance exponent, b. If b is relatively large, then there is a rapid drop-off of contact. Accordingly, b will be larger for health posts than for maternity centres such that people will be willing to travel farther to utilize maternity centres than they would health posts. If the friction of distance or distance decay is high for a certain level of health care service, then this service should be decentralised and made locally accessible.

This usually applies to low-order facilities and services such as health posts and first aid facilities. High-order facilities and services, such as specialist hospitals and the treatment of rare diseases or heart transplants, are not as sensitive to distance as health post or treatment of minor injury. Resources can be centralized because patients are willing to travel longer distances for these services (Meade et al. 1988). Distance decay can be used to establish threshold distances for different health care facilities and services. For instance, it has been demonstrated that people in low-income

countries normally will walk up to three-kilometres (1.86 miles) to a primary health care clinic but that a low-level clinic beyond this threshold has limited usefulness (Meade, et al. 1988).

However, the gravity model has sometimes been criticized in the literature as having a merely descriptive value and lacking a theoretical framework (Huff, 1961; Sneider 1959 cited in Abumere 1982). Furthermore, the model has been attacked on the grounds that it is neither deterministic nor optimising, but merely predicting what is likely to happen (Richardson, 1969 cited in Abumere, 1982). The model was further criticised by Pounds (1981) for failing to make allowance for either the relative attractiveness or the physical difficulties of the road to a nearby health care facility. This he observed, may modify very greatly the perceived distances, because in all human behaviour there is a strong psychological factor impossible to measure and at times difficult to identify. Thus, a smaller but yet farther lower-order PHC facility may offer some particular attraction, such as, easy access to service, less waiting time, pleasant atmosphere or good relationship with the health workers, which patients enjoy, but cannot define explicitly.

Nevertheless, Olsson (1965 cited in Abumere, 1982) has argued that much of these criticisms can be countered if the gravity model is regarded more frequently as a type of regression analysis, because it is possible to apply standard statistical techniques for testing both the reliability of the whole model and the significance of the constants. This has largely been demonstrated in econometric analysis using the negative binomial regression model which with proper calibration gives the same result as in the Poisson regression model (Aiello and Demaria, 2009: 22).

2.2.1 Behavioural Models of Health Care Services Utilisation

The application of non-spatial models to the study of healthcare utilisation became popular as the methods incorporate individual variations in need, aspirations, abilities and attitudes. The essence of the health belief model (HBM) is that individual beliefs affect the actions a person takes relating to their health (Rawlett, 2011). The HBM was developed in the 1950s by social psychologist trying to understand lack of participation by individuals in a free tuberculosis screening programme. Currently, the

HBM is the most frequently used theory in health education, health promotion and disease prevention (Jones & Bartlett, 2010). Taken together, the behavioural models of utilisation and access to facilities and services developed by Anderson, Aday and Andersen, Rosenstock, Gross, and Suchman are commonly referred to as the 'five models' of health services utilisation (Veeder, 1975 cited in Joseph and Phillips, 1984).

The Rosenstock model (1966) made an attempt to explain why people fail to utilise health care services even when the facility is available. As posited by Joseph and Phillips, (1984: 112) 'the emotional rather than cognitive 'beliefs' of a person are crucial to understanding utilisation'. As such, Rosenstock sees utilisation as a response to a precipitating cue influenced by the interplay of numerous psychosocial factors. Thus the perceived nature of health systems in terms of accessibility, availability, organisation and cost will in essence influence the decision of a potential patient. Of the models that predicate decisions mainly on individual psychological variables, the most well known example is the health belief model (HBM) suggested by Rosenstock (1966) and modified by Gochman (1972) and Becker and Maiman (1975) cited in Igun (1988).

The HBM was developed to address problem behaviours that evoke health concerns. It postulates that an individual's likelihood of engaging in a health related behaviour is determined by his/her perception of the following six variables: Perceived susceptibility which is the perceived risk for contracting the health condition of concern; Perceived severity that relates to the perception of the consequence of contracting the health condition of concern; Perceived benefit in terms of the perception of the good outcome that could happen from undertaking specific behaviours; Perceived barrier estimating the perception of the difficulties and cost of performing behaviours in physical, psychological or financial terms; Cue to action emphasizing awareness or exposure to factors that prompt action; and Self efficacy which underscore the confidence in one's ability to perform the new health behaviour) (Orji et al, 2012)

The HBM asserts that the motivation for people to take action to prevent a disease is based on how strongly they believed that they are susceptible to the disease in question; whether the disease would have serious effect on their lives if they contract it, whether the suggested health intervention is of value, whether the effectiveness of the treatment is worth the cost, which barriers they must overcome to institute and maintain specific behaviours, and whether they can successfully take the recommended action (Tarkang, 2013). In Rosenstock's original formulation, cues to action could include external cues such as a mass media campaign, social influence, or internal cues such as a negative change in bodily state or perception of symptoms. More generally, cues to action can be events, people, or things that spur people to change their behaviour (Orji et al, 2012). Therefore, cues to action are coined as plans to activate readiness and may be contained in health education from a formal health provider or may come as advice from a neighbor or family member. Self-efficacy within the expanded HBM is the faith in one's own aptitude to readily take effective action (Pender et al., 2011). In the same vein, Joseph and Phillips (1984: 139) argued that, "an individual will use a service only when it is perceived that the recognised need should be satisfied, that the facility provides the required and desired service, and that it is convenient". In this light the model surmised that once the psychological state of readiness to use health services exists, a 'cue' such as reminders from physicians or preventive mass-media announcements might trigger the required action for utilisation (Rosenstock 1960, 1966).

The Suchman model (1966) considers the socio-cultural and environmental determinants of utilisation. It sees individual utilisation pattern as a function of social networks of family and friends within which an individual finds himself, as well as the influence of the level of health knowledge of kin and contacts. In this regard, it has been argued that a 'cosmopolitan' social structure is more likely to be related to a 'scientific' orientation to health and medicine whilst a 'parochial' or traditional society is more likely to hold popular or folk beliefs (Suchman, 1964, 1966). To this extent, the model presumes that 'attitudes to illness and awareness of treatment vary enormously among cultural groups, low socio-economic status and minority groups tending to be more isolated and to have lower factual levels of disease and treatment knowledge' (Suchman, 1966 cited in Joseph and Phillips 1984: p112-113; This

proposition was demonstrated by Norman and Gerald (2004) who found that socioeconomic and ethnic disparities are major disparities in access to recommended treatments of Coronary heart disease between the Maori and non-Maori population. In Maori males aged 45–64 years, heart failure mortality rates and hospital admissions due to heart failure are more than 8 times greater than for non-Maori; a similar trend is noticed for Maori females compared with non-Maori. In the same vein, Bywood et al, (2011) also observed that in addition to the cultural aspects of Indigenous Australians background, their population commonly experiences disadvantage due to low SES, living in rural/remote areas and high rates of disability, homelessness, drug and alcohol problems and mental illness.

Corroborating the above model is that of Anderson (1968), which emphasised family-cycle and behavioural determinants of facility utilization. This model presumed that certain factors 'predispose' people towards utilization. These are family composition - sex, age, size and marital status; social structure - occupation, social class, education, ethnicity; and health beliefs, relating to attitudes to physicians, healthcare and disease. It also incorporates enabling factors to utilization - factors such as income, savings, insurance and access to an available regular source of care for the family. Furthermore, the community in which one lives would have to have the requisite resources expressed in terms of a certain ratio of hospital beds or physicians to the local population. According to Anderson, the presence or absence of these factors would enable or hinder utilization. The family would require the stimulus of need. In this regard, Anderson suggested that 'need' variables are perhaps the most powerful predictors of utilization and also that the balance between factors may vary among different levels of service (dentists, primary physicians, and hospitals, for instance) (Anderson, 1968 cited in Joseph and Phillips, 1984).

'Advancing in sophistication but perhaps losing in clarity' (Joseph and Phillips, 1984:113), is Gross's (1972) proposed regression model operating within a 'behavioural' framework. The model includes accessibility variables as well as the predisposing, enabling, and need component earlier highlighted by Anderson (1968) as factors influencing utilisation. But given the assumption of this model, Gross himself (1972: 75) states that 'we need to know a lot more about the relative

explanatory powers of behavioural or predisposing variables, the enabling variables (including financial and spatial-temporal accessibility measures) and health level indicators on the utilisation of health services' before the model can be made operational. However, Gross's model is particularly interesting, attempting, as it predicts and explains utilisation behaviour. If operationalized, it could be a most promising advance (Joseph and Phillips, 1984).

Lastly, the Aday and Andersen's model (1974) conceptualises utilisation as the product of the characteristics of the patients, care providers and the system as a whole. In this context, Joseph and Phillips (1984) states that although the model was a framework proposed for the study of 'access' to health care, it really involves a wider proposition: that national health policy should be taken into account when viewing the delivery of health care by a given system for a given population at risk. The disaggregation of this proposition provides the inputs to the model. As such, the health policy (in terms of financing, education, manpower and organisation), and the delivery system (in terms of resources volume and distribution), as well as, the characteristics of the population at risk (in terms of predisposition, enabling and needs factors) are quantified as 'inputs' to health services. The 'output' on the other hand, is measured by percentage of a studied population group, who were satisfied with specific aspects of the services used, such as quality, convenience, cost, co-ordination and courtesy. The usefulness of this model is hinged on its emphasis on a holistic approach.

In summary, the Health Belief Model (HBM), developed in the 1950s to investigate why people fail to undertake preventive health measures, remains one of the most widely employed theories of health behaviour. The main strength of the HBM is its use of simplified health-related constructs that make it easy to implement, apply, and test (Conner, 2010 cited in Orji et al, 2012). The HBM has provided a useful theoretical framework for investigating the cognitive determinants of a wide range of behaviours for over three decades. Additionally, it has focused researchers' and health care professionals' attention on variables that are prerequisites for health behaviour. However, despite the success of HBM in informing and predicting a range of behaviours with health outcomes, previous research shows that HBM's determinants

are insufficient predictors of behaviour (Norman and Brain, 2005). This is due to two main limitations of HBM: the low predictive capability of the determinants; their small effect size; and the lack of clear rules for combination of the variables and the relationships between them. However, the weakness on combination can also be viewed as strength, because lack of strict rules of combination offers flexibility that makes the HBM adaptable and applicable to many health behaviour and population groups (Orji et al, 2012). In addition, the non strict rules have also made it possible for the model expansion hence the original HBM consisting of the four primary variables (susceptibility, severity, benefit, and barrier) has been modified by researchers to include cue to action and Self-Efficacy (Rosenstock, 1966; Rosenstock et al, 1988) and the growth is still been recently expanded by four other variables (see Orji et al, 2012).

2.2.2 Culture and Traditional Concepts of Disease

There is shared belief among social scientists that in every culture there are means by which the health problems of the community are managed (Lambo, 1955; Erinosho 1976, and Oke (1982). Culture sometimes dictates the causes and types of disease and the course of action to be taken. Given diverse environments these conceptions also vary spatially. What is culture that influences peoples' behaviour?

Culture is a learned, shared, compelling and interrelated set of symbols whose meaning provides a set of orientations for members of a society. These orientations, taken together, provide solutions to problems that all societies must solve if they are to remain viable (Terpstra and David, 1985). In detail it is "that complex whole which includes knowledge, belief, art, morals, custom and any other capabilities and habits acquired by members of a society…The totality of the experiences shared by a group in beliefs, values and norms; that which form the history of a people" (Lasebikan, 1986: 152). For any programme targeted on rural communities therefore, these beliefs and values must be considered especially if the root cause of their problems can be correlated specifically with any of these social factors. Appraising his experience with the non-literate societies over the years, Lambo (1961, 1966) contends it is culture that determines the acceptability, the success or failure of a given therapeutic orientation. According to Fabrega Jnr. (1970) knowledge about health, illness and

management is a generally known phenomenon among the people and are determined by their culture.

This point of view was further supported by Unschuld (1976: 5) who observed that, "wherever Western medicine was introduced and no matter how urgent the need for its immediate application was felt to be, it was never a question of its filling a medical vacuum" – which by implication meant that methods of health management well entrenched amongst the people have been known in different cultures before the advent of Western medicine. The geographic underpinning in all these assertions is the fact that as culture varies over space, so does disease, its conception and traditional management.

What likely constraints will culture and cultural beliefs have on the use of PHC services given the long-standing practice of traditional systems? As observed by Pearce (1982: 15), 'all cultures evolve methods of dealing with ill-health, discomfort and maintenance of health'. And before the advent of Western medicine in the Nigerian society, Nigeria had developed various specialists among different ethnic groups to handle their health problems. This claim was amplified by Oyebola (1980), who noted that before the first hospital in Nigeria was built in 1873, traditional medicine was the sole source of healthcare delivery available to the members of the society. Pela (1985) also shares this view. Therefore, traditional healthcare practices are usually identified with the culture where they are situated. In this regard, we have among the Yoruba the Babalawo or Onisegun; Alfa or Boka among the Hausa-Fulani; Dibia among the Ibos and then in parts of Delta State (Okpe) and largely in Edo State, we have the Oboh. These terms refer generally to community experts associated with healing practices well known amongst the people and commanded their respect, before the advent of the Europeans (Good et al, 1979; Pela, 1985). These practices were spatially defined and patterned by the culture of the society. The conception of the cause of disease dictates the course of action and the method of therapy to be utilised. Among Nigerians and Africans in general, the concept of disease rests on three major factors; natural, preternatural and supernatural, and these are of course dictated by culture.

Confirming the above assertion, Lambo, (1955), Erinosho (1976), and Oke (1982) point out that among the Yoruba people, the traditional conception of disease centres on three etiological factors: natural, preternatural and supernatural. Belief in these factors influences the pathways to healthcare. This becomes all the more important because the conception of illness causation is defined by the culture and belief systems of the people; and therefore it is to be expected that the treatment of and responses to diseases would be patterned by the culture of the people (Ackerhnecht, 1946).

Thus, it could be hypothesized that when an orthodox system fails to produce desired results, the patient would often resorts to the traditional means of health care. Given our environment and the socio-cultural background of the people, Owumi (1993) has suggested integrating the traditional medicine with PHC services if the people are to be meaningfully incorporated within the overall health care system. This is particularly so because findings in Nigeria reveal that about 75 percent of the population utilize traditional medicine due partly to the fact that it is highly accessible, affordable and acceptable to the general population. In fact, it was recognised by WHO (1981) that the target of 'Health for all by the year 2000' was unlikely to be met from modern medicine alone without the incorporation of traditional medicine, especially in the Third World societies. This reasoning was informed by the realization that few developing countries could afford the spiralling costs of providing modern health care for all their populations and that adequate resources in terms of scientifically trained manpower would hardly be available before the end of the 20th century (Joseph and Phillips, 1984). This fact was made more revealing as Vuori (1982b, p. 129 cited in Joseph and Phillips, 1984: 46) notes 'traditional medicine… has been estimated to be the principal, if not the only source of medical care for two-thirds of the world's population'. Some authors (such as Scarpa, 1981 cited in Joseph and Phillips, 1984: 46) even went further to suggest "that 'pre-scientific' medicine may treat up to 80 percent of the world's people".

As a result, the WHO has since 1979 set up guidelines for the development of a programme to promote traditional medicine subject to rigorous scientific investigation. The aim is to foster a realistic approach to traditional medicine in order

to promote its contribution to health care and to explore its merits scientifically. Besides enabling the encouragement of its beneficial aspects and discouraging the harmful aspects, the programme's most important aim, however, seems to be that of promoting the integration of proven, valuable knowledge and skills of traditional and Western medicine (Vuori, 1982b, cited in Joseph and Phillips, 1984). This seems necessary if steps are to be taken to achieve 'health for all', although numerous pitfalls and problems resulting from lack of mutual respect between the two parts of the medical profession, and 'professional recognition' of traditional healers, pose a major stumbling block (see Jeffrey, 1982; Lee, 1975 and Topley, 1975 cited in Joseph and Phillips, 1984: 47).

2.2.3 Decision-making processes and Concept of Epidemiological Determinants of Utilisation

The central concern of the decision-making concept is the process through which potential patients identify and evaluate symptom, interpret their causes and implications before seeking or availing themselves of medical assistance. The spatial location of health facilities influences decision patterns through behavioural mechanisms by affecting the readiness of individuals to recognise that a state of illness exists, hence the decision once this recognition has been made, to consult with a doctor (Girt, 1973; Ingram, et al., 1978 cited in Joseph and Phillips, 1984). Illness and therapeutic behaviours have been recognized as two mechanisms influencing ones' decision whether or not to consult a doctor when sick. Illness behaviour corresponds with potential patient's conception that a state of illness does exist while therapeutic behaviour is the decision to seek and avail oneself of medical care once illness has been perceived and recognized. But, distance influences the motivation of individuals and affects the way the stimulus of ill health is appraised (Mechanic, 1962; Girt, 1973; Ingram, et al., 1978 cited in Joseph and Phillips, 1984).

In evaluating the motivating factors involved in illness and therapeutic behaviours, the effect of distance can be assessed in terms of the tendency for consultation (utilisation) to decline with increasing distance between the individual and the physician or health facility. Distance decay in utilization rates manifests itself for various medical services and the effects (of distance) appear to vary for different groups of people (Pilkington et al, 2012), for different services, and for various ailments. Though the question has been raised whether distance (or accessibility) itself is the major influence or just an 'intervening obstacle' to health care (Kaliszer and Kidd 1981 cited in Joseph and Phillips, 1984) for instance, found in their study of ante-natal clinics utilization that employment status, parity, and age were more important influences than accessibility, although they felt that greater distances than they examined might play a bigger role in utilization behaviour.

The effect of distance is however, sometimes limited because the level and urgency of need to visit a health care facility or consult a doctor varies with the type of illness. In this regard, the friction of distance on healthcare use would be less for potentially serious ill health such as 'heart transplant' than for malaria treatment. Thus dealing with hypothetical illness behaviour in rural Newfoundland, Girt (1973), points out that 'distance has both a positive and a negative effect on behaviour. Individuals are likely to become the more sensitive to the development of disease the farther they live from a physician but those at a distance may be more discouraged about actually consulting than one living nearer because of the additional effort involved' (Girt, 1973, cited in Joseph and Phillips, 1984: 131-132). To this extent, it has been recognised that patients' reaction to some diseases is apparently so low that only a negative distance effect was discernable. This implies that only patients with the more urgent types of cases or serious conditions such as treatment of cancer or tuberculosis rather than common cold may attend healthcare services if living farther away. This scenario, according to Joseph and Phillips (1984), is true of conditions, such as, febrile and non-febrile common cold and sore throat, while for more 'serious' conditions, such as benign hypertension and diabetes, distance has both a positive and negative effect on the probability of an individual consulting. The distance at which this effect changes seems different with different illnesses or conditions and this could have important implications for locational planning of facilities (Joseph and Phillips,

1984: 132). However, besides distance there are other attributes such as quality of service, type, capacity, price and physical amenities (Dear, 1977a) that may influence the decision to utilize health care services. More subtle factors are the attitudes of the providers: whether or not the physician or community health worker displays a favourable 'affective behaviour' to listen to and spend sufficient time with patients or to give what is felt to be appropriate treatment (Ben-Sira, 1976; Phillips, 1979b, 1981a, cited in Joseph and Phillips, 1984; Chuma et al, 2010).

The concept of epidemiological determinants of utilisation is another behavioural approach; presented by Kohn and White (1976). It presents a holistic behavioural insight into the study of healthcare utilisation. Essentially, it reckons that the central aim of healthcare service utilisation is to address the problem of morbidity. In this regard, they suggested that individual characteristics, socio-demographic factors, life-changing events as well as attitudes towards medical care are the main factors to be examined.

Other confounding factors commonly associated with medical care utilisation include severity of symptom, level of distress, poverty, inclination to use medical facilities, scepticism about medical care, ethnicism and one's faith in doctors (Herbert and Thomas 1982, cited in Joseph and Phillips, 1984; Cockerham, 1978). The strength of the epidemiological determinants of utilization lies in its attempt to proffer solution for such question as: How important is ill health as a cause of use? The decision of a patient to utilize health care services is greatly influenced by the type of illness, severity of symptom, and whether or not the illness could be ameliorated or cured if the health facility is used.

2.3 Literature Review: Introduction

This section presents the review of empirical studies regarding the location, accessibility and the effect of traditional health care options on the utilisation and management of lower-order health care services, most especially PHC in Nigeria and elsewhere.

2.3.1 Location, Accessibility and Utilisation of PHC Facilities

In location theory, equity and efficiency are two concepts that feature prominently in discussions about the provision of public facilities and yet remain only very little understood by planners and analysts (Alonso, 1972; Symons, 1973; Fieldman & Gonen, 1975; and Mumphrey 1973 cited in Ayeni et al. 1986). Equity, whether in health, wealth or power is rarely, if ever, fully achieved. Some societies are more egalitarian than others, but on the whole the world is “unequal” with unfair “inequalities” (Lübker 2004; Halman et al 2008). The Health-for-all Policy for the 21st Century in the African Region: Agenda 2020 (WHO, 2002) identifies equity as an essential principle and a core value for health development policies focused on a vision of health for all. It states that equity is 'based on the principle of, availability of and universal access to essential health care'. The issues of equity in health care and the impact of poverty on the possibilities for health, are huge concerns in sub-Saharan Africa (WHO, 2005; Commission for Africa, 2005). While equity implies addressing differences in access to health care and health status that are unnecessary, avoidable, and unfair, these decisions are socially defined (Levers, et al, 2011).

In Nigeria, equity is an explicitly stated distributional criterion for the provision of health care services. A vital government objective during the fourth National Development Plan 1981-1985 was to ensure an equitable distribution of health services, manpower, and facilities to all parts of the country (Nigeria, 1981a). Nigeria has a three-tier federal structure comprising the federal/central government, the state and the local governments. With this federal structure goes a distribution of responsibilities that has implications for the spatial pattern of health care provision (Okafor, 1987). Although health care provision is a concurrent responsibility in Nigeria with all the three levels of government participating in it, the different levels of government focus on the provision of different facilities and services. As such, besides providing the broad policy guidelines in the health sector, the central government concentrates on teaching hospitals and other specialist institutions, such as the national eye hospital and the national orthopaedic hospitals. The state governments have the responsibility for general hospitals, while the local governments specifically focus on lower-order facilities, such as clinics, health posts and dispensaries (Okafor, 1987).

For the purpose of this study, emphasis is on the third tier, that is, the local government and the provision and utilisation of primary health care (PHC) facilities. Primary Health Care (PHC) was adopted as a strategy towards reaching the HFA/2000 goal. The Declaration confirmed that although health is a right of every citizen, majority of the world's population especially the poor have no access to any form of health care. PHC was therefore adopted as the key to the attainment of the target of HFA/2000 as part of overall development and in the spirit of social justice (WHO 1979; 2006). Therefore, in response to the Alma Ata Declaration, Nigeria formally adopted PHC in 1986, as one of the cornerstones of her national health policy. Although the PHC programme is specifically aimed to provide health care services at the grass-roots level, the three-tiers of government do have a certain stake in its realisation. Hence at the federal level, there is the PHC Department headed by a Director, in the Federal Ministry of Health that takes charge of policy issues. The Director is responsible to the Minister of Health, liaises with international agencies, formulates and transmits guidelines to the states of the federation. For the purpose of effective management, the country is divided into four PHC zones; each headed by a zonal co-ordinator who takes charge of the PHC management committee which draws its members from all the states that make up the zones. The duty of the zonal coordinator and the zonal management committee is essentially to coordinate and implement the federal PHC programme within the framework of the state and local government health delivery system (Adeniyi et al, 1987).

Below the zonal level are the State Coordinators who supervise the planning and implementation of PHC programme in the states of the federation. There is also at this level, a State PHC management committee with membership drawn from various interest groups. At the local government level, there is the local government coordinator as well as a management committee. At the district and village levels are the District and Village Health Committees (DHC/VHC) as the lowest levels of PHC organization (Egunjobi, 1991; Adeyemo, 2005). In sum, the PHC organizational framework in the country comprises six levels – the Federal, Zonal, State, Local Government, District and Village levels. Policy decisions are passed from the federal level down the various levels to the village level while feedback information also

emanates from the local levels and goes up the ladder in the opposite direction to the federal level.

PHC provision started in Nigeria in 1986 with 52 LGAs in the four PHC zones and was designated as Model-PHC-LGAs. Within the first year of the commencement of PHC activities in the PHC model LGAs, integrated services were rendered in a number of upgraded facilities, while the construction of basic rural facilities had started with the participation of community members. As a mark of progress, the number of local government that integrated PHC into their health care delivery system rose from the initial 52 to 80 within the first year. The number further rose to 100 in 1988 and was 113 LGAs in 1991 at various stages of PHC planning and implementation activities (Egunjobi, 1991). Today, all the 774 LGAs in Nigeria's 36 states and the Federal Capital Territory (FCT) are served with PHC facilities.

Because PHC facilities are lower-order health care facilities and essentially the main responsibility of the LGAs, they are more ubiquitous in space and therefore are more accessible than the costly and capital-intensive secondary and tertiary facilities provided by the state and federal (central) governments. However, in a study examining jurisdictional partitioning, distribution policies and the spatial structure of healthcare provision in Nigeria, Okafor (1987) revealed that even lower-order facilities such as health centres and dispensaries, are not equitably distributed among local government areas; and that the general pattern that emerge in Bendel state was one in which the more urbanized local government areas had larger shares of health care facilities than the predominantly rural areas. Therefore, to stem the inequality in distribution, he advised that 'greater central control' is needed to enhance territorial equity.

In respect of access to healthcare, a study by World Bank (1994) found that if access to personal care is defined as the patient being no more than an hour away from a health facility by local means of transportation, only 11 percent of rural population in Cote d'Ivoire, 15 percent in Somalia, 25 percent in Rwanda, and 30 percent in Liberia, Niger, and Nigeria have such access to any form of health care facility. However, the study reports that some African countries have made a concerted effort

to improve access by emphasizing the delivery of primary health care in rural areas. Quoting WHO, the report had it that some 99 percent of the rural residents of Mauritius have such access, as do 85 percent in Botswana, 73 percent in Tanzania, and 70 percent in Congo. In some other African countries, access to personal health care tends to be highly unequal across administrative districts and between rural and urban areas. In a study covering 30 states in Nigeria, for instance, the number of health facilities ranges from one per 200 people in Lagos state to one per 129,000 in Benue state. Three fourths of the country's public and private health facilities are located in the urban areas, which contain only 30 percent of the population (World Bank, 1994).

Further studies revealed that "even in better-resourced urban settings, severe health-care disparities exist, so that people from a lower (or working) socio-economic status do not always receive adequate health-care services from either the central or the regional governments (Hilhorst, Van Liere, Ode and de Koning, 2006; Levers et al 2011). Within the state of Victoria, Australia, McGrail and Humphreys (2009) confirms that spatial accessibility to health care services is low in sparsely populated areas and generally higher in more populated areas where health services are more likely to be located.

In theory, lower-order health care facilities (such as village health posts, local dispensaries, health centres, and small rural hospitals) are meant to provide the preventive and primary care needed by the people living in rural and peri-urban areas. This is so, because, this is where the bulk of Africa's population lives, and it is where preventive and primary care would have the greatest positive impact on national health. Ironically, however, at these lower levels of the healthcare hierarchy, bureaucratic authority is weakest and spending is lowest. The resulting gaps in health care provision in the local areas are neither filled by the private providers nor by private voluntary organisations, such as missions, because their efforts only account for between 5 and 10 percent of all health expenditure in most African countries (World Bank, 1994). This reality becomes all the more worrisome as urban hospitals are given preference over primary health care, with only 30 percent of aid for health care going for basic health services and facilities aimed at meeting the needs and

health problems of poor and under-privileged communities where millions suffer from easily treatable or preventable diseases (Annan, 1998). ‘Health equity in Africa is a complex issue which cannot be viewed as separate from other salient socio-cultural and political issues. But strengthening district health systems is an essential step in making health services accessible and affordable for those population groups who would otherwise be unable to reap the benefits of health promotion, good quality healthcare and access to essential drugs (Brandrup-Lukanow, 2004; Levers et al, 2011).

The poor quality of care in many rural and peri-urban areas is often the result of shortages of qualified staff, lack of essential supplies (like effective generic drugs), unreliable health data, and insufficient numbers of health facilities (Abeille et al, 1991; Tollman et al, 2007). Given the total lack or inadequacy of many village clinics, health care centres, and small rural hospitals, they are often bypassed by potential clients who decide to seek better care at full-fledged urban hospitals (Bocar, 1989). In an empirical survey of districts and first referral hospitals in sub-Saharan Africa (Van Lerberghe, Van Balen, and Kegels, 1989) it was revealed that most major hospitals in sub-Saharan Africa now commonly provide primary and preventive health care services such as vaccination, growth monitoring, and prenatal care, becoming in effect direct competitors with lower-order facilities. This trend has the negative impact of reducing the enthusiasm for providing and maintaining the lower-order health care facilities at the local level. As rightly observed by the World Bank (1994), the pressure of primary care provision by hospital facilities also distorts health programme development at the community level because it fixes attention on the distressed hospital, creating the impression that further extension and development is required, when the real need is for a very large increase in the number of effectively functioning health centres. The concept of health centre as a necessary part of health care system was well articulated in the 1960s (Fendall, 1963; King, 1966; Roemer 1972 cited in World Bank, 1994). As such, by the 1970s and 1980s, a number of African towns began to witness the location of health centres with community outreach launched with donor assistance in such areas as Danfa in Ghana, Pahou in Benin Republic, Machakos in Kenya, Pikine in Senegal, Kasongo in Zaire and Lagos in Nigeria (see Lehmann et al 2004).

The health centre, sometimes known as health post or dispensary in many African countries, is the first level of contact with the formal health care system. Community participation and especially that of women, in deciding the location and operation of health centres is critical to their success (World Bank, 1994; Tollman et al, 2007). In Nigeria, for instance, data from the NHMIS indicate that in 1999 there were 18,258 registered PHC facilities across the country. Of these, the public sector accounted for 67 percent and the private sector 33 percent (UNICEF, 2001). While it may be fair to state that in terms of lower-order health infrastructures, the country is quite well covered, it is however, argued that the fact that health facilities physically exist, does not necessarily mean that they are functional. This is because besides many being poorly equipped and lacking essential supplies and qualified staff, distortions in the geographical distribution of health infrastructure still left certain communities with difficult physical access to health facilities (UNICEF, 2001; WHO, 2007). In the same vein, the 1999 NDHS reported that 53 percent of the Nigerian population lives within 1km of a health centre, clinic or hospital, and 73 percent within 5km. 'The fact that 47 percent of the population lives within 15km of a town facilitates physical access' (NDHS, 1999 cited in UNICEF, 2001). However, the odd is that one-third of rural communities are accessible by seasonal roads only (NPopC, 2000). The situation is further compounded by logistical problems and the weak referral systems that mean timely access to secondary and tertiary health facilities is much more problematic, especially in the rural areas, than these figures would suggest (UNICEF, 2001).

Thus, the NDHS report demonstrated that 9 percent of the households surveyed did not have access to any health facility (health centre, clinic or hospital), 34 percent had no access to a private doctor and 24 percent had no access to a pharmacy. Geographically, wide zonal variations exist, with the north and central part of the country worse served than the south. The most worrying situation according to the report was in the North East, where 21 percent of households were found to have no access to orthodox health care facilities (UNICEF, 2001).

In terms of standard health facilities, there is a great variation. Federal level hospitals and private sector facilities have higher standards of equipment, personnel and

infrastructure than the lower–order local government or village/community health care facilities. However, the health care system as a whole in Nigeria has been plagued with problems of service quality, including unfriendly staff attitudes to clients, inadequate skills, decaying infrastructure and chronic shortages of essential drugs. An evaluation report on PHC systems/Bamako Initiative project in ten LGAs in Katsina, Kebbi and Oyo States, sponsored by the UK DFID, revealed that many PHC facilities were dilapidated, with little or no evidence of preventive maintenance or repair, and no provision for consultation in privacy ... were not using prescribed diagnostic tools nor sterilizing their instruments or maintaining good standard hygiene and cleanliness, and often they lacked potable water (IDS, 1998).

In a similar study in the south west of Nigeria by Centre for Health Sciences Training, Research and Development (CHESTRAD, 1999), it was reported that many primary health care (PHC) facilities were not providing the range of basic service expected of them. An inquiry into the services available over the previous years (1997/98) in public sector health facilities at the local government level in Ekiti, Ogun, Osun and Oyo States, no service was reported to be available in more than 50 percent of the facilities surveyed. Immunisation was the service most widely available, but even in this case only 45 percent of facilities had been providing immunisation in the preceding years. Primary health care, which is supposed to be the bedrock of the country's healthcare policy, is currently catering for less than 20 percent of the potential patients (Gupta et al, 2004). In addition, while most PHC facilities are in various state of disrepair, with equipment and infrastructure being either absent or obsolete, the referral component is almost non-existent (Abdulraheem, et al, 2012).

In Nigeria, even with the glaring high rate of maternal mortality (Michael, 2008; Okeh, 2009) and low levels of antenatal care and delivery in health facilities, it is pertinent to note that 'Essential Obstetric Care' (EOC) was available in only 994 facilities nationwide. Major disparities was reported on their geographical distribution to the extent that a large and relatively deprived State such as Sokoto, has only five EOC facilities, all located in the State capital, whereas at the opposite extreme, Abuja, with a small and concentrated population has 24 of such facilities. Furthermore, the EOC services available in most of these facilities are of extremely poor quality

(Adeyemi, 2000). In a related study, Odunlami (2000) revealed that in some health centres, equipment such as sphygmomanometers, thermometers, weighing scales, delivery kits, waste bins and mucus extractors were unavailable. Besides many having irregular power supply because they could not maintain a standby generator, some did not even have a source of regular water supply and therefore required their patients to provide their own water.

This is the reality in many African countries where healthcare systems are not providing cost-effective services in ways that would have the greatest impact on the major causes of illness and death. Chronic shortages of drugs, infrequent equipment maintenance, inadequate logistical support, and weak supervision at these lower-order healthcare facilities further contribute to inefficiency. For the households, this means low confidence in the healthcare system and barely marginal improvements in health. For governments, it means that a large share of public expenditure on health is wasted (Smith and Bryant, 1988; Pangu, 1988; World Bank, 2007).

On human resources, attempt have been made to expand primary health care (PHC) by establishing networks of village or community health workers (VHW or CHW) modelled on China's success in using "barefoot doctors" to enlarge the geographic scope of health care. While the VHW programmes are aimed at extending health care to un-served areas, the CHW programmes are principally intended to be catalysts for community development and involve a more holistic approach to health that comprises such tasks as developing safe water supplies (World Bank, 1994; Lehmann et al. 2004). As the World Bank report notes, the VHW/CHW programmes perform relatively well when their role as intermediaries between the community and the health care system is clearly defined, and when they receive viable support from health centres. Few African countries exemplified this scenario such as Lesotho with more than 4,000 trained village health workers being supported by local development councils; Zimbabwe, where more than 6,000 CHWs receive stipends as general development workers; and in Zaire, where CHWs are persons selected by their communities to act as liaisons to the health establishment (Reynders et al. 1992). The contribution of village and community health workers (VHW/CHW) to community involvement in the planning and management of health care services has also been

documented in Kenya, Tanzania, Zaire, and Somalia (Beza et al, 1987; Leneman and Fowkes, 1986:4; Vaughn, Mills, and Smith, 1984; Lehmann et al. 2004).

However, the VHW/CHW programme works ineffectively when their links to the national health system and the communities is weak. This was the case in Burkina Faso, Gambia, Ghana, Niger and Tanzania where community health workers were trained on a large scale in the 1980s to be the principal providers of primary health care but weakened by lack of constant support and supervision (Sauerborn, Nougtara, and Diesfeld 1989). In addition, limited training and health workers lack of modern concept of PHC, gave rise to inadequate intrasectoral and intersectoral coordination and community participation. As a result, most of the services rendered often lack community linkage, and because of this, most community members are unaware of some available services (WHO 2007; Abiondun et al, 2010).

Furthermore, VHW and CHW programmes review in a number of Africa countries revealed that in nine of the ten regions of Ghana, the programme (VHW) failed to achieve its objectives due to problems related to selection, training, abuse of functions, lack of remuneration, shortage of drugs, and supervision. In Gambia, an assessment of the impact of TBA programme on maternal mortality shows that there was no positive impact. In Edo state, Nigeria, it was reported that over 56 percent of traditional birth attendants (TBAs) do not wash their hands during the delivery process and that 20 percent attempt difficult and complicated deliveries rather than refer at-risk mothers to formal sector health facilities. In the extreme, some healers employed harmful practices such as the use of cow urine to manage febrile convulsions in children, contributing substantially to the high levels of mortality among young children ... much of the morbidity and mortality reported in public and private sector health facilities result directly from the unhygienic, over-ambitious and failed interventions of traditional healers and TBAs (UNICEF, 2001).

In Burkina Faso, representative households' survey on maternal child health (MCH) revealed that the presence of village health posts did not increase the use of MCH services. In Niger Republic, the training of more than 13,000 VHWs provided additional access to primary health care in 45 percent of the villages of Niger, but low

quality of care was linked to weak support and supervision. The same conclusion was drawn in other parts of Africa (Knippenberg, Ofosu-Amaah, and Parker 1991). Commenting on the above mixed results, the World Bank study concludes that where there is no clear connection of low-order health programmes to the existing health system, community health workers are often bypassed by household members who consult providers at the first level of the formal system. Their presence, it noted, may even delay access to professional care rather than deter unnecessary consultations (World Bank, 1994). Similarly, a DFID-sponsored evaluation of PHC facilities in Nigeria noted that while many of the PHC facilities had trained staff, attendance to the public suffered from staff absenteeism, sometimes for reasons other than illness or approved leave. Waiting periods for consultations were unbearably long and in many cases consultations were left to untrained assistants and maids (IDS, 2000).

In health care provision, health systems seem to be drifting from one short-term priority to another, increasingly fragmented and without a clear sense of direction. Today, it is clear that left to their own devices, health systems do not gravitate naturally towards the goals of health for all through primary health care as articulated in the Declaration of Alma Ata. Rather, health systems are developing in directions that contribute little to equity and social justice and fail to get the best health outcomes for their money. Emerging from this lack of comprehensive coordination is: health systems that focus disproportionately on a narrow offer and specialised curative care (highly selective “vertical” programmes designed to deal separately with specific health problems); health systems where a command-and-control approach to disease control, focused on short-term results is fragmenting service delivery, and health systems where hands-off or laissez-faire approach to governance has allowed unregulated commercialisation of health to flourish (World Bank, 1994; Macintosh M, 2007; WHO, 2008).

This trend has both positive and negative impacts on the success rate of PHC utilisation. On a positive note, selective PHC programmes have recorded some success in situations where health centres and under-five clinics offer integrated childcare. In Guinea and Benin Republic, for instance, a sustained high level immunisation results in significant reductions in infant and child mortality rates

achieved by integrating maternal and child health care services in health facilities (WHO, 1993). In Zimbabwe, (Cornea, Jolly, and Stewart 1987), Botswana and Cape Verde (UNICEF, 1990a), immunisation coverage was high and significant reductions in infant and child mortality were achieved when immunisation and maternal and child health services became the ongoing responsibility of permanent health facilities.

In contrast, however, the expanded programme of immunisation (EPI) in Togo, Senegal, Ivory Coast, and Congo (UNICEF 1990a) only temporarily increased the number of children vaccinated because vaccinations were not part of the daily responsibilities of health centres. The reason for this shortcoming as noted by the World Bank (1994) report is that vertical programmes are not intended to and cannot provide steady and ongoing care because oftentimes routine health care can be disrupted and national capacity weakened when vertical programmes temporarily or permanently lure away specialists from national health systems.

In Nigeria, specifically, the problem of vertical programme in the delivery of PHC services is most noticeable in the country's National Programme of Immunisation (NPI), which is still clearly under the auspices of the Federal Ministry of Health, with all resources controlled at the centre. Immunisation is not yet effectively integrated into the PHC system due to wider systemic weaknesses in the health sector. 'Consequently, immunisation efforts in Nigeria remain focused on massive, costly mobile campaigns, rather than routine immunisation at fixed PHC facilities' (UNICEF, 2001). The lack of fixed PHC immunisation services had its shortcomings as a child born after a mobile team spends a week in a community to vaccinate children against an immunisable disease may not be immunised until another team comes along six months later. Meanwhile, the child may get the diseases. Evaluating the routine annual FMOH data for BCG and DPT3 coverage as indicators for the trends in immunisation, UNICEF revealed that coverage that peaked in 1990, at 95 percent (BCG) and 65 percent (DPT3) respectively for children aged 0-11 months, relapsed to levels only slightly higher than in the mid-1980s. "By 1999, the DPT3 coverage rate was as low as 19 percent and BCG coverage was even worse, at 13 percent" (UNICEF, 2001: 83). The low coverage was blamed on over-reliance on

high-cost mobile strategies, irregular vaccine supply, sporadic funding and insufficient community mobilisation. As UNICEF succinctly puts it:

> **The fundamental reason was that EPI was overwhelmingly donor funded and donor driven, while depending on massive and costly single-antigen mobile campaigns that were inherently hard to sustain. As a result, EPI went into headlong decline when donor support diminished in the 1990s due to premature optimism about the attainment of UCI (Universal child immunization) and later the freeze on aid to Nigeria by several major donors during the Abacha era (UNICEF, 2001: 83).**

In fact, as reflected in the literature, this aspect of healthcare system suffers a very weak sense of "ownership" on the part of Government (Michael, 2008), and when funding was no longer available, the vehicles and other equipment provided by the donors were poorly maintained, and when they broke down they were neither repaired nor replaced. To complicate issues, the massive increase in the number of LGAs from 159 in 1988 to 774 in 1996 introduced new institutional difficulties. In conclusion, the UNICEF study notes that in the long term, a significant and lasting improvement in the country's performance on immunisation can only be achieved through the reform, institutional strengthening and improved financing of the PHC system itself, with child immunisation being incorporated as one of its principal components (UNICEF, 2001: 84).

Another serious problem facing the sustainability of primary health care in Nigeria is the provision of equipment and logistics. Shortages of the most elementary equipment, poor maintenance of equipment and lack of standardization in equipment procurement affect the provision of local level health facilities throughout the country. A survey of PHC facilities in Ekiti, Ogun, Osun and Oyo State, found that only 59 percent of the facilities had oral thermometers, 41 percent had rectal thermometers and less than 25 percent had diagnostic sets. Meanwhile, these are the basic equipment needed for clinical assessment of a sick child. Furthermore, less than three-quarter of the facilities surveyed had examination couches, measuring tapes or a foetal stethoscope, which are the basic necessities for safe management of pregnancy and delivery. Generally, the survey noted that less than 50 percent of the available equipment was in working order (CHESTRAD, 1999).

In terms of logistics, shortages or the misuse of vehicles posed another constraint on primary health care delivery and is one of the main obstacles to an effective referral system, including the rapid transfer of patients for emergency obstetric care or for other urgent medical attention at secondary level facility (UNICEF, 2001; Adeyemo, 2005). A nationwide survey of PHC facilities (Osibogun, 1996) found that 88 percent of LGAs had some means of transportation for health services, but that usually this was limited to a single vehicle that was rarely used for health service operations; and in most cases poorly maintained or altogether in a state of disrepair (Abdulraheem et al, 2012)

As the overall supply of health services has improved, it becomes more obvious that barriers to access are important factors of inequity: user fees, in particular, are important sources of exclusion from needed care utilisation (WHO, 2008). Since the late 1980s, because of the pressure on public finances and the dwindling budgetary allocations to health (Michael, 2008), fees have been introduced for most services, at primary, secondary and tertiary levels, in an attempt to generate additional funds and curtail the decline of the health system. As UNICEF earlier study noted, "coming at a time of spreading, deepening poverty and the decline of traditional extended family coping mechanisms and in the absence of a national social security system, a great barrier to access has been erected that is insurmountable for many Nigerians" (UNICEF, 2001: 82). As consequences of these policies, the 1999 NDHS findings indicate that only 37 percent of births take place in health facilities; that 30 percent of expectant mothers do not make any ante-natal visits and that 39 percent do not receive any tetanus toxoid vaccinations. Again, only 9 percent of married women use modern contraceptive methods (NPC, 2000) – and these are services supposedly part of the activities of PHC delivery system, though they can also be provided at secondary and tertiary level facilities. Therefore, despite the availability of PHC services, some rural dwellers in Nigeria tend to underuse the services due to perceptions of poor quality and inadequacy of available services (Sule et al., 2008); and in Kenya, perception of unqualified young health care staff by patients (Lawrence, 2004).

To ensure drug supplies and distribution, the Essential Drug Programme (EDP) introduced in the late 1980s and the drug revolving funds set up in line with the 1989

principles enunciated by African health ministers in the Bamako Initiative (BI), were aimed at making sure that health care facilities at all levels (PHC in particular, in the case of the Bamako Initiative) had constant supplies of drugs and maintain standards for drug procurement in the public health services. Even with these efforts it has been noted that since the 1980s, there has been no real sustained improvement in the provision of drugs to government health facilities. In a nationwide study of a small sample of LGA-level PHC facilities in each of the six geo-political zones, Osibogun (1988) found that while 89 percent of the LGAs had essential drugs, only 42 percent had them continuously. In other words, well over half experienced the 'out-of-stock syndrome'. Again several factors have been linked to the shortcomings in supplies of essential drugs. Amongst these, 'exaggerated dependency on donors carried inherent risks of un-sustainability' (Osibogun, 1988). Also in the 1990s, drug procurement and distribution, like the immunisation programme, were hived off to parallel structures outside the health system, such as the Family Support Programme (FSP) and Petroleum Trust Fund (PTF), resulting in mismanagement, waste and theft of resources, and institutional instability. At the local level, many of the district and village development committees set up under the Bamako Initiative to enhance greater community participation in management of the PHC system also faced organisational difficulties. Added to these, poorly qualified PHC staff found it difficult to understand and implement drug pricing guidelines while at the same time substantial quantities of drugs were diverted from the public sector by underpaid staff to supplement their incomes through clandestine sales of drugs (UNICEF, 2001). The reason for these inefficiencies directly results from lack of co-ordinated PHC programme activities at the local level.

The sustainable development of PHC programme is aimed at effectively promoting active community participation and self-reliance in disease control and health promotion. Hence, the Alma-Ata Declaration affirmed that the people have a right and duty to participate individually and collectively in the planning and implementation of their health care system (WHO, 1978). The goal of community participation is to promote equity, improve access and ensure the responsiveness of the health system to locally perceived needs. It was furthermore, aimed at enhancing options for resource mobilization for primary level care, by engaging communities actively in

management (UNICEF, 2001). This strategy became an important new element in the primary health care option adopted in Nigeria in 1987-88. Although the concept of community involvement was endorsed in the National Health Policy, it was never clearly defined how this was to be implemented, or which powers were to be devolved to the community level.

At the village level, for instance, there is supposed to be a Village Development Committee, Chaired by a community elected member for that purpose, and coordinated by wider District Development Committees. However, according to findings by Osibogun et al. (1998), these village and district committees are non-functional in a majority of communities nationwide. In his earlier study, Osibogun (1996) found that, while 87 percent of LGAs had a PHC Management Committee, it met regularly in only 38 percent of LGAs. As a direct consequence of this, and in addition to the failure to devolve real decision-making powers to the local level, LGA health units remained dependent on state and federal government directives (UNICEF, 2001). These institutional deficiencies, along with the funding constraints, are likely to be one of the major reasons for the failure to overcome the problems bedevilling primary health care at the local level. To overcome these failures, it has been argued that a critical first step is to clarify what powers the PHC management Committee and the Village and District Development Committees should exercise. To this end, it has been suggested that basic guidelines accompanied by an appropriate legal framework that would clearly define the scope of local decision-making, including with respect to staff hiring and discipline within the public health services should be specified (Osibogun, 1988; Atim, 1998; Michael, 2008).

Another crucial factor extensively discussed by researchers in respect of location and utilisation of health care services is the question of accessibility and distance. In an attempt to grasp the detailed implication of the inverse relationship between distance and utilisation of health services, the question of accessibility has been tackled applying the concepts of ‘distance decay’ (Shannon, 1969; Joseph and Phillips, 1984; Meade et. al. 1988). According to Joseph and Phillips (1984), the distance decay effects on such health services as hospitals, emergency rooms and primary care facilities presents a more or less gradual fall-off in utilisation rates over distance,

although the steepness of the decline varies considerably from facility to facility in terms of size of facility, range of services offered, transport availability and costs and human resources available. Analysing factors influencing choice of health facilities patronage in the northern part of Oyo State, Egunjobi (1983) found that nearness to hospital was the most significant individual factor accounting for 31.8 percent of utilisation. Thus, he posited that the relative position (location) of facilities and consumers in space affects the degree of awareness, attractiveness and the consequent use of a facility. Also corroborating this view are Walmsley (1978), Stock (1987), and Bennett et al, (2000). The inverse relationship between class and health demonstrates itself not only in terms of morbidity and mortality rates –that is, the lower the class the higher the sickness and death rates – but also in access to health care (Hart, 1971 cited in Watt 1992). Access as a concept includes the social inappropriateness of the health services for certain categories of people, as well as geographical issues of access (Watt, 1992).

However, given the relevance of other factors a note of caution has been signalled on researchers and planners alike not to over-emphasise the influence of accessibility on facility utilisation to the neglect of other factors. These other factors include the 'health service environment' (HSE), the consumers who seek to utilise health services – whether living in urban or rural areas, population density, the availability of health care providers and the type of services offered (Rosenberg and Neil, 1996).

In addition, with specific reference to Africa and the developing world generally, it is important to emphasise the role of traditional medicine as a major source of care to a large number of communities. As defined by WHO (1976), traditional medicine is the sum total of all knowledge and practices, whether explicable or not, used in diagnosis, prevention and elimination of physical, mental or social imbalance and relying exclusively on practical experience and observations handed down from generation to generation, whether verbally or in writing. In this regard, it is important to stress the relevance of traditional medicine to the majority of Nigerians. Most Nigerians, especially those living in rural communities do not have access to orthodox medicine and it is estimated that about 75 percent of the populace still prefer to solve their health problems consulting traditional healers. Where such access exists, the rising

cost of imported medications and other products used for medicines have posed a big problem. Besides, many rural communities have great faith in traditional medicine, particularly the inexplicable aspects as they believe that it is the wisdom of their fore-fathers and it also recognizes their socio-cultural and religious background which orthodox medicine seems to neglect (Adesina, 2008). Recent reports show that more people in the world embrace traditional medicine. In 1996, the WHO found (WHO Policy and Activities in the Field of Traditional Medicine) that in China, the ratio of medical doctors to the population stood at 1:20,000 compared with traditional practitioners ratio of 1:2000, and in Swaziland, these figures are respectively 1:10,000 and 1:100 (WHO, 1996 cited in Adesina, 2008). In china and elsewhere in the Asian countries, people with peculiar ailments, such as stroke, use more of Traditional Chinese Medicine (TCM) than orthodox medicine (Chien-Chang Liao et al., 2012).

The preceding paragraph corroborates Stock's (1983) earlier study that looked beyond accessibility in examining health care behaviour in Hadejia district of north-east Kano State, Nigeria. The study provides a detailed analysis of field data, recording the utilisation of several categories of health facilities such as rural dispensaries, rural health centres, and district hospitals and then examined the range of geographical and demographic factors that influence their utilisation. It also relates the use of these Western-style medical health services to the availability and use of traditional healthcare services, which are available in various forms (Good, 1977; Good et al., 1979 and Stock, 1983). In his findings, Stock (1983) pointed out that the art of traditional health care was popular amongst the communities in the north-east of Kano and in fact, that the tendency is for majority of patients to first consult with traditional healers before the orthodox medicine. Self-medication and purchase of drugs from chemists was high among the rural dwellers and that where distances to health care centres are long, patients easily resort to either self-medication or patronise traditional healers. Furthermore, women were generally found to utilise the orthodox health care services more than men. However, TBAs were seen to be more important and widely utilised in the mother-and-child health services than the orthodox medicine. This broad investigative approach is being applauded for being in accords with contemporary thinking on the provision of medical services in developing countries in

general and particularly in tropical Africa to achieve a maximum satisfaction of needs from limited available resources (Prothero, 1983).

In sum, primary health care (PHC) facilities handle routine and, in some cases very simple health problems that do not require hospital care. As such they are cheaper to provide and are more ubiquitous in distribution than hospitals. They are essentially meant to complement hospitals with which they form a hierarchical system. Ultimately, all health care facilities constitute a hierarchical system and in Nigeria while the teaching hospitals occupy the apex of the hierarchy the dispensaries occupy the bottom. This conceptualisation conforms to the concept of central places recognised in Christaller's central place theory. Like central places, health care facilities can be categorised into higher and lower-order facilities, based on size, the variety of services they offer, their range and threshold, and the calibre of human resources they possess (Okafor, 1987). In the same vein, the utilisation of health care facilities also conforms to the gravity model, such that the greater the distance from facility the lesser the rate of utilisation by the population. Furthermore, the impacts of spatial factors on patients' behaviour are influenced by non-spatial factors, such as people health belief that assumes that the beliefs and attitudes of persons are critical determinants of their health related actions.

Although vast literature exists on the activities of primary health care (PHC) in Nigeria, there is scant discussion on spatial pattern and distance threshold to access PHC facilities. Against this backdrop, this study examined amongst other issues the spatial pattern and actual distances travelled by consumers in Edo State to access PHC facilities. As a first step, the next chapter presents the major diseases in Edo State that underscore the provision of PHC facilities, and for which people travel to utilise PHC services.

CHAPTER THREE

DISEASE PROFILE IN EDO STATE

3.1 Introduction

The major diseases in Edo State can be broadly classed into three groups. The first consists of tropical diseases whose aetiology is enhanced by high temperature and high humidity necessary for the propagation of the disease agent or its vector. In this category are diseases such as malaria, yaws, sleeping sickness, the filarial diseases, bilharzias, guinea worm and yellow fever. The second group of diseases are common in parts of the world where living standards are low and hygiene and sanitation very poor. To a large extent, diseases in this category are confined to the developing world where these conditions are prevalent. In this class are diseases such as typhoid fever, relapsing fever, leprosy, malnutrition and a host of other helminth diseases. Finally, the third group comprises diseases that can afflict mankind in any climate and in any state of prosperity, and have no climatic, socio-economic or cultural barriers and include measles, mumps, chicken pox, tuberculosis, various cardiovascular diseases, venereal diseases, asthma, pneumonia, bronchitis and a number of degenerative diseases (Okafor, 1984). The focus of this chapter is on the most common group of diseases termed 'immediate notifiable diseases' and some other infectious and parasitic diseases that are a major health problem in Edo State.

3.2 Common diseases in Edo State 1997 – 1998

Despite advances against many infectious diseases, Edo State communities have continued, through the last two and a half decades (1980 – 2005), to be infected by major infectious and parasitic diseases. Amongst these diseases are cerebrospinal

meningitis, yellow fever, Lassa fever and currently HIV/AIDS. Others include malaria, guinea worm, schistosomiasis (bilharzias), onchocersiasis (river blindness) and tuberculosis. Malnutrition and its attendant diseases also continued to be a problem not only amongst infants and children but also amongst adults in many areas of the state. It should be noted that the occurrence of these infectious and parasitic diseases justifies the government policy that emphasizes PHC.

Over the years the Edo State medical and statistics department of the State Ministry of Health has been collecting data on the prevalence of various types of diseases among communities as well as the causes of mortality in the state. As expected, however, the figures oftentimes are inaccurate because not all deaths or cases of illness in hospitals and other modern health care institutions are documented and reported in official publications (Onokerhoraye, 1997). In addition, more important cases of ill health and deaths (that are) handled by traditional medical practitioners as well as in some religious institutions are never reported in official documents. Nevertheless, the available data are quite useful in terms of providing information on the causes of morbidity and mortality in the state.

Table 3.1 shows the data on reported cases of some common human diseases in Edo State between 1997 and 1998. The data represent outpatient attendance at the various modern health care facilities in the state. As indicated in the table, the data show that during the period in question malaria was the major cause of morbidity, being responsible for 46.4 percent of the reported cases of illness. In their order of magnitude other diseases affecting considerable proportions of the population during the period are diarrhoea 11.8 percent, accidents 5.0 percent, pneumonia 3.0 percent, malnutrition 1.6 percent and measles 1.3 percent. However, accounting for 30.9 percent of morbidity is the group of diseases simply classified as ‘others’.

In terms of geographical distribution among the local government areas, Orhionmwon (14.33 percent), Oredo (14.28 percent), Uhunmwonde (11.91 percent) and Ovia North-East (10.15 percent) respectively had the highest measles notification and outpatient attendance at the various modern health care facilities for the period in question. Column three shows that malaria was more in Etsako East (12.71 percent)

Table 3.1: Reported Cases for Some Common Diseases in Edo State 1997 - 1998

Age cohort	Measles			Malaria			Diarrhoea			Malnutrition			Accidents			Pneumonia			Others		
	0 - 4Yrs	5 –14Yrs	15Yrs +	0 - 4Yrs	5 –14Yrs	15Yrs +	0 - 4Yrs	5 –14Yrs	15Yrs +	0 - 4Yrs	5 –14Yrs	15Yrs +	0 - 4Yrs	5 –14Yrs	15Yrs +	0 - 4Yrs	5 –14Yrs	15Yrs +	0 - 4Yrs	5 –14Yrs	15Yrs +
Akoko-Edo	41	8	12	5149	1990	2384	2030	585	563	311	104	91	188	203	466	448	144	175	2939	1160	2320
Esan Central	85	19	14	1910	874	1635	575	326	320	79	26	6	47	174	276	49	30	54	884	522	1430
Esan N. East	44	9	9	4088	1124	3258	734	318	377	56	15	7	63	137	386	190	38	52	2215	1967	5129
Esan S. East	49	14	7	539	183	268	165	61	101	16	-	-	17	15	26	41	5	12	23	8	-
Esan West	68	39	14	2514	1029	1432	842	385	340	215	73	55	287	448	467	400	197	233	1385	664	1572
Etsako Cent.	46	19	19	1579	497	2274	436	141	219	74	46	6	39	60	87	180	64	84	245	213	2497
Etsako East	131	68	10	4777	1708	4510	1316	164	442	72	4	3	18	62	154	288	60	149	1283	736	5510
Etsako West	39	17	6	1273	712	1332	309	114	159	21	155	6	36	91	194	67	12	63	343	221	1118
Egor	35	5	-	1006	312	304	318	69	41	20	1	-	3	18	31	25	6	3	256	99	154
Igueben	35	5	8	1552	682	1224	348	174	186	76	15	2	47	53	104	66	15	33	423	351	1020
Ikpoba Okha	42	13	3	2136	422	422	349	44	45	30	12	1	32	22	44	157	20	16	756	243	569
Oredo	289	50	10	1443	293	289	761	89	106	334	61	17	202	109	80	317	58	28	1122	240	253
Orhionmwon	235	51	64	2783	1383	1601	1387	440	258	134	35	20	257	432	298	204	77	71	1618	1136	1202
Ovia N.East	156	73	19	3308	1984	2914	1116	375	427	263	42	20	301	594	833	229	73	116	974	1245	2445
Ovia S. West	87	22	17	1779	599	1337	795	167	265	108	13	7	46	58	136	84	52	20	891	162	733
Owan East	34	6	4	966	530	1308	340	78	93	86	44	12	67	162	221	79	43	38	306	325	1105
Owan West	44	24	34	1329	600	838	476	123	115	67	12	8	39	60	137	83	39	50	523	376	779
Uhunmwonde	106	88	97	2637	1543	2029	991	488	561	151	62	22	160	257	479	294	100	114	1251	900	1921
Cohort Totals	1566	530	347	40768	17350	29359	13288	4141	4648	2113	569	283	1849	2955	4419	3201	1033	1311	17439	10563	27084
State Total			2443			86592			22047			2965			9223			5549			55086
Age Cohort %	**64.1**	**21.7**	**14.2**	**47.1**	**20.0**	**33.9**	**60.3**	**18.7**	**21.0**	**71.3**	**19.2**	**9.5**	**20.1**	**32.0**	**47.9**	**57.7**	**18.6**	**23.6**	**31.6**	**19.2**	**49.2**

Source: State Ministry of Health (SMOH) PHC Unit Benin City. Fieldwork, 2004/2005

than in Akoko-Edo (11.11 percent), Esan North-East (9.78 percent), Ovia North-East (9.48 percent), Uhunmwonde (7.17 percent), Orhionmwon (6.66 percent) and other LGAs.

Furthermore, as indicated in column four, Akoko-Edo (14.41 percent), Orhionmwon (9.46 percent), Uhunmwonde (9.25 percent), Etsako East (8.72 percent) and Ovia North-East (8.71 percent) had more of diarrhoea diseases. Concerning malnutrition, Akoko-Edo also topped the list with 17.07 percent; Oredo came next with 13.89 percent, Esan West had 11.57 percent, Ovia North-East 10.96 percent and Uhunmwonde 7.92 percent amongst others. Accident was very common in all of the LGAs and in fact was even more serious than malnutrition and pneumonia incidence put together. In this regard, of all the 9,223 accident victims in the state, four LGAs including Ovia North-East (18.74 percent), Esan West (13.03 percent), Orhionmwon (10.70 percent) and Uhunmwonde (9.7 percent) had more than fifty percent of the cases. In the case of pneumonia, Esan West (14.96 percent), Akoko-Edo (12.18 percent), Uhunmwonde (9.1 percent), Etsako East (8.9 percent), Ovia North-East (7.5 percent) and Oredo (7.3 percent) had more of the disease among the local government areas. Egor and Esan South-East had the lowest incidence as shown in column seven of Table 3.1.

Finally, as for the unclassified diseases termed ‘others’, Esan North-East (16.12 percent), Etsako East (13.03 percent), Akoko-Edo (11.11 percent), Ovia North-East (9.8 percent), Orhionmwon (9.7 percent) and Uhunmwonde (9.2 percent) et cetera, had the highest incidence. From the foregoing analysis, it is clear that although malaria (86592 cases), diarrhea (22047 cases) and the group of diseases termed ‘others’ (55086 cases) are much more common than other diseases, the effect of all of the diseases on the population is substantial and they are found in all the LGAs. Their distribution amongst the various age cohorts also shows that both the young and old are affected.

The effect of these diseases amongst the various age cohorts shows that the under five years of age (0–4 years) were highly vulnerable to all of these diseases in all of the local government areas of the State (Table 3.1). As indicated in Table 3.2 from

Table 3.2: Percentage distribution of Incidence Cases of Common Diseases on Age Cohorts in Edo State, 1997-1998

Age Cohorts	Measles	Malaria	Diarrhoea	Malnutrition	Accident	Pneumonia	Others
0 – 4 Years	64.1	47.1	60.3	71.3	20.1	57.7	31.6
5 – 14 Years	21.7	20.0	18.7	19.2	32	18.6	19.2
15+ Years	14.2	33.9	21.0	9.5	47.9	23.6	49.2
Total	100	100	100	100	100	100	100

Source: State Ministry of Health (SMOH) PHC Unit Benin City. Fieldwork, 2004/2005

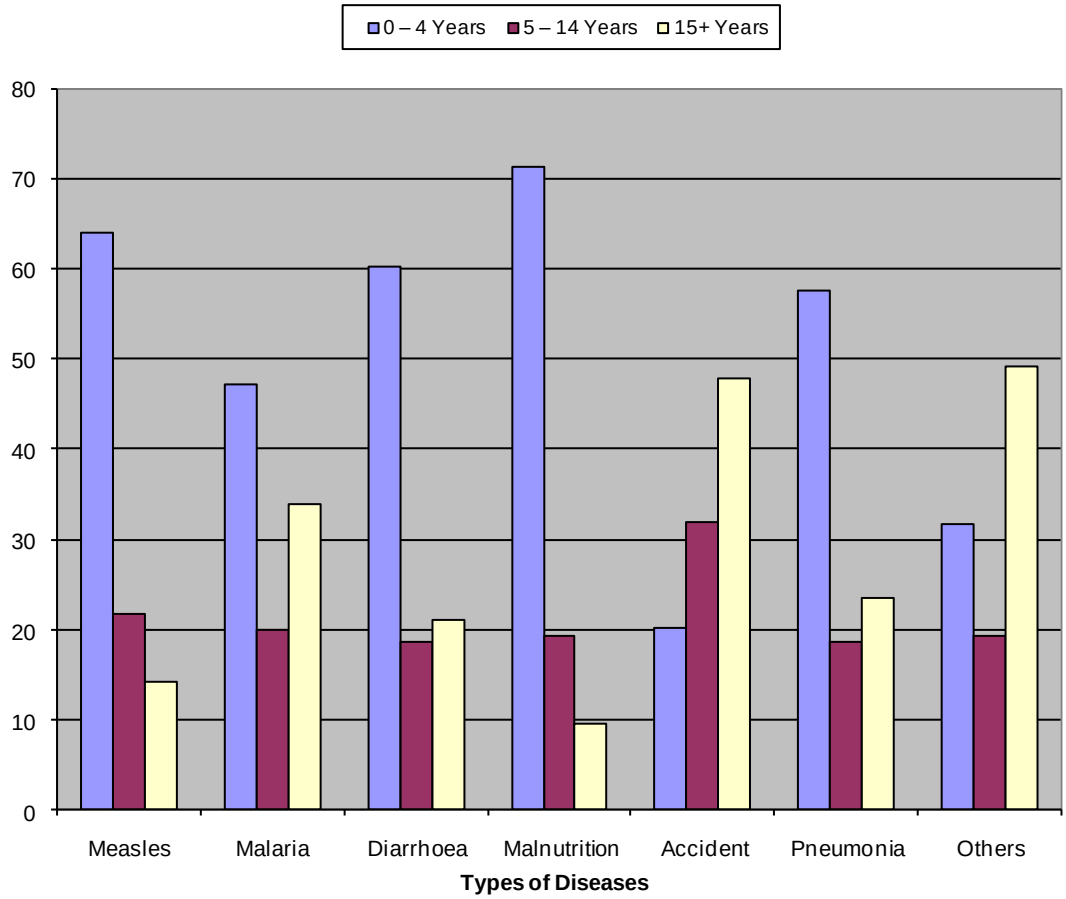

Figure 3.1: percentage distribution of Incidence cases of common diseases on age cohorts in Edo State, 1997 – 1998.

column two (measles) through column eight ('others'), the under five years age cohort accounts for 64.1 percent of measles incidence, 47.1 percent of malaria, 60.3 percent of diarrhoea, 71.3 percent of malnutrition and 57.7 percent of pneumonia cases. In this regard, they were more affected by these diseases than the other age cohorts. Next affected in terms of the proportion of the population is the 15 years and above age cohort. It accounts for 33.9 percent of malaria, 21.0 percent of diarrhoea, 47.9 percent of accident cases, 23.6 percent of pneumonia and 49.2 percent of the group of diseases termed 'others'. Generally, the 5-14 years age cohort had the lowest incidence of diseases as it accounts for 21.7 percent of measles, 20.0 percent of malaria, 18.7 percent of diarrhoea, 19.2 percent of pneumonia and again 19.2 percent of 'other' diseases (Table 3.2). Figure 3.1 shows the bar graph of the various diseases among the age cohorts.

However, although the data on the causes of illness as presented in Table 3.2 are State aggregates based on age cohorts, there are spatial variations in the incidence of these diseases among the LGAs of the state as shown in Table 3.1. This is a reflection of the geographical variation in the distribution of the major ecological factors influencing the incidence of diseases in Edo State. Amongst these ecological factors are topography and the patterns of population and human activities. Thus an examination of the spatial pattern of these diseases in the State shows that measles, malaria, diarrhoea and pneumonia were consistently more prominent in Orhionmwon, Uhunmwonde, Ovia North-East, Akoko-Edo and Etsako East local government areas during the period in question.

3.3 Notifiable diseases in Edo State 2001 - 2005

Table 3.3 presents data on reported cases of notifiable diseases in Edo State from the year 2001 to 2005. Despite the remarkable improvement with regard to provision of health care facilities in the State, the data show that infectious and parasitic diseases are still widespread in the state. As indicated in the table malaria, diarrhoea and dysentery, pneumonia, typhoid and paratyphoid fever, measles, sexually transmitted infections, tuberculosis, chicken pox and cerebrospinal meningitis were the major causes of illness during the period. Among these diseases the case of malaria stands out as it accounts for more than half of the morbidity resulting from all the diseases in Table 3.3.

However, the significance of malaria does not lie in the number of deaths it causes, but in its contribution to morbidity in the population at large. Although the death rates

among malaria patients is less than one per thousand cases, the disease can incapacitate in chronic cases and is normally debilitating even in less serious cases. In fact, as pointed out by Okafor (1984: 2) malaria "may result in individuals never attaining more than 50 to 75 percent of their potential ability in terms of physical and mental work, without necessarily ever causing prolonged or severe illness".

Table 3.3: Major Causes of Morbidity and Mortality from Notifiable Diseases in Edo State, 2001 - 2005

	DISEASES	CASES					DEATHS				
		2001	2002	2003	2004	2005	2001	2002	2003	2004	2005
1	AIDS	254	427	822	404	909	18	2	60	16	35
2	Anthrax human	1	-	-	-	-	-	-	-	-	-
3	Brucellosis human	2	-	12	-	-	-	-	-	-	-
4	CSM	79	165	294	180	319	12	5	12	3	12
5	Chicken pox	215	214	216	14	-	-	1	-	-	-
6	Cholera	2	4	338	2	55	-	-	-	-	1
7	Diarrhea	5100	7193	8799	2949	7158	1	-	1	1	4

8	Dysentery	1471	2134	3113	826	2091	-	-	-	-	1
9	Diphtheria	6	6	26	10	-	-	1	-	-	-
10	Guinea Worm	42	-	8	-	38	-	-	-	-	-
11	Filariasis	9	53	-	3	-	-	-	-	-	-
12	Food poisoning	19	76	22	5	-	-	-	2	-	-
13	Gonorrhea	264	415	406	126	-	-	-	-	-	-
14	Hepatitis	86	111	181	44	85	-	1	1	-	1
15	Lassa fever	3	3	6	17	47	-	-	2	9	11
16	Leprosy	316	24	39	18	43	-	-	-	-	-
17	Louse borne T.F.	1453	-	-	-	-	-	-	-	-	-
18	Malaria	41650	52484	94951	30744	70172	8	84	31	11	84
19	Measles	5006	6304	1056	606	544	-	9	-	4	1
20	Onchocerciasis	7	83	34	2	23	-	-	-	-	-
21	Ophthalmic neonatal	110	37	36	7	-	-	-	-	-	-
22	Pertussis	87	66	826	41	10	-	-	-	-	-
23	Pneumonia	2824	4541	5577	2181	4910	4	-	11	4	10
24	Poliomyelitis	-	36	-	-	-	-	-	-	-	-
25	Rabies human	-	3	-	-	-	-	-	-	-	-
26	Schistosomiasis	40	23	24	3	-	-	-	-	-	-
27	Snake bite	25	12	11	10	-	-	-	-	-	-
28	Syphilis	43	70	35	15	-	-	-	-	-	-
29	STIs	703	682	961	395	1857	-	-	-	-	6
30	Tetanus neonatal	18	10	38	2	46	-	-	-	2	4
31	Tetanus others	115	72	13	1	-	-	-	-	-	-
32	Sleeping sickness	6	-	403	-	-	-	-	-	-	-
33	Tuberculosis	490	843	495	362	579	-	2	-	-	6
34	Typhoid/paratyphoid	2147	5043	3932	1440	-	-	63	-	-	-
35	Viral influenza	133	-	2	-	-	-	-	-	-	-
36	Plague	-	-	22	-	-	-	-	-	-	-
37	Trachoma	-	-	73	-	-	-	-	-	-	-

Source: State Ministry of Health (SMOH) PHC Unit Benin City. Fieldwork, 2004/2005

Table 3.4 illustrates the mortality figures and their *case fatality rates* resulting from notifiable diseases in Edo State. Of all the diseases, *case fatality rate* (cfr) among patients of Lassa fever, cerebrospinal meningitis (CSM) and AIDS is high and more common, varying unusually between 3.7 and 15.1 per 100 cases for CSM and 23.4 and 52.9 percent for Lassa fever and 0.5 and 7.3 per 100 cases for AIDS over the period in question. For the year 2004 and 2005, neonatal tetanus had *case fatality rates* of 100 percent and 8.7 percent respectively. Moreover, though mortality resulting from diphtheria is rare, it had a *case fatality rate* of 16.7 percent in the year 2002. Without doubt therefore, these are killer diseases of the first order; especially as other diseases in the table including malaria had *case fatality rates* of less than two percent.

Table 3.4: Mortality and *case fatality rates* from notifiable diseases in Edo State, 2001 - 2005

DISEASES	2001	cfr*	2002	cfr	2003	cfr	2004	cfr	2005	cfr	Total	% of Total
AIDS	18	7.0	2	0.5	60	7.3	16	4.0	35	3.8	131	23.6
CSM	12	15.1	5	3.0	12	4.1	3	1.7	12	3.8	44	7.9
Cholera	-	-	-	-	-	-	-	-	1	1.8	1	0.2
Diarrhea	1	0.02	-	-	1	0.01	1	0.03	4	0.05	7	1.2

Dysentery	-	-	-	-	-	-	-	-	1	0.05	1	0.2
Diphtheria	-	-	1	16.7	-	-	-	-	-	-	1	0.2
Food poisoning	-	-	-	-	2	9.1	-	-	-	-	2	0.4
Hepatitis	-	-	1	0.9	1	0.5	-	-	1	1.2	3	0.5
Lassa fever	-	-	-	-	2	5.1	9	52.9	11	23.4	22	4.0
Malaria	8	0.02	84	0.16	31	0.03	11	0.03	84	0.12	218	39.2
Measles	-	-	9	0.14	-	-	4	0.66	1	0.18	14	2.5
Pneumonia	4	0.14	-	-	11	0.20	4	0.18	10	0.20	29	5.2
STIs	-	-	-	-	-	-	-	-	6	0.3	6	1.1
Tetanus neonatal	-	-	-	-	-	-	2	100	4	8.7	6	1.1
Tuberculosis	-	-	2	0.24	-	-	-	-	6	1.04	8	1.4
Typhoid/paratyphoid	-	-	63	1.25	-	-	-	-	-	-	63	11.3
Total		43		167		120		50		176	556	100.0

Source: Fieldwork, 2004/2005: State Ministry of Health, PHC Unit Benin City. *cfr means *case fatality rate*.

Case fatality rate expressed as a percentage of: number of persons dying from a particular disease divided by number of persons contracting the disease during a period of time multiplied by *K* **(*K*** being 100**)**, is here calculated based on Table 3.3 and reflected in Table 3.4.

However, although cerebrospinal meningitis and Lassa fever have very high *case fatality rates* each time they occur, they invariably affect relatively small proportions of the population with regard to morbidity when compared with malaria, diarrhoea and dysentery, measles, typhoid, pneumonia and tuberculosis. Furthermore, in terms of the contribution of specific diseases to total mortality over the period in question, the table reveals that out of 556 cases of mortality, malaria accounts for 39.2 percent, AIDS had 23.6 percent and typhoid, 11.3 percent. The rate for Cerebrospinal meningitis was 7.9 percent, pneumonia victims were 5.2 percent and Lassa fever 4.0 percent. Measles with 2.5 percent and tuberculosis 1.4 percent were the other major diseases causing death amongst the population (Table 3.4). From the table it is obvious that apart from AIDS seven of these notifiable diseases were the major cause of mortality in the State.

With regard to mortality among the various age cohorts, Table 3.5 presents seven of the culpable diseases that can be substantially managed by the primary health care facilities. As indicated in the table, malaria (77.4 percent), pneumonia (11.0 percent) and measles (7.5 percent) constitute the main diseases causing death amongst the age cohorts. Generally, more males (62 percent) than females (38 percent) died as a result of these diseases. Specifically, the 15 years and above age cohorts that account for 36.5 percent of the total mortality were slightly more affected than the less than 5 years age cohort with 35.8 percent and the 5-14 years age cohort with 27.7 percent. Nevertheless, mortality resulting from these notifiable diseases appears to substantially affect all the age cohorts. Paradoxically, these are preventable or treatable diseases that can be effectively managed with improved hygiene habits.

In conclusion, the major diseases in Edo State fall into the three main categories identified earlier. These are diseases associated with tropical regions, for example malaria. The second category consists of diseases associated with poverty, illiteracy, ignorance and poor standards of hygiene and sanitation. Finally, we have diseases that are found everywhere, irrespective of level of development, for example measles. Most of these diseases are preventable, and fairly easy to handle. Little wonder therefore that PHC is the foundation of not only the national health policy, but also the health policy of Edo State.

Table 3.5: Mortality Cases from seven most Common Notifiable Diseases in Edo State, 2001 - 2005

SEX	MALE					FEMALE					TOTAL
DISEASES	AGE COHORTS										
	Under 1	1 – 4 yrs	5-14 Yrs	15 Yrs +	TOTAL	Under 1	1 – 4 yrs	5-14 Yrs	15 Yrs +	TOTAL	Grand Total	% of Total
Malaria	18	11	23	34	76	10	9	18	21	58	134	77.4
Chicken pox	1	-	-	-	1	-	-	-	-	1	1	0.6
Measles	8	-	5	-	13	-	-	-	-	13	13	7.5
Pneumonia	8	1	1	4	14	2	1	-	2	5	19	11.0
Diarrhea	2	-	1	-	3	-	-	-	-	-	3	1.7
Tuberculosis	-	-	-	-	-	-	-	-	2	2	2	1.2
Diphtheria	1	-	-	-	1	-	-	-	-	-	1	0.6
Total	28	12	30	38	107	12	10	18	25	65	173	100
% of Total	23.1		17.3	22	62%	12.7		10.4	14.5	38%	100	

Source: Fieldwork, 2004/2005: State Ministry of Health, PHC Unit Benin City.

CHAPTER FOUR

THE SPATIAL PATTERN OF PROVISION OF PHC FACILITIES

4.1 Introduction

The chapter examined the spatial pattern of provision of PHC facilities aimed at treating diseases in the state. The facilities include PHC centres, health care personnel and immunisation resources. The examination became necessary in view of the fact that the physical proximity and availability of these facilities play an important role in their utilisation by the people.

4.2 Organisation of health care facilities in Edo State

The three levels of health care emphasised in the Nigerian constitution and articulated in the National Health Programme and policy exist in Edo State; as in other states of the federation. In the main, PHC is to enable the health authority reach every individual. The entry point of care nearest to the people in Nigeria is the Primary Health Care (PHC) system.

The year 1986 marked the beginning of the Federal Ministry of Health's new strategy for the implementation of PHC using selected LGAs as PHC models and involving the communities in planning, implementation and evaluation of health projects within the localities. Since its creation in 1991, Edo State with eighteen LGAs had PHC activities fairly well distributed amongst the local communities. Following the Federal Government directives of 1992, Local Government Areas became the custodians of PHC facilities in order to achieve adequate grassroots coverage. There were a total number of 330 PHC centres in Edo State by the year 2005 when these data were collected. Given the arrangement of health care delivery in Edo State, serious disease problems are taken care of by hospitals that serve as referrals for the PHC out-patient units. Essentially, PHC units are established to serve the purpose of notification,

prevention and control of diseases. One of such units is the National Programme on Immunisation (NPI), which is a kind of preventive medicine unit in charge of immunisation as well as health education to reduce diseases of all kinds. The 'pre- and post-natal' care unit is responsible for maternal and child health. Also, in Edo State there are special PHC units such as the TB/Leprosy, Schistosomiasis, Guinea worm and Onchocerciasis control units that are jointly funded by both government and NGOs. The existence and activities of these units and other sub-departments of health are meant to control and reduce the incidence of infectious and parasitic diseases on the one hand, and on the other, to bring about a drastic reduction in mortality incident upon these diseases. Figure 4.1 is the organogram of Edo State LGAs Health Departments.

Based on the organogram, the major components of PHC functions are: Maternal and child health including family planning, immunisation and treatment of minor ailments; Essential drug supply including nutrition and food supply; Environmental sanitation and water supply; Monitoring and Evaluation including control of endemic diseases; Health education and women affairs including integrated mental and oral health services in the Nigeria version of PHC programme.

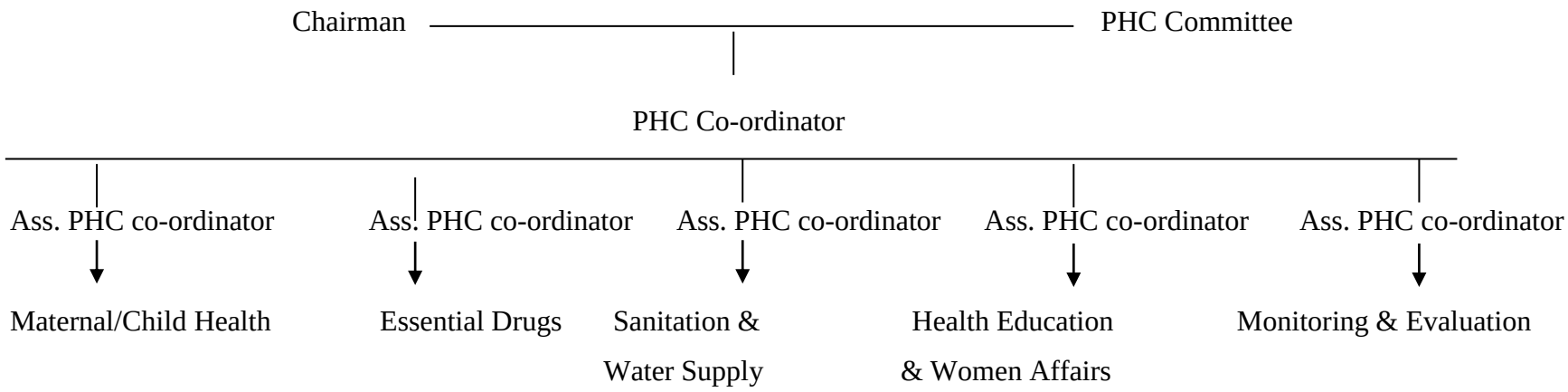

Figure 4.1: Organogram of Edo State LGA Health Departments.

4.3 Population distribution and PHC districts in Edo State

The locational objectives of government policy decision makers often influence the spatial pattern of public facilities. Because they are non-profit oriented in nature the central concern is often utility maximisation or the quest to reach as much population as possible. In Edo State, however, the allocation of health districts per LGA and the number of personnel available per health district may have been influenced by factors other than population size alone. Yet, the cardinal objective with regard to PHC is to serve as large a population as possible, especially the vulnerable grassroots.

Table 4.1 presents data on population distribution per LGA, number of health districts, percentage of health districts per LGA and population per health district. Column two of the table shows the eighteen local government areas of the state with their population in column three. Using the 1991 official population census figures for Nigeria, the state had a total population of 2,172,005 (two million one hundred and seventy-two thousand and five) persons. Of this, seven LGAs comprising Akoko-Edo, Egor, Etsako West, Ikpoba-Okha, Oredo, Orhionmwon and Ovia North-East account for 60.84 percent (1,320,726) of the total State population leaving the other twelve LGAs with a total population of 850,279 persons (39.16 percent).

Table 4.1: Population and Distribution of Health Districts in Edo State, 2005

S/N	LGAs	1991 Population Census *	Distribution of Health Districts	Percentage of total Health districts	Population per Health District
1	Akoko-Edo	123686	10	3.0	12368.6
2	Egor	217912	28	8.3	7782.57
3	Esan Central	78264	10	3.0	7826.4
4	Esan N. East	88687	10	3.0	8868.7
5	Esan S. East	81728	74	21.9	1104.43
6	Esan West	75832	80	23.7	947.9
7	Etsako Central	41081	10	3.0	4108.1
8	Etsako East	97316	10	3.0	9731.6
9	Etsako West	126112	12	3.5	10509.33
10	Igueben	47611	5	1.5	9522.2
11	Ikpoba-Okha	230792	7	2.0	32970.29
12	Oredo	352918	12	3.5	29409.83
13	Orhionmwon	147537	13	3.8	11349
14	Ovia N. East	121769	13	3.8	9366.85
15	Ovia S. West	80692	10	3.0	8069.2
16	Owan East	90927	8	2.4	11365.88
17	Owan West	70374	11	3.2	6397.64
18	Uhunmwonde	98767	15	4.4	6584.47
	State Total	2,172,005	338	100	**6426.05

Source: Fieldwork 2004/5: PHC Unit, State Ministry of Health, Benin City.

** Data on population figures, NPC, Benin City, 2005*

***Average population per health district at the state level in Edo State.*

Column four of Table 4.1 shows the distribution of the 338 health districts among the 18 LGAs of the State. The table further reveals that the health districts were not distributed using population criterion alone. Otherwise, LGAs such as Oredo, Ikpoba-Okha, Orhionmwon and Ovia North-East should have had more of the health districts than they have. The inequitable distribution is all the more evident in column five that shows the percentage of health district per LGA. From the column, it is obvious that three local government areas namely, Esan West (23.7 percent), Esan South-East (21.9 percent) and Egor (8.3 percent) with only 17.3 percent of the state population had more than half (53.85 percent) of the health districts in Edo State. Attempts to explore the rationale for this trend at the Edo State PHC management board revealed that PHC was patterned along the existing health districts pending when distribution according to wards in the local government areas became operational.

Population per health district is shown in column six. The State average is 6426.05 persons per health district. Four local government areas, namely, Esan West (947.9), Esan South-East (1104.43), Etsako Central (4108.1) and Owan West (6397.64) had population per health district lower than the state average. Essentially, the more urbanised LGAs have higher population per health district because they have larger concentrations of population per unit area than the rural LGAs with dispersed populations. As such, Ikpoba-Okha (32,970.29), Oredo (29,409.83), Akoko-Edo (12,368.6), Owan East (11,365.88) and Orhionmwon (11,349) LGAs all have a population of well over 10,000 persons per health district. This trend may be explained by the fact that these LGAs with some urbanised communities also have more of secondary and sometimes tertiary health care facilities than the predominantly rural LGAs. Moreover, given the dispersed population of rural areas, large health district populations would imply very extensive territories. This of course, would create accessibility problem for users. To overcome this problem, there is the creation of more health districts in the rural than in the urban LGAs.

4.4 Distribution of Primary Health Centres in Edo State

Primary health care centres in Edo State comprise health posts, clinics, dispensaries, comprehensive health centres, and maternity centres. Generally speaking, these health care facilities serve as first points of call whenever people fall ill in the rural communities where there are no hospitals. Nurses, midwives and community health workers to a very large extent, manage the primary health centres. The distribution and accessibility of these health services is important in the rural communities.

Table 4.2 indicates that by the year 2005, Edo State had 330 Primary Health Centres distributed among the 18 LGAs of the state. The location of primary health centres in the

state reflects to a large degree the rural composition of each local government area rather than the absolute population size. This is reflected in the fact that urban LGAs such as Oredo (16.2%), Ikpoba-Okha (10.6%) and Egor (10.0%) with larger shares of the total population of the state had fewer PHC facilities, given that they have more higher-order health facilities. As such, while Ikpoba-Okha had 3.3 percent of the total PHC facilities, Oredo and Egor had 2.1 percent each, and each of these LGAs had a population per PHC of between 20,981 and 50,417 persons.

In the State, the average population per primary health centre in the various LGAs varies between 2,934 and 50,417. While the state average stood at 6,582 persons, it is to be noted that in relation to other LGAs, the most advantaged LGA is Etsako Central which accounts for 1.9 percent of the state population with a total of 4.2 percent of the PHC centres and a population per PHC of 2,934 persons. Other local government areas with good access include Orhionmwon with 6.8 percent of the state population, 12.7 percent of the PHC centres and a population per PHC of 3,513 persons. Uhunmwonde with 4.6 percent of the total population of the state had 7.9 percent of the PHC facilities and a population per PHC of 3,779 persons. Akoko-Edo came next with 5.7 percent of the total population of the State, 9.7 percent of the PHC centres and a population per PHC of 3,865 persons.

As earlier noted, it is obvious from Table 4.2 that the most PHC deficient LGAs are Oredo with a population per PHC facility of 50,417 persons, Egor 31,130 persons, Ikpoba-Okha 20,981 persons and Owan West 8,797 persons. However, it is pertinent to point out that these LGAs especially Oredo, Egor and Ikpoba-Okha are some of the most urbanised local government areas where majority of the secondary and tertiary health care institutions that also provide primary care services are located. This may explain why these *lower-order* healthcare facilities are not widely distributed here as they are in the more rural Local Government Areas.

Table 4.2: Population and distribution of PHC centres in Edo State, 2005

S/N	LGAs	1991 Population Census *	% of Total Population	PHC Centres	% of Total PHC	Population per PHC
1	Akoko-Edo	123686	5.7	32	9.7	3865
2	Egor	217912	10.0	7	2.1	31130
3	Esan Central	78264	3.6	11	3.3	7115
4	Esan N. East	88687	4.1	14	4.2	6335
5	Esan S. East	81728	3.8	17	5.2	4808

6	Esan West	75832	3.5	18	5.5	4213
7	Etsako Central	41081	1.9	14	4.2	2934
8	Etsako East	97316	4.5	17	5.2	5724
9	Etsako West	126112	5.8	18	5.5	7006
10	Igueben	47611	2.2	7	2.1	6802
11	Ikpoba-Okha	230792	10.6	11	3.3	20981
12	Oredo	352918	16.2	7	2.1	50417
13	Orhionmwon	147537	6.8	42	12.7	3513
14	Ovia N. East	121769	5.6	31	9.4	3928
15	Ovia S. West	80692	3.7	20	6.1	4035
16	Owan East	90927	4.2	30	9.1	3031
17	Owan West	70374	3.2	8	2.4	8797
18	Uhunmwonde	98767	4.6	26	7.9	3799
	State Total	2,172,005	100	330	100	**6582

Source: Fieldwork 2004/5: PHC Unit, State Ministry of Health, Benin City.

** Data on population figures: NPC, Benin City, 2005.*

*** Average population per PHC at the state level in Edo State*

Figure 4.2 shows the distribution of primary health care (PHC) facilities per LGA in Edo State as at 2005. In the map, each dot represents a single PHC facility. Four LGAs, namely, Egor, Igueben, Oredo and Owan West fall within the LGAs having between seven and eight PHC centres each. Nine of the LGAs including Esan Central with eleven PHC centres and Ovia South-West with twenty centres, etcetera, fall within the LGAs that have between eleven and twenty PHC centres each. Five LGAs, namely, Uhunmwonde (26 centres), Owan East (30), Ovia North-East (31), Akoko-Edo (32) and Orhionmwon (42) had between twenty-six and forty-two PHC centres each.

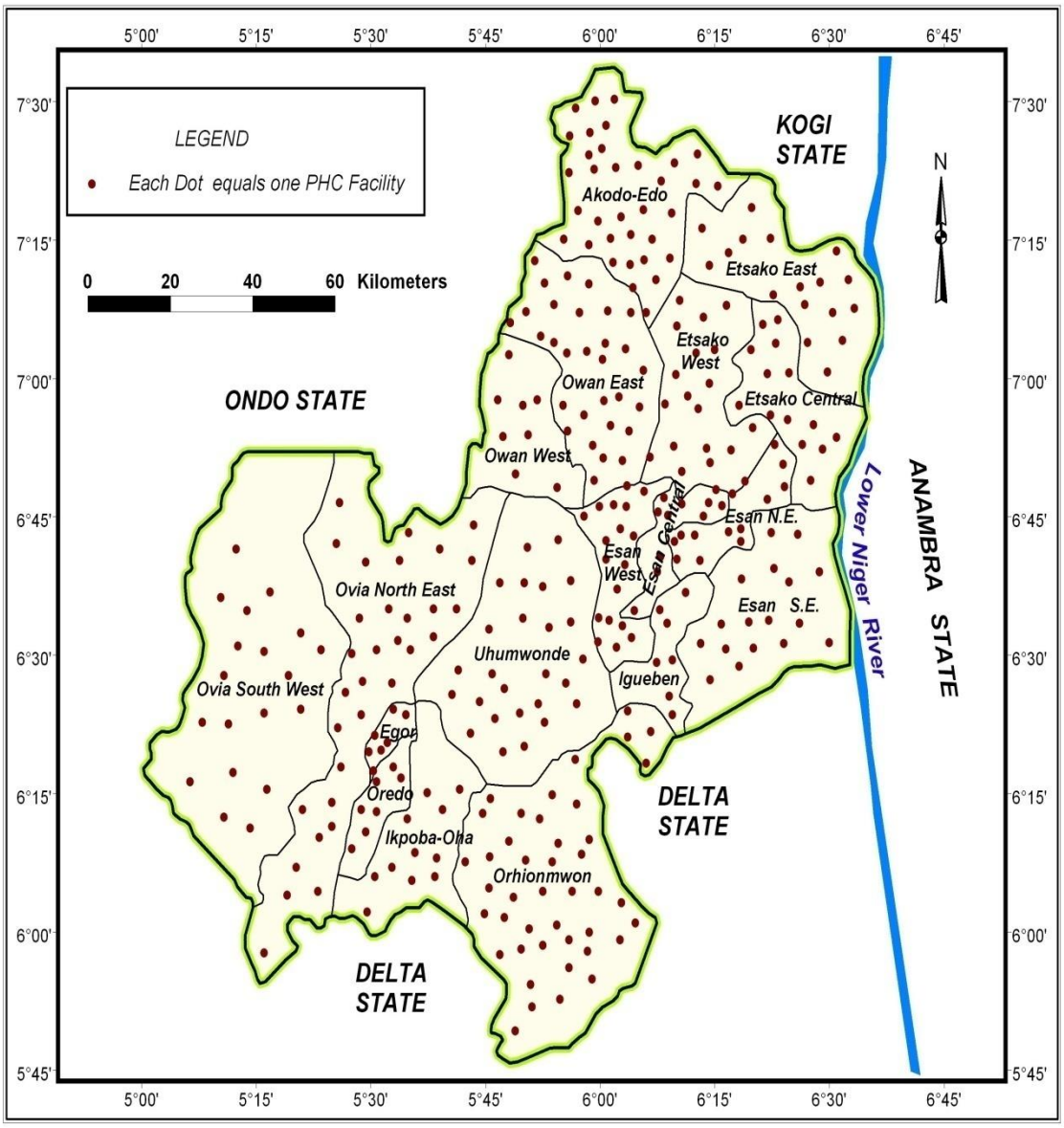

Figure 4.2: Spatial Distribution of PHC Facilities in Edo State

Figure 4.3 presents the spatial distribution of PHC as well as some of the secondary and tertiary healthcare facilities that serve as referrals to PHC centres in the local government areas of the state. The distribution of primary health care (PHC) facilities along with the urban and rural populations per Local Government Area is presented in Table 4.3.

However, it is not certain whether it is the population size of the urban or rural communities per Local Government Area or the overall population of each Local Government Area that influenced the spatial distribution of these *lower-order* health care facilities. To ascertain this, the hypothesis which states that: '*There is a positive correlation between the size of the rural population of LGAs and the number of PHC facilities per LGA'* was tested using the Pearson correlation analysis.

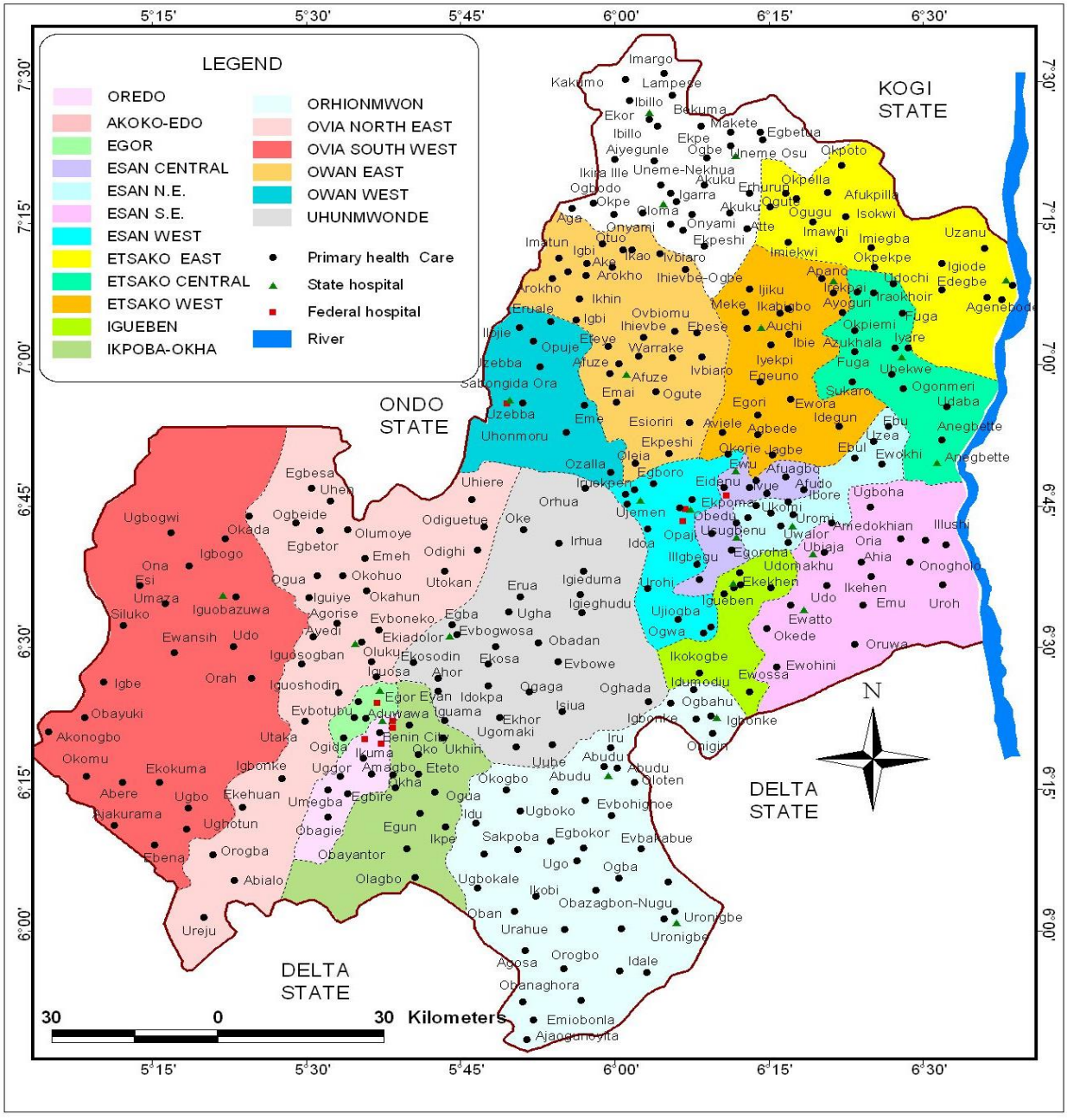

Figure 4.3: Spatial Patterns of PHC and Referral Health Facilities in Edo State

Table 4.3: Population size of urban and rural communities per LGA and the number of PHC facilities in Edo State

S/N	LGAs	1991 Population Total	Urban Population	Rural Population	Number of communities	Number of PHC facilities
1	Akoko-Edo	123686	22857	100829	88	32
2	Egor	217912	207833	10079	7	7
3	Esan Central	78264	-	78264	28	11
4	Esan N. East	88687	73368	15319	15	14
5	Esan S. East	81728	20363	61365	76	17
6	Esan West	75832	40382	35450	21	18
7	Etsako Central	41081	-	41081	35	14
8	Etsako East	97316	-	97316	67	17
9	Etsako West	126112	42610	83502	51	18
10	Igueben	47611	-	47611	16	7
11	Ikpoba-Okha	230792	184833	45959	61	11
12	Oredo	352918	350051	2867	16	7
13	Orhionmwon	147537	24556	122981	133	42
14	Ovia N. East	121769	-	121769	186	31
15	Ovia S. West	80692	-	80692	128	20
16	Owan East	90927	-	90927	44	8
17	Owan West	70374	-	70374	77	30

18	Uhunmwonde	98767	-	98767	167	26
	State Total	2,172,005	966853	1205152	1216	330

Source: Fieldwork 2005: NPC Benin City

The result of the Pearson correlations (Table 4.4) show that there is a high positive and significant correlation between the size of the rural population of LGAs and the number of PHC facilities per LGA (*r = .713, P = .001*) at the *0.01* level. On the other hand, there is a significant high negative correlation between the urban population of each LGA and the number of PHC facilities (*r = -.678, P = 0.045*) at the *0.05* level. Furthermore, at the local government level there is an insignificant negative relationship between the total population of each local government area (r = -.200, P = .426) and the number of PHC facilities. In the first instance, this means that the larger the rural population of LGAs the more the number of PHC facilities.

In other words, the total population of a local government area is not a very important criterion for the spatial distribution of PHC facilities. Rather the size of the rural population of LGAs is a far more important criterion for the spatial distribution of PHC facilities than the urban and total population of the LGAs. In summary, these results signify that in accord with the central place theory, PHC facilities that are *lower-order* facilities are more in *lower-order* settlements.

Table 4.4: Results of correlation analysis between populations and the distribution of PHC facilities

		Population	Urban	Rural	Facilities
Population	Pearson Correlation	1.000			
	Sig (2-tailed)	-			
Urban	Pearson Correlation	.943**	1.000		
	Sig (2-tailed)	.000	-		
Rural	Pearson Correlation	-.366	-695*	1.000	
	Sig (2-tailed)	.136	.038	-	
Facilities	Pearson Correlation	-200	-.678*	.713**	1.000
	Sig (2-tailed)	.426	.045	.001	-

4.5 Quadrant Count Analysis of Spatial Pattern of PHC facilities

Two main methods that provide quantitative descriptions of point patterns are identified in the literature. These are the Quadrant Count Analysis (QCA) and the Nearest Neighbour Statistic (NNS). For the purpose of this study, however, the quadrant count analysis (QCA) is used. The spatial distribution of PHC facilities by quadrant count is shown in Figure 4.4.

Quadrant Count Analysis (QCA) is a method which assumes that the spatial distribution of points is random in the sense that every quadrant has an equal chance of receiving a point. Therefore, the probability of P (X= x) of finding *x* points in a specific quadrant is given by the Poisson probability function of the form:

$$P(X = x) = P(X - x) = e^{-\lambda} \quad \lambda x/x_{i,} \quad X = 0, 1, 2, 3, 4 \quad \ldots n \quad (4.1)$$

To operationalize the equation, the function becomes denoted as:

$$e^{-m}; m.e^{-m}; m^{2e-m}/2!; m^{3.e-m}/3!; m^{4e.-m}/4! \ldots\ldots n \quad (4.2)$$

for probabilities of finding 0, 1, 2, 3, 4…, points in a quadrant respectively. Next, Chi-square statistics and the variance/mean ratio are used to ascertain the reliability of the model and determine the spatial pattern of PHC facilities respectively.

Interpretation of results: In a completely random pattern the value of variance/mean ratio (VMR) is a unit (1). A ratio greater than 1 indicates a clustered pattern, while a ratio less than 1 is indicative of regular pattern of distribution.

This technique is used to enable us test the hypothesis that "*There is a random distribution of PHC facilities in Edo State".*

The X^2 table value of 26.296 is less than the calculated X^2 value of 3522.73 with k-1 degrees of freedom (17-1 = 16) and is statistically significant at the 0.05% critical level. Therefore, there is a significant difference between the observed and expected number of PHC facilities in Edo state ($P < 0.05$). To establish the spatial pattern of distribution the variance/mean ratio was computed as shown in Appendix B. Given the calculated variance/mean ratio of 5.0, the results indicate that the spatial pattern of PHC facilities in Edo State is clustered. This finding suggests that the central places providing primary health care (PHC) services are not distributed over space in such a way as to fully cover every settlement. Thus, we reject the null hypothesis and conclude that there are particular areas in Edo State where the distribution of PHC facilities are highly clustered.

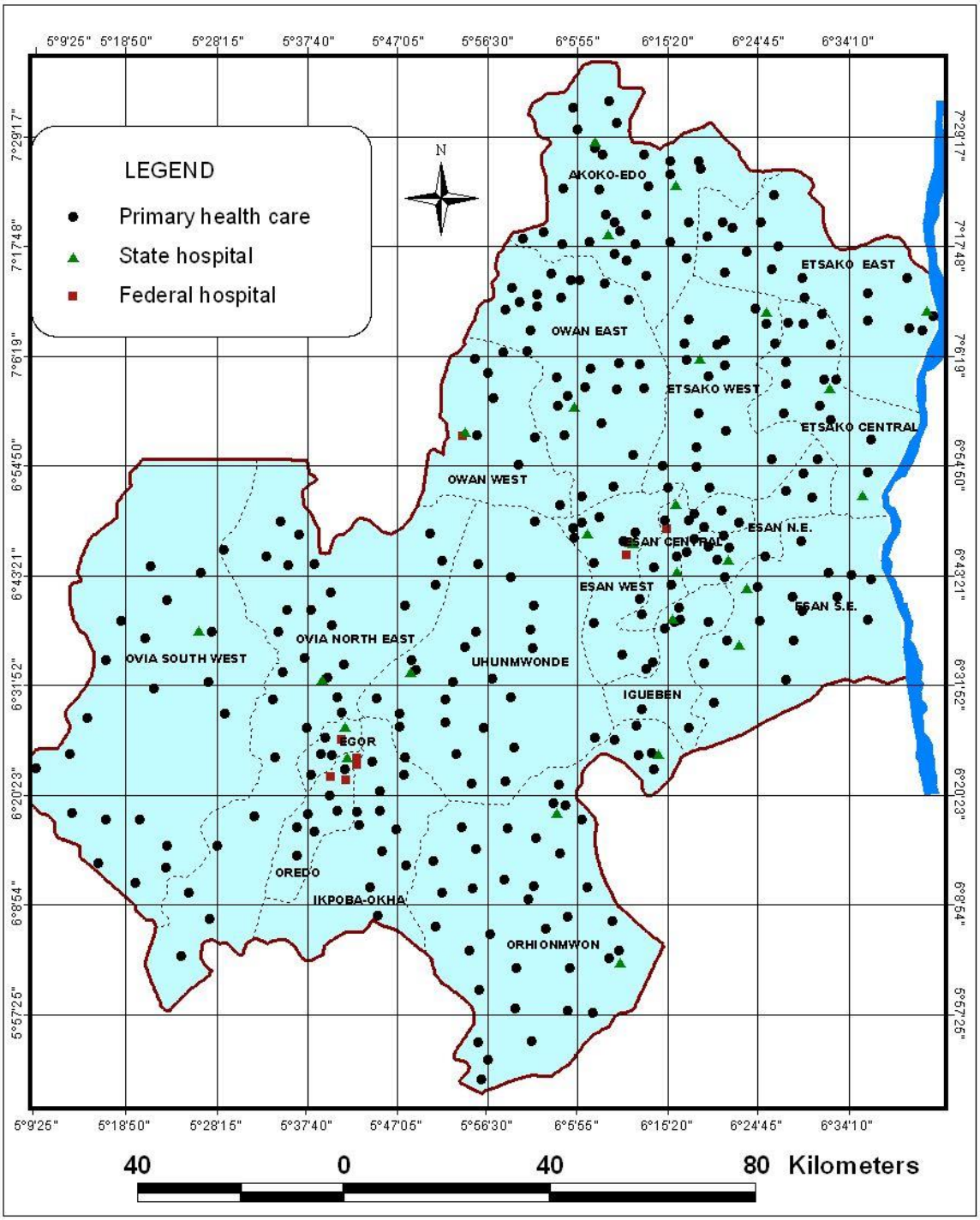

Figure 4.4: The spatial distribution of PHC facilities by quadrant

4.6 Distribution of PHC personnel in Edo State

The primary health centres are largely managed by nurses, midwives and community health workers. Table 4.5 depicts the population pattern and the distribution of Public Health Nursing Officers, Staff Nurses and Staff Midwives in Edo State. There were 287 nurses, staff nurses and staff midwives at the various PHC centres in the State. However, as evident from the table, while the state population per health personnel stood at 7568 persons, none of the LGAs met the WHO requirement of 1000 population per nurse or midwife. This is reflected in the fact that the population per nurse/midwife in the various LGAs varies between 3,031 and 50,417. Again, just like the case of PHC distribution in Section 4.4, LGAs with large population per nurse/midwife include Oredo (50,417 persons per nurse), Egor (24,212 persons) and Orhionmwon (10,538 persons).

Nevertheless, the few LGAs with less than 5000 persons per nurse and midwife include Owan East (3031 persons), Esan South-East (3553 persons), Esan North-East (4223 persons), Esan West (4740 persons), Igueben (4761 persons) and Esan Central (4892 persons). Given that these six LGAs with only 21.4 percent of the total population of the State, share 40.5 percent of the nurses and midwives, it can be concluded that other factors than population size were used for the distribution of these categories of health personnel.

Table 4.5: Distribution of Public Health Nursing Officers, Staff Nurses and Midwives in Edo State, 2005

S/N	LGAs	1991 Population Census *	% of Total Population	Number of PHNO, Staff Nurse and Midwives	% of Total PHNO, Staff Nurse and Midwives	Population per PHNO, Staff Nurse &. Midwives
1	Akoko-Edo	123686	5.7	14	4.9	8835
2	Egor	217912	10.0	9	3.1	24212
3	Esan Central	78264	3.6	16	5.6	4892
4	Esan N. East	88687	4.1	21	7.3	4223
5	Esan S. East	81728	3.8	23	8.0	3553
6	Esan West	75832	3.5	16	5.6	4740
7	Etsako Central	41081	1.9	7	2.4	5869
8	Etsako East	97316	4.5	16	5.6	6082
9	Etsako West	126112	5.8	20	7.0	6306
10	Igueben	47611	2.2	10	3.5	4761
11	Ikpoba-Okha	230792	10.6	26	9.1	8877
12	Oredo	352918	16.2	7	2.4	50417
13	Orhionmwon	147537	6.8	14	4.9	10538
14	Ovia N. East	121769	5.6	22	7.7	5535
15	Ovia S. West	80692	3.7	13	4.5	6207
16	Owan East	90927	4.2	30	10.5	3031
17	Owan West	70374	3.2	11	3.8	6398
18	Uhunmwonde	98767	4.6	12	4.1	8231
	State Total	2,172,005	100	287	100.0	**7568

Source: Fieldwork 2004/5: PHC Unit, State Ministry of Health, Benin City.

** Data on population figures, NPC, Benin City, 2005*

*** Average State population per health personnel*

Table 4.6 presents the distribution of 441 community health officers and community health extension workers (CHO/CHEW) among the eighteen local government areas of Edo State. Although six of the LGAs, Orhionmwon (43), Ovia North-East (41), Ikpoba-Okha (39), Uhunmwonde and Oredo (34 each), and Akoko-Edo (32), with 49.5 percent of the total population of the state had more than half or 50.67 percent of community health officers and community health extension workers, the distribution could be said to reflect population size as local government areas with large population had more of these personnel than LGAs with small population.

The average population per CHO/CHEW in Edo State was 4,925 persons. There was a wide variation among the LGAs ranging from 1,984 to 13,621 persons. In this instance, some of the better served LGAs include Igueben with 2.2 percent of the state population, 5.4 percent of CHO/CHEW and a population of 1,984 persons per personnel; Uhunmwonde with 4.6 percent of the total population of the state had 7.7 percent of CHO/CHEW and a population of 2,905 persons per personnel. Etsako Central had 1.9 percent of the state population, 3.2 percent of CHO/CHEWS and a population of 2,934 persons per personnel.

As indicated in Table 4.6, the worst served LGAs with regard to population per community health officer and extension worker include Esan South-East with 3.8 percent of the total population of the state and only 1.4 percent of these personnel and a population of 13,621 persons per CHO/CHEW; Oredo had a population of 10,380 persons per CHO/CHEW, Egor 9080 persons per CHO/CHEW, and Etsako East a population of 8847 persons per CHO/CHEW. Given this trend, Esan South-East and Etsako East particularly, and Esan North-East and Etsako West generally, are therefore largely disadvantaged in terms of community's access to health workers. Essentially, these categories of health workers are expected to be involved in preventive health care delivery mostly in the rural areas. But Oredo and Egor may not be said to be so disadvantaged because they have large urban centres that have *higher-order* facilities that also provide these *lower-order* services for their populations.

Table 4.6: Distribution of Community Health Officers and Community Health Extension Workers in Edo State, 2005

S/N	LGAs	1991 Population Census *	% of Total Populati	No. of CHO/CHEW	% of Total CHO/CHEW	Population per CHO/CHE

			on			W
1	Akoko-Edo	123686	5.7	32	7.3	3865
2	Egor	217912	10.0	24	5.4	9080
3	Esan Central	78264	3.6	21	4.8	3727
4	Esan N. East	88687	4.1	14	3.2	6335
5	Esan S. East	81728	3.8	6	1.4	13621
6	Esan West	75832	3.5	18	4.1	4213
7	Etsako C.	41081	1.9	14	3.2	2934
8	Etsako East	97316	4.5	11	2.5	8847
9	Etsako West	126112	5.8	23	5.2	5483
10	Igueben	47611	2.2	24	5.4	1984
11	Ikpoba-Okha	230792	10.6	39	8.8	5918
12	Oredo	352918	16.2	34	7.7	10380
13	Orhionmwon	147537	6.8	43	9.8	3431
14	Ovia N. East	121769	5.6	41	9.3	2970
15	Ovia S. West	80692	3.7	20	4.5	4035
16	Owan East	90927	4.2	28	6.3	3247
17	Owan West	70374	3.2	15	3.4	4692
18	Uhunmwonde	98767	4.6	34	7.7	2905
	State Total	2,172,005	100	441	100	**4925

Source: Fieldwork 2004/5: PHC Unit, State Ministry of Health, Benin City.

** Data on population figures, NPC, Benin City, 2005*

*** Average State population per CHO/CHEW*

The distribution of health superintendents and ward orderlies in Edo State is presented in Table 4.7. These categories of health workers are essentially rural based and are largely responsible for the co-ordination of rural community health care delivery. As indicated in

the table, the distribution of these health workers significantly favoured those LGAs with large concentrations of rural communities.

The population per health superintendent and ward orderlies (HS/WO) at the state level is 4161. The general variation of population per HS/WO at the local government level is between 1,467 and 70,584 persons. In this regard, some of the LGAs where patients have improved access to these personnel include, Etsako Central with 1.9 percent of the total population of the state, 5.4 percent of health superintendent and ward orderlies and a population of 1467 persons per HS/WO. Owan West came next with 3.2 percent of the total population of the state, 7.5 percent of health superintendent and ward orderlies and a population of 1804 persons per HS/WO. Also in this group is Esan South-East with 3.8 percent of the total population of the state, 8.2 percent of HS/WO and a population of 1,901 persons per HS/WO.

Given the emphasis on primary health care (PHC) as a *lower-order* health services aimed at the rural communities, it is not surprising that the urban LGAs are the least served with these categories of health personnel. Amongst these urban LGAs are Oredo with 16.2 percent of the total population of the state having only 0.9 percent of health superintendents and ward orderlies and a population of 70584 persons per HS/WO; Egor had 10 percent of the total population of the state, 1.3 percent of health superintendents and ward orderlies and a population of 31310 persons per HS/WO. Ikpoba-Okha had 10.6 percent of the total population of the state, 4.2 percent of the personnel and a population per HS/WO of 10491 persons as shown in Table 4.6. In summary, the distribution of various categories of personnel and the number of PHC facilities is more a function of the size of the rural settlement populations per LGA than the absolute population of each LGA.

Table 4.7: Distribution of Health Superintendents / Ward Orderlies in Edo State, 2005

LGAs	1991 Population Census *	% of Total Population	Health Superint-endent	Ward Orderlies	Total HS/WO	Population per HS/WO
Akoko-Edo	123686	5.7	1	26	27	4581

Egor	217912	10.0	-	7	7	31130
Esan Central	78264	3.6	-	22	22	3557
Esan N. East	88687	4.1	2	13	15	5912
Esan S. East	81728	3.8	-	43	43	1901
Esan West	75832	3.5	-	27	27	2809
Etsako Central	41081	1.9	6	22	28	1467
Etsako East	97316	4.5	7	13	20	4866
Etsako West	126112	5.8	8	32	40	3153
Igueben	47611	2.2	-	26	26	1831
Ikpoba-Okha	230792	10.6	-	22	22	10491
Oredo	352918	16.2	-	5	5	70584
Orhionmwon	147537	6.8	13	52	65	2270
Ovia N. East	121769	5.6	-	25	25	4871
Ovia S. West	80692	3.7	9	19	28	2882
Owan East	90927	4.2	12	27	39	2331
Owan West	70374	3.2	15	24	39	1804
Uhunmwonde	98767	4.6	7	37	44	2245
State Total	2,172,005	100	80	442	522	**4161

Source: Fieldwork 2004/5: PHC Unit, State Ministry of Health, Benin City

** Data on population figures, NPC, Benin City, 2005*

*** Average State population per HS/WO*

4.7 PHC Immunisation (NPI) Services

Immunisation is carried out against major infectious diseases like yellow fever, cholera, schistosomiasis, measles and hepatitis B1, et cetera. The Expanded or lately National Programme on Immunisation (E/NPI) is the most popular and recognised sector of the PHC system. However, emphasis has been placed on immunisation against the six major

childhood killer diseases which include poliomyelitis, measles, diphtheria, tetanus, whooping cough and tuberculosis. These were specifically identified and built into the PHC programme.

In Edo State, there is daily immunisation of children against these diseases at the various PHC centres while some special days are also set at intervals for intensive coverage of children. These special days are very important as they enable those who could not be immunised at the health centres to do so. It is the most effective means of covering a wider population if appropriately timed, as immunisation teams move from house to house or school to school or with the assistance of community leaders meet children at the village or town square and at times at the market square or popular playground.

Table 4.8 gives the summary of the projected targets and the outcome of children immunisation 'antigen by antigen' between January 1994 and December 1996 when the state had fourteen LGAs, and between January 1999 and December 2003 when the state had eighteen LGAs. The first column of the table depicts the two different time periods covered. Column two shows the target population of zero to eleven months old and reveals almost near constant increase of additional three thousand plus population annually. Although there were no data for the years 1997 and 1998 – as these were not available, - the trend from 1994 to 1996 and that of 1999 to 2003 confirmed this progressive increment. Over the years, UNICEF has had to set benchmarks for PHC programme especially for immunisation against the six childhood killer diseases. The UNICEF's PHC 'end of century goals', endorsed by the signatory governments following the 1990 world summit for children that was reaffirmed at the *'State of the World's Children'* summit in March 1995 at Copenhagen, Denmark, are here stated to enable some comparison of our data with the expected goals.

Table 4.8: Projected Population Targets and the Actual number of Children Immunised in Edo State, 1994 - 96 and 1999 - 2003

1994-96	POP 0-11	BCG *	%	OPV 3	%	DPT3*	%	Measles vaccine	%	Yellow fever	%	HB V 1	%

1999-03	months												
1994	94413	38060	40	30549	32	30892	33	30269	32	-	-	-	-
1995	97996	39971	40.7	39247	40	43268	44. 1	43191	44	-	-	-	-
1996	101131	51815	51.2	33536	33. 2	31519	31. 2	35703	35. 3	-	-	-	-
Mean %	293540	129846	44.0	103332	35. 1	105679	36. 1	109163	37. 1	-	-	-	-
1999	110045	37195	33.8	45296	41. 2	45093	40. 9	41796	38	-	-	-	-
2000	113550	68787	61	55145	49	51950	46	57902	51	-	-	-	-
2001	116749	57597	49.3	49012	42	49229	42	47531	41	-	-	-	-
2002	120249	91275	76	47493	39. 5	45952	38. 2	45022	37. 4	17960	15	-	-
2003	123862	50219	41	37625	30	16350	13. 2	34348	27	17869	14	16447	14
Mean %	584455	305073	52.2	234571	40. 3	208574	36.1	226599	38.9	35829	6.1	16447	2.81
Mean of means %	877995	54365	48.1	42238	37.7	39286	36.1	4197025	38.0	17915	6.1	1647	2.81

Source: Fieldwork 2004/5: PHC Unit, State Ministry of Health, Benin City.
** Records show often-short supply of BCG, DPT3 & some other vaccines in the state.

- That by the year 2000 there should be 90% immunisation coverage among under one year of age, eradication of polio, the elimination of neo-natal tetanus, 90% reduction in measles cases, and 95% reduction in measles death – compared to pre-immunisation levels.

- ❖ Secondly is the halving of child deaths caused by diarrhoeal diseases, a one third reduction in child deaths from acute respiratory infections, a halving of 1990 maternal mortality and malnutrition rates and the provision of clean water and safe sanitation for all communities' (UNICEF, 1995).

Examining our data in relation to these goals, it is clear that the level of immunisation coverage for the six childhood killer diseases and vaccination for TT2 for women in Edo State is still a far cry from the UNICEF target. Vaccination against tuberculosis (BCG) for instance, remained well below 50 percent for much of the periods covered and stood at 48.1 percent for both periods but was 43.97 percent and 52.22 percent respectively for 1994 to 1996 and 1999 to 2003 (Table 4.8, columns 3 & 4). This means that less than half of the less than one-year-old population in Edo State were reached with BCG vaccination. Furthermore, even the 80 percent target envisaged in Edo State as against the 90 percent UNICEF goal was not achieved. In fact, records show consistent complaint over the years of short supply of some vaccines but most especially BCG and DPT3 vaccines. DPT3, which is a vaccination against Diphtheria, Pertussis and Tetanus, is a marker and an indicator for immunisation coverage. This, as shown in columns 7 & 8 of Table 4.7, has been low over the years hitting the bottom at 13.2 percent population coverage in the year 2003. The average for the two periods was 36.1 percent. This, again, is a remarkably low coverage compared with UNICEF/WHO target of 90 percent.

Polio is one disease that has remained endemic and made Nigeria a reference point by WHO and social epidemiologists in the recent times. It is a disease meant to be eliminated all over the world but has remained endemic. In fact, a recent WHO report states that Nigeria accounts for more than 77 percent of cases of polio in the world and accounted for 84 percent of Africa's total in the year 2004 with 785 confirmed cases. Of these, Kano led the pack with 175 cases as a result of the controversies that mired the national efforts in the northern states (The Guardian, February 12, 2005: 3). In Table 4.7, columns five and six show the population and the percentage of polio coverage over the years. The period 1994 to 1996 had a value of 35.07 percent when the state had 14 LGAs and then reached 40.34 percent from 1999 to 2003 when the state had 18 LGAs. The average for both periods was 37.70 percent vaccination coverage of under-one year of age in Edo State.

The coverage for measles, yellow fever and hepatitis B1 is also pathetic. Measles intervention has been programmed the world over to hit a target of 90 percent coverage and as much as 95 percent reduction of its mortality. But as shown in columns nine and ten of Table 4.8, the coverage has been progressively dwindling with an all time low of 27 percent coverage in the year 2003. The period 1994 to 1996 had 37.1 percent coverage, while it was 38.88 percent from 1999 to 2003. Total coverage in both periods stood at only 37.99 percent in the state. These figures are a far cry from the '99 percent reduction rate in polio since 1988' and 40 percent reduction in measles since 1999 worldwide (The Guardian, May 1st 2005: 8). In fact, a survey by the National Population Commission states that it is more distressing that the proportion of one-year-old children vaccinated against the major childhood diseases had decreased from 30 percent in 1990 to a shockingly low 17 percent in 1999 (The Punch, 1st September 2003).

From all indications, comparing these figures and the actual total coverage with even the 65 percent target set for Edo State in 2003 and the UNICEF year 2000 goals, it is clear that Edo State in particular, and Nigeria generally still have a long way to go to meet the 90 percent coverage envisaged by WHO even by the year 2010. Figures 4.5 and 4.6 depict in percentage bar graphs the 1994-1996 and 1999-2003 immunisation coverage of the 0-11 months' old population in Edo State.

The graphs (Figures 4.5 and 4.6) show that on the average there was more utilisation of BCG vaccines for tuberculosis followed by OPV3 for polio and then measles vaccines (M.V) than DPT3 which serves as the marker for immunisation coverage. This observed low immunisation coverage for these childhood killer diseases goes a long way to confirm the global concern about Nigeria's lag in the fight to eradicate these infectious diseases, most especially poliovirus.

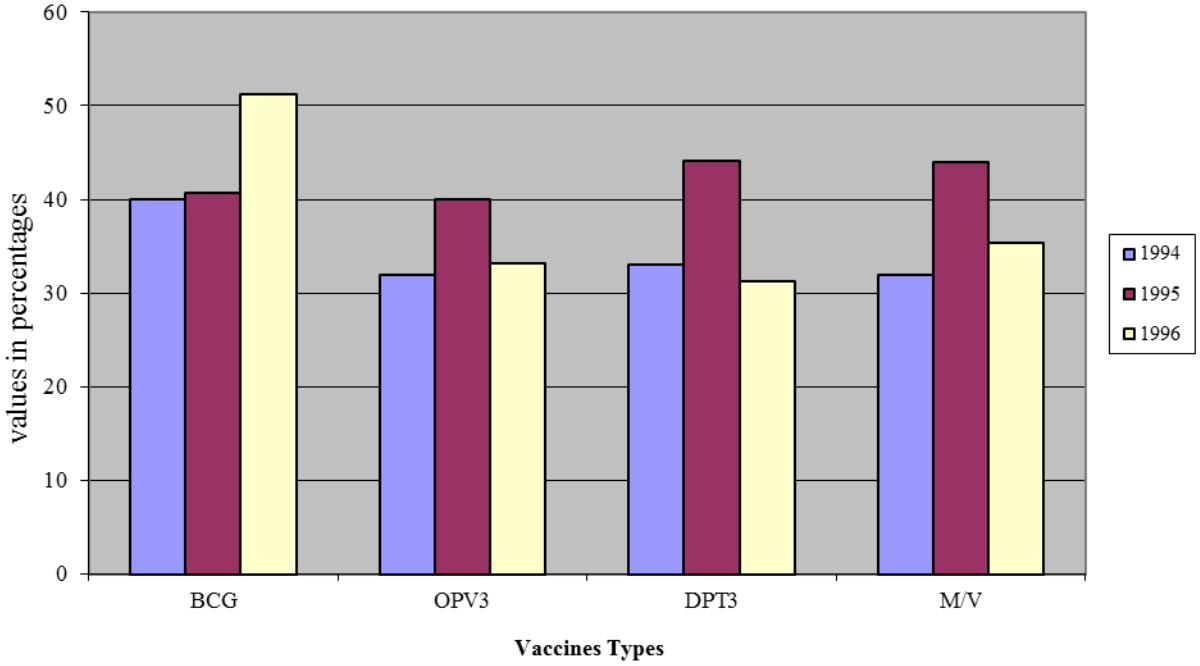

Figure 4.5: The less than 1 year old infant immunisation coverage in Edo State, 1994 - 1996

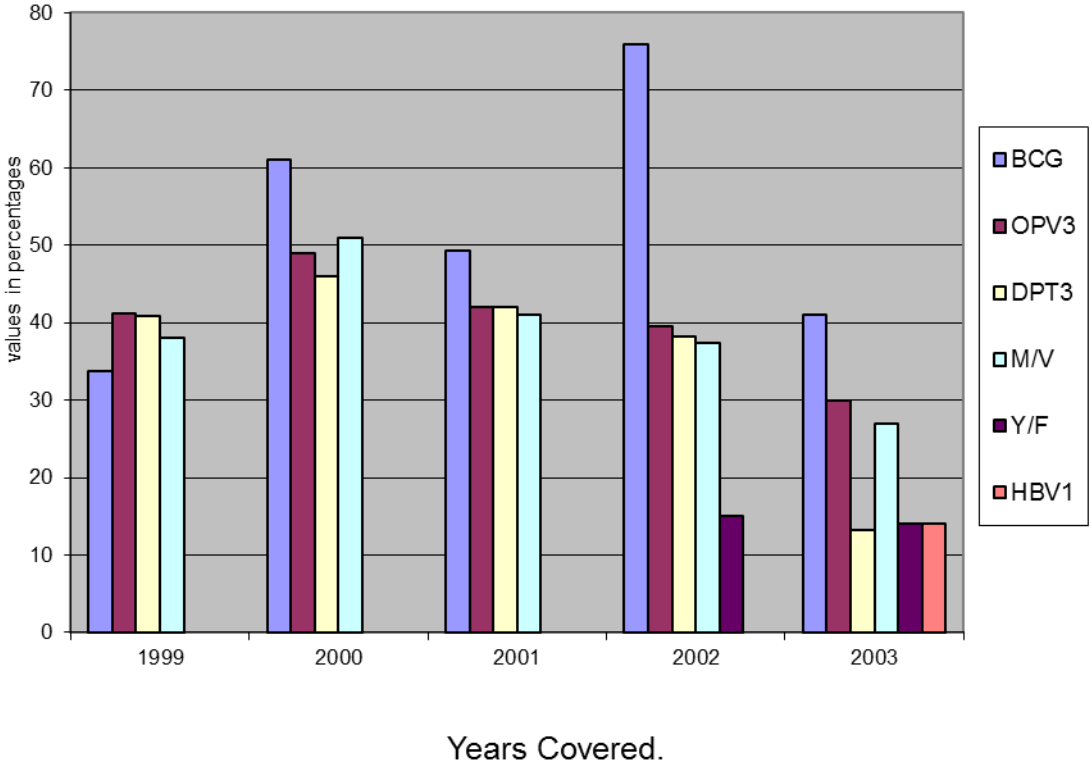

Figure 4.6: The less than 1 year old infant immunisation coverage in Edo State, 1999-2003

4.8 Spatial Pattern of Vaccine Provision and Immunisation coverage 1999 – 2003

This section discusses the five years period of immunisation coverage of the zero to eleven months' old population in Edo State. Table 4.9 shows the mean values and indicates that Igueben LGA had the highest immunised population for tuberculosis (BCG, 79.7 percent), poliomyelitis (OPV3, 70.8 percent), diphtheria (DPT3 72 percent) and measles (71 percent). Orhionmwon came next with BCG (67 percent), OPV3 (78 percent), DPT3 (56 percent), measles (70 percent), yellow fever (1.0 percent) and HBV1 (6.6 percent). Etsako Central and Uhunmwonde are in the third and fourth positions respectively.

As observed in the preceding section, the aggregate performance at the state level for the period 1999-2003 was quite low. While the value for BCG was 47.7 percent, OPV3 coverage was 39.0 percent, DPT3 36.0 percent, measles 34.0 percent, yellow fever 13.6 percent and HBV1 13.0 percent. On the average, except for BCG (47.7 percent), the major infant killer diseases immunisation programme had less than 40 percent coverage in Edo State (Table 4.9).

Table: 4.9: Five years mean immunisation coverage in Edo State, 1999 – 2003

LGAs	BCG	OPV3 (Polio)	DPT3	Measles	Yellow Fever	HBV1 (Hepatitis)
Akoko Edo	33.5	25.0	23.0	27.7	14.6	13.0
Egor	45.0	32.0	33.5	35.5	8. 5	16.0
Esan Central	51.8	42.0	41.0	35.9	7. 6	34.0
Esan North East	48.0	40.6	38.0	37.0	18.0	18.0
Esan South East	53.9	33.6	31.0	45.0	6.0	3.0
Esan West	32.7	36.0	30.0	29.7	0.8	19.0
Etsako Central	68.0	42.0	36.6	57.6	61.5	4.0
Etsako East	46.7	29.0	27.0	22.0	18.0	15.0
Etsako West	43.9	33.0	30.0	31.0	15.0	28.0
Igueben	79.7	70.8	72.0	71.0	0.0	0.0
Ikpoba-Okha	40.0	35.0	28.8	28.9	2.0	10.0
Oredo	57.0	46.0	43.6	42.8	32.0	22.0
Orhionmwon	67.0	78.0	56.0	70.0	1.0	6. 6
Ovia North East	35.5	33.6	31.8	34.0	21.0	6.0
Ovia South West	30.0	22.6	19.9	33.9	5.0	7.0
Owan East	33.5	30.0	26.0	37.0	3.0	0.0
Owan West	36.0	28.6	27.0	30.0	1.0	5.0
Uhunmwonde	55.8	52.0	49.8	44.0	30.0	2.0
STATE average	47.7	39.0	36.0	34.0	13.6	13.0

Source: Fieldwork 2004: PHC Unit, State Ministry of Health, Benin City.

Figure 4.7 depict the immunisation coverage of tuberculosis, diphtheria, pertussis and polio vaccines among the various LGAs. The figures indicate that the most successful LGAs in terms of immunisation coverage are Igueben 79.7 percent, Etsako Central 68.0 percent, Orhionmwon 67.0 percent, Oredo 57.0 percent, Uhunmwonde 55.8 percent, Esan South-East 53.9 percent and Esan Central 51.8 percent. Other LGAs had less than 50 percent BCG coverage. With regard to Polio vaccines (OPV3), only three LGAs, namely, Orhionmwon (78.0%), Igueben (70.8%) and Uhunmwonde (52.0%) had more than 50 percent coverage while all other LGAs had between 22 and 46 percent. Access to Diphtheria and Pertussis Vaccines (DPT3) was limited in the state, as only Igueben with 72 percent and Orhionmwon (56.0%) had more than 50 percent of their children immunised with this vaccine.

With regard to measles, yellow fever and hepatitis B1, Figures 4.8 and 4.9 indicate Igueben with 71.0 percent, Orhionmwon (70.0%), Etsako Central (57.6%) and Esan South-East (45.0%) had the highest coverage for measles vaccine. Generally, yellow fever and hepatitis B1 vaccines were the least available to the LGAs. In particular reference to yellow fever, only Etsako Central had 61.5 percent vaccine coverage, while all other LGAs had between zero and 32 percent coverage. Ultimately, in terms of availability of the various vaccines, Igueben, Orhionmwon, Etsako Central, and Uhunmwonde respectively, had higher coverage among the different LGAs of Edo State (see Table 4.9, and Figures 4.7 to 4.8).

Personal communications with the Manager of National Programme on Immunisation (NPI), Edo State branch, revealed that although every child below the age of five was expected to be vaccinated against these vaccine preventable diseases, the variations in

coverage as observed among the local government areas was, among other factors determined, first and foremost, by the variations in occurrence of some of these diseases in different parts of the state and secondly, by the availability of the vaccines. As such, LGAs prone to certain disease(s), for instance, yellow fever in Etsako Central and measles in Orhionmwon local government areas respectively, would require that Etsako Central had higher supply of Yellow fever vaccine as Orhionmwon would have for measles vaccine than other LGAs not experiencing the same magnitude of the problem.

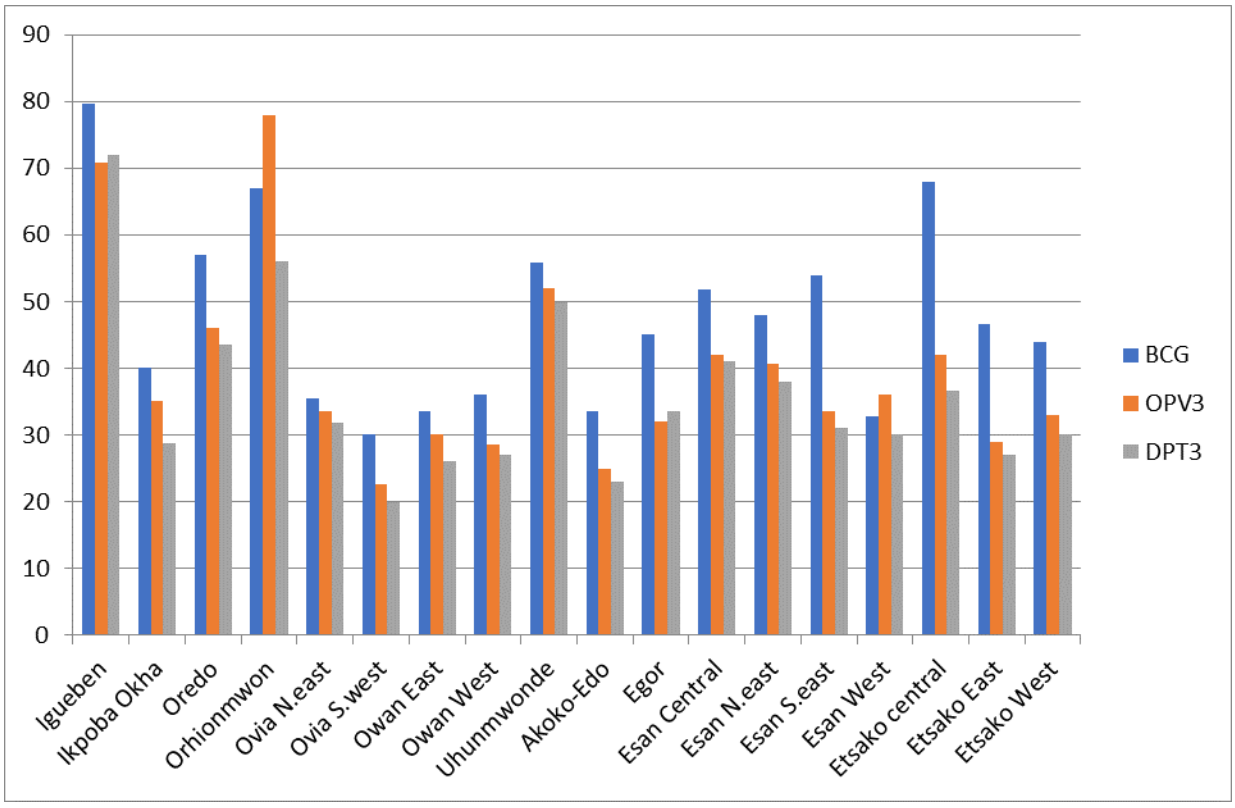

Figure 4.7: BCG, OPV3 and DPT3 Immunisation coverage in Edo State, 1999-2003

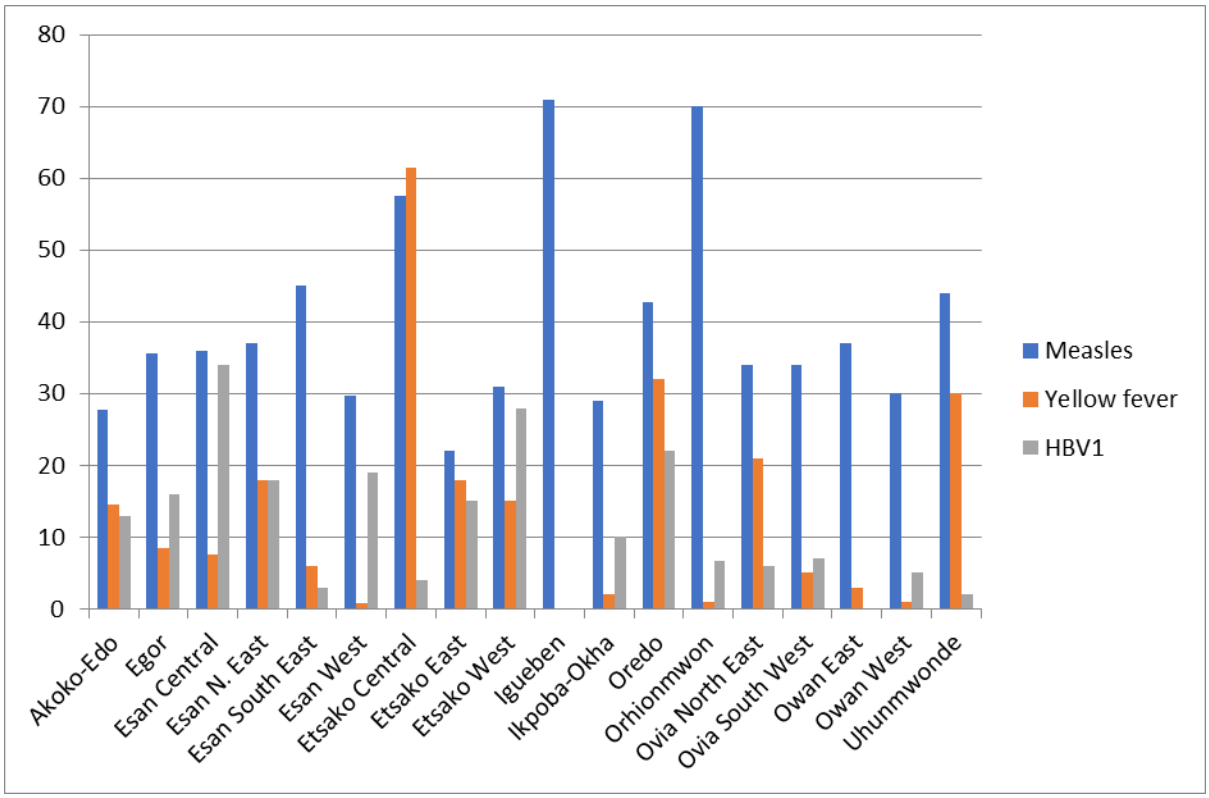

Figure: 4.8: Measles Yellow Fever and HBV1 Immunization Coverage, Edo State, 1999 – 2003

Figures 4.9-4.13 portray the spatial pattern of the State immunisation coverage showing areas with low, medium and high coverage given the 65 percent projected target for Edo State in 1999 - 2003. Figure 4.9 shows only two of the 18 LGAs, that is, Igueben and Etsako Central had *high* coverage rate of 68-100 percent. Twelve of the LGAs are within

the *medium* coverage of 34-67 percent, while two LGAs, comprising Ovia South-West and Esan West are within the *low* coverage of 0-33 percent.

The spatial pattern for Polio (OPV3) immunisation depicts Igueben LGA in the *high* coverage category; 10 LGAs within *medium* coverage, and seven LGAs within *low* coverage as in Figure 4.10. About the same pattern obtained for DPT3, with only Igueben in the *high* coverage category, six LGAs within *medium* coverage and 11 of the 18 LGAs were within *low* coverage as in Figure 4.11 In terms of access to measles immunisation, the spatial pattern presented in Figure 4.12 shows only two LGAs, that is, Igueben and Orhionmwon are within the *high* coverage. Ten LGAs had *medium* coverage while six LGAs had *low* coverage.

The pattern for yellow fever and hepatitis B1 immunisation (Figures 4.13 and 4.14) show none of the LGAs made the *high* coverage of 68-100. But Etsako Central in the case of yellow fever, and Esan Central in respect of hepatitis B1 had *medium* coverage. The 17 other LGAs had *low* coverage of 0-33 percent for both diseases.

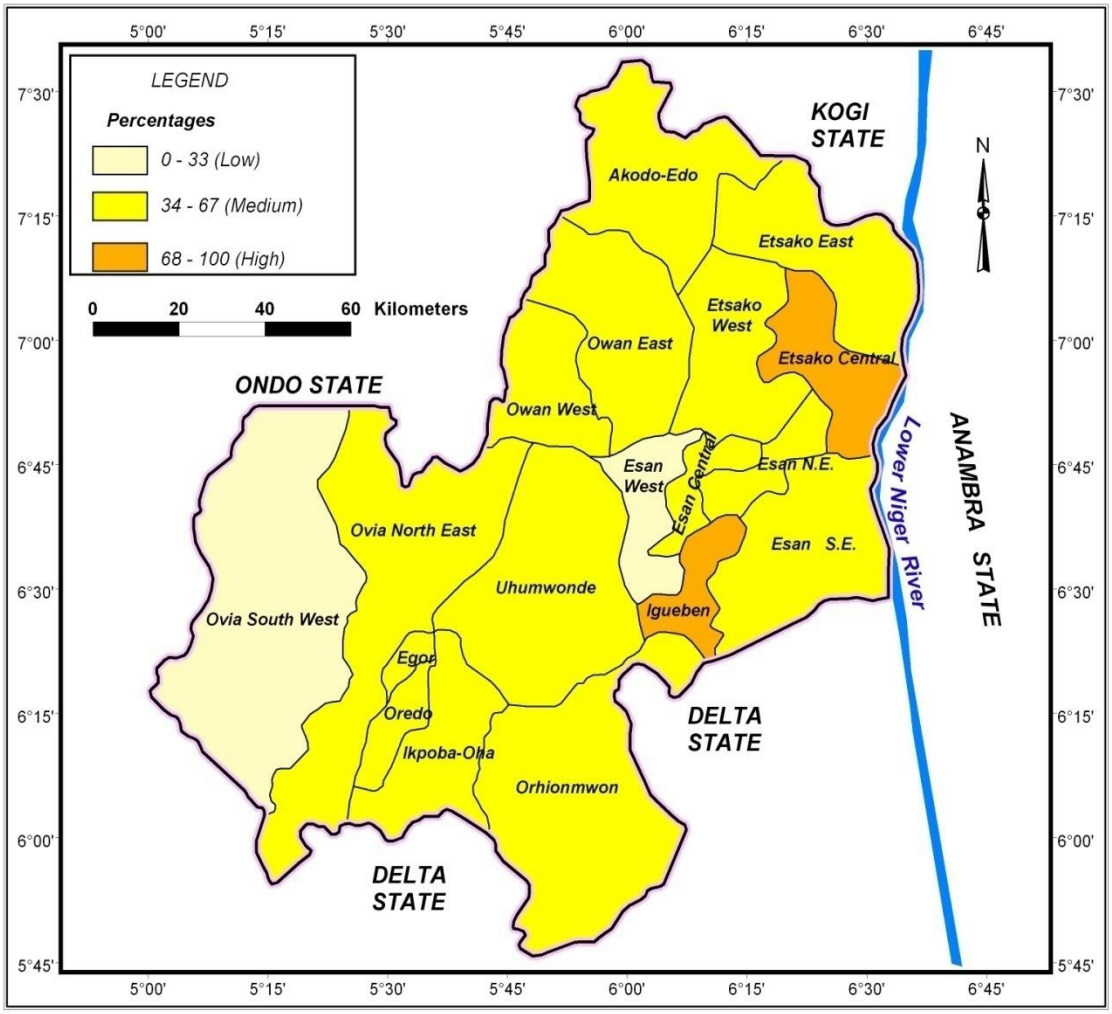

Figure 4.9: BCG Immunisation Coverage in Edo State, 1999 – 2003

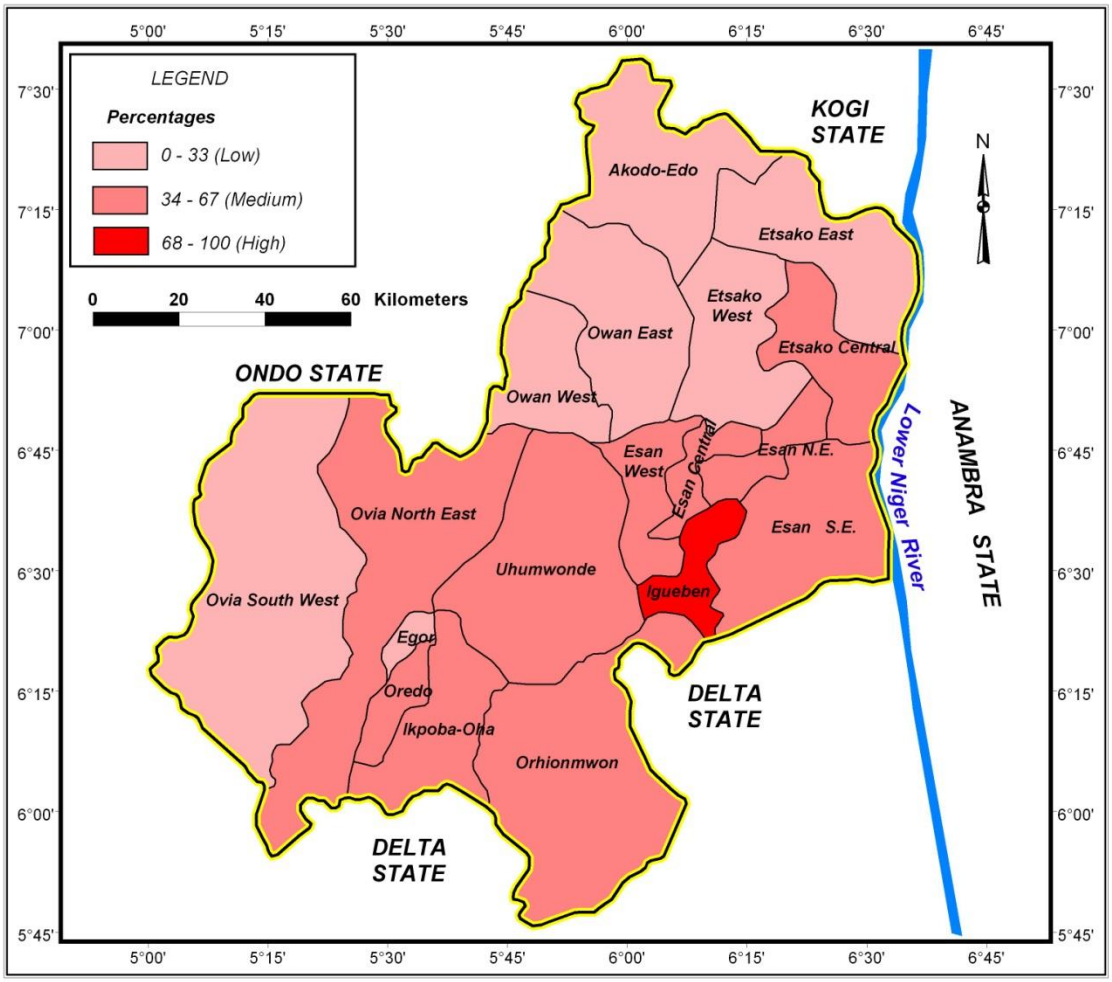

Figure 4.10: OPV3 Immunisation Coverage in Edo State 1999 – 2003

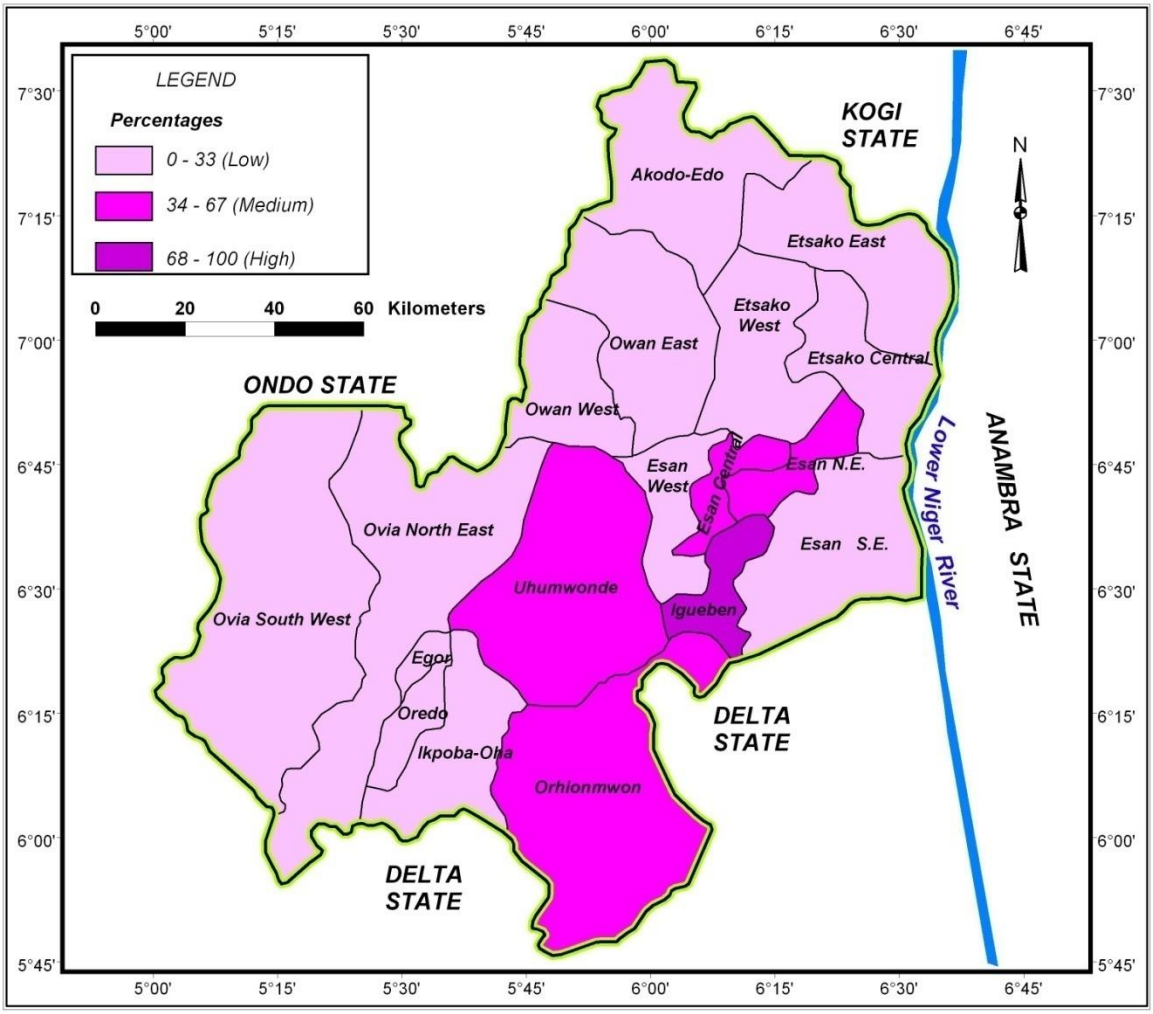

Figure 4.11: DPT3 Immunisation Coverage in Edo State, 1999 – 2003

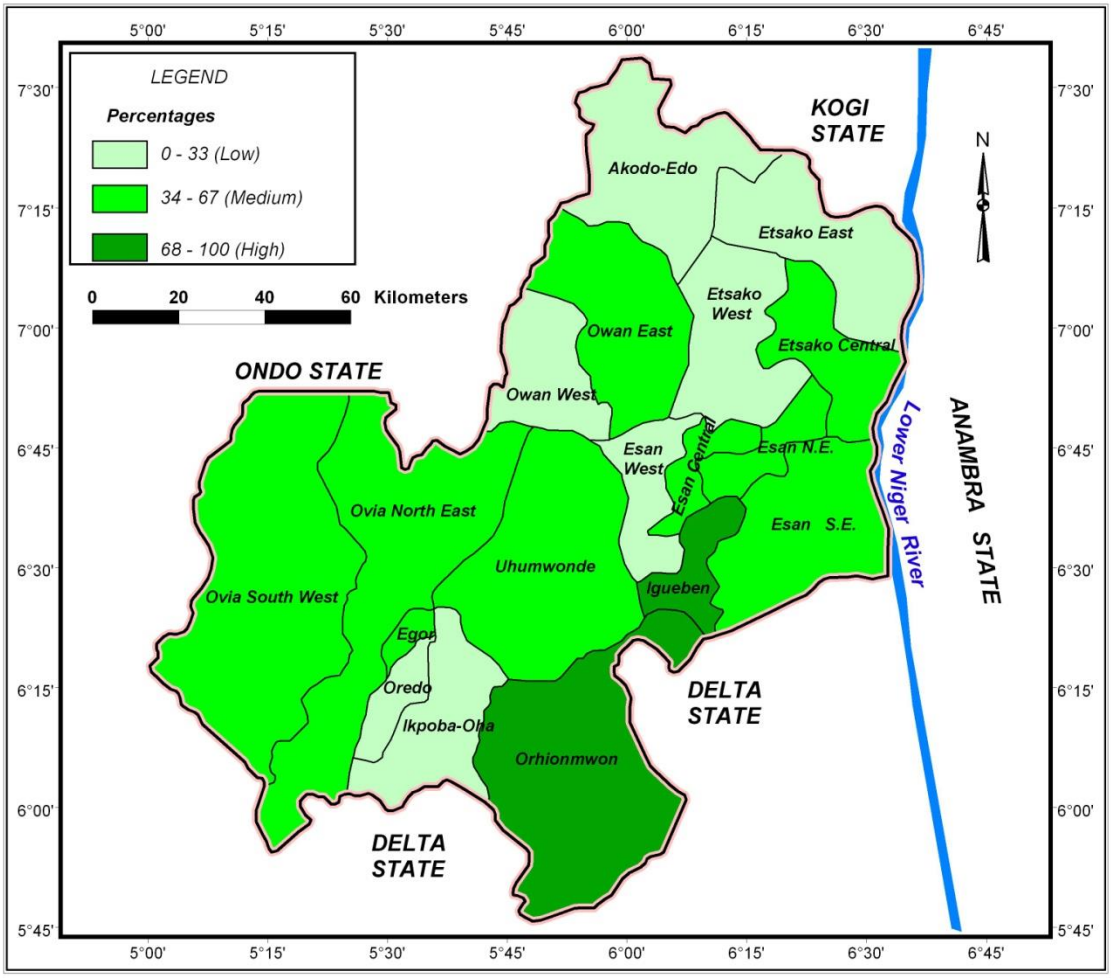

Figure 4.12: Measles Immunisation Coverage in Edo State, 1999 – 2003

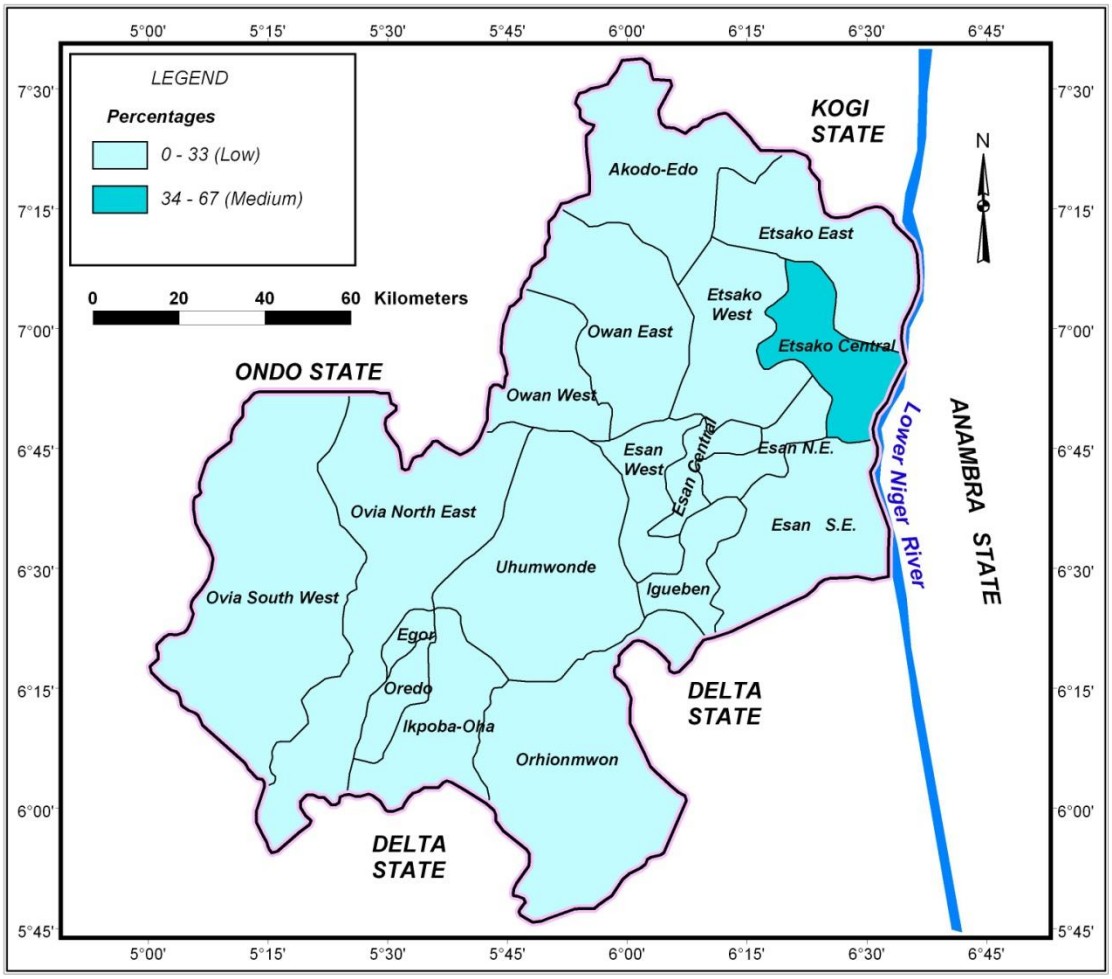

Figure 4.13: Yellow Fever Immunisation Coverage in Edo State, 1999 – 2003

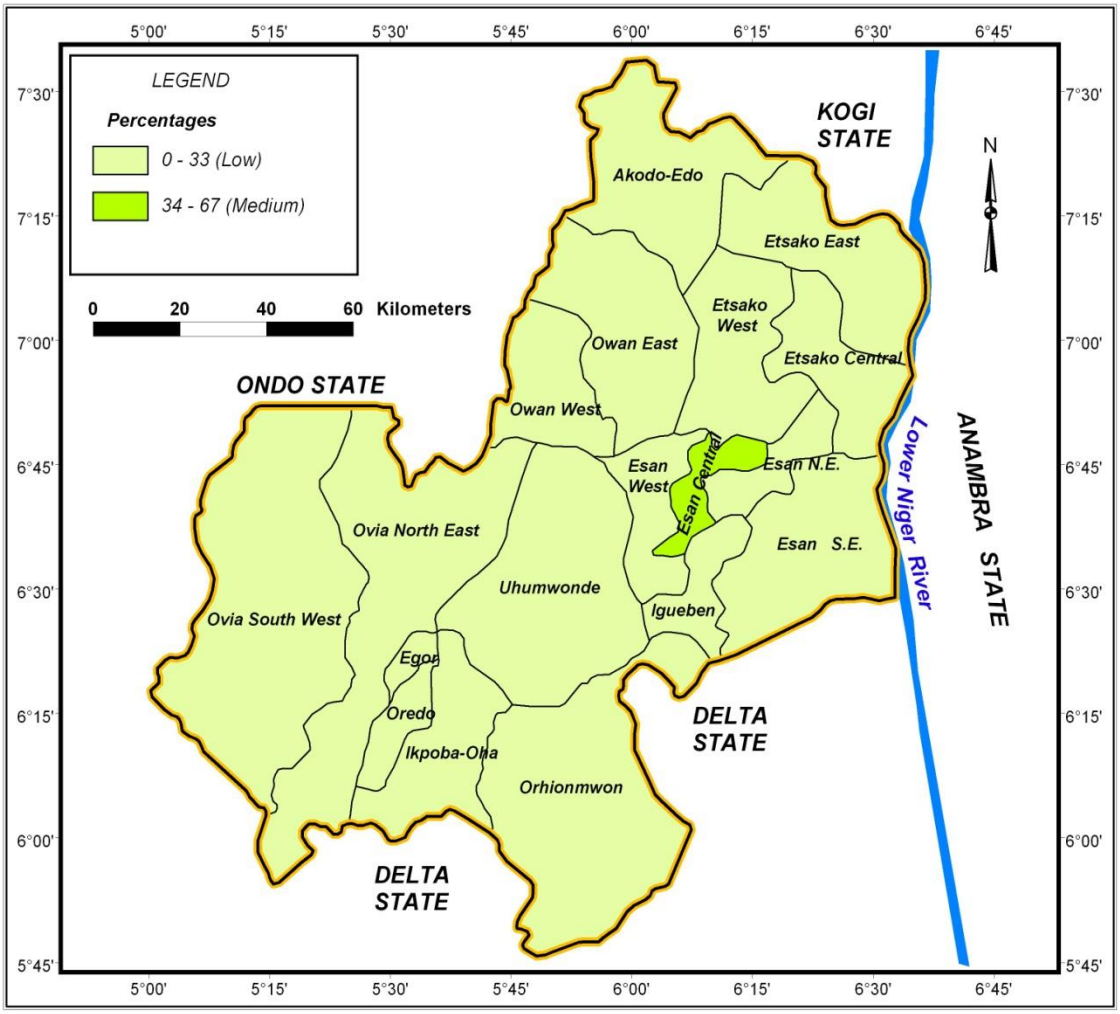

Figure 4.14: HBV1 Immunisation Coverage in Edo State, 1999 – 2003

4.9 Antenatal and Postnatal Care Utilisation

Table 4.10 presents PHC data on monthly antenatal care and pregnancies outcome in Edo State. Usually, it is expected that women who received ante-natal care vaccines, such as, tetanus toxoid should report for post-natal care for completion of maternal and child health care vaccinations. Columns two and three of the table show the total population of women that utilised antenatal and post-natal care services in the state. Altogether, a total population of 104,035 women utilised antenatal care services. Out of this, only 5608 (5.39%) of the women utilised PHC facilities for post-natal care services (Table 4.10, columns 3 &. 4). Therefore, there is a great differential between antenatal and postnatal care utilisation as more women utilised antenatal care services than postnatal care.

In the same vein, fewer women (10,598 or 10.19%) gave birth at PHC facilities than received antenatal services [(104,035) (*columns* 2, 8 & 9)]. Generally, the rate at which women gave birth in PHC facilities both at the state level and in the individual LGAs was less than 15 percent. This observation shows that either these women preferred higher-order orthodox health care facilities or otherwise chose other facilities, in particular, traditional health care through traditional birth attendant.

The 2003 Nigeria Demographic and Health Survey (NDHS) data revealed the majority of births in Nigeria (66%) occurred at home; that is, only one-third of live births during the five years preceding the survey occurred in orthodox health facility. This implies that slightly more than one-third of births were attended to by a doctor, nurse or midwife among others. A smaller proportion of women receive postnatal care, which is crucial for monitoring and treating complications arising from child delivery in the first two days of birth. Moreover the survey shows rural women are more disadvantaged than urban women on maternal care indicators, and there are marked regional differences among the surveyed women (NDHS, 2003: Pp. xxv – xxvi).

Table 4.10 reveals the geographical variation in the level of utilisation of postnatal facility. LGAs with the lowest rate of postnatal utilisation include Oredo (0.26%), Etsako East (0.58%) and Etsako West (1.25%). On the other hand, the only four LGAs that achieved the set target of 10 percent coverage for the state are Ovia South-West (13.94%), Uhunmwonde (13.57%), Esan West (11.90%) and Akoko-Edo (10.0%). The state PHC management dubbed the general pattern an 'unacceptable outcome', because the average service coverage of 5.39 percent that obtained was far less than the 10 percent coverage envisaged during the period in question.

Incidence of stillbirths, perinatal and maternal mortality in the various LGAs of the state was high. Columns five, six and seven of Table 4.10 indicate total registered cases of 215 stillbirths, 21 perinatal deaths and three maternal mortalities. LGAs with the worst record of stillbirths include Esan North-East (57 cases; 26.51%), Esan Central (28 cases; 13.02%), Etsako West (25 cases; 11.63%) and Etsako East (20 cases; 9.30%). Although perinatal and maternal mortalities were low in the state, Esan North-East experienced the worst incidence with 10 cases of perinatal deaths and a single case maternal mortality.

Altogether, the table indicate a low utilisation of antenatal and post-natal care services in Edo State. Figure 4.15 present the utilisation trend of ante-natal and post-natal care services in 17 of the 18 LGAs of the State. The bar graph shows that in 15 of the 18

LGAs less than 10 percent of the women utilised post-natal care services at the PHC centres.

Table: 4.10: Monthly record of PHC Antenatal and pregnancy care outcome in Edo State

Jan. – Dec. 1997 LGAs	Ante-natal attendance	Post natal visits	post natal visits as a % of Ante-natal	Still Births	Peri-natal Deaths	Maternal Deaths	Live Births	State level rate in %	LGA level rate in %
Akoko-Edo	8444	842	9. 97	13	-	-	571	5. 51	6. 76
Esan Central	11199	282	2. 52	28	3	-	1160	11. 24	10. 64
Esan N. East	15187	578	3. 80	57	10	1	1706	16. 73	11. 67
Esan S. East	4211	209	4. 96	13	1	-	555	5. 40	13. 49
Esan West	7360	876	11. 90	9	-	-	873	8. 32	11. 98
Etsako Central	4527	363	8. 02	7	-	-	492	4.70	11. 02

Etsako East	5800	34	0. 58	20	-	-	713	6. 92	12. 64
Etsako West	7814	98	1. 25	25	-	-	802	7. 80	10. 58
Egor	488	NA	NA	NA	NA	NA	NA	NA	NA
Igueben	4354	354	8. 13	5	4	-	520	5. 00	12. 15
Ikpoba Okha	4079	143	3. 51	2	-	1	340	3. 23	8. 38
Oredo	377	1	0. 26	NA	NA	NA	46	0. 43	12. 20
Orhionmwon	7380	356	4. 82	11	-	1	729	6. 98	10.03
Ovia N. East	3807	312	8. 19	10	1	-	470	4. 53	12. 63
Ovia S. West	1736	242	13. 94	-	-	-	80	0. 75	4. 61
Owan East	8708	193	2. 22	2	-	-	487	4. 60	5. 62
Owan West	3812	80	2. 10	10	2	-	344	3. 36	9. 34
Uhunmwode	4752	645	13. 57	3	-	-	474	4. 50	10. 04
State Total	104035	5608	5. 39*	215	21	3	10362	9. 96	-
All births including columns 5, 6 & 8						=	10598	10.19	-

Source: PHC Unit, State Ministry of Health, Benin City, 2004

*State average for post-natal utilisation

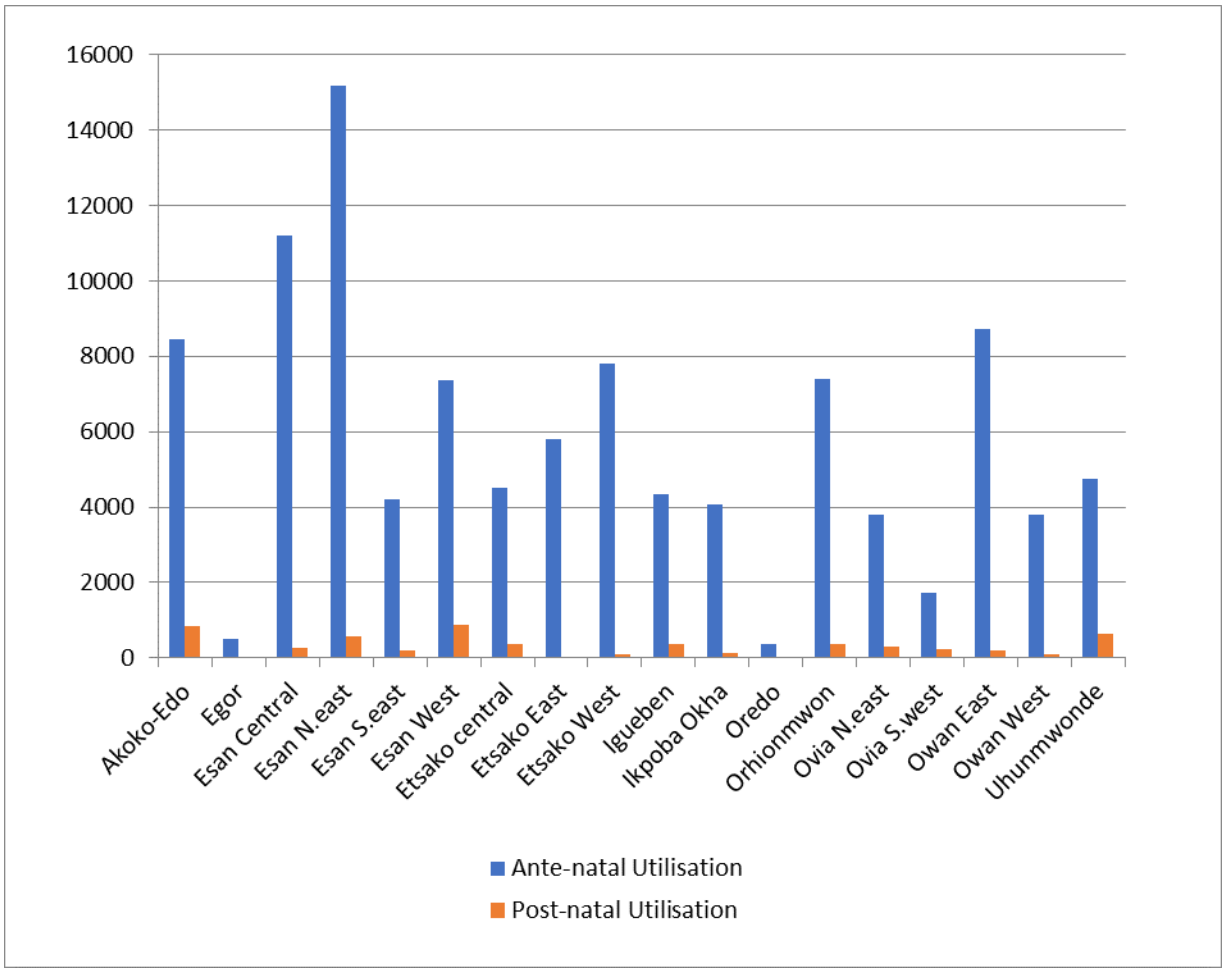

Figure 4.15: Ante and postnatal care utilization, Edo State, Jan – Dec, 1997

Conclusion

Generally, we found a positive correlation between size of rural population of LGA and number of PHC facilities. The calculated variance/mean ratio of 5.0 indicates a clustered spatial pattern of PHC facilities in Edo State. On the average, Edo State has performed very poorly with respect to immunization coverage for the six childhoods' killer diseases. Less than 50 percent of the infants had been immunised against each of these diseases from 1999-2003.

Low maternal and child vaccination coverage in Edo State is a reflection of the general pattern of inadequate PHC immunisation coverage in Nigeria. To improve the system, there is need for provision of more community health personnel and vaccines, especially OPV3 for poliovirus and DPT3 for diphtheria, pertussis and tetanus among others to halt the worsening situation of under-five years of age health problems. In the same vein, provision of tetanus toxoid (TT2) vaccine should be increased to ensure a wider coverage of women of reproductive age (WRA) and, in particular pregnant women, to reduce maternal morbidity and its consequent impacts such as still-birth, neonatal tetanus and maternal mortality that currently pose serious problems to maternal health. In essence, adequate attention should be paid to maternal health by sensitizing women of reproductive age, especially those bearing children, to utilise antenatal and postnatal care services. Adequate provision of vaccines for a wider immunisation coverage against the six childhood killer diseases would go a long way in reducing maternal mortality as well as both infant and under-five mortality.

Finally, while it could be said that the distribution of PHC facilities has been expanding over the years, it is arguable if the services, for instance, antenatal and postnatal care, are meeting the health needs of the most vulnerable groups in the various communities.

CHAPTER FIVE

5.1 PHC UTILISATION: SPATIAL FACTORS AS DETERMINANTS

Geographers are convinced that spatial factors play very important roles in the utilisation of health services. Sometimes, these spatial factors may be the key variables determining whether an individual will or will not utilise a health service (Joseph and. Phillips, 1984). Usually, one of the essential factors that influence the utilisation of primary health care (PHC) facilities is the consumers' access to the available PHC centres. This chapter examines the question of accessibility so as to identify the maximum distance usually travelled to primary health care centres. The measures of accessibility are distances of respondents' residence to PHC locations, mode of daily commuting and transport cost to nearest PHC centre.

5.2 Mode of Daily Commuting

In any given community, distance and the mode of transport available exert a great influence on the utilisation of services, such as health care. Empirical studies have found that distance limits patronage. Thus, the frictional effect of distance has led to the notion of lapse rate of movement with increasing distance from service locations (Abler et al., 1972). The distance decay effect has as its corollary the demand field of services, that is, the territory from which a facility or service attracts most of its consumers, (Okafor, 1980).

Table 5.1 shows that the most popular and common mode of daily movement is commercial public buses/motorbikes (56.0 percent). Walking (27.5%) and use of personal car (16.0%) came next. Only 0.5 percent of the respondents were aided by companies/institutions' vehicles (Table 5.1). The table also shows the difference in volume between the suburban/urban and the rural communities.

Table 5.1: Mode of Transport

Daily Means of Movement	SUBURBAN/URBAN		RURAL		TOTAL	
	No	%	No	%	No	%
Personal Car	41	10. 3	23	5.8	64	16.0
Public buses/motorbikes	144	36.0	80	20.0	224	56.0
Walking	63	15.8	47	11.8	110	27. 5
Company	2	0. 5	-	-	2	0. 5
Total	250	62.5	150	37.5	400	100.0

Source: Fieldwork, December 2004.

The spatial variation in mode of movement among the LGAs is shown in Table 5.2. Egor (3.8%), Owan West (2.5%), Esan North-East (2.0%) and Etsako Central (1.8%) account for respondents who went about their daily movement on personal car. Etsako East (6.8%), Esan West and Ovia North-East (6.5% each), Etsako West and Esan North-East (6.3% each) and, Etsako Central (6.0%) account for more of the respondents who use commercial public buses and motorbikes for their daily movement. On the other hand, Owan West (3.0%) accounts for respondents with lowest use of public commercial buses and motorbikes. In Uhunmwonde (4.5%), Owan West (4.3%), Ovia North-East and Ovia South-West (3.3% each), Etsako West (2.5%), followed by Etsako Central and Etsako East (2.3% each), walking dominates other mode of daily mobility for majority of the respondents. Generally, walking is a popular mode of commuting in all of the LGAs. The use of company/institutions vehicles for daily commuting was applicable only among respondents in Owan West and Esan West (1.3% each) (Table 5.2).

Given that over one-quarter of the respondents (27.5%) indicated most of their daily commuting is by walking, it follows that this group of people might be very reluctant to walk long distances to utilise PHC services if the facility is not within an easy walking distance.

Although respondents who access PHC facilities by means of public buses and motorbikes (49.0%) constitute the largest proportion of consumers, the table indicates that those who walk to PHC centres (23.0%) and those who make the journey in their personal cars (14.0 percent) also made up a reasonable proportion of the users. So, are the differences in PHC utilisation according to modes of mobility statistically significant? Can one conclude that mode of mobility influences utilisation? To address these questions, Chi-Square is used (Table 5.3). The X^2 value at the .05 level of significance, with 3 degrees of freedom is 7.81. Our computed X^2 value of 1.331 with a P-value of .722 is less than the critical value of 7.81. Given this result, we conclude that X^2 is not statistically significant. Therefore, mode of mobility does not significantly influence the utilisation of PHC services. PHC awareness and availability of the services may therefore play more important roles.

Table 5.2: Mode of Transport by LGAs

	Daily Mobility									
	Personal car		Public bus		Walking		Company car		TOTAL	
LGA	No	%	No	%	No	%	No	%	No	%
OWAN WEST	10	2. 5	12	3.0	17	4. 3	1	. 3	40	10.0
ESAN WEST	2	. 5	26	6. 5	11	2.8	1	. 3	40	10.0
ESAN N.E.	8	2.0	25	6.3	7	1.8	-	0.0	40	10.0
ETSAKO WEST	5	1. 3	25	6. 3	10	2. 5	-	0.0	40	10.0
ETSAKO C.	7	1.8	24	6.0	9	2. 3	-	0.0	40	10.0
ETSAKO EAST	4	1.0	27	6.8	9	2.3	-	0,0	40	10.0
UHUNMWONDE	6	1.5	16	4.0	18	4.5	-	0.0	40	10.0
EGOR	15	3.8	22	5.5	3	0.8	-	0.0	40	10.0
OVIA N. EAST	1	0.3	26	6.5	13	3.3	-	0.0	40	10.0
OVIA S. WEST	6	1.5	21	5.3	13	3.3	-	0.0	40	10.0
TOTAL	64	16.0	224	56.0	110	27.5	2	0.5	400	100

Source: Fieldwork, December 2004.

Table 5.3: Mode of daily mobility and PHC utilisation

MODE OF DAILY MOBILITY	PHC UTILISATION				Total	
	Utilized		Not utilized			
	No	%	No	%	No	%
Personal car	56	14.0	8	2.0	64	16.0
Public buses & motorbikes	196	49.0	28	7.0	224	56.0
Walking	92	23.0	18	4.5	110	27.5
Company car	2	0.5	0	0.00	2	0.5
Total	346	86.5	54	13.5	400	100.0

Source: Fieldwork 2004. X^2 table value = 7.81; X^2 computed value = 1.331, P = .722

5.3 Transport cost to nearest PHC facility

Table 5.4 shows the average transport cost to nearest PHC facility in the various communities. In both the suburban/urban and rural areas, 61.3 percent of the respondents spent an average of ₦80.00 each to and from the nearest PHC centre. In the same vein, 19.8 percent and 19.0 percent of the respondents spent an average of ₦120.00 and ₦160.00 respectively. In both cases the rural areas were more disadvantaged as they account for 12.3 percent of the 19.8 percent, and 10.3 percent of the 19.0 percent of respondents who spent ₦120.00 and ₦160 to and from a PHC facility. A breakdown of the data by LGA shows respondents in Etsako East fared better than their counter-part in other LGAs as they spent less than ₦90.00 per clinic visit. By and large, Uhunmwonde (8.5%), Ovia North-East (5.5%) and Ovia South-West (4.3%) account for the LGAs with the highest number of less privileged respondents who spent ₦150 and above to the nearest PHC facility. The reason for this observed pattern in the case of Uhunmwonde, most especially, is that Ehor the LGA headquarters has neither adequate Comprehensive Health Centre nor a maternity centre and therefore lack any standard public health care facility, leaving patients with choices of having to travel to Benin City, Iruekpen or Ekpoma to utilise better medical services. In the case of Ovia South-West and Ovia North-East the villages surveyed were quite a distance from the local government headquarters where standard units of PHC are located. Nevertheless, though these communities have PHC facilities, they are seldom functioning.

Table 5.5 presents the effect of transport cost on PHC utilisation among the respondents. As indicated in the table, more than half of the respondents (54.0%) spent an average of ₦80 to and from PHC centres. Those who spent an average of N120 made up 16.8 percent, while 15.8 percent spent an average of ₦160. A Chi-Square test on the importance of the variation in average transport cost and respondents' utilisation of PHC services indicates X^2 value at the .05 level of significance with 2 degrees of freedom is 5.99. The computed X^2 value of 3.845 had a P-value of .146. We conclude that variations in respondents transport cost to PHC centres does not significantly affect PHC utilisation in Edo State.

Table 5.4: Average Transport cost to nearest PHC facility

Average Transport cost to PHC Facility	SUBURBAN/URBAN		RURAL		TOTAL	
	No	%	No	%	No	%
₦80	185	46. 3	60	15.0	245	61. 3
₦120	30	7. 5	49	12. 3	79	19.8
₦160	35	8.8	41	10. 3	76	19.0
TOTAL	250	62. 5	150	37. 5	400	100.0

Source: Fieldwork, December 2004.

Table 5.5: Effect of Transport cost on PHC utilisation

	PHC UTILISATION					
	Utilized		Not Utilized		Total	
	No	%	No	%	No	%
Average Transport Cost to Nearest PHC Centre						
₦80	216	54.0	29	7.3	245	61.3
₦120	63	15.8	16	4.0	79	19.8
₦160	67	16.8	9	2.3	76	19.0
Total	346	86.5	54	13.5	400	100.0

Source: Fieldwork 2004. X^2 table value = 5.99; X^2 computed value = 3.845; P = .146

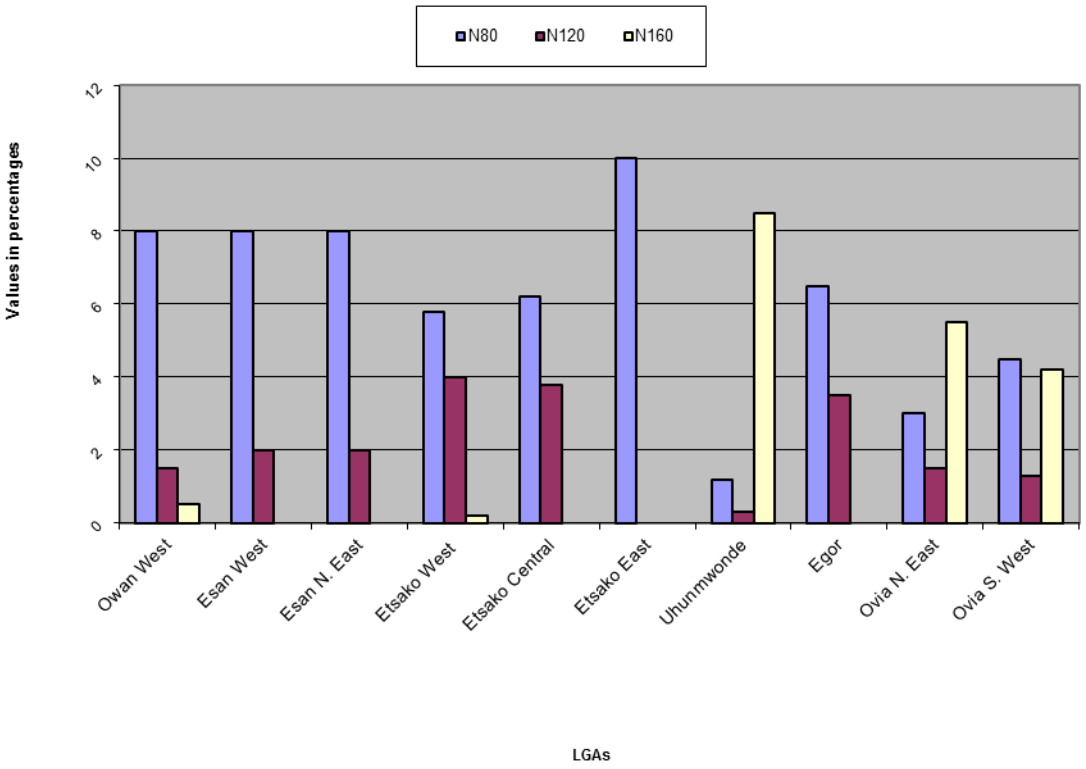

Figure 5.1: Average Transport cost to nearest PHC facility.

Figure 5.1 reveals Uhunmwonde, Ovia North-East and Ovia South-West, Owan West and Etsako West are the LGAs containing the largest number of respondents who spent above ₦160.00 to the nearest PHC centre. These LGAs need urgent provision of health personnel and equipment, because as earlier stated, they contain communities that lack equipment and personnel to make their PHC facilities functional. Generally however, 61.3 percent of the respondents spent less than ₦80.00 to access PHC services.

5.4 Distances travelled to PHC facilities in Edo State

The discussions in the preceding chapters show that one of the essential factors that influence utilisation of primary health care (PHC) facilities is respondents' access to available PHC centres. In this section, the question of accessibility is examined by identifying the maximum distances usually travelled by majority of respondents to PHC centres in 10 of the 18 LGAs of Edo State. The measures of accessibility are distances of respondents' residence to PHC locations.

Generally, accessibility to basic health care in Nigeria fall short of international standards which stipulates that every Nigerian should be within an easy reach of not more than four kilometres or more than an hour walking distance from a health care facility for Nigeria to be regarded as a country with adequate health care coverage' (Aregbeyen, 2001; P32). Given this condition, the study aims at determining if this government health policy has been attained in the context of PHC facilities in Edo State. Consequently, access in the context of this study, was measured by the number of respondents who are within four kilometres of PHC facilities. In our case, distance is measured in kilometres and two kilometres distance bands were employed. The aim is to determine the number of consumers that have access to PHC facilities at a minimum distance of two kilometres and four kilometres maximum distance. Again, the goal is to ascertain if the government policy objective of meeting international standards has been accomplished. The minimum distance refers to the average distance travelled to access PHC. On the other hand, the maximum distance refers to the distance beyond which consumers would be very reluctant to patronise PHC facilities.

Table 5.6 indicate the specific distances travelled by respondents to PHC centres in the sampled communities. To examine if there was any significant variation in access to healthcare centres between the suburban/urban and rural communities, the data was first organised into suburban/urban centres and the rural communities (Tables 5.6 and 5.7) and then, in Table 5.8 the general pattern in the study area is depicted.

Tables 5.6 depict distances of respondents' residence to PHC locations in the suburban/urban settlements. The spatial distribution shows most respondents live within 0-1.99 kilometres of the suburban/urban PHC centres; except in Ehor in Uhunmwonde LGA where 43.4 percent of respondents travel beyond 15 kilometres. Specifically, the proportion of respondents who live within 0-1.99 kilometres of a PHC centre was highest in Fugar with 84 percent. Agenebode and Uselu had 80 percent each, Ekpoma 72 percent, Uromi 68 percent, Sabongida-Ora 66.7 percent, Auchi 64 percent and Ekiadolor 54.6 percent. Iguobazuwa had 52.6 percent while Ehor had the lowest case of 17.4 percent.

Within a distance band of 0-3.99 kilometres, the proportion of respondents utilising PHC services in Fugar was 100 percent; Uromi had 96 percent while Agenebode, Ekpoma and Uselu each had 92 percent. In Auchi the proportion was 91 percent, Ekiadolor had 77.3 percent and Iguobazuwa 78.9 percent. Again, among these suburban and urban areas, Ehor had the fewest respondents (34.8 percent) within 0-3.99 kilometres of PHC centres.

Tables 5.7 present distances travelled by respondents to various rural PHC centres in Edo State. Within a distance band of 0-1.99 kilometres Iviari community (100%) in Etsako East was the most accessible to PHC facilities among the rural communities (Table 5.7). Other communities where a good proportion of the populace were within 0-1.99 kilometres of PHC centres are Udo in Ovia South-West (73.3%), Azukhala in Etsako Central (64.3%) and Iguosogban in Ovia North-East (53.3%). However, within 0-3.99 kilometres of PHC centres, six of the rural communities namely, Iviari, Uhunmora-Ora and Udo (100% each), and Ogida (90%), Iguosogban (73.3%) and Azukhala (85.7%), had most of their respondents within the said distance (Tables 5.7).

Table 5.6: Distance to PHC centres in the Suburban/Urban centres

Suburban/ Urban centres	Auchi		Fugar		Agenebode		Uromi		Ekpoma		Ehor		Ekiadolor		Iguobazuwa		Uselu		Sabongida-Ora	
Distance (Km)	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
0 – 1.99	14	64	21	84	20	80	17	68	18	72	4	17.4	12	54.6	10	52.6	20	80	10	66.7
2 – 3.99	6	27	4	16	3	12	7	28	5	20	4	17.4	5	22.7	5	26.3	3	12	4	26.6
4 – 5.99	2	9	-	-	2	8	1	4	2	8	1	4.4	5	22.7	4	21.1	2	8	1	6.7
6 – 9.99							-	-	-	-	1	4.4	-	-	-	-	-	-	-	-
10 – 14.99							-	-	-	-	3	13.0	-	-	-	-	-	-	-	-
15 and Above							-	-	-	-	10	43.4	-	-	-	-	-	-	-	-
Total	22	100	25	100	25	100	25	100	25	100	23	100	22	100	19	100	25	100	15	100

Source: Fieldwork, December 2004.

Table 5.7: Distance to PHC centres from the various rural communities in Edo State

Rural Centres	Aviele		Azukhala		Iviari		Awo Village		Ukhun		Idumhugha Village		Iguosogban		Udo		Ogida		Uhunmora-Ora	
Distance (Km)	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
0 – 1.99	2	20	9	64.3	14	100	3	27.3	4	36.4	2	15.4	8	53.3	11	73.3	4	40	5	71.4
2 – 3.99	1	10	3	21.4	-	-	1	9.1	1	9.1	1	7.7	3	20	4	26.7	5	50	2	28.6
4 – 5.99	1	10	2	14.3	-	-	5	45.5	1	9.1	2	15.4	4	26.7	-	-	1	10	-	-
6 – 9.99	5	50	-	-	-	-	2	18.1	5	45.4	3	23.1	-	-	-	-	-	-	-	-
10 – 14.99	1	10	-	-	-	-	-	-	-	-	1	7.7	-	-	-	-	-	-	-	-
15 and Above	-	-	-	-	-	-	-	-	-	-	4	30.7	-	-	-	-	-	-	-	-
Total	10	100	14	100	14	100	11	100	11	100	13	100	15	100	15	100	10	100	7	100

Source: Fieldwork, December 2004.

.

The rural communities with poor access to PHC facilities include Aviele in Etsako West, Awo village in Esan North-East, Ukhun community in Esan West and Idumhugha village in Uhunmwonde LGAs where majority of PHC consumers travel as much as between six and 15 kilometres to PHC centres. Nonetheless, as observed during the fieldwork, though these latter groups of rural areas had PHC centres in their communities, the facilities were seldom functioning due to lack of dedicated health personnel and adequate equipment to work with. As a result, consumers here usually had to travel long distances to utilise PHC centres outside their communities.

In determining the difference in distances travelled to PHC facilities between suburban/urban and the rural dwellers, Table 5.8 indicates while 64.8 percent of the suburban/urban respondents are within 0–1.99 kilometres of PHC centres, only 50 percent of rural respondents had the same advantage.

Within a distance of 0–3.99 kilometres the figure for suburban/urban centres was 84.4 percent while that of the rural areas was 68 percent. As a general remark, these findings show that residents in the suburban and urban centres have better access to PHC services than their counterpart in the rural areas at two and four kilometres from PHC facilities. The reasons are due to lack of dedicated and effective health personnel and adequate equipment to work with in the rural areas as earlier explained.

Table 5.8: Accessibility of PHC centres to Urban and Rural Respondents

Edo State	Suburban/Urban Respondents		Rural Respondents	
Distance (Km)	No.	%	No.	%
0 – 1.99	162	64.8	75	50
2 – 3.99	49	19.6	27	18
4 – 5.99	25	10	20	13.3
6 – 9.99	1	0.4	21	14
10 – 14.99	3	1.2	2	1.3
15 and Above	10	4	5	3.3
Total	250	100	150	100

Source: Fieldwork, December 2004.

As a summary of all the tables, Table 5.9 shows that for all respondents at the suburban/urban and rural centres, (that is, at the State level) 59.25 percent of them are within 0–1.99 kilometres, while 78.25 percent are within 0–3.99 kilometres of PHC centres. This therefore, means that although every respondent had access to PHC centres in the study area more than 20 percent of them cannot access PHC services within the distance threshold of four kilometres.

Finally, as all the tables indicate, there is a general decline in accessibility as distance increases above two kilometres in the first instance and more rapidly at four kilometres away from PHC centres. Consequently while 59.25 percent of the respondents had access to PHC facilities within 0–1.99 kilometres distance, within 2–3.99 kilometres the number of consumers that have access to PHC facilities diminished to only 19 percent and to 11.25 percent within a distance band of 4–5.99 kilometres and so on. This again shows the limited capacity of PHC facilities to attract people from distant places largely because of the nature of the services they provide.

Table 5.9: Access of all respondents to PHC centres

Rural and Urban centres

Distance (Km)	Frequency	Percentage
0 – 1.99	237	59.25
2 – 3.99	76	19.0

4 – 5.99	45	11.25
6 – 9.99	22	5.5
10 – 14.99	5	1.25
15 and Above	15	3.75
Total	400	100

Source: Fieldwork, December 2004.

5.5 Variation in accessibility to PHC facilities by LGA

Table 5.10 presents variations in respondents' access to Primary Health Care (PHC) centres by Local Government Areas. The table show there was more variation in access to PHC facilities between different communities in the LGAs within 0–1.99 kilometres than within 2–3.99 kilometres. Within 0–1.99 kilometres, three different levels of respondents' access to PHC facilities can be distinguished among the LGAs. These are first, LGAs where more than 71 percent of the respondents had access; second, are those between 51-70 percent and, thirdly, are those where less than 51 percent of the respondents had access to PHC.

In the first category are Etsako East (85.0%), Owan West (77.5%), Etsako Central (75.0%) and Egor (72.5%). Local Government Areas in the second category are Ovia South-West (65.0%), Ovia North-East (57.5%) and Esan West (55.0%). In the third category where respondents had the least access to PHC services within two kilometres from the facilities are Esan North-East (50.0%), Etsako West (40.0%) and Uhunmwonde (15.0%). From this analysis it is obvious that the effect of distance differs in different places.

Table 5.10: Respondents accessibility to PHC facilities by LGAs

Source: Fieldwork, December 2004.

+Values approximated to the nearest whole km.

LGAs	Distance in km						Access in %		β Coefficients	Prob. t-statistic
	0-1.99	2-3.99	4-5.99	6-9.99	10-14.99	15+	0 -2 km+	2 -4 km+		
Etsako West	16	9	3	10	1	1	40.0	62.5	-1.88	0.013*
Etsako Central	30	8	2	-	-	-	75.0	95.0	-3.23	0.068
Etsako East	34	3	3	-	-	-	85.0	92.5	-3.31	0.109
Esan N. East	20	9	8	3	-	-	50.0	72.5	-2.62	0.007**
Esan West	22	6	7	5	-	-	55.0	70.0	-2.57	0.019*
Uhunmwonde	6	9	3	4	4	14	15.0	37.5	0.79	0.219
Ovia N. East	23	8	9	-	-	-	57.5	77.5	-2.87	0.022*
Ovia S. west	26	8	6	-	-	-	65.0	85.0	-3.03	0.037*
Egor	29	8	3	-	-	-	72.5	92.5	-3.18	0.059
Owan West	31	8	1	-	-	-	77.5	97.5	-3.28	0.078

*Significant at 5 percent level

**significant at <1 percent level

However, within the distance band of 2–3.99 kilometres the variation between the LGAs in access to PHC facilities was not so remarkable, although the three levels of access earlier classified in the preceding paragraph retained its relevance to our explanations. In this regard, in the first category more than ninety-two percent of the respondents in four of the LGAs had access to PHC facilities. These LGAs are Owan

West (97.5%), Etsako Central (95.0%), Etsako East (92.5%) and Egor (92.5%). Local Government Areas in the second category are Ovia South-West (85.0%), Ovia North-East (77.5%) and Esan North-East (72.5%). Again, Esan West (70.0%), Etsako West (62.5%) and Uhunmwonde (37.5%) are the LGAs containing respondents with the least access to PHC facilities among the 10 LGAs examined in Edo State.

Therefore, while it is presumed that every Nigerian should have an easy access of not more than four kilometres to a primary health care facility it is obvious from our analysis that three different access scenarios can be observed in Edo State. First, that in none of the 10 LGAs examined did all respondents have access to PHC facilities at four kilometres maximum travel distance. However, LGAs such as Owan West, Etsako Central, Etsako East and Egor, had more than ninety-two percent of their consumers having access to PHC facilities. These LGAs contain several settlements with populations of 2,000 and above. They also have suburban/urban settlements where relatively well equipped PHC centres are located. They have good road networks that enhanced respondents' access to these facilities. In fact, as explained in Section 5.3, these are again the group of LGAs where majority of respondents spent an average of ₦80 on transport to and from a PHC centre.

The second scenario consists of LGAs whose respondents fall within the second category of access to PHC. These LGAs essentially consist of communities with poor access roads to their headquarters where good units of PHC facilities with equipment to work with are located. These LGAs include Ovia South-West, Ovia North-East and Esan North-East. They are largely rural LGAs with substantial number of communities lacking PHC facilities. The populations of most of the communities are in hundreds. Between 15 and 27 percent of the respondents in these LGAs had no access to PHC facilities within four kilometres threshold. Again, they spent an average of ₦120 and, in some cases ₦160 as transport cost to and from PHC centres (see Section 5.3). Thirdly and more importantly, is the set of LGAs such as Esan West, Etsako West and Uhunmwonde that had more than 30 percent of their respondents without access to PHC facilities within four kilometres. These are the group of LGAs with communities provided with PHC facilities but which seldom function due to lack of dedicated personnel and adequate equipment to work with. Uhunmwonde which has only 37.5 percent of its respondents having access to PHC

centres within four kilometres represents a special case where majority of respondents spent an average of ₦160 to and from a PHC centre.

Deriving from the above analysis, we find that using the proportion of consumers within specified distances as measures of access to PHC facilities more than 20 percent of the respondents at the State level lack access to PHC facilities within the four kilometres distance threshold. Moreover, there was a great variation between the LGAs such that the predominantly rural LGAs and some communities with PHC facilities lacking personnel and adequate equipment to work with were far less accessible compared to the suburban locations and LGA headquarters with standard PHC facilities. These findings negate the international standards as well as government policy objective of ensuring that every Nigerian has access to PHC facilities within four kilometres or within an hour walking distance.

Therefore, from the standpoint of policy, while government may have the good intention of providing health care for all and sundry, setting the same distance threshold of four kilometres for all places can be faulted. This is because the effect of distance is not the same in all places as is reflected in the different percentages of consumers with access at the same distance from facilities. The policy of setting the same distance for all places has some implications. First and foremost, emphasizing four kilometres distance threshold as a policy indicates that the objective of providing primary health care services for all and sundry most especially in the rural areas cannot be attained with the present level of provision. Secondly, the predominantly rural LGAs such as Ovia South-West, Ovia North-East and Uhunmwonde etcetera with greatly dispersed communities and poor access road networks are highly disadvantaged. This is because they had between 15 and 62.5 percent of their respondents pretty far away from PHC facilities compared to LGAs containing settlements with large rural populations. Finally, given poor access road networks and transportation difficulties, the rural consumers are most likely to prefer indigenous medicine over orthodox PHC services.

5.6 The effect of distance on access to PHC services

The most important interaction in any health care delivery system is that between consumer and provider (or health care facility). Many studies have drawn the

conclusion that physical proximity is an important factor in accessibility and utilisation of health care resources (Pilkington et al., 2012; Brual et al, 2010; Chan et al, 2006). Therefore, closeness to a particular facility is one of the main reasons for using such a resource. This is truer of lower-order facilities such as the primary health care (PHC) because the friction of distance for clinic use, for instance, is far greater than for secondary and tertiary health care facilities.

In this section, emphasis is placed on the effect of distance on access to PHC facilities in the various LGAs. The aim is to determine whether distance significantly account for the observed variations in access to PHC services in different communities of the study area (see previous section, Table 5.10). It is also to determine if the effect of distance is the same in different LGAs. Consequently, correlation analysis and simple regression model were used to test the hypothesis that 'access to PHC services decreases differentially with increasing distance from facilities in different LGAs (Tables 5.11). In our model, access to PHC services is the dependent variable while distance from the facilities is the independent variable.

Table 5.11: Simple Regression Results

LGAs	β Coefficients	t-statistic	Prob. (t-statistic)	R^2 (%)
Etsako West	- 1.88	4.25	0.013*	50.00
Etsako Central	- 3.23	2.48	0.068	32.00

Etsako East	- 3.31	2.05	0.109	22.00
Esan North-East	- 2.62	4.93	0.007**	67.00
Esan West	- 2.57	3.80	0.019*	53.00
Uhunmwonde	0.79	1.46	0.219	3.00
Ovia North-East	- 2.87	3.63	0.022*	53.00
Ovia South-West	- 3.03	3.08	0.037*	44.00
Egor	- 3.18	2.61	0.059	35.00
Owan West	- 3.28	2.36	0.078	30.00

Source: Fieldwork, December 2004.
*Significant at 5 percent level
**significant at <1 percent level

The results of the regression analysis are set out in Table 5.11. The coefficients of determination (R^2) show the effect of distance from PHC facilities on consumers' access to PHC services in different LGAs of Edo State. From column two of the table, it is clear that for all but one LGA (Uhunmwonde LGA), there is an inverse relationship between distance from facilities and consumers access to PHC services. This indicates that in nine of the 10 LGAs consumers access to PHC services decreases with increasing distance from the facilities. More importantly, the effect of distance is not the same in all the LGAs. Access decreases differentially in different LGAs.

In fact, the regression coefficients show that the predicted access to PHC services decreases in Etsako West by -1.88 units, in Etsako Central by -3.23, Etsako East -3.31, Esan North-East -2.62, Esan West -2.57 and in Ovia North-East by -2.87 units

for each unit increase in distance in these LGAs. In Ovia South-West access decreased by -3.03 units, while in Egor the value is -3.18 and in Owan West it is -3.28 units for each unit increase in distance. This means that in all of these LGAs consumers access to PHC services decreases differentially with increasing distance from the facilities. Accordingly, the t-statistic, which in this study is a measure of the importance of distance effect on access to PHC, are respectively for Etsako West, 4.25, Etsako Central 2.48, Etsako East 2.05, Esan North-East 4.93, Esan West 3.80 and Ovia North-East 3.63. The values are 3.08 for Ovia South-West, Egor 2.61 and Owan West 2.36.

Consequently, at the 0.01 and 0.05 significance levels with 1 and 4 degrees of freedom, friction of distance in Etsako West (P = .013), Esan North-East (P = .007), Esan West (P = .019), Ovia North-East (P = .022) and Ovia South-West (P = .037) significantly curtail consumers access to PHC services. The level of explanation (the coefficient of determination R^2) shows that 50 percent of the variation in access to PHC services in Etsako West is explained by the distance variable. The levels of explanation are 67 percent in Esan North-East, 53 percent each in Esan West and Ovia North-East, and 44 percent in Ovia South-West. Even in those LGAs where distance does not significantly curtail consumers' access to PHC services at the 0.01 and 0.05 levels, the coefficients of determination (R^2) are 35 percent for Egor, 32 percent in Etsako Central, 30 percent in Owan West and, 22 percent in Etsako East.

The results of the zero-order correlation analysis (Appendixes C-2 and C-3) also support that of the regression model. Again, except for Uhunmwonde LGA with a positive relationship, there was an inverse relationship between distance and respondents' access to PHC facilities in all of the LGAs. Accordingly, at the 0.05 significant level, the correlation coefficient of distance on access to PHC in Etsako West is -0.812; the values for Etsako Central, Egor, Ovia South-west and Owan West is -0.941 respectively. In the same vein, the coefficients for Etsako East is -0.926; Esan North-east, -0.986; Esan West, -0.928, and Ovia North-east, -0.880.

Of all the LGAs considered in the analyses, only Uhunmwonde LGA has positive relationship between distance and access to PHC services. This unexpected trend could be explained by the fact that Ehor, the local government headquarters, and

Idumugha village (survey sites) are both located along Benin and Ekpoma trunk 'B' road. This gives both places easy access to Benin City, Ekpoma, Iruekpen or Igueben, that are all between fifteen and twenty-five minutes travel distance. Transport cost to any of these towns is also cheap at less than ₦200 to and fro. Also, the availability of better kept and equipped PHC facilities in these towns may have influenced the respondents' decision to travel long distances to utilise their services in the absence of functional PHC facilities in their own communities. Consequently, distance accounts for only 3 percent of the variation in access to PHC facilities in Uhunmwonde LGA. Therefore, because there is no friction of distance due to good roads and low transport costs as well as the vital need to routinely immunise the children against the six childhood killer diseases, access to PHC among respondents in Uhunmwonde tends to increase with distance at least to a very large extent if they must avail themselves of primary health care.

Generally, it is clear from the analysis that for five of the 10 LGAs examined, distance does not significantly explain variations in access to PHC services. This is because not only are the levels of explanation (R^2) low, the regression equations are not significant at the 0.01 and 0.05 levels. Nevertheless, the models for Etsako West, Esan North-East, Esan West, Ovia North-East and Ovia South-West are all significant. Specifically, the levels of explanation (R^2) across the LGAs did show that distance effect accounts for between 22 and 67 percent of the variations in access to PHC services in the study area. As such, a distance-decay effect was apparent in consumers' access to PHC services as access decreases differentially with increasing distance from facilities in different communities.

Conclusion

Generally, respondents in the suburban/urban areas have better access to PHC facilities within the distance band of 0-1.99 kilometres and 2-3.99 kilometres (64.8% and 84.4% respectively), than their rural counterparts (50.0% and 68.0%). However, there was a sharp decline in access beyond 1.99 kilometres as only 19.6 percent of the suburban/urban and 18 percent of the rural respondents had access to PHC facilities at distances between 2–3.99 kilometres. The application of simple regression analyses revealed that for all but one of the LGAs there was a consistent inverse relationship between distance from facilities in different communities and access to PHC services.

Also, respondents access to PHC facilities decreases differentially with increasing distance from facilities in different communities. Consequently, from the standpoint of policy, setting the same distance threshold of four kilometres for all places has some health implications. First and foremost, emphasizing four kilometres distance threshold as a government health policy indicates that the objective of providing primary health care services for all and sundry most especially in the rural areas cannot be attained with the present level of provision. Secondly, the predominantly rural LGAs such as Ovia South-West, Ovia North-East and Uhunmwonde etcetera with greatly dispersed communities and poor access road networks are highly disadvantaged and they had between 15 and 62.5 percent of their consumers without access to PHC facilities compared to LGAs containing settlements with large rural populations. The next chapter discusses the effects of non-spatial factors which in combination with the spatial factors discussed here affect the utilisation of PHC facilities by patients.

CHAPTER SIX

PHC UTILISATION: IMPACT OF NON-SPATIAL FACTORS

6.1 Introduction

This chapter examined the effect of non-spatial factors on the utilisation of PHC services. Emphasis is placed on PHC awareness, the sources of awareness and its effect on PHC utilisation. The demographic and socio-economic characteristics of the respondents and their effect on PHC utilisation are also discussed.

6.2 Respondents' awareness, sources of awareness and PHC utilisation

The use of any facility or service and most especially health care services is to a large extent dependent on the knowledge of such facility or service in the local communities where they are located. One of the essential aspects of PHC promotion relates to the awareness of its services. Awareness therefore, is the first step in the patronage and utilisation of PHC services. To establish the knowledge of PHC programme in the chosen communities, respondents were asked about their awareness of PHC services in their community. Their responses indicate that 96.3 percent of the respondents were aware of PHC programme. This figure is made up of 61.0 percent suburban/urban respondents and 35.3 percent rural respondents. On the other hand, 1.5 percent of the suburban/urban and 2.3 percent of the rural respondents lack knowledge of PHC programmes in their respective communities (Table 6.1).

Table 6.1: Respondents' awareness of PHC by area location

	URBAN		RURAL		TOTAL	
PHC Awareness	No	%	No	%	No	%
Aware	244	61.0	141	35. 3	385	96. 3
Not Aware	6	1. 5	9	2. 3	15	3.8
TOTAL	250	62.5	150	37.5	400	100

Source: Fieldwork, December 2004.

The geographical pattern of PHC awareness among the LGAs is presented in Table 6.2. The table shows that except for Owan West (1.8%), Etsako West (1.3%), Egor

(0.5%) and Ovia South-West (0.3%), all respondents in each of the other LGAs had some knowledge of PHC programmes in their respective communities.

On the important question of mode or sources of awareness, Table 6.3 reveals that the public campaign medium was the most important means of keeping the communities aware of PHC programmes. It accounted for 39.5 percent of the numerous means of communicating PHC programme to the populace both at the suburban/urban and rural areas. Television (29.3%) came next as a means of acquainting both the suburban/ urban (17.5%) and rural (11.8%) respondents of PHC programmes. The third most important sources of PHC awareness was through neighbours/relatives (15.3%). This was made up of 10 percent suburban/urban and 5.3 percent rural respondents. Radio (13.5%) and finally newspapers (1.3%) were the fourth and fifth means of PHC awareness by the respondents. Those who could not state precisely how they got acquainted with PHC programmes were only 1.3 percent of the respondents.

Table 6.2: Respondents' awareness of PHC by LGAs

LGA	PHC Awareness					
	Aware		Not Aware		TOTAL	
	No	%	No	%	No	%
OWAN WEST	33	8. 3	7	1.8	40	10.0
ESAN WEST	40	10.0	-	-	40	10.0
ESAN NORTH.EAST	40	10.0	-	-	40	10.0
ETSAKO WEST	35	8.8	5	1. 3	40	10.0
ETSAKO CENTRAL	40	10.0	-	-	40	10.0
ETSAKO EAST	40	10.0	-	-	40	10.0
UHUNMWONDE	40	10.0	-	-	40	10.0
EGOR	38	9. 5	2	. 5	40	10.0
OVIA N. EAST	40	10.0	-	-	40	10.0
OVIA S. WEST	39	9.8	1	. 3	40	10.0
TOTAL	385	96. 3	15	3.8	400	100.0

Source: Fieldwork December 2004.

Table 6.3: Respondents' mode or sources of awareness of PHC

Mode of Awareness	SUBURBAN/ URBAN		RURAL		TOTAL	
	No	%	No	%	No	%
No response	1	. 3	4	1.0	5	1. 3
Newspaper	4	1.0	1	. 3	5	1. 3
Radio	34	8. 5	20	5.0	54	13. 5
Television	70	17. 5	47	11.8	117	29. 3
Neighbour/Relatives	40	10.0	21	5. 3	61	15. 3
Public Campaign	101	25. 3	57	14. 3	158	39. 5
TOTAL	250	62.5	150	37.5	400	100.0

Source: Fieldwork, December 2004.

In terms of spatial variation among the LGAs, Etsako Central and Etsako East (5.0% each), Ovia North-East (4.8%), Ovia South-West and Uhunmwonde (4.3% each) and Esan North-East (3.8%) respectively, had the highest respondents who became aware of PHC programmes through 'public campaign'. For awareness through 'television', Egor (4.5%), Ovia South-West and Owan West (4.0% each), and Uhunmwonde (3.5%) ranked highest among the LGAs. Respondents in Etsako West (2.0%), Esan West, Esan North-East, Etsako Central and Ovia North-East (1.8% each) got acquainted with PHC programmes through their neighbours/relatives. Radio fared better in Esan West (2.3%), Owan West and Etsako West (1.8% each), and Etsako East and Ovia North-East (1.5% each) as indicated in Table 6.4.

Table 6.4: Respondents' mode of awareness of PHC by LGAs

LGA	Mode of Awareness													
	NR		Newspaper		Radio		Television		Neighbour/ Relative		Public Campaign		TOTAL	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%
OWAN WEST	-	-	1	.3	7	1.8	16	4.0	6	1.5	10	2.5	40	10.0
ESAN WEST	1	.3	1	.3	9	2.3	8	2.0	7	1.8	14	3.5	40	10.0
ESAN N.E	-	-	2	.5	5	1.3	11	2.8	7	1.8	15	3.8	40	10.0
ETSAKO WEST	3	.8	-	-	7	1.8	8	2.0	8	2.0	14	3.5	40	10.0
ETSAKO CENT	-	-	-	-	3	.8	10	2. 5	7	1.8	20	5.0	40	10.0
ETSAKO EAST	-	-	-	-	6	1. 5	8	2.0	6	1. 5	20	5.0	40	10.0
UHUNMWONDE	-	-	-	-	3	.8	14	3. 5	6	1. 5	17	4. 3	40	10.0
EGOR	-	-	1	. 3	5	1. 3	18	4. 5	4	1.0	12	3.0	40	10.0
OVIA N. EAST	-	-	-	-	6	1. 5	8	2.0	7	1.8	19	4.8	40	10.0
OVIA S. WEST	1	. 3	-	-	3	.8	16	4.0	3	.8	17	4. 3	40	10.0
TOTAL	5	1. 3	5	1. 3	54	13.5	117	29. 3	61	15. 3	158	39.5	400	100

Source: Fieldwork, December 2004

In order to examine the rate of primary health care utilisation, respondents were asked if they, their children or wards ever patronised PHC services. Altogether 86.5 percent of the respondents confirmed they had actually utilised PHC facilities. This figure is made up of 53.7 percent suburban/urban respondents and 32.8 percent rural respondents (Table 6.5). The geographical distribution of these respondents amongst the LGAs is depicted in Table 6.6. The table shows that Owan West (4.5%) Etsako West (2.0%), Ovia South-West (1.5%) and Egor (1.3%) account for most of the 13.5 percent of the respondents that do not patronize PHC services. Generally, it is encouraging to note that there was a high patronage of PHC services in all of the LGAs surveyed as the tables indicated. Table 6.1.5 shows the relationship between PHC awareness and utilisation, while Table 6.1.6 relates the influence of sources of awareness on PHC utilisation.

Table 6.5: Respondents' utilisation of PHC

	SUBURBAN/URBAN		RURAL		TOTAL	
PHC Utilization	No	%	No	%	No	%
Utilized	215	53.7	131	32.8	346	86. 5
Not Utilized	35	8.8	19	4.8	54	13. 5
TOTAL	250	62.5	150	37.5	400	100

Source: Fieldwork, December 2004.

Table 6.6: Respondents' utilisation of PHC by LGAs

LGA	PHC Utilisation					
	Utilized		Not Utilized		TOTAL	
	No	%	No	%	No	%
OWAN WEST	22	5.5	18	4.5	40	10.0
ESAN WEST	36	9.0	4	1.0	40	10.0
ESAN N.E.	36	9.0	4	1.0	40	10.0
ETSAKO WEST	32	8.0	8	2.0	40	10.0
ETSAKO CENTRAL	39	9.8	1	0.3	40	10.0
ETSAKO EAST	39	9.8	1	0.3	40	10.0
UHUNMWONDE	36	9.0	4	1.0	40	10.0
EGOR	35	8.8	5	1.3	40	10.0
OVIA N. EAST	37	9.3	3	0.8	40	10.0
OVIA S. WEST	34	8.5	6	1.5	40	10.0
TOTAL	346	86.5	54	13.5	400	100.0

Source: Fieldwork, December 2004.

The effect of PHC awareness on the utilisation of PHC services is presented in Table 6.7. The table indicates that awareness (86.0%) was a very important factor influencing the utilisation of PHC services. Applying Chi-Square analysis to assess the statistical significance of this observation, the table value of X^2 at the .05 level of significance with 1 degree of freedom is 3.84. Our computed X^2 value of 71.444 with P-value of .000 is far greater than the critical value of 3.84. Given this result, we conclude that there is statistically significant difference between respondents with some PHC awareness and those without PHC awareness in utilising PHC services in Edo State. In other words, respondents with adequate knowledge of PHC programmes utilise the services more than those without its essential knowledge.

Furthermore, as presented in Table 6.8 the assessment of the effect of mode of awareness on PHC utilisation indicates that public campaign (37.0%) and television (25.0%) stand out as the most important media influencing consumers' decision to utilise PHC. Other modes of substantial importance are awareness through neighbours/relatives (12.3%) and radio (11.5%). A Chi-Square test of difference between respondents mode of awareness and PHC utilisation shows that the table value of X^2 at the .05 significance level with 5 degrees of freedom is 11.07. Our computed X^2 value of 44.178 with P-value of .000 is far greater than the critical value of 11.07. In view of this result, we conclude that there is a statistically significant difference in respondents' utilisation of PHC services on the basis of mode of awareness. In this regard, public campaign, television, neighbours/relatives and radio, play more vital roles as means of keeping the respondents aware of PHC services. The subsequent sections of this chapter discuss the socio-economic factors that may have aided or impeded respondents' utilisation of PHC services in Edo State, Nigeria.

Table 6.7: Effect of PHC awareness on PHC utilisation

	PHC UTILISATION					
	Utilized		Not Utilized		Total	
PHC AWARENESS	No	%	No	%	No	%
Aware	344	86.0	41	10.3	385	96.3
Not Aware	2	0.5	13	3.3	15	3.8
Total	346	86.5	54	13.5	400	100.0

Source: Fieldwork 2004.

X^2 Table Value = 3.84; X^2 Computed Value = 71.444; P-value = .000

Table 6.8: Mode of awareness and PHC utilization

MODE OF AWARENESS	PHC UTILISATION					
	Utilized		Not Utilized		Total	
	No	%	No	%	No	%
NR	0	0.0	5	1.3	5	1.3
Newspaper	3	0.8	2	0.5	5	1.3
Radio	46	11.5	8	2.0	54	13.5
Television	100	25.0	17	4.3	117	29.3
Neighbours/Relatives	49	12.3	12	3.0	61	15.3
Public campaign	148	37.0	10	2.5	158	39.5
Total	346	86.5	54	13.5	400	100.0

Source: Fieldwork 2004.

X^2 Table Value = 11.07; X^2 Computed Value = 44.178; P-value = .000

6.3 Age, Sex and Religious characteristics of respondents

The age and sex structure of a population and to some extent religion are quite vital when analysing the utilisation of health care services. This is because they have a number of implications on the pattern of utilisation of these services. In this study, the age cohort 35-44 years constitutes the largest number of respondents (31.8%). They were followed by 25-34 years (26.0%), and 45 years and above (24.8%). The 15-24 years age cohort (17.5%) constitutes the smallest number of respondents. With regard to residential location, respondents living in the sub-urban/urban centres constitute 62.5 percent of the survey while those living in the rural communities are 37.5 percent as shown in Table 6.9.

Table 6.10 depicts the age of respondents by LGAs. The table indicates that while Owan West had more of its respondents (4.0%) within 15-24 years age cohort, Esan West had this same value in the 45 years and above age cohort. Again, while Uhunmwonde (4.0%), Ovia South-West, Esan North-East and Ovia North-East had more of their respondents (3.5% each) in the 35-44 years age cohort, Etsako West had 3.5 percent of its respondents within the 25-34 years age cohort. Furthermore, Egor and Etsako East (4.5% each), and Etsako Central (3.3%) had more of their respondents within the 35-44 years age cohort.

Table 6.9: Age of respondents

Age	SUBURBAN/URBAN		RURAL		TOTAL	
	No	%	No	%	No	%
15-24yrs	51	12.8	19	4.8	70	17.5
25-34yrs	67	16.8	37	9.3	104	26.0
35-44yrs	76	19.0	51	12.8	127	31.8
45yrs Above	56	14.0	43	10.8	99	24.8
Total	250	62.5	150	37.5	400	100.0

Source: Fieldwork, December 2004.

Table 6.10: Respondents' age by LGAs

LGA	AGE									
	15-24 yrs		25-34 yrs		35-44 yrs		45 yrs+		TOTAL	
	No	%	No	%	N0	%	No	%	No	%
OWAN WEST	16	4.0	11	2.8	4	1.0	9	2. 3	40	10.0
ESAN WEST	11	2.8	10	2.5	3	.8	16	4.0	40	10.0
ESAN N.E.	7	1.8	7	1.8	14	3. 5	12	3.0	40	10.0
ETSAKO WEST	6	1. 5	14	3. 5	11	2.8	9	2. 3	40	10.0
ETSAKO C.	6	1. 5	11	2.8	13	3. 3	10	2. 5	40	10.0
ETSAKO EAST	4	1.0	11	2.8	18	4. 5	7	1.8	40	10.0
UHUNMWONDE	9	2. 3	6	1. 5	16	4.0	9	2. 3	40	10.0
EGOR	3	.8	12	3.0	18	4. 5	7	1.8	40	10.0
OVIA N. EAST	5	1. 3	11	2.8	14	3. 5	10	2. 5	40	10.0
OVIA S. WEST	3	.8	11	2.8	16	4.0	10	2. 5	40	10.0
TOTAL	70	17.5	104	26.0	127	31.8	99	24.8	400	100.0

Source: Fieldwork, December 2004.

Table 6.11 presents the cross-tabulation between age and PHC utilisation. In their order of magnitude the age cohorts 35-44 years (29.5%), followed by those of 45 years and above (22.5%) and the 25-34 years (20.8%) utilised PHC services more than the younger age cohort of 15-24 years (13.8%). Although the age cohorts 35-44 years and 45 years and above made more use of PHC facilities, the table indicates that utilisation cuts across all age cohorts among the respondents. A Chi-Square test reveals that at the .05 level of significance the X^2 table value of 7.81 with 3 degrees of freedom is less than our computed X^2 value of 13.875 with P-value of .003. With this result we conclude that there is a statistically significant difference between the various age cohorts in their utilisation of PHC services. By and large, respondents above 25 years of age utilised PHC services more than those below 25 years.

With respect to gender, there were more female (56.0%) respondents than males (44%). Of these, 36.3 percent of the females and 26.3 percent of the males live in the sub-urban and urban centres while 19.7 percent and 17.7 percent of the females and males respectively were resident in the rural areas (Table 6.12).

Table 6.11: Age effect on PHC utilisation

AGE	PHC UTILISATION				Total	
	Utilized		Not Utilized			
	No	%	No	%	No	%
15-24 years	55	13.8	15	3.8	70	17.5
25-34 years	83	20.8	21	5.3	104	26.0
35-44 years	118	29.5	9	2.3	127	31.8
45 &. above	90	22.5	9	2.3	99	24.8
Total	346	86.5	54	13.	400	100.0

Source: Fieldwork 2004.

X^2 Table Value = 7.81; X^2 Computed Value = 13.878, P-value = .003

Table 6.12: Respondents' sex distribution

SEX	SUBURBAN/ URBAN		RURAL		TOTAL	
	No	%	No	%	No	%
Male	105	26.3	71	17.7	176	44.0
Female	145	36.3	79	19.7	224	56.0
TOTAL	250	62.5	150	37.5	400	100.0

Source: Fieldwork, December 2004.

The effect of gender on PHC utilisation is presented in Table 6.13. The table shows that more females (49.5%) than males (37.0%) utilised PHC services. The Chi-Square test did show that the X^2 table value of 3.84 at the .05 level of significance with 1 degree of freedom is greater than our computed X^2 value of 1.562 with P-value of

.211. In the light of this result, we conclude that PHC utilisation is not significantly influenced by the gender of respondents in Edo State.

Religious beliefs to some extent also influence people's choice of health care intervention. As such, while certain sects would not agree to blood transfusion as a medical treatment, others would not subscribe to the idea of abortion even for the safety of the mother at risk while yet some would choose to remain indifferent. In Edo State, the dominant religious beliefs are Christianity, Islam and Traditional religion. The bulk of the respondents (76.2%) are Christians comprising 47.5 percent suburban/urban and 28.7 percent rural residents. The Moslems constitute 20.8 percent out of which 13.5 percent were suburban/urban dwellers and 7.3 percent rural dwellers. Traditional religion accounted for only 3.0 percent, comprising 1.5 percent each for both suburban/urban and rural areas (Table 6.14).

With regard to spatial variation among the LGAs, Edo North comprising Etsako West (3.3%), Etsako Central (4.0%) and Etsako East (5.0%) accounted for the largest number of Muslim respondents (12.2%). Christianity is generally well represented among the 10 LGAs with Egor having the largest of these respondents (9.5%). Other LGAs with quite a high number of Christian respondents are Ovia North-East (9.0%), Ovia South-West (8.8%), Esan North-East (8.5%), and Uhunmwonde (8.3%), etcetera as depicted in Table 6.14. Only in four of the 10 LGAs were there respondents who claimed to be fully traditional religious worshippers.

Table 6.13: Gender and PHC utilisation

	PHC UTILISATION					
	Utilized		Not Utilized		Total	
GENDER	No	%	No	%	No	%
Male	148	37.0	28	7.0	176	44.0
Female	198	49.5	26	6.5	224	56.0
Total	346	86.5	54	13.5	400	100.0

Source: Fieldwork 2004.

X^2 Table Value = 3.84; X^2 Computed Value = 1.562; P-value = .211

Table 6.14: Religion of respondents by LGAs

	Religion						TOTAL	
	Islam		Christianity		Traditional			
LGA	No	%	No	%	No	%	No	%
OWAN WEST	7	1.8	29	7. 3	4	1.0	40	10.0
ESAN WEST	8	2.0	29	7. 3	3	.8	40	10.0
ESAN N.E.	2	. 5	34	8. 5	4	1.0	40	10.0
ETSAKO WEST	13	3. 3	27	6.8	-	-	40	10.0
ETSAKO CENTRAL	16	4.0	24	6.0	-	-	40	10.0
ETSAKO EAST	20	5.0	20	5.0	-	-	40	10.0
UHUNMWONDE	7	1.8	33	8. 3	-	-	40	10.0
EGOR	2	. 5	38	9. 5	-	-	40	10.0
OVIA N. EAST	3	.8	36	9.0	1	. 3	40	10.0
OVIA S. WEST	5	1. 3	35	8.8	-	-	40	10.0
TOTAL	83	20.8	305	76. 2	12	3.0	400	100.0

Source: Fieldwork, December 2004.

The effect of religion on PHC utilisation is cross-tabulated in Table 6.15. Although the utilisation of PHC services cuts across religious beliefs in Edo State, it should be noted that Christians (66.5%) as against Moslems (17.8%) and Traditional worshipers (2.3%) had the largest proportion of the respondents. To examine if the difference in utilisation between the three religious groups is statistically significant, Chi-Square

test was used. The X^2 table value of 5.99 at the .05 significance level with 2 degrees of freedom is greater than our computed X^2 value of 1.557 with P-value of .459. With this result, we conclude that there is no statistically significant difference between the three religious groups with respect to PHC utilisation.

Table 6.15: Effect of religion on PHC utilisation

RELIGION	PHC UTILISATION					
	Utilized		Not Utilized		Total	
	No	%	No	%	No	%
Islam	71	17.8	12	3.0	83	20.8
Christianity	266	66.5	39	9.8	305	76.3
Traditional	9	2.3	3	0.8	12	3.0
Total	346	86.5	54	13.5	400	100.0

Source: Fieldwork 2004.

X^2 Table Value = 5.99; X^2 Computed Value = 1.557; P-value = .459

6.4 Marital status and number of children of respondents

The marital status of an individual also influences health care utilisation, most especially primary health care (PHC). In the study area, married respondents utilised PHC services more than other respondents. However, more often than not the utilisation of PHC services for the treatment of minor ailments cuts across marital

status and age. In this study, Table 6.16 shows that while 62.8 percent of the respondents are married, the ‘singles’ made up 34.2 percent. Only 1.8 percent and 1.3 percent were widowed and divorced respectively.

The geographical distribution of these respondents shows that Etsako East (7.8%), Esan North-East (7.3%) and Uhunmwonde (7.0%) had more of married respondents among the 10 LGAs examined. Esan West (6.8%) and Egor (6.5%) followed closely as shown in Table 6.17. On the other hand, there were more single respondents in Etsako West (5.0%), Owan West (4.5%), Etsako Central (4.3%) and Ovia South-West (3.8%).

The effect of marital status on PHC utilisation is set out in Table 6.18. As indicated in the table, married respondents (58.5 percent) utilised PHC services more than the ‘singles’ (25.5%), widow/widowers and the divorced (1.3% each) put together; although, utilisation cuts across all categories of respondents. The Chi-Square test shows that at the .05 alpha level, the X^2 table value of 7.81 with 3 degrees of freedom is far lower than our computed X^2 value of 28.897 with P-value of .000. This result indicates that there is a statistically significant evidence to conclude that PHC utilisation differs by marital status.

Table 6.16: Marital Status of respondents

	SUBURBAN/URBAN		RURAL		TOTAL	
Marital Status	No	%	No	%	No	%
Single	96	24.0	41	10.2	137	34. 2
Married	149	37.3	102	25.2	251	62.8
Widow/widower	3	0.8	4	1.0	7	1.8
Divorced	2	0.5	3	0.8	5	1. 3
Total	250	62.5	150	37.5	400	100.0

Source: Fieldwork, December 2004.

Table 6.17: Marital status of respondents by LGAs

	Marital Status									
	Single		Married		Widow		Divorced		TOTAL	
LGA	No	%	No	%	No	%	No	%	No	%
OWAN WEST	18	4.5	19	4. 8	2	. 5	1	. 3	40	10.0
ESAN WEST	13	3.3	27	6.8	-	-	-	-	40	10.0
ESAN N.EAST	11	2.8	29	7.3	-	-	-	-	40	10.0
ETSAKO WEST	20	5.0	20	5.0	-	-	-	-	40	10.0
ETSAKO CENTRAL	17	4. 3	22	5.5	1	.3	-	-	40	10.0
ETSAKO EAST	8	2.0	31	7.8	1	. 3	-	-	40	10.0
UHUNMWONDE	12	3.0	28	7.0	-	-	-	-	40	10.0
EGOR	12	3.0	26	6. 5	-	-	2	. 5	40	10.0
OVIA N. EAST	11	2.8	25	6. 3	2	. 5	2	. 5	40	10.0
OVIA S. WEST	15	3.8	24	6.0	1	. 3	-	-	40	10.0
TOTAL	137	34. 3	251	62.8	7	1.8	5	1. 3	400	100.0

Source: Fieldwork, December 2004.

Table 6.18: Effect of marital status on PHC utilisation

	PHC UTILISATION					
	Utilized		Not Utilized		Total	
MARITAL STATUS	No	%	No	%	No	%
Single	102	25.5	35	8.8	137	34.3
Married	234	58.5	17	4.3	251	62.8
Widow/widower	5	1.3	2	0.5	7	1.8
Divorced	5	1.3	0	0.0	5	1.3
Total	346	86.5	54	13.5	400	100.0

Source: Fieldwork 2004.

X^2 Table Value = 7.81; X^2 Computed Value = 28.897; P-value = .000

The number of children per couple is relatively high in the study area as 16.3 percent of the respondents had five children and above. Those with only two children as at the time of survey account for 15.3 percent while those with three and four children constitute 13.8 percent and 13.0 percent respectively. Those without children as at the

time of survey made up 30.5 percent of the respondents while those with one child are 11.3 percent. As depicted in Table 6.19, there is no remarkable difference between respondents who has three and those who has five children in the suburban/urban and rural areas. In the suburban/urban areas while each of the 7.5 percent of the respondents has three children, 8.5 percent of them have five children. In the case of the rural areas while each of the 6.3 percent had three children, 7.8 percent had five children.

As Table 6.20 indicates, LGAs with large concentration of singles (bachelors and spinsters) and married respondents that have not had children but utilise PHC services are Owan West (5.0%), Etsako West (4.3%), Ovia South-West and Etsako Central (3.8% each). On the other hand, respondents with five children and above who utilise PHC services are 3.3 percent in Esan West, 3.0 percent in Esan North-East, 2.3 percent in Ovia North-East, and Etsako West 2.0 percent.

Generally, PHC facilities are the first points of call for both maternal and child health, as well as for various minor ailments and injuries in most communities. As such, the utilisation of its services is not only for people with children. Hence, as this study reveals the reality is that both the singles as well as couples with children are found to substantially patronise PHC services.

Table 6.19: Number of children per adult respondent

	SUBURBAN/URBAN		RURAL		TOTAL	
Number of Children	No	%	No	%	No	%
None	86	21.5	36	9.0	122	30.5
One	31	7.8	14	3.5	45	11.3
Two	38	9.5	23	5.8	61	15.3
Three	30	7.5	25	6.3	55	13. 8
Four	31	7.8	21	5.3	52	13.0
Five and Above	34	8.5	31	7.8	65	16. 3
TOTAL	250	62.5	150	37.5	400	100.0

Source: Fieldwork, December 2004.

Table 6.20: Number of children per respondent by LGAs

	Number of Children per adult											TOTAL	
	None		One		Two		Three		Four		Five +			
LGA	No	%	No	%	No	%	No	%	No	%	No	%	No	%
OWAN WEST	20	5.0	2	. 5	3	.8	4	1.0	8	2.0	3	.8	40	10.0
ESAN WEST	13	3.3	2	. 5	6	1.5	3	.8	3	.8	13	3.3	40	10.0
ESAN N.EAST	10	2.5	5	1.3	4	1.0	2	. 5	7	1.8	12	3.0	40	10.0
ETSAKO WEST	17	4.3	4	1.0	4	1.0	8	2.0	3	.8	4	1.0	40	10.0
ETSAKO CENTRAL	15	3.8	7	1.8	2	. 5	5	1. 3	6	1. 5	5	1. 3	40	10.0
ETSAKO EAST	7	1.8	5	1.3	10	2.5	6	1.5	4	1.0	8	2.0	40	10.0
UHUNMWONDE	11	2.8	3	.8	6	1. 5	11	2.8	5	1. 3	4	1.0	40	10.0
EGOR	5	1. 3	7	1.8	10	2. 5	7	1.8	8	2.0	3	.8	40	10.0
OVIA N. EAST	9	2. 3	7	1.8	8	2.0	5	1. 3	2	. 5	9	2.3	40	10.0
OVIA S. WEST	15	3.8	3	.8	8	2.0	4	1.0	6	1.5	4	1.0	40	10.0
TOTAL	122	30.5	45	11.3	61	15.3	55	13.8	52	13.0	65	16. 3	400	100.

Source: Fieldwork, December 2004. +: Respondents having five and above children.

Table 6.21 presents the cross-tabulation between number of children per respondent and PHC utilisation. As shown in the table, respondents with five and above children (15.3%), followed by those with two (14.3%) and three (13.3%) made more use of PHC services than respondents with one (9.5%) and four children (11.5%). However, from the table it is obvious that respondents without children, but who may have utilised PHC services other than for maternal and child health care also made up substantial proportion (22.8%) of PHC users. Furthermore, amongst these respondents (22.8%) are consumers who probably may have utilised PHC services for their first pregnancy. A Chi-Square test of difference between number of children per respondent and PHC utilisation indicates that at the .05 level of significance the X^2 table value of 11.07 at 5 degrees of freedom is far lower than the computed X^2 value of 25.257 with P-value of .000. Given this result, we conclude that there is statistically significant evidence that PHC utilisation differs amongst respondents having different number of children.

Table 6.21: Effect of number of children on PHC utilisation

	PHC UTILISATION					
	Utilized		Not Utilized		Total	
NUMBER OF CHILDREN	No	%	No	%	No	%
None	91	22.8	31	7.8	122	30.5
One	38	9.5	7	1.8	45	11.3
Two	57	14.3	4	1.0	61	15.3
Three	53	13.3	2	0.5	55	13.8
Four	46	11.5	6	1.5	52	13.0
Five above	61	15.3	4	1.0	65	16.3
Total	346	86.5	54	13.5	400	100.0

Source: Fieldwork 2004.
X^2 Table Value = 11.07; X^2 Computed Value = 25.257; P-value = .000

6.5 Education, Occupation and Income of respondents

Education, occupation and income are three non-spatial factors that greatly influence the utilisation of medical services. Specifically, education is an important factor governing choices people make and their consequent use of health care facilities. Some studies in developing nations have found a strong effect of education (Caldwell J.C, 1979; Mensch et al., 1985; Onokerhoraye, 1997), especially maternal education, on the utilisation of maternal and child health services (Rutstein, Sommerfelt & Schoemaker, 1990; Canovas 1991; Das Gupta, 1997 and Adetunji, 1995). In Nigeria, for instance, Onokerhoraye (1997) had observed that educated people make more frequent use of modern health care facilities in a study of Benue State hospital facilities. However, given health care availability and awareness of its benefits this difference in utilisation between the educated and the illiterate could become blurred. Thus, as concluded by Onokerhoraye (1997, 215) 'the only difference is that in localities which do not have general hospitals people with formal education are generally more determined to travel longer distances to visit hospitals'.

In Edo State as indicated in Table 6.22, literacy level was above average as more than 75 percent of the respondents had gone beyond primary school education. While only 6.3 percent of the respondents had no formal education, those with primary education accounts for 16.3 percent. Respondents with secondary and tertiary education account for 38.3 percent and 39.3 percent respectively. With regard to geographical distribution, Egor (6.3%), Owan West (5.5%), Etsako West (4.8%), Ovia South-West and Etsako Central (4.3% each) had more respondents with tertiary education than other LGAs. The LGAs where respondents had more of secondary education are Esan North-East, Etsako West and Uhunmwonde (4.5% each), Etsako Central (4.0%), and Ovia North-East and Ovia South-West (3.8% each). Respondents with primary education are more in Ovia North-East (2.8%), Esan West and Etsako East (2.5% each) and Esan North-East (2.3%). In terms of the distribution of these respondents by urban-rural location, Table 6.23 shows that there is no remarkable difference between the suburban/urban and the rural areas as substantial number of all categories of respondents with different educational backgrounds are located in both areas.

Although the literature is replete with studies pointing to level of education (Caldwell, J.C, 1979; Mensch et al., 1985), and especially that of females (Caldwell, J.C., 1993; Cleland J., 1990; Canovas 1991; Das Gupta 1997) as an important factor aiding the utilisation of health care services, there are studies that indicate access to and utilisation of health care services such as PHC are not wholly a function of educational level (Adetunji, 1995; Feyisetan 1985; Caldwell, 1989; Streatfield et al.

1990). For instance, Streatfield et al. (1990) observed a U-shaped relationship between maternal education and immunisation. Mothers with no education and those with a high level of education had a high level of use of immunisation while those with intermediate levels of education had a low level of use of immunisation.

Furthermore, Streatfield et al. (1990) also noted that the effect of formal education on the probability of a child being fully immunised disappears once the mother has correct knowledge of vaccine function. In addition, Amhanyunonsen (1994) also observed that the utilisation of PHC among females utilising antenatal and postnatal care services in the rural communities of Oluyole LGA in Oyo State, was not purely a function of the educational status of women as both the literate and uneducated were found to substantially utilise these services given the availability of PHC facilities. In the same vein, Adetunji (1995) citing Caldwell (1989) in a survey of infant mortality in Ondo State Nigeria, remarked that there is "no stability across countries in absolute level of child survival according to mother's level of education" (Adetunji, 1995, p.254).

Table 6.24 shows there was some variation in utilisation rate between the educated and uneducated respondents on the one hand, and on the other, between respondents with different educational backgrounds. Therefore, although PHC utilisation by 86.5 percent of the respondents cuts across educational lines, it appears respondents with low educational status utilise the services less than those with higher education. This argument is supported by a Chi-Square test that reveals that at the .05 level of significance with 3 degrees of freedom the X^2 table value of 7.81 is less than our computed X^2 of 11.714 with P-value of .039. Thus, we conclude that the difference in PHC utilisation between respondents with different educational backgrounds is statistically significant. In this regard, this study has shown that education is a strong determinant of respondents' utilisation of PHC services.

Table 6.22: Education of respondents by LGAs

	Education									
	No Schooling		Primary		Secondary		Tertiary		TOTAL	
LGA	No	%	No	%	No	%	No	%	No	%
OWAN WEST	2	. 5	4	1.0	12	3.0	22	5. 5	40	10.0
ESAN WEST	4	1.0	10	2.5	14	3.5	12	3.0	40	10.0
ESAN N. EAST	2	. 5	9	2.3	18	4.5	11	2.8	40	10.0
ETSAKO WEST	-	-	3	.8	18	4.5	19	4.8	40	10.0
ETSAKO CENTRAL	5	1.3	2	. 5	16	4.0	17	4. 3	40	10.0
ETSAKO EAST	4	1.0	10	2.5	15	3.8	11	2.8	40	10.0
UHUNMWONDE	1	. 3	7	1.8	18	4.5	14	3.5	40	10.0
EGOR	-	-	3	.8	12	3.0	25	6. 3	40	10.0
OVIA N. EAST	5	1.3	11	2.8	15	3.8	9	2. 3	40	10.0
OVIA S. WEST	2	. 5	6	1.5	15	3.8	17	4.3	40	10.0
TOTAL	25	6.3	65	16.3	153	38. 3	157	39. 3	400	100.

Source: Fieldwork, December 2004.

Table 6.23: Education of respondents by area location

	SUBURBAN/ URBAN		RURAL		TOTAL	
Education	No	%	No	%	No	%
No schooling	15	3.8	10	2.5	25	6.3
Primary	38	9. 5	27	6.8	65	16.3
Secondary	84	21.0	69	17. 3	153	38.3
Tertiary Institution	113	28.3	44	11.0	157	39.3
Total	250	62.5	150	37.5	400	100.0

Source: Fieldwork, December 2004.

Table 6.24: Effect of education on PHC utilisation

	PHC UTILISATION					
	Utilized		Not Utilized		Total	
EDUCATION LEVEL	No	%	No	%	No	%
No Schooling	24	6.0	1	.2	25	6.2
Primary	62	15.5	3	.8	65	16.3
Secondary	133	33.3	20	5.0	153	38.3
Tertiary	127	31.7	30	7.5	157	39.2
Total	346	86.5	54	13.5	400	100

Source: Fieldwork, December 2004

X^2 Table Value = 7.81; X^2 Computed Value = 11.714; P-value = .039

Occupation, and its effect as an important determinant of who utilises public services is quite substantial because it brings about awareness through interaction with other people either in the offices as workers or in the market places as traders or in schools as tutors and students. In this study as indicated in Table 6.25, trading (31.3%) is the

dominant occupation of the respondents. Esan North-East (4.8%), Etsako West (4.0%), Ovia North-East (3.8%) and Esan West, Etsako East and Uhunmwonde LGAs (3.5% each respectively) had more of the traders than other LGAs. Civil servants (18.3%) were next in rank to trading; and Egor (4.3%), Owan West and Etsako Central (2.8% each) had more of these respondents compared with other LGAs. Furthermore, Etsako East and Ovia South-West (2.3% each), followed by Uhunmwonde (2.0%) and Esan North-East (1.8%) had more of the farmers. Altogether, those engaged in farming account for 13.8 percent of all the respondents.

The distribution of occupational groups between the suburban/urban and rural areas is depicted in Table 6.26. As expected, the table indicates that respondents engaged in farming activities are more in rural areas (8.3 percent) just as other occupations are more in sub-urban/urban areas than in rural communities.

A cross-tabulation between occupation and PHC utilisation (Table 6.27) shows that traders (28.3%), students (17.8%) and civil servants (16.0%) constitute the largest proportion of PHC users, compared with the farmers (13.0%) and the professionals (11.5%). A Chi-Square test reveals that at the .05 alpha level with 4 degrees of freedom the X^2 table value is 9.49. Our computed X^2 value of 13.057 with a P-value of .011 indicates that there is a statistically significant difference in PHC utilisation among the various occupational groups. Consequently, we conclude that, generally, although PHC utilisation cuts across occupational groups in Edo State, some occupational groups utilise the services more than others.

Table 6.25: Respondents' occupation by LGAs

	Occupation											
	Farmer		Trader		Civil Servant		Professional		Student		TOTAL	
LGA	No	%	No	%	No	%	No	%	No	%	No	%
OWAN WEST	3	.8	4	1.0	11	2.8	4	1.0	18	4.5	40	10.0
ESAN WEST	6	1.5	14	3.5	3	.8	2	. 5	15	3.8	40	10.0
ESAN N.E.	7	1.8	19	4.8	3	.8	4	1.0	7	1.8	40	10.0
ETSAKO WEST	1	. 3	16	4.0	6	1.5	9	2.3	8	2.0	40	10.0
ETSAKO C.	6	1.5	5	1.3	11	2.8	7	1.8	11	2.8	40	10.0
ETSAKO EAST	9	2.3	14	3.5	3	.8	7	1.8	7	1.8	40	10.0
UHUNMWONDE	8	2.0	14	3.5	6	1.5	5	1.3	7	1.8	40	10.0
EGOR	-	-	11	2.8	17	4.3	6	1.5	6	1.5	40	10.0
OVIA N. EAST	6	1.5	15	3.8	8	2.0	5	1.3	6	1.5	40	10.0
OVIA S. WEST	9	2.3	13	3.3	5	1.3	5	1.3	8	2.0	40	10.0
TOTAL	55	13.8	125	31.3	73	18.3	54	13.5	93	23.3	400	100.0

Source: Fieldwork, December 2004.

Table 6.26: Respondents' occupation by area location

	SUBURBAN/URBAN		RURAL		TOTAL	
Occupation	No	%	No	%	No	%
Farmer	22	5.5	33	8.3	55	13.8
Trader	87	21.8	38	9.5	125	31.3
Civil Servant	47	11.8	26	6.5	73	18.3
Professional	34	8.5	20	5.0	54	13.5
Student	60	15.0	33	8.3	93	23.3
TOTAL	250	62.5	150	37.5	400	100.0

Source: Fieldwork, December 2004.

Table 6.27: Impact of Occupation on PHC utilisation

	PHC UTILISATION					
	Utilized		Not Utilized		Total	
OCCUPATION	No	%	No	%	No	%
Farming	52	13.0	3	0.8	55	13.8
Trading	113	28.3	12	3.0	125	31.3
Civil servants	64	16.0	9	2.3	73	18.3
Professionals	46	11.5	8	2.0	54	13.5
Students	71	17.8	22	5.5	93	23.3
Total	346	86.5	54	13.5	400	100.0

Source: Fieldwork 2004.

X^2 Table Value = 9.49; X^2 Computed Value 13.057; P-value = .011

To a very large extent, income in most cases is essentially a reflection of education, as well as one's occupation. Since high-level education determines a good occupation, income is expected to be high among people with high levels of education, all things been equivalent. In this study however, a larger proportion of respondents who patronise PHC services fall within low-income group of which 29.7 and 29.4 percent earn a monthly income of between ₦500-3500 and ₦3501-7500 respectively. Furthermore, 12.1 and 9.6 percent of the respondents were within income group of ₦7501-11000 and ₦11001-14,500 respectively. Only 2.5 and 7.9 percent earn above ₦21,500 and ₦25,000 per month. And of the 7.9 percent that earn more than ₦25,000 monthly, Egor LGA accounts for 3.7 percent, followed by Etsako West and Etsako Central with 1.4 percent each (Table 6.8). Again, respondents in the suburban and urban areas generally have higher income than those in rural locations (Table 6.8.1).

To assess the impact of income on utilisation, a cross-tabulation between monthly income and PHC utilisation as shown in Table 6.8.2 indicates that utilisation cuts across all levels of income. However, respondents within low income bracket of between ₦500-3500 and ₦3501-7500 (22.8% each) constitute the largest proportion of PHC consumers. Those respondents who did not reveal their monthly income made up 10 percent of PHC consumers. To examine if there is any significant difference in PHC utilisation between the various income groups, Chi-Square test was used. The result shows that the table value of X^2 at the .05 level of significance with 7 degrees of freedom is 14.07. Our computed X^2 value of 5.05 with P-value of .654 is less than the critical value of 14.07. With these results, we conclude that respondents' utilisation of PHC services in Edo State is not significantly influenced by income.

Table 6.28: Respondents' monthly income by LGAs

	Income															
	N500-3500		3501-7500		7501-11000		11001-14500		14501-18000		18001-21500		215001-25000 +		Total	
LGA	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
OWAN WEST	11	3.1	6	1.7	4	1.1	5	1.4	4	1.1	2	.6	1	. 3	33	9. 3
ESAN WEST	14	4.0	13	3.7	1	. 3	-	-	2	.6	-	-	1	. 3	31	8.8
ESAN N. EAST	11	3.1	11	3.1	5	1.4	3	.8	1	. 3	1	. 3	2	.6	34	9.6
ETSAKO WEST	7	2.0	12	3.4	4	1.1	2	.6	1	. 3	2	.6	5	1.4	33	9. 3
ETSAKO CENTRAL.	8	2. 3	9	2. 5	1	. 3	4	1.1	8	2. 3	1	. 3	5	1.4	36	10.2
ETSAKO EAST	10	2. 8	16	4. 5	4	1.1	7	2.0	1	. 3	-	-	-	-	38	10.7
UHUNMWONDE	15	4.2	12	3.4	3	.8	1	. 3	4	1.1	1	. 3	-	-	36	10.2
EGOR	6	1.6	6	1.7	5	1.4	4	1.1	4	1.1	-	-	13	3.7	38	10.7
OVIA N. EAST	16	4. 5	9	2. 5	6	1.7	4	1.1	-	-	1	. 3	1	. 3	37	10. 5
OVIA S. WEST	7	2.0	10	2.8	10	2.8	4	1.1	6	1.7	1	. 3	-	-	38	10.7
TOTAL	105	29.7	104	29.4	43	12.1	34	9.6	31	8.8	9	2. 5	28	7.9	354	100

Source: Fieldwork, December 2004.

Table 6.29: Income of respondents by residential location

	SUBURBAN/ URBAN		RURAL		TOTAL	
Income	No	%	No	%	No	%
₦ 500-3500	61	17.2	44	12.4	105	29.7
₦ 3501-7500	67	18. 9	37	10. 5	104	29.4
₦ 7501-11000	26	7. 3	17	4.8	43	12.1
₦ 11001-14500	21	5. 9	13	3.7	34	9.6
₦ 14501-18000	22	6.2	9	2. 5	31	8.8
₦ 18001-21500	6	1.7	3	0.8	9	2.5
₦ 21500-25000 above	21	5. 9	7	2.0	28	7.9
TOTAL	224	63.3	130	36.7	354	100.0

Source: Fieldwork, December 2004.

Table 6.30: Effect of Income on PHC utilisation

	PHC UTILISATION					
	Utilized		Not Utilized		Total	
INCOME	No	%	No	%	No	%
None	40	10.0	6	1.5	46	11.5
₦ 500-3500	91	22.8	14	3.5	105	26.3
₦ 3501-7500	91	22.8	13	3.3	104	26.0
₦ 7501-11000	34	8.5	9	2.3	43	10.8
₦ 11001-14500	28	7.0	6	1.5	34	8.5
₦ 14501-18000	27	6.8	4	1.0	31	7.8
₦ 21500-25000	8	2.0	1	0.3	9	2.3
₦ 25001+	27	6.8	1	0.3	28	7.0
Total	346	86.5	54	13.5	400	100.0

Source: Fieldwork 2004.
X^2 Table Value = 14.07; X^2 Computed Value = 5.051; P-value = .654

6.6 Relationship between socio-economic and behavioural characteristics of respondents and PHC utilisation

The residential location of an individual or a community determines to a large extent the type, quantity and quality of a service the individual or community enjoys. In the case of primary health care (PHC), the quantity and quality an individual enjoys is highly predicated upon the availability of the facilities and services. So also is utilisation a function of the socio-economic and behavioural characteristics of the respondents. Therefore, the patronage and utilisation of PHC services as well as other orthodox health care services is largely influenced by a number of factors such as age, marital status, household size, education, income, occupation, and the awareness of primary health care benefits among others. However, in the study area, it is difficult to ascertain which of these factors influenced respondents' utilisation of PHC services. To determine this, the hypothesis that: 'The utilisation of PHC services is a function of the socio-economic and behavioural characteristics of the respondents' was tested using logistic regression model.

Rationale for Logistic Regression model: The logistic regression model is an extension of the simple linear regression model. The logistic regression model is used to analyse ordinal variables derived from questionnaires which conventionally, are not suitable for linear regression. The technique usually involves the coding of variables as binary or dummy variables by assigning values of either '1' for 'active' variable (that is, the probability of event occurring) or '0' for 'inactive' variable (the probability of event not occurring). In the context of this analysis, the dummy variable 'inactive' is the excluded K-1 dummies entered into the regression equation. Generally, the exclusion of one of the dummy variables does not actually result in a loss of information (Abumere, 1986); for according to Kim and Kohout (1975 cited in Abumere, 1986), the excluded category becomes a sort of reference point by which the effects of other dummies are judged and interpreted. For this reason, the excluded category is referred to as the reference category. Specifically, logistic regression attempts to predict the probability that the dependent variable will acquire the event of interest (coded 1) as a function of one or more independent variables. Put another way, the logistic regression equation predicts the probability that the unit under analysis will, as a function of one or more independent variables, obtain the condition of interest which is (usually) coded as 1 in a zero/one coding scheme (Karp, 2001). However, the meaning of a logistic regression coefficient is not as straightforward as that of a linear regression coefficient. While B, the parameter estimate is convenient for testing the usefulness of predictors, Exp (B), the odds ratio is easier to interpret. Exp (B) represents the ratio-change in the odds of the event of interest for a one-unit change in the predictor. When Exp (B) is less than 1, increasing values

of the variable correspond to decreasing odds of the event's occurrence. When Exp (B) is greater than 1, increasing values of the variable correspond to increasing odds of the event's occurrence (SPSS Inc., 2004). In fact, the odds ratio is derived from the parameter: Odds Ratio = $e^{parameter}$ (Walker, 1996). In other words, exponentiation of the parameter estimate(s) for the independent variable(s) in the model by the number e (about 2.17) yields the odds ratio, which is a more intuitive and easily understood way to capture the relationship between the independent and dependent variables (Karp, 2001). In this study both the dependent and all independent variables are dummies. The general equation for the model is:

$$\log_e P/(1-P) = b_0 + b_1 x_1 + b_2 x_2 ... + b_k x_k \qquad (1)$$

Where:

P = the probability that a respondent utilised PHC, given independent variables $x_1, x_2 ..., x_k$. In the model, the dependent variable, PHC utilisation, is coded one if a respondent utilised PHC services and zero if otherwise. The statistical package used to fit the logistic models is the SPSS version 13.0 forward stepwise Likelihood Ratio, a particular type of multivariate logistic modelling that assumes that the observations are independent (or at least uncorrelated) with individual error term in the model. With the introduction of a constant in our model the equation becomes:

$$Y = a + b_1 x_1 + b_2 x_2 + b_3 x_3 ... + b_n x_n + e \qquad (2)$$

Where:

Y = Dependent variable and is 1 if respondents utilised PHC, 0 otherwise (dummy)

X1 = 1 if age is 15-24 years, 0 otherwise (dummy)

X2 = 1 if age is 25-34 years, 0 otherwise (dummy)

X3 = 1 if age is 25-44 years, 0 otherwise (dummy)

X4 = 1 if female, 0 otherwise (dummy)

X5 = 1 if married, 0 otherwise (dummy)

X6 = 1 if respondents have less than five children, 0 otherwise (dummy)

X7 = 1 if occupation is farming/petty trading, 0 otherwise (dummy)

X8 = 1 if income is below N7,500.00, 0 otherwise (dummy)

X9 = 1 if no education, 0 otherwise (dummy)

X10 = 1 if primary education, 0 otherwise (dummy)

X11 = 1 if education is secondary level, 0 otherwise (dummy)

X12 = 1 if education is HND/B.Sc, 0 otherwise (dummy)

X13 = 1 if respondent is aware of PHC services, 0 otherwise (dummy)

X14 = 1 if daily commuting is by walking, 0 otherwise (dummy)

X15 = 1 if transport cost to nearest PHC is less than N100, 0 otherwise (dummy)

Rationale for variable specifications:

Age: The age of an individual in particular and that of a population in general is quite vital when analysing the utilisation of health care services. This is because it has a number of implications on the pattern of utilisation of these services. In the context of this analysis, age is grouped into three cohorts as 15-24 years, 25-34 years and 25-44 years to assess the influence of each cohort on PHC utilisation. The age cohort 25-44 years is in this study used as the norm because the social and demographic policies of Nigeria seem to emphasise that between the age of three and twenty-five years most youths are either still in school or just graduating from higher institutions of learning. The age 25-44 years is therefore regarded as the most active reproductive period. And that given the national policy of four children per woman, a woman is expected to successfully bear four children within this period given a birth interval of three years apart. As such, this age cohort is regarded as the one that has serious impact on maternal and child health care utilisation in Nigeria. This supposition might not be true most especially for respondents in the rural areas with limited access to all-round education. Therefore, to examine if there is any fundamental difference between the 25-44 years age cohort and other age cohorts in utilising PHC, the dummy variable for the 25-44 cohort is coded active while other age cohorts are coded inactive as the reference point.

Sex: It is the general belief that females and most especially women with children utilise PHC services more than men. To verify this assumption in the context of this study the dummy variable for female is set to be ‘active’ while that of the male is coded ‘inactive’.

Marital status: Married couples are regarded to use PHC services more than the ‘singles’. To assess the relative correctness of this assumption the dummy variable for ‘married’ is coded ‘active’ while that for the ‘singles’ is coded ‘inactive’.

Occupation: The dominant occupation for people in the rural and suburban areas is farming/petty trading. To assess the influence of this category of occupation on PHC utilisation, the dummy variable for farming/petty trading is coded 'active' while other occupations are coded 'inactive'.

Income: The national minimum wage is N7,500.00. Therefore, it is expected that whether as a farmer, petty trader or a worker in the local government setting generally, any individual who earns this income should have access to PHC services; the more so as PHC services do not charge so much for services. In this study, the attempt is to examine if respondents earning N7,500.00 or below per month utilise PHC services more than those with higher income, as those with higher income would likely prefer more efficient secondary health care services than PHC facilities.

Education: Education is an important factor governing choices people make and their consequent use of health care facilities. Some studies in developing nations have found a strong effect of education (Caldwell J.C, 1979; Mensch et al., 1985; Onokerhoraye, 1997) on the utilisation of health care services. In Nigeria, for instance, the educated people had been found to make more frequent use of modern health care facilities in a study of health care facilities in Benue State (Onokerhoraye, 1997). In the context of this study education is categorized into four groups to allow for the assessment of the impact of each of these groups on PHC utilisation. The dummy variable for each of these groups (1, 2, 3 and 4) is coded active while holding others constant as inactive.

Walking: Daily movement in the rural areas, and generally for short distances everywhere, is more by walking. Therefore, as PHC policy emphasizes a walking distance of 2-4 kilometres for patients, it is expected that walking to access PHC centre either within or beyond the specified distance would have an influence on PHC utilisation. As such, the variable 'walking' is coded the active dummy while all other modes of movement are coded 'inactive'.

PHC Awareness: Awareness of the location of a facility is an important factor that could influence the utilisation of the services by those concerned. In this study, it is expected that those who are very familiar with the location and services of PHC programme would make

more use of it. The dummy for this variable is therefore set as 'active' if a respondent is familiar with PHC services and 'inactive' for those not familiar with them.

Transport cost: The cost of transport is known to have certain influences on the utilisation of social and welfare services. Empirical studies reveal that distance limits patronage. It is expected that in the context of this study if transport cost to PHC centre is high, less use will be made of the services. The dummy for this variable is coded 'active' for an average transport cost of ₦80 while transportation cost above ₦80 to and from a PHC centre is set as 'inactive'.

Subject and method of analysis:

The population sample was selected by multi-stage sampling approach in which the LGAs form the basic primary sampling unit. In the first instance, out of the 18 LGAs of Edo State, 10 LGAs with their headquarters were randomly selected for questionnaire survey. Secondly, at the Local Government level 10 communities, one per LGA, classified as 'rural' areas were purposively selected for detailed questionnaire survey. Altogether, 400 respondents were surveyed for the study. A breakdown of this gives a sample of 40 respondents per LGA. For the purpose of the hypothesis which states that: 'The utilisation of PHC services is a function of the socio-economic and behavioural characteristics of respondents', all the selected factors, both the dependent and independent variables were encoded as dummy variables in the logistic regression model. To assess how these variables affect utilisation in the rural, the suburban/urban and at the State level the analysis was carried out in stages; first, for the State level; secondly, for the suburban/urban communities and, finally, for the rural communities.

Data Set and Sources: The data used for testing the above hypothesis is derived from the household survey discussed in Sections 5.3 of Chapter Five and 6.2 of this chapter. The specified variables in the model statement are presented in Tables 5.2, 6.2 and 6.3, 6.9 and 6.10, 6.12, and 6.6. For instance, variable 13, PHC awareness, is presented in Tables 6.2 and 6.3. Variable 1, age, is presented in Tables 6.9 and 6.10; variable 4, sex, is in Table 6.12 while variable 15, transport cost to nearest PHC centre, is presented in Table 5.2 etcetera. The dependent variable, PHC utilisation, is in Table 6.6 in Section 6.2 of this chapter. The binary logistic equation used for testing the hypothesis is of the form:

$$Y = a + b_1x_1 + b_2x_2 + b_3x_3 ... + b_nx_n + e$$

Where:

Y = Dependent variable PHC utilisation (dummy)

X1 = Age1, 15-24 years (dummy)

X2 = Age2, 25-34 years (dummy)

X3 = Model age, 25-44 years (dummy)

X4 = Sex, coded 1 if a female (dummy)

X5 = Marital status, coded 1 if married (dummy)

X6 = Respondents with less than five children (dummy)

X7 = Occupation is farming/petty trading (dummy)

X8 = Income is equal to or below N7, 500.00 (dummy)

X9 = No education1 (dummy)

X10 = Primary education2 (dummy)

X11 = Secondary education3 (dummy)

X12 = Education is HND/B.Sc4 (dummy)

X13 = Respondent is aware of PHC services (dummy)

X14 = Daily commuting, coded 1 if respondents walk to PHC centre (dummy)

X15 = Transport cost to nearest PHC is less than N100 (dummy)

Results and Discussions:

Of the 400 respondents used for these analyses, the suburban/urban ones constitute 250 (62.5 percent) while the rural areas made up 150 (37.5 percent) cases. The analysis at the State level is based on the entire respondents; the suburban/urban analysis consists of 250 respondents while in the rural level the 150 respondents surveyed there were used. The aim, as earlier stated, is to verify if there is any significant variation in the socio-economic and behavioural characteristics of these respondents in different locations with respect to PHC utilisation. In these analyses the forward stepwise Likelihood Ratio method is used. The method considers first, the most important and highest explanatory variable to the estimate parameter. In the next step, the second most important variable is included in the model and so on until the least significant explanatory variable is considered before the procedure terminates.

As presented in Tables 6.31, 6.32 and 6.33, all the parameter estimates are significantly different from zero at the 5 percent confidence level, indicating that the explanatory variables have significant influence on the dependent variable, PHC utilisation. Specifically, in this model only three of the fifteen variables namely PHC awareness, marital status and primary education had significant positive influence on PHC utilisation in all the levels of analyses.

In both the State and rural levels of analyses PHC awareness had a positive statistically significant influence on PHC utilisation [(State Odd Ratio = 108.42, P =.000); (Rural Odd Ratio = 48.57, P= .000)]. This means that the utilisation of PHC in both locations is positively influenced by respondents' familiarity with primary health care services. Furthermore, with positive parameter estimates and odds ratios far greater than 1 at both levels of analyses, it means that the more the number of respondents who are aware of PHC facilities, the higher the likelihood to utilise PHC services. In fact, as indicated in Tables 6.31 and 6.32, the resulting odd ratios for PHC awareness in the State and rural levels of analyses are respectively 108.42 and 48.57. This suggests that respondents who are aware of or familiar with PHC services are about 108 times at the State level and 49 times in the rural areas more likely to utilise PHC services than respondents who are not familiar with the services.

With regard to marital status, the results indicate that married respondents utilise PHC services more than other respondents in the State (OR = 4.54, P= .000), rural (OR = 3.75, P= .027) and in the suburban/urban areas (OR = 5.99, P= .000). Therefore, a unit increase in the number of married people increases the likelihood to utilise PHC services by married respondents by about 4.5 times in the State, 3.8 times in the rural areas and about 6 times more than other categories of respondents in the suburban/urban areas.

The effect of primary education in these analyses had a weak positive statistically significant influence on PHC utilisation at the State level (OR = 4.56, P= .065). However, the odds ratio indicates that respondents with primary education are about 5 times more likely to utilise PHC services than those without and those with higher levels of education. This result indicates that respondents with primary education utilised PHC services more than those without education and those with higher education in the study area.

Generally, as the results of these analyses have shown, the utilisation of primary health care (PHC) services is a function of respondents' awareness of PHC services, marital status and level of formal education. Thus, having at least primary education, being aware of PHC services and an increase in the number of married couples among respondents would also significantly increase the likelihood to utilise PHC services generally in the State, rural areas and in the suburban/urban areas. However, on the basis of these analyses we conclude that the supposition that the utilisation of PHC services is a function of the socio-economic and behavioural characteristics of respondents is at least only partially supported by some of the socio-economic and behavioural variables used in the analyses.

Nevertheless, in spite of the limitations of some of the variables used in these analyses, the logistic regression model provides some explanation of the influence of some variables on PHC utilisation. Although on the basis of reliability the Nagelkerke R-Square statistics for the logistic regression model is often lower when compared with that of ordinary regression analysis (SPSS Inc, 2004), its approximations did indicate that at the State level the independent variables accounted for 31 percent of the variation in PHC utilisation. The levels of explanation are 28.3 percent in the suburban/urban communities and 31.4 percent in the rural communities.

All in all, given the low level of explanation and the insignificant logistic regression coefficients for most of the variables, it is clear from the analyses that the models are not robust enough to explain the utilisation of PHC services in the study areas on the basis of socio-economic and behavioural factors. However, the equations and coefficients for education, PHC awareness and marital status are all significant. Therefore, for PHC utilisation, some level of education, strong awareness of PHC services and marital status are very important determinants.

Table 6.31: Logistic regression at the State level of analysis [Forward Stepwise: Likelihood Ratio]

		B	S.E.	Wald	df	Sig.	Exp(B) Odds Ratios	95.0% C.I. for EXP(B)	
								Lower	Upper
Step 1(a)	PHC Awareness	3.999	.777	26.465	1	.000	54.537	11.886	250.231
	Constant	-1.872	.760	6.073	1	.014	.154		
Step 2(b)	Marital Status	1.666	.358	21.606	1	.000	5.291	2.621	10.681
	PHC Awareness	4.230	.819	26.698	1	.000	68.745	13.814	342.099
	Constant	-2.897	.831	12.160	1	.000	.055		
Step 3(c)	Marital Status	1.512	.364	17.289	1	.000	4.537	2.224	9.254

	PHC Awareness	4.686	.947	24.483	1	.000	108.420	16.943	693.799
	Education2	1.518	.824	3.393	1	.065	4.563	.907	22.944
	Constant	-3.407	.966	12.432	1	.000	.033		

a Variable(s) entered on step 1: PHC Awareness. b Variable(s) entered on step 2: Marital Status.
c Variable(s) entered on step 3: Education2.

Table 6.32: Logistic regression at the rural level of analysis

		B	S.E.	Wald	df	Sig.	Exp(B) Odds Ratios	95.0% C.I. for EXP(B)	
								Lower	Upper
Step 1(a)	PHC Awareness	3.628	.857	17.931	1	.000	37.625	7.019	201.699
	Constant	-1.253	.802	2.441	1	.118	.286		
Step 2(b)	Marital Status	1.320	.598	4.881	1	.027	3.745	1.161	12.084
	PHC Awareness	3.883	.909	18.261	1	.000	48.566	8.182	288.261

	Constant	-2.239	.957	5.472	1	.019	.107

a Variable(s) entered on step 1: PHC Awareness.
b Variable(s) entered on step 2: Marital Status.

Table 6.33: Logistic regression at the suburban/urban level of analysis

		B	S.E.	Wald	df	Sig.	Exp(B) Odds Ratios	95.0% C.I. for EXP(B)	
								Lower	Upper
Step 1(a)	PHC Awareness	23.206	16408.704	.000	1	.999	11976793265.203	.000	.
	Constant	-21.203	16408.704	.000	1	.999	.000		

Step 2(b)	Marital Status	1.790	.457	15.334	1	.000	5.988	2.445	14.668
	PHC Awareness	22.943	15779.026	.000	1	.999	920246517 5.448	.000	.
	Constant	-21.730	15779.026	.000	1	.999	.000		

a Variable(s) entered on step 1: PHC Awareness. b Variable(s) entered on step 2: Marital Status.

Table: 6.34: Model summary for the three levels of analyses in tables 6.31-33

Location	- 2 Log Likelihood	Nagelkerke R-Square
State	243.575	.305 (31 percent)
Rural	86.528	.314 (31.4 percent)
Suburban/Urban	159.729	.283 (28.3 percent)

The r-square statistic cannot be exactly computed for logistic regression models, so these approximations are computed instead. Larger pseudo r-square statistics indicate that more of the variation is explained by the model, to a maximum of 1 (SPSS Inc., 13.0 for windows Tutorials, 2004).

Hosmer and Lemeshow Test for Tables 6.31-33

Location	Chi-Square	Df.	Sig.
State	.154	2	.926
Rural	.032	1	.857
Suburban/Urban	.000	1	1.000

At each step, this is a goodness-of-fit test of the null hypothesis that the model adequately fit the data. If the significance is small (P<0.05) then the model does not adequately fit the data.

Conclusion

This chapter has shown that there was a high awareness (96.3%) of PHC programme in Edo State. Public campaign and television (68.8%) are the most popular means of keeping the populace aware of PHC programme. In the same vein, there was a substantial amount of PHC utilisation (86.5%) among the respondents. The study also shows that PHC utilisation was significantly influenced by age, number of children per respondent, occupation and mode of PHC awareness. With regard to socio-economic and behavioural characteristics, educational level (P = .065), PHC awareness (P = .000) and marital status (P = .000) were found to be the most important factors influencing PHC utilisation among the respondents in Edo State. Thus, on the basis of these analyses we conclude that the third hypothesis that states 'the utilisation of PHC services is a function of the socio-economic and behavioural characteristics of respondents' has only partial support on the basis of the socio-economic and behavioural variables used. Therefore, for PHC utilisation, some level of education, strong awareness of PHC services and marital status (being married) are very important determinants among other factors.

CHAPTER SEVEN

SOCIO-CULTURAL BELIEF AND TRADITIONAL HEALTH CARE: IMPACT ON UTILISATION OF PHC SERVICES

7.1 Introduction

This chapter examined the impact of socio-cultural health belief and availability of traditional health care option on utilisation of orthodox primary health care (PHC) services. The specific intent was to elicit and appraise the geographic variations in the belief and patronage of traditional medicine among the selected communities and isolate factors likely to impede the use of PHC services. Finally, responses are analysed with regard to what the respondents thought are the major hindrances to the operation and sustainability of PHC programmes in Edo State.

7.2 Effect of traditional medical practices on Primary Health Care (PHC) utilisation

This section examined the consequences of traditional health care beliefs on the utilisation of PHC services. Table 7.1 indicates 99.2 percent of the respondents attest to the practice of indigenous health care system in their various communities. This figure is made up of 61.7 percent (out of the 62.5%) suburban/urban respondents and all of the 37.5 percent respondents interviewed in the rural areas. Only 0.8 percent of the suburban/urban respondents including those in Owan West (0.3%) and Esan West (0.5%) claimed ignorance of indigenous health care system in their communities (Table 7.2).

Nevertheless, of the 99.2 percent of the respondents that confirmed the practice of indigenous health care system in their communities, 76.2 percent (of which 44.8% utilised regularly and 31.4% sometimes) claimed they utilised traditional health care option when the need arises. As indicated in Table 7.3, only 23.8 percent of the respondents do not utilised traditional health care. In terms of geographical variation in utilisation, Egor (5.8%), Etsako Central (4.0%), Uhunmwonde (3.8%) and Etsako West (3.0%) are the only LGAs where at least about a third of their respondents claimed not to have utilised traditional health care services.

Different factors could be responsible for the variation in patronage of indigenous medicine in different communities. In the case of Egor LGA, the huge availability of orthodox medical care option besides PHC facilities may have discouraged the utilisation of traditional medicine. In Fugar, (Etsako Central LGA), fieldwork observation revealed a substantial number of both public and private health care facilities though the town is small. In Etsako West, although Aviele lack PHC facilities as at the time of this survey, the community is less than four kilometres with average transport cost of ₦60 return journey from Auchi. The reason in the case of Ehor in Uhunmwonde LGA is not very clear because, besides the PHC facility that was not functioning as at the time of this survey, there was no secondary health care facility except that the town is a short distance from Ekpoma and Igueben and to some extent Benin City where patients could easily go to utilise orthodox health care services. Otherwise, the utilisation of indigenous health care ought to be higher where orthodox health care facilities are lacking or not easily accessible.

The preceding discussions revealed a general patronage of both indigenous and orthodox PHC services among the respondents in Edo State. To the extent that 76.2 percent of the respondents utilised traditional medicine when the need arises (Table 7.3), it can be concluded that the nature of individuals' illness rather than the availability of indigenous medicine per se, may influence the choice of treatment option.

Table 7.1: Practice of traditional medicine

	Suburban/Urban		Rural		Total	
Practice of Traditional Medicine	No	%	No	%	No	%
Practised	247	61.8	150	37.5	397	99. 2
Not Practised	3	.8	-	-	3	.8
Total	250	62. 5	150	37.5	400	100.0

Source: Fieldwork December 2004.

Table 7.2: Practice of traditional medicine by LGAs

	Practice of Traditional Medicine					
	Practised		Not Practised		Total	
LGA	No	%	No	%	No	%
OWAN WEST	39	9.8	1	. 3	40	10.0
ESAN WEST	38	9. 5	2	. 5	40	10.0
ESAN N.E.	40	10.0	-	-	40	10.0
ETSAKO WEST	40	10.0	-	-	40	10.0
ETSAKO CENTRAL	40	10.0	-	-	40	10.0
ETSAKO EAST	40	10.0	-	-	40	10.0
UHUNMWONDE	40	10.0	-	-	40	10.0
EGOR	40	10.0	-	-	40	10.0
OVIA N. EAST	40	10.0	-	-	40	10.0
OVIA S. WEST	40	10.0	-	-	40	10.0
TOTAL	397	99. 2	3	.8	400	100.0

Source: Fieldwork December 2004.

Table 7.3: Respondents' use of indigenous treatment

	Indigenous Treatment							
	Regularly		Do Not Utilise		Sometimes		Total	
LGA	No	%	No	%	No	%	No	%
OWAN WEST	19	4.8	6	1.5	15	3.8	40	10.0
ESAN WEST	13	3.3	6	1.5	21	5.3	40	10.0
ESAN N.EAST	27	6.8	4	1.0	9	2.3	40	10.0
ETSAKO WEST	10	2.5	12	3.0	18	4.5	40	10.0
ETSAKO CENTRAL	20	5.0	16	4.0	4	1.0	40	10.0
ETSAKO EAST	17	4.3	5	1.3	18	4.5	40	10.0
UHUNMWONDE	24	6.0	15	3.8	1	. 3	40	10.0
EGOR	9	2.3	23	5.8	8	2.0	40	10.0
OVIA N. EAST	19	4.8	2	. 5	19	4.8	40	10.0
OVIA S. WEST	21	5.3	6	1.5	13	3.3	40	10.0
TOTAL	179	44.8	95	23.8	126	31.4	400	100.0

Source: Fieldwork December 2004.

7.3 Influence of traditional customs on health care seeking behaviour

More often than not, it is the norm in traditional African society for women and dependants generally, to seek advice or informed consent of the household heads before seeking any means of health care intervention when ill. However, this is more peculiar to married women and their children than other older members of the family.

Table 7.4 indicates 63.8 percent of the respondents confirmed as a married woman, one needs the acquiescence of a husband or senior in-law in the absence of the husband (as required by some traditional customs) before seeking any kind of health care for self or the children. In the same vein, 24.8 percent of the respondents confirmed it is sometimes necessary to get the husband or a senior member of the household's consent depending on the nature of illness. Generally, 88.5 percent of the respondents confirmed the customary practise of patients seeking consent from household heads to consult medical experts for care when ill. However, 11.5 percent of the respondents are of the contrary view that there should be no need for the husband or household heads to grant permission before a married woman or other dependants could seek health care.

Table 7.5 shows the geographical variation of this belief among the 10 LGAs surveyed. The table indicate that Owan West (4.5%) had the largest proportion of the 11.5 percent of the respondents with contrary view. Although the reason for this is not clear, this trend among the respondents in Owan West may have been as a result of the large number of young respondents that also include students who tend to identify more with modern day religious influences. In all other local government areas the belief is strongly upheld and even among the women themselves. This finding is supported by some studies on gender inequalities in health in the Third World (Okojie, 1994; NDHS, 2003). As pointed out by Okojie, the effect of traditional practices is quite telling on the health of those concerned as 'these contribute to delays in the decisions to seek medical care for the woman. Thus traditional medical

practices…that discriminate against women prevent them from obtaining prompt treatment for themselves and their children often leading to their deaths' (Okojie, 1994, pp 1242).

Table 7.4: Influence of traditional custom on women seeking health care

	Suburban/Urban		Rural		Total	
Traditional Custom	No	%	No	%	No	%
Seek Consent	152	38.0	103	25.8	225	63.8
No Consent	38	9. 5	8	2.0	46	11.5
Sometimes	60	15.0	39	9.8	99	24.8
TOTAL	250	62.5	150	37.5	400	100.0

Source: Fieldwork December 2004.

Table 7.5: Influence of traditional custom on women seeking health care by LGA

	Traditional Custom							
	Seek Consent		No consent		Sometimes		Total	
LGA	No	%	No	%	No	%	No	%
OWAN WEST	11	2.8	18	4.5	11	2.8	40	10.0
ESAN WEST	26	6.5	5	1.3	9	2.3	40	10.0
ESAN N.EAST	29	7.3	4	1.0	7	1.8	40	10.0
ETSAKO WEST	27	6.8	7	1.8	6	1.5	40	10.0
ETSAKO CENTRAL	30	7.5	-	-	10	2.5	40	10.0
ETSAKO EAST	32	8.0	-	-	8	2.0	40	10.0
UHUNMWONDE	31	7.8	1	. 3	8	2.0	40	10.0
EGOR	23	5.8	4	1.0	13	3.3	40	10.0
OVIA N. EAST	18	4.5	4	1.0	18	4.5	40	10.0
OVIA S. WEST	28	7.0	3	. 8	9	2.3	40	10.0

TOTAL	255	63.8	46	11.5	99	24.8	400	100.0

Source: Fieldwork December 2004.

In the same vein, analysing the 'perceived constraints to use of health care' in Nigeria, the DHS survey found that one in every ten women affirm that getting permission to go to health care facility is a problem (NDHS, 2003). However, with the growth in education, religious beliefs and better understanding between modern-day couples, it is expected that the effect of cultural inhibitions on women health care seeking behaviour particularly, and dependants generally, will diminish in most communities over time.

7.4 Respondents choice and preference for traditional medicine

The choice of health care services first utilised by respondents when ill is depicted in Table 7.6. The table shows that only 10 percent of the respondents indicated they first utilised traditional treatment before orthodox PHC. A breakdown of this figure shows that 6.8 percent of the 62.5 percent suburban/urban respondents, and 3.2 percent of the 37.5 percent rural areas respondents constitute the 10 percent. In the same vein, 47.5 percent of the respondents confirmed they sometimes utilised indigenous medicine as their first choice of health care. This figure is made up of 29.5 percent suburban/urban and 18.0 percent rural respondents.

Generally, although it is expected that respondents in rural areas should have higher preference for indigenous medicine than their urban counterparts, the results of this analysis indicate otherwise. The major reason for this is that some of the LGA headquarters with populations far less than 20,000 persons, which conventionally should have been grouped as rural areas, are indeed, classified as suburban/urban towns because of their status as LGA headquarters. Among these LGA headquarter towns are Ehor (5,463 persons) in Uhunmwonde, Iguobazuwa (6,134 persons) in Ovia South-West, Sabongida-Ora (6,911 persons) in Owan West, Ekiadolor (2,949 persons) in Ovia North-East, Fugar (10,669 persons) in Etsako Central, and Agenebode (4,335 persons) in Etsako East. Furthermore, in

these towns the availability and practice of indigenous medicine is also common. However, 42.5 percent of the respondents comprising 26.2 percent suburban/urban and 16.3 percent rural respondents indicate they did not seek treatment in traditional healthcare centres as their first option.

Table 7.6: Respondents first choice of treatment option

	Suburban/ Urban		Rural		Total	
First choice of treatment	No	%	No	%	No	%
Traditional Option First	27	6.8	13	3.2	40	10.0
Not first choice	105	26.2	65	16.3	170	42.5
Sometimes	118	29.5	72	18.0	190	47.5
Total	250	62.5	150	37.5	400	100.0

Source: Fieldwork December 2004.

As shown in Table 7.7, the geographical pattern of choice of treatment among the LGAs indicates Ovia North-East (2.0%), Esan North-East (1.5%) and, Owan West and Uhunmwonde (1.3% each) had more of the 10.0 percent of the respondents that utilised traditional medicine as their first choice of treatment. Of the 42.5 percent of respondents that preferred orthodox medical care, Uhunmwonde (6.0%) Etsako Central (5.8%), Etsako West (5.5%) and, Egor and Owan West (5.3% each respectively) had respondents with higher preference for orthodox medical care.

Furthermore, as depicted in Table 7.7, respondents that 'sometimes' first utilised traditional medical care are more in Etsako East (7.0%), Ovia North-East (6.3%), Esan West (5.8%) and, Esan North-East and Ovia South-West (5.3% each). From all indications therefore, it is obvious as shown in these tables that a large number of respondents (57.5%) readily utilised traditional health care options depending on the nature of their illness.

With regard to preference for traditional healthcare services, there is a strong feeling that traditional healthcare treatment is sometimes (50.3%) better than orthodox PHC treatment (Table 7.8). Furthermore, 6.3 percent of the respondents believed traditional medicine was better for them when ill than orthodox PHC treatment. However, 43.5 percent of the respondents (25.7% suburban/urban and 17.8% rural residents) disagreed with this assertion.

Table 7.9 presents the variations in respondents' preference for treatment belief options among the LGAs. The table shows that Esan North-East (1.5%), Etsako West and Ovia South-West (1.0% each) had more of the 6.3 percent respondents that believed traditional medicine was better for them than orthodox care. Conversely, Egor (7.8%), Uhunmwonde (6.5%) and Etsako Central (5.8%) had more of the 43.5 percent respondents that disagreed traditional medicine is better than orthodox PHC services. For the 50.3 percent respondents who believed traditional medicine is sometimes better depending on the type and nature of ill-health, Ovia

North-East (8.3%), Esan West (6.8%), Etsako East and Ovia South-West (6.0% each) and, Owan West and Etsako West (5.3% each) had more of this category of respondents.

Finally, just as Tables 7.6 and 7.7 indicate 57.5 percent of the respondents utilised traditional medicine as their first choice of health care, Tables 7.8 and 7.9 also indicate 56.6 percent of the respondents preferred traditional health care treatment as a better option at some point in time depending on the nature of their illness.

Table 7.7: Respondents' first choice of treatment option by LGAs

	Traditional Option First							
	Yes		No		Sometimes		Total	
LGA	No	%	No	%	No	%	No	%
OWAN WEST	5	1.3	21	5.3	14	3.5	40	10.0
ESAN WEST	4	1.0	13	3.3	23	5.8	40	10.0
ESAN N.EAST	6	1.5	13	3.3	21	5.3	40	10.0
ETSAKO WEST	1	.3	22	5.5	17	4.3	40	10.0
ETSAKO CENTRAL	2	.5	23	5.8	15	3.8	40	10.0
ETSAKO EAST	2	.5	10	2.5	28	7.0	40	10.0
UHUNMWONDE	5	1.3	24	6.0	11	2.8	40	10.0
EGOR	4	1.0	21	5.3	15	3.8	40	10.0
OVIA N. EAST	8	2.0	7	1.8	25	6.3	40	10.0
OVIA S. WEST	3	. 8	16	4.0	21	5.3	40	10.0

TOTAL	40	10.0	170	42.5	190	47.5	400	100.0

Source: Fieldwork December 2004.

Table 7.8: Respondents preference for treatment option by location

	Suburban/ Urban		Rural		Total	
Is Traditional Medicine Better?	No	%	No	%	No	%
Yes (believed)	16	4.0	9	2.3	25	6.3
No (disagreed)	103	25.8	71	17.8	174	43.5
Sometimes	131	32.8	70	17.5	201	50.3
Total	250	62.5	150	37.5	400	100.0

Source: Fieldwork December 2004.

Table 7.9: Respondents' preference for treatment option by LGAs

	Is Traditional Medicine Better?							
	Yes		No		Sometimes		Total	
LGA	No	%	No	%	No	%	No	%
OWAN WEST	1	.3	18	4.5	21	5.3	40	10.0
ESAN WEST	-	-	13	3.3	27	6.8	40	10.0
ESAN N.EAST	6	1.5	17	4.3	17	4.3	40	10.0
ETSAKO WEST	4	1.0	15	3.8	21	5.3	40	10.0
ETSAKO CENTRAL	-	-	23	5.8	17	4.3	40	10.0
ETSAKO EAST	3	.8	13	3.3	24	6.0	40	10.0
UHUNMWONDE	4	1.0	26	6.5	10	2.5	40	10.0
EGOR	2	.5	31	7.8	7	1.8	40	10.0
OVIA N. EAST	1	.3	6	1.5	33	8.3	40	10.0

OVIA S. WEST	4	1.0	12	3.0	24	6.0	40	10.0
TOTAL	25	6.3	174	43.5	201	50.3	400	100.0

Source: Fieldwork December 2004.

7.5 Influence of education and age on choice of health care

The level of educational attainment of an individual is known to influence respondents' choice of health care service. Therefore, in an attempt to verify the impact of education on utilisation of traditional health care services, a cross-tabulation in Table 7.10 shows that for the 6.3 percent respondents without formal education, 5.8 percent of them utilised indigenous health care. For the 16.3 percent with primary education, 15.0 percent of them also utilised indigenous health care. In the case of secondary and tertiary education, 30 percent of the 38.3 percent, and 25.5 percent of the 39.3 percent respondents respectively, also affirmed to have utilised traditional health care services when the need arises. So, given these variations can we conclude that there is any significant difference in the utilisation of indigenous medicine between respondents with different educational backgrounds?

The results of Chi-Square test indicate the table value of X^2 at the .01 significance level with 6 degrees of freedom is 16.812. Our computed X^2 value of 36.151 with P-value of .000 is far greater than the critical value of 16.812. With these results, we conclude that there is a statistically significant difference between respondents with different educational backgrounds in their utilisation of indigenous treatment (Table 7.10). Tables 7.11 and 7.12 present a cross-tabulation between education and age, and the utilisation of traditional health care as a first choice of treatment. As shown in Table 7.11, out of the 10 percent of the respondents who utilised traditional medicine as their first choice of health care, those without formal education account for 1.0 percent, tertiary education 2.0 percent, primary education

had 2.8 percent and secondary education 4.2 percent. On the other hand, among those with preference for orthodox PHC treatment as first choice of care, respondents with tertiary education account for 20.8 percent followed by those with secondary education (15.3%), primary (5.2%) and no formal education (1.3%) respectively. For respondents that sometimes preferred traditional care services, those without formal education accounts for 4.0 percent, primary education 8.2 percent, secondary education 18.8 percent and those with tertiary education 16.5 percent.

For the effect of age on choice of health care, Table 7.12 shows that among the 44.8 percent of the respondents that utilised traditional treatment as their first choice of health care, the age cohort 35-44 years constitutes the largest proportion (15.0%). Next in their order of importance is the age group 45 years and above (13.2%), 25-34 years (9.8%) and 15-24 years age cohort (6.8%). To ascertain if there was any significant difference among the different age cohorts in their utilisation of indigenous treatment, the Chi-Square test was used. The results show that at the .01 significance level with 6 degrees of freedom the table value of X^2 is 12.592. Our computed X^2 value of 14.43 with P-value of .025 is greater than the critical value of 12.592. This means that there is a statistically significant evidence to conclude that the utilisation of indigenous medicine varies significantly among the different age cohorts.

The high acceptance of indigenous medical care as revealed in this study is supported by earlier findings such as those by Lambo (1961, 1966), Unschuld (1976) and Pearce (1982). In fact, Unschuld (1976) had observed that, wherever Western medicine was introduced and no matter how urgent the need for its immediate application was felt to be, it was never a question of its filling a medical vacuum. This meant that traditional method of health care was well entrenched and valued among the people before the advent of Western medicine. Its utilisation cuts across age and educational levels as revealed in this study.

Table 7.13 depicts method of treatment most easily accessible (available and easy to get) by respondents. As indicated in the table, 75.8 percent (of which 49.5 percent suburban/urban and 26.3 percent rural respondents respectively), indicate orthodox PHC treatment as the most accessible. Indigenous treatment came next with 23.8 percent. Of this, 12.8 percent of the respondents were in the suburban/urban areas while 11 percent were rural residents. Spiritual

healing only accounted for 0.5 percent as a treatment option. The distribution of these health care options among the LGAs is also depicted in Table 7.13.

Generally, respondents' level of educational attainment and their age have some measures of influence on their choices of health care services. For instance, while the likelihood to utilise indigenous health services cuts across educational lines, with respect to age, the older the respondent the more the likelihood to utilise indigenous medicine as the first choice of care.

Table 7.10: Relationship between education and indigenous treatment

	Traditional Treatment							
	Yes		No		Sometimes		Total	
EDUCATION	No	%	No	%	No	%	No	%
No Schooling	16	4.0	2	. 5	7	1.8	25	6.3
Primary	40	10.0	5	1.3	20	5.0	65	16.3
Secondary	67	16.8	33	8.3	53	13.3	153	38.3
Tertiary	56	14.0	55	13.8	46	11.5	157	39.3
Total	179	44.8	95	23.8	126	31.5	400	100.0

Source: Fieldwork December 2004.

X^2 table value = 16.812; X^2 computed value = 36.151; P = .000; df= 6.

Table 7.11: Relationship between education and 'first choice' of health care

	Traditional Option as First choice							
	Yes		No		Sometimes		Total	
EDUCATION	No	%	No	%	No	%	No	%
No Schooling	4	1.0	5	1.3	16	4.0	25	6.3
Primary	11	2.8	21	5.2	33	8.3	65	16.3
Secondary	17	4.2	61	15.3	75	18.8	153	38.3
Tertiary	8	2.0	83	20.8	66	16.5	157	39.3

Total	40	10.0	170	42.5	190	47.5	400	100.0

Source: Fieldwork December 2004.

Table 7.12: Age as a factor for preference for traditional treatment

	Preference For Traditional Treatment							
	Yes		No		Sometimes		Total	
AGE	No	%	No	%	No	%	No	%
15 – 24 Yrs	27	6.8	21	5.3	22	5.5	70	17.5
25 – 34 Yrs	39	9.8	30	7.5	35	8.8	104	26.0
35 – 44 Yrs	60	15.0	33	8.3	34	8.5	127	31.8
45 Yrs Above	53	13.2	11	2.8	35	8.8	99	24.8

Total	179	44.8	95	23.8	126	31.5	400	100.0

Source: Fieldwork December 2004.

X^2 table value = 12.592; X^2 computed value = 14.43; P = .025; df= 6.

Table 7.13: Health care treatment most easily accessible by LGAs

	Most Accessible treatment method							
	PHC		Traditional		Religious		Total	
LGA	No	%	No	%	No	%	No	%
OWAN WEST	18	4.5	22	5.5	-	-	40	10.0
ESAN WEST	28	7.0	11	2.8	1	.3	40	10.0
ESAN N.E.	31	7.8	9	2.3	-	-	40	10.0
ETSAKO WEST	33	8.3	7	1.8	-	-	40	10.0
ETSAKO CENTRAL	30	7.5	10	2.5	-	-	40	10.0
ETSAKO EAST	33	8.3	7	1.8	-	-	40	10.0
UHUNMWONDE	29	7.3	10	2.5	1	.3	40	10.0

EGOR	38	9.5	2	.5	-	-	40	10.0
OVIA N. EAST	39	9.8	1	.3	-	-	40	10.0
OVIA S. WEST	24	6.0	16	4.0	-	-	40	10.0
TOTAL	303	75.8	95	23.8	2	.5	400	100.0

Source: Fieldwork December 2004.

7.6 Influence of Religion on choice of health care utilisation

Religious belief to some extent also influences people's choice of health care service. For the purpose of this study the religions are Islam, Christianity and Traditional religion. Of the three, Christianity is practiced by the bulk of the respondents (76.2%). This comprised 47.5 percent of the suburban/urban and 28.7 percent of the rural residents. The Moslems constitute 20.8 percent out of which 13.5 percent are suburban/urban respondents and 7.3 percent rural dwellers. Traditional religion accounted for only 3.0 percent comprising 1.5 percent each of both suburban/urban and rural respondents.

With regard to spatial variation among the LGAs, Edo North comprising Etsako West (3.3%), Etsako Central (4.0%) and Etsako East (5.0%) contains the bulk of Moslems (12.2%). Christianity is widely distributed among the 10 chosen LGAs with Egor however, having the largest of these respondents (9.5%). Ovia North-East (9.0%), Ovia South-West (8.8%), Esan North-East (8.5%) and Uhunmwonde (8.3%) etcetera, came next as depicted in Table 7.14. Only four of the 10 LGAs had some respondents who claimed they are fully traditional religious worshippers.

To assess the effect of religion on utilisation of indigenous health care services, Table 7.15 presents the cross-tabulation of religious beliefs and treatment option. The result shows that of

the 20.8 percent of respondents who are Moslems only 4.0 percent did not utilised traditional health care service. This means that 16.8 percent of Moslems utilised traditional health care. Among the Christian respondents, only 19.8 percent claimed they did not patronised traditional health care at all. Those respondents who regularly and sometimes utilised indigenous medicine constitute 33.3 percent and 23.2 percent respectively. As expected none of the traditional religionists denied having patronised traditional medical care.

So, is there any significant difference in the utilisation of indigenous healthcare among the adherents of the three religions? The results of Chi-Square test indicate the table value of X^2 at the .05 significance level with 4 degrees of freedom is 9.488. Our computed X^2 value of 10.098 with P-value of .039 is greater than the critical value of 9.488. Thus, we conclude that there is a statistically significant difference between the three religions in the utilisation of indigenous healthcare.

In the final analysis, it is obvious from the table that the utilisation of indigenous healthcare in Edo State cuts across religious groups as revealed by the high percentage of all respondents (76.3%) that either 'regularly' or 'sometimes' utilised indigenous treatment (Table 7.15).

Table 7.14: Religion of respondents by LGAs

	Religion							
	Islam		Christianity		Traditional		Total	
LGA	No	%	No	%	No	%	No	%
OWAN WEST	7	1.8	29	7.3	4	1.0	40	10.0
ESAN WEST	8	2.0	29	7.3	3	.8	40	10.0
ESAN N.E.	2	.5	34	8.5	4	1.0	40	10.0
ETSAKO WEST	13	3.3	27	6.8	-	-	40	10.0
ETSAKO CENTRAL	16	4.0	24	6.0	-	-	40	10.0
ETSAKO EAST	20	5.0	20	5.0	-	-	40	10.0

UHUNMWONDE	7	1.8	33	8.3	-	-	40	10.0
EGOR	2	.5	38	9.5	-	-	40	10.0
OVIA N. EAST	3	.8	36	9.0	1	.3	40	10.0
OVIA S. WEST	5	1.3	35	8.8	-	-	40	10.0
TOTAL	83	20.8	305	76.3	12	3.0	400	100.0

Source: Fieldwork December 2004.

Table 7.15: Religious belief and herbal treatment

	Indigenous Treatment							
	Yes (Regularly)		Not Utilise		Sometimes		Total	
RELIGION	No	%	No	%	No	%	No	%
Islam	36	9.0	16	4.0	31	7.8	83	20.8
Christianity	133	33.3	79	19.8	93	23.2	305	76.3
Traditional	10	2.5	-	-	2	.5	12	3.0
Total	179	44.8	95	23.8	126	31.5	400	100.0

Source: Fieldwork December 2004.

X^2 table value = 9.488; X^2 computed value = 10.098; P = .039; df = 4.

7.7. Relationship between traditional health care beliefs and utilisation of PHC services

Traditional health care belief systems have various ways of influencing the adoption and acceptance of orthodox health care services in various communities (Lambo, 1961, 1986; Fabrega Jnr., 1970, Oyebola, 1980; Pearce 1982 and Pela, 1985). In this study, to assess the extent to which traditional health care beliefs have impacted the utilisation of PHC services, logistic regression model is used to estimate the influence of 'customary or traditional constraints on health care seeking behaviour', 'traditional medicine as first choice of treatment option' and 'preference for traditional medicine' on PHC utilisation. This was in a bid to test the hypothesis that: "The utilisation of PHC services is significantly influenced by traditional health care belief system in Edo State". As a first step, a separate analysis was done to examine the impact of these factors at the State level, suburban/urban areas and finally in the rural communities. The rationale for using Logistic Regression model is as explained in chapter six.

Data set and sources: The data used for testing the above hypothesis is derived from the household survey discussed in Sections 7.2 through 7.4. Variable one, the utilisation of indigenous medicine is presented in Table 7.3; variable two, customary constraint on health care seeking behaviour is presented in Tables 7.4 and 7.5 while variable three, respondents'

preference for treatment option is presented in Tables 7.8 and 7.9. The model used is as follows:

$$Y = a + b_1 x_1 + b_2 x_2 + b_3 x_3 ... + b_n x_n + e$$

Where:

Y = Dependent variable, PHC utilisation (dummy)

X1 = Utilisation of indigenous medicine (dummy)

X2 = Customary constraints on women health care seeking behaviour (dummy)

X3 = Preference for indigenous medicine (dummy)

Variable specifications:

Customary beliefs: The belief that dependants and most especially women should discuss their health matters with their spouses or senior members of households before seeking medical care is widespread in African indigenous tradition. As such, we believed the practice would have some impact on PHC utilisation in the communities. Although the practice can at times actually delay the act of seeking medical care, it does increase mutual consent between the spouses and in the long run increases the likelihood to utilise any medical care system. To assess the relevance of this argument and verify if actually the practice has more significant impact on women than other respondents, the variable customary constraint on health care seeking behaviour is coded 1, for those women who dialogue and seek permission from their husbands, while those that do not is coded '0' otherwise.

The utilisation and to a large extent preference for indigenous medicine over orthodox medical care system, can also have some negative impact on PHC utilisation. In this study, the variables utilisation of indigenous medicine and preference for indigenous medicine are coded '1' for active responses and '0' otherwise. In the multiple logistic models used for these analyses the 'enter' method is utilised to assess the intrinsic influence of each of these variables on PHC utilisation. Subjects and method of analysis is again as discussed in chapter six.

Results and Discussions:

The analysis at the State level entailed the entire respondents; the suburban/urban analysis involved 250 respondents (62.5 percent) while for the rural analysis the 150 respondents (37.5 percent) surveyed there were used. The categorization is aimed at verifying if there was any significant variation in traditional beliefs of these respondents in different areas with regard to PHC utilisation. The impact of traditional belief system on the utilisation of PHC services is

here examined using three main variables. Given the logistic regression results in Tables 7.16 – 7.18, it is obvious that these variables had varied effects on PHC utilisation.

At the State and rural levels of analyses, the results revealed that 'customary constraints' on women's health care seeking behaviour has a strong restrictive impact on PHC utilization. In other words, this factor had a high statistically significant relationship with PHC utilisation in both the State (OR = 2.66, P = .001) and rural areas (OR = 6.12, P = .001). Therefore, 'customary constraints' on health care seeking behaviour have more impact on women than other respondents. In other words, married women are more constrained than other respondents in utilising PHC services as they are expected to first discuss their health problems with their spouses or household heads before seeking care. As earlier indicated, the practice is essentially widespread in the study area as 63.8 percent of the respondents (Table 7.5) confirmed that in the African tradition women or subordinates need to inform and seek the consent of their spouses or head of households, as the case may be, before seeking any kind of medical care. From all indications therefore, the practice delays prompt and early consultation of medical services, although, in the long run it might foster active and timely utilisation when mutual and consensual agreement has been reached between spouses and or heads of household.

To a large extent therefore, the more the need for mutual consent between spouses and heads of household, the less the likelihood to promptly utilise PHC services. In fact, with the odds ratio values far greater than '1' (State level OR = 2.66, Rural = 6.12), the results indicate that at the State level women who seek permission to avail themselves of healthcare will be 2.7 times less likely to promptly utilise PHC services than those who do not require such consent. In the rural areas they are about 6 times less likely to promptly utilise PHC services than those respondents who do not need to seek permission. Even in the suburban/urban areas where 'customary constraint' was not statistically significant (P > 0.05), the need for mutual consent has some implications for PHC utilisation. The odds ratio value of 1.75 indicates that respondents in the suburban/urban areas are about 1.8 times less likely to promptly utilise PHC services than their counterparts not requiring such mutual consent.

With regard to use of indigenous treatment and preference for indigenous medicine, the results across the three levels of analyses indicate a consistent inverse relationship with PHC utilisation. Although none of these two factors is statistically significant (P > 0.05) at the various levels of analyses, the prediction is that a unit increase in the use of indigenous treatment and preference for traditional medicine, generally lead to a decreasing likelihood to utilise PHC services.

Table 7.16: Logistic regression at the State level

		B	S.E.	Wald	df	Sig.	Exp(B) Odds Ratios	95.0% C.I. for EXP(B) Lower	Upper
Step 1(a)	Customary constraint	.980	.300	10.668	1	.001	2.664	1.480	4.796
	Preference for Indigenous Medicine	399	.455	.769	1	.381	.671	.275	1.637
	Use of Indigenous Treatment	-.395	.307	1.654	1	.198	.674	.369	1.230
	Constant	1.502	.249	36.459	1	.000	4.491		

Chi-Square: 13.868, P = .003 -2 Log-Likelihood = 302.758 Nagelkerke R-Square = .062

This is the odds ratio of indigenous beliefs as it affects PHC utilization. It is derived from the parameter: Odds Ratio = $e^{\text{parameter}}$. If **1** in the outcome variable is defined as something **negative** (here it is customary constraint) then if the odds ratio is less than one, the covariate is not a **problematic effect**. If it is more than one, it is a **constraining effect**. If it is not significantly different from one, it has no effect (see **Walker**, 1996).

Table 7.17: Logistic regression at the Suburban/Urban level

		B	S.E.	Wald	df	Sig.	Exp(B) Odds Ratios	95.0% C.I. for EXP(B) Lower	Upper
Step 1(a)	Customary constraint	.557	.368	2.288	1	.130	1.745	.848	3.590
	Preference for Indigenous Medicine	-.158	.585	.073	1	.787	.854	.271	2.688
	Use of Indigenous Treatment	-.359	.381	.887	1	.346	.698	.331	1.474
	Constant	1.650	.318	26.986	1	.000	5.206		

Chi-Square: 3.395, P = .335 Nagelkerke R-Square = .024 -2 Log-Likelihood = 199.087

Table 7.18: Logistic regression at the Rural level

		B	S.E.	Wald	df	Sig.	Exp(B) Odds Ratios	95.0% C.I. for EXP(B) Lower	Upper
Step 1(a)	Customary constraint	1.811	.541	11.214	1	.001	6.117	2.119	17.657
	Preference for Indigenous Medicine	-.887	.773	1.316	1	.251	.412	.091	1.874
	Use of Indigenous Treatment	-.364	.537	.460	1	.497	.695	.243	1.990
	Constant	1.196	.404	8.745	1	.003	3.305		

Chi-Square: 14.629, P = .002 Nagelkerke R-Square = .173 -2Log-Likelihood= 99.371

In addition, as indicated in Table 7.16 – 7.18, the odd ratios for preference for and utilisation of indigenous medicine are less than one. This indicates that a unit increase in preference for, and utilisation of indigenous medicine would decrease the likelihood to utilise PHC services by 0.671 and 0.674 units at the State level of analysis. In the suburban/urban areas, those respondents who had preference for, and utilise indigenous medicine are less likely to utilise PHC services by 0.854 and 0.698 units than their counterparts with alternative choice. In the rural areas, respondents with preference for

and who utilise indigenous medicine are less likely to utilise PHC services by 0.412 and 0.695 units than their counterparts with preference for PHC services. Therefore, respondents who increasingly prefer and utilise indigenous medicine are less likely to adequately utilise PHC services than other respondents who held alternative views. Nevertheless, although the statistical significance of these values are low in the three levels of analyses, it should be noted that the consistency of the inverse relationship across the three levels of analyses is of great importance as it reveals that respondents' utilisation and preference for indigenous medicine would consistently decrease the likelihood to utilise PHC facilities.

In the final analysis, we conclude that traditional health care practices such as customary constraints on health care seeking behaviour significantly restrain respondents, most especially women, and dependants generally, from prompt utilisation of PHC services. In addition, although the use of and preference for indigenous medicine are not statistically significant at the 95 percent confidence level, the practice decreases the likelihood to utilise PHC services at all levels of analyses. This observed trend might be because, even though a large proportion of respondents utilised PHC services, this does not prevent them from patronising traditional health care services that in fact is still very efficient in combating lots of ailments among the various communities.

7.8 Socio-economic and cultural constraints to PHC utilisation

This section discusses the question of major problems militating against the success of PHC and the extent to which these problems hamper peoples' decision to make use of PHC services. For an objective assessment of these problems both the consumers and higher cadre PHC personnel were interviewed through the use of separate questionnaires; one for the consumers and the other for PHC personnel to identify barriers to accessing PHC services at the community level.

Starting off at the community level, respondents were asked to identify the major problems they observed to be limiting the success of PHC activities in their respective communities. One of the major handicaps of PHC programme identified by majority of the respondents (38.0%) was lack of staff and qualified nurses. Cost of drugs and expensive cost of services was identified as the second most serious problem by 28.8 percent of the respondents. In the same vein, while 14.3 percent of the respondents recognized distance and transportation problem as the third major difficulty, 2.8 percent of them saw availability of native drugs to substitute orthodox PHC services as one more problem, among others (Table 7.19).

On the part of PHC personnel, the first three major problems identified as hindering PHC activities are lack of funds (77.78%), lack of adequate health personnel and lack of equipment to work with (55.56% each). Other listed problems as indicated in Table 7.20 are the effect of factors such as lack of proper awareness of the benefits of PHC services (22.22%), preference for traditional medicine, lack of transportation, poor attitude of some health workers and lack of stable energy supply (11.11% each).

Asked to give reasons why the populace are not making maximum use of primary health care (PHC) services, 55.56 percent each of the personnel indicates inadequate health personnel and cost of services. In the same vein, 44.44 percent each also stated that lack of proper awareness of the benefits of PHC programme coupled with poor accessibility to rural areas affects utilisation. Lack of equipment to work with (33.33%), lack of drugs at the clinics and lack of community ownership of health facilities (22.22% each) are other stated reasons why the communities do not as yet make maximum use of PHC services (Table 7.21).

Table 7.19: Identified problems hindering PHC success in the communities

	Suburban/ Urban		Rural		Total	
Problems hindering PHC programme	No	%	No	%	No	%
No Response	-	-	1	.3	1	.3
Distance and transport	26	6.5	31	7.8	57	14.3
Lack of qualified staff/Nurses	98	24.5	54	13.5	152	38.0
Long waiting & wasting time	35	8.8	7	1.8	42	10.5
Cost of drugs & services	80	20.0	35	8.8	115	28.8

Available native drugs to use	11	2.8	-	-	11	2.8
Lack of PHC in Community	-	-	22	5.5	22	5.5
Total	250	62.5	150	37.5	400	100.0

Source: Fieldwork December 2004.

Table 7.20: Problems limiting the attainment of PHC set objectives

Problems	No	%
(1). Lack of funds.	7	77.78
(2). Lack of adequate health personnel.	5	55.56
(3). Lack of equipment to work with.	5	55.56
(4). Lack of awareness.	2	22.22
(5). Non involvement of communities.	1	11.11
(6) Lack of steady energy supply.	1	11.11

(7) Preference for traditional healer.	1	11.11
(8) Lack of transportation.	1	11.11
(9) Poor attitude of health workers.	1	11.11

Source: Fieldwork in-depth interview, December 2004.

Table 7.21: Reasons against full patronage of PHC programmes in Edo State

Reasons for low utilisation of PHC in Edo State	No	%
1. Inadequate health personnel.	5	55.56
2. Cost of services not affordable.	5	55.56
3. Lack of proper awareness of PHC benefits.	4	44.44
4. Poor accessibility to village communities.	4	44.44

5. Lack of equipment.	3	33.33
6. Lack of community ownership of health facility.	2	22.22
7. Lack of drugs.	2	22.22

Source: Fieldwork in-depth interview, December 2004.

The spatial pattern of these problems is depicted in Figure 7.1. Among the LGAs, Ovia South-West (6.3%), Ovia North-East, Uhunmwonde and Esan North-East (4.5% each) had more complaint of lack of PHC staff and qualified nurses. With regard to distance and transportation problems Owan West (3.0%), Uhunmwonde (2.3%), Esan West and Etsako East (2.0% each) accounted for more of the 14.3 percent of the respondents who identified this as a hindrance to PHC performance.

The fourth most identified problem is that of 'long waiting time' in the clinics. Esan West (2.5%), Esan North-East and Ovia North-East (1.3% each) followed by Owan West, Etsako Central, Uhunmwonde and Egor (1.0% each) respectively, were more hard hit by this problem. Expensive drugs and cost of services as problems against PHC success had the highest number of respondents (5.0%) in Egor LGA and was lowest in Uhunmwonde (0.5%) as depicted in Figure 7.1. The distribution of these constraints in the suburban/urban and the rural settings is shown in Table 7.19.

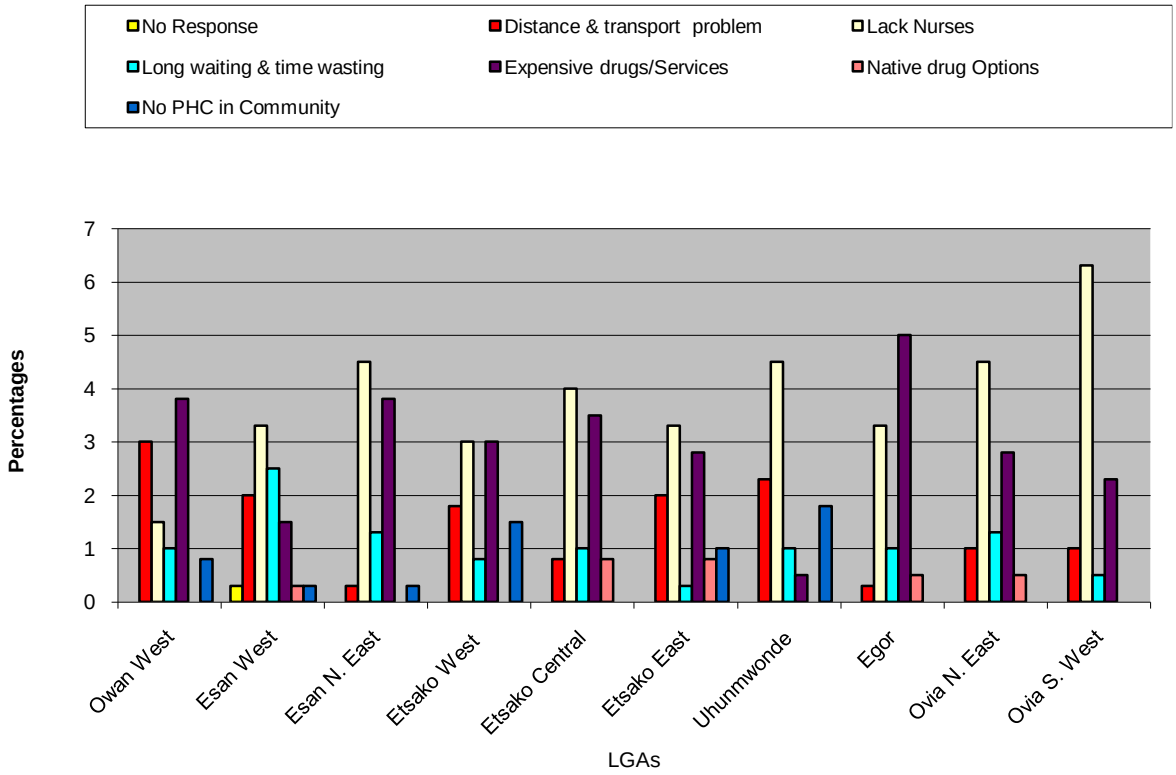

Figure 7.1: Respondents' Perception of problems hindering PHC success

To condense the various problems into fewer variables three major problems were listed for the officials to rank in their order of importance. As depicted in Table 7.22, the problem of cost of services (55.56%) followed by no drugs in PHC centres (55.56%), and lastly, long distances to good PHC centres for majority of the communities (88.89%) were the three most crucial problems inhibiting adequate utilisation of primary health care services in the study area.

Given these results as ranked, the hunch is that as cost of drugs and user charges become high in PHC centres, patients could resort to traditional healers and self-medication at chemist stores or seek better services at secondary health care centres. This assertion is re-enforced by lack of drugs at PHC centres which was ranked second by PHC officials themselves. In addition, other behavioural factors such as patients' consciousness of time factor, value for their money as well as the cost of getting to health centres could influence their decisions and choices to the extent that less use will be made of PHC services.

Therefore, to examine the extent to which these observed problems may have influenced respondents' choices and decisions to use or not to use PHC services anymore, respondents were asked if they would stop patronising PHC services due to these problems. As indicated in Tables 7.23 and 7.24, 30.3 percent of the respondents stated they might not bother to utilise PHC services anymore. On the other hand, 66.0 percent of the respondents comprising 39.8 percent suburban/urban and 26.2 percent rural respondents maintained that these problems would not prevent them from patronising PHC facilities.

Concerning the geographical distribution of those who thought they might not patronise PHC any longer, Table 7.24 reveals that the apathy towards the use of PHC services was generally more among respondents in Esan West (4.5%), Owan West (4.3%), Etsako West (4.0%) and Uhunmwonde LGA (3.8%). A plausible reason for this stance may have resulted from the fact that of the rural areas surveyed, PHC programme were either very poorly rooted or altogether rarely operational in the case of Ukhun in Esan West, Aviele in Etsako West and Idumhugha village in Uhunmwonde LGAs among others. Therefore, people in these areas see PHC as highly ineffective.

Finally, on the question of effective management responsibility, 88.89 percent of the PHC personnel preferred PHC system being jointly managed by Federal, State and Local governments. While 11.11 percent of them desired PHC system to be an independent body, none of the officials thought PHC should be the sole responsibility of the Federal, State or Local governments (Table 7.25). On this note, they advised that PHC would be more effectively managed if responsibility is shared between the three tiers of government rather than be the exclusive responsibility of the local governments.

Table 7.22: Major problems inhibiting full utilisation of PHC services in Edo State

	Ranking					
	1st		2nd		3rd	
Problems	No	%	No	%	No	%
No drugs in PHC centres.	4	44.44	5	55.56	0	0.00
Communities cannot afford the cost of services.	5	55.56	3	33.33	1	11.11

Good PHC centres far from majority of communities.	0	0.00	1	11.11	8	88.89

Source: Fieldwork in-depth interview, December 2004.

Table 7.23: Respondents' decision on PHC services

	Suburban/Urban		Rural		Total	
Will problems faced by PHC discourage you as a patient from utilizing the services?	No	%	No	%	No	%
No Response	11	2.8	4	1.0	15	3.8
Will Utilize PHC	80	20.0	41	10.3	121	30.3

Will Not Utilize PHC	159	39.8	105	26.2	264	66.0
Total	250	62.5	150	37.5	400	100.0

Source: Fieldwork, December 2004.

Table 7.24: Respondents' decision on PHC services by LGAs

	Will PHC problems discourage your patronage?							
	NR		Yes		No		Total	
LGA	No	%	No	%	No	%	No	%
OWAN WEST	4	1.0	17	4.3	19	4.8	40	10.0
ESAN WEST	3	.8	18	4.5	19	4.8	40	10.0
ESAN N.E.	2	.5	10	2.5	28	7.0	40	10.0

ETSAKO WEST	3	.8	16	4.0	21	5.3	40	10.0
ETSAKO CENTRAL	1	.3	5	1.3	34	8.5	40	10.0
ETSAKO EAST	-	-	11	2.8	29	7.3	40	10.0
UHUNMWONDE	2	.5	15	3.8	23	5.8	40	10.0
EGOR	-	-	8	2.0	32	8.0	40	10.0
OVIA N. EAST	-	-	11	2.8	29	7.3	40	10.0
OVIA S. WEST	-	-	10	2.5	30	7.5	40	10.0
TOTAL	15	3.8	121	30.3	264	66.0	400	100.0

Source: Fieldwork, December 2004.

Table 7.25: Who should manage PHC system?

Stakeholders.	No	%
1. Local Government only	0	00.00
2. Federal Government only	0	00.00

3. State Government only	0	00.00
4. Should be independent body by itself.	1	11.11
5. Federal, State and Local governments together.	8	88.89

Source: Fieldwork in-depth interview, December 2004.

Conclusion**:**

The analyses in this chapter have revealed there was a general consensus among the respondents (99.2%) on the widespread practice of indigenous medicine in Edo State. Furthermore, utilisation of indigenous medicine (76.3%) alongside PHC services was found to be widely accepted among the respondents. Also, respondents' level of educational attainment and their age have significant influences on health care utilisation such that the lower the level of education the more the likelihood to utilise indigenous medical services while with respect to age, the older the respondent the more the likelihood to utilise indigenous medicine as the first choice of care. Traditional health care practices, and beliefs (such as customary constraints on health care seeking behaviour) were found to significantly restrict respondents (especially women) from prompt utilisation of PHC services ($P < 0.05$). In addition, the use of

and preference for indigenous medicine also had decreasing odds for respondents' likelihood to utilise PHC services at all levels of analyses.

With regard to major problems militating against the realization of PHC goals, this study revealed that both the patients and PHC officials point to inadequate qualified health personnel, lack of funds, and the influence of traditional medicine as well as the general inaccessibility of most of the rural communities as the major problems of PHC programme in Edo State.

CHAPTER EIGHT

SUMMARY AND CONCLUSIONS

8.1 Introduction

This chapter presents the major findings of this study. Vital issues ranging from the spatial pattern, accessibility and distance threshold to PHC facilities, coverage of various immunisation programmes, and the impact of socio-cultural and traditional health care beliefs on PHC utilisation are discussed. The problems and prospects of PHC system in Edo State were also examined. Furthermore, the significant findings of this research are discussed and the theoretical issues and health policy implications are considered.

8.2 Summary of Findings

Specifically, this study investigates the spatial distribution of PHC facilities in Edo State with a view to determine their spatial pattern and level of accessibility against the backdrop of government policy that emphasized a distance threshold of four kilometres for every Nigerian to access PHC. It also identifies the effects of distance on access to PHC services. It explored the influence of socio-cultural and traditional health care beliefs on PHC utilisation. In addition, the spatial distribution of key diseases that justified the emphasis on PHC in the study area was discussed. Finally, the level of primary health care awareness and its influence on respondents' utilisation of PHC services as well as the major problems faced in PHC management and implementation were examined.

By and large, the major diseases in Edo State fall into three main categories. These are diseases associated with tropical regions, for example malaria. The second category consists of diseases associated with poverty, illiteracy, ignorance and poor standards of hygiene and sanitation. Finally, we have diseases that are found everywhere, irrespective of level of development, for example measles. Most of these diseases are preventable, and fairly easy to handle. Little wonder therefore that PHC is the foundation of not only the national health policy, but also the health policy of Edo State.

Quadrant count analysis and variance/mean ratio (QCA & VMR) was used to determine the spatial pattern of PHC facilities in Edo State. The variance/mean ratio value of 5.0 indicates a clustered spatial pattern of PHC distribution in the State. With regard to geographical distribution of PHC facilities, Pearson correlation analysis indicate a high positive and significant relationship between the size of rural population of LGAs and number of PHC facilities per LGA ($r = .713$, $P = .001$) at the *0.01* level. On the other hand, there was a high negative and significant correlation between urban population of LGAs and number of PHC facilities per LGA ($r = -.678$, $P = 0.045$) at the *0.05* level. Furthermore, at the local

government level there was an insignificant negative relationship between the total population of each local government area and the distribution of PHC facilities (*r = -.200, P = .426*). This indicates that total population of LGAs was not the decisive factor for PHC distribution.

Generally, there was a high rate of PHC utilisation (86.5%) among the respondents. Within a distance of 0-1.99 kilometres from PHC facilities, 59.25 percent of the respondents at the suburban/urban and rural areas had access to PHC services. Within 2-3.99 kilometres distance 78.25 percent of the respondents had access to primary health care centres. In the study area, therefore, majority of the population who utilised primary health care services are within the travelling distance band of 0-3.99 kilometres. However, there was a sharp decline in accessibility as distance increases above 1.99 kilometres in the first instance and more rapidly beyond 3.99 kilometres from these facilities.

In addition, we find that within the prescribed four kilometres distance more than 20 percent of the respondents lack access to PHC facilities at the State level. Moreover, there was a great variation between the LGAs in accessing PHC facilities. For instance, predominantly rural LGAs, as well as some communities with PHC facilities lacking personnel and adequate equipment to work with had far less access compared to suburban and Local Government headquarters where standard units of PHC facilities are located. Therefore, from the standpoint of policy, while government may have the good intention of providing health care for all and sundry, setting the same distance threshold of four kilometres for all places can be faulted. This is because the effect of distance is not the same in all places as is reflected in the different percentages of consumers with access at the same distance from facilities. Therefore, the policy of setting the same distance for all places has some implications.

First and foremost, emphasizing four kilometres distance threshold as a policy indicates that the objective of providing primary health care services for all and sundry most especially in the rural areas cannot be attained with the present level of provision. Secondly, the predominantly rural LGAs such as Ovia South-West, Ovia North-East and Uhunmwonde etcetera with greatly dispersed communities and poor access road networks are highly disadvantaged. They had between 15 and 62.5 percent of their consumers with very poor access to PHC facilities compared to Local Government Areas containing settlements with large rural population. Again, the underprivileged rural dwellers who are essentially the main

focus of PHC programme would end up spending more in terms of time and monetary cost per clinic visit than their suburban and urban counterpart in covering the four kilometres pre-determined distance threshold. Finally, given poor access road networks and transportation difficulties, the rural consumers are most likely to have preference for indigenous medicine over orthodox PHC services.

Assessing the effect of distance on access to PHC facilities, the results of correlation and simple regression model indicates that consumers' access to PHC services decreases differentially with increasing distance in different communities. The regression coefficients show that the decrease in access varies differentially between -3.31 and -1.88 units in different LGAs. The coefficients of determination (R^2) show that distance explains between 22 – 67 percent of the variations in access to PHC services in the different sampled communities.

The correlation results also show an inverse relationship with coefficients ranging from -0.812 to -0.986. These results are significant at the *0.01* and *0.05* levels. As such, a distance-decay effect was apparent in consumers' access to PHC services. This finding validates our hypothesis that 'access to PHC services decreases differentially with increasing distance from facilities in different communities'. Thus, we conclude that distance is one of the factors determining the level of access to PHC facilities in different communities of Edo State.

The coverage and utilisation rate of antenatal and postnatal immunisation services, especially tetanus toxoid (TT2) for women of reproductive age (<10%) and immunisation against the six childhood killer diseases including BCG for tuberculosis (47.70%), OPV3 for polio (39.00%), measles (34.00%) and DPT3 (36.00%) were found to be awfully poor for the period in question. To explain the impact of non-spatial factors on PHC utilisation, the analysis shows that PHC awareness *(P = .000*), marital status (*P = .001*) and education (*P = 0.065*) are the most significant socio-economic and behavioural factors influencing respondents' utilisation of PHC services in Edo State. With regard to differences in residential location, it was observed that these variables were more significant at both the state and rural levels than at the suburban/urban level of analyses.

Basically, there is a general consensus among the respondents concerning the widespread practice of indigenous medicine (99.2%) in Edo State. In addition, utilisation of indigenous

medicine (76.3%) alongside PHC services was found to be widely accepted among the respondents. Also, respondents' level of educational attainment and their age have some influence on their choice of health care facility, such that, the higher the level of education the more the likelihood to utilise PHC services, while with respect to age, the older the respondent the more the likelihood to utilise indigenous medicine as first choice of care when the need arises. Traditional health care beliefs (such as, the use of, and preference for indigenous medicine, and practices, such as, customary constraints on health care seeking behaviour), have some important influences on PHC utilisation at all levels of the analyses. Statistically, the variable 'customary constraints' on health care seeking behaviour has a strong restrictive influence on PHC utilisation.

In other words, this factor had a high significant relationship with PHC utilisation in both the State ($P = .001$) and rural areas ($P = .001$). Therefore, traditional practices, such as customary constraints (having to seek the permission of household head or husband on health care seeking behaviour) significantly delay respondents (most especially women and dependants in the State and rural areas) from prompt utilisation of PHC services. With regard to 'use of indigenous treatment' and 'preference for indigenous medicine', the results across the three levels of analyses indicate a consistent inverse relationship with PHC utilisation. Although none of these two factors was statistically significant ($P > 0.05$) at the three levels of analyses, the prediction is that increasing 'use of indigenous treatment' and 'preference for traditional medicine' by the respondents would generally lead to decreasing likelihood for PHC utilisation at the State, suburban/urban and rural areas. This trend is occasioned by the fact that though large proportion of the respondents utilised PHC services, it does not however prevent them from patronising traditional care system which has become part of the culture and in fact still very efficient in combating lots of ailments in the various communities.

In assessing the major problems militating against the realisation of PHC goals, both the respondents and PHC officials point to inadequate qualified health personnel, lack of funds, influence of traditional medicine and the general inaccessibility of most rural communities as some of the major problems of PHC programmes in Edo State. However, it has been suggested by the higher cadre PHC personnel that, instead of PHC programme being integrated into either the State or Federal Ministries of Health, the status of PHC should rather be enhanced through allocation of funds and human resources both by the State and Federal Governments to substantially complement the efforts of Local Government Areas.

8.3 Theoretical Issues and Health Policy Implications

This study has demonstrated the relevance of *central place theory* with regard to the spatial distribution of primary health care facilities in Edo State, Nigeria. The theory was further operationalized using Pearson correlation model to determine the relationship between population size of communities in the LGAs and the spatial distribution of PHC facilities. The result reveals that PHC facilities which render *lower-order* healthcare services are found to be more in rural areas than in urban centres. In other words, as *lower-order* health care facilities, PHC facilities are more ubiquitous in LGAs mostly composed of rural communities than those with large urban centres. In the same vein, using quadrant count and variance/mean ratio to determine the spatial pattern of PHC facilities, the QCA/VMR result with a value of 5.0 indicates a clustered pattern of PHC distribution in Edo State. This means that PHC facilities are concentrated in some areas than others.

In fact, the fieldwork revealed there are still a number of large rural communities in some LGAs such as Ukhun in Esan West, Aviele in Etsako West, and Ehor in Uhunmwonde etcetera, where facilities and personnel are grossly underprovided. The implication of this for healthcare planning and utilisation is that respondents in these communities usually have to travel long distances to utilise orthodox health care facilities or otherwise resort to the services of indigenous medical facilities. Policy-wise, therefore, this calls for location of more *lower-order* health care centres (PHC), as well as, provision of staff in more of these communities if the goal of ensuring adequate provision and coverage is to be attained. This becomes all the more important as PHC system is the first entry point to orthodox health care system for majority of the populace.

One of the explanatory variables determining the spatial behaviour of patients is Distance. It has been noted that patients make more use of nearer facilities so as to minimise the cost or effort involved in overcoming distance (Bennett, *et al*., 2000; Pilkington et al, 2012; Brual et al, 2010). The application of simple regression analysis showed that respondents access to PHC services decreases differentially with increasing distance from facilities in the different chosen communities. While within 0-1.99 kilometres distance from PHC facilities as much as 59.25 percent of the respondents had access to PHC services, only 19.00 percent of them had

access to PHC services within 2-3.99 kilometres. Within a distance band of 4-5.99 kilometres the proportion of respondents who had access to PHC services declined to 11.25 percent. These findings show that not all consumers had access to PHC facilities at the prescribed four kilometres distance threshold by government health care policy. Furthermore, we found that the predominantly rural LGAs had less access to PHC than the suburban/urban areas. This negates the government objective of ensuring every Nigerian and especially the underprivileged rural dwellers have access to PHC facilities. Therefore, a distance-decay effect was apparent in the use of PHC services.

These findings have some health implications for the study area in that, in the rural areas where there is no adequate provision of transport facilities, patients would be very reluctant to walk long distances to utilise PHC services. Alternatively, this could lead patients to resort to self-medication by purchasing medicine in drug stores or resort to patronage of indigenous health care facilities. Therefore, since PHC services are *lower-order* and community based facilities, it is important that adequate provision of equipment and manpower and access to the facilities be ensured at not more than the prescribed four kilometres maximum travel distance or an hour walking distance. This is to stem the inequalities in distribution and utilisation between the various LGAs in the first instance, and secondly, between communities in the same LGA in Edo State.

The application of non-spatial models, such as, 'decision-making process and epidemiological determinants of utilisation', and 'culture and traditional concept of disease' to the study of healthcare utilisation, became necessary as the methods incorporate individual variations in needs, aspirations, abilities and attitudes. However, of the models that predicate decisions mainly on individual psychological variables, the most well known example is the 'health belief model' (HBM) suggested by Rosenstock (1966) and modified by Gochman (1972) and Becker and Maiman (1975). Theoretically, our findings in this study lend weight to the concept of health belief model (HBM) which emphasize that the beliefs and attitudes of persons are critical determinants of their health related actions. In other words, the probability of a patient taking action to consult a health care facility is a function of the level of perceived threat to health; beliefs about the likely benefits from proposed action to counter the threat; and the estimated level of cost or inconvenience involved in pursuing the proposed action. For a healthcare action to be triggered a relevant stimulus must be present.

The stimulus can be internal such as perception of body dysfunction, or it could be external such as the advice of a friend or physician (Igun, 1988). In the same light, Joseph and Phillips (1984: 139) point out that "an individual will use a service only when it is perceived that the recognised need should be satisfied, that the facility provides the required and desired service, and that it is convenient". Little wonder therefore that the utilisation of either orthodox PHC or indigenous medicine could be triggered by its availability, convenience or ease of access, place of residence as well as the belief in its efficacy. With respect to residential location Suchman (1964, 1966) had argued that a 'cosmopolitan' social structure (urban area) is more likely to be related to a 'scientific' orientation to health and medicine whilst a 'parochial' or traditional society (rural area) is more likely to hold popular or folk beliefs.

In this study, the relevant stimulus to utilise indigenous healthcare is the availability and ease of access and the belief that it has stood the test of time in combating lots of ailments before and even with the advent of 'Western medicine'. Thus, the action to utilise indigenous medicine was triggered by the belief that it provides and satisfies the health needs of the individual. On the other hand, the relevant stimulus to utilise PHC services is predicated upon the availability of PHC facilities and the provision of maternal and child healthcare services especially the availability of vaccines for the six childhood killer diseases. As such, the utilisation of either indigenous or orthodox medicine can be regarded as complementary rather than competing with each other in Edo State. Policy-wise, a balance should be struck to harmonise and integrate both systems for all-round healthcare development in the State.

With specific reference to folk beliefs, we found that traditional health care beliefs and cultural practices significantly influence PHC utilisation in the study area. Consequently, customary constraints on health care seeking behaviour and the use of, and preference for indigenous medical treatment have some important influences on PHC utilisation. Generally, however, with regard to scale of analysis, we observed that these variables were more significant at both the State and rural levels of analyses than in the suburban/urban areas. Concerning the implications of these findings for primary health care planning, it is important to stress the need to examine, harmonise and take into account those cultural values and indigenous healthcare beliefs that could sometimes negatively influence patients' utilisation of orthodox PHC services at the grassroots level. Secondly, there is also the need to know and

document those ailments for which patients often prefer indigenous medicine. This would help in standardizing the traditional means of handling these ailments and enable their harmonisation with the main PHC system. These goals can be achieved by engaging knowledgeable healthcare personnel that can render services of both orthodox and indigenous medicine and as such appropriately advice patients on the best care to use depending on the type of ailment. With regard to socio-economic and behavioural factors, education, PHC awareness and marital status were found to be the most important non-spatial factors influencing respondents' utilisation of PHC services in Edo State. These findings highlight the need to further educate and sensitize the populace that PHC programme benefits not only those that are married and educated, but rather for all and sundry.

These findings can be linked to the purpose of this research, which is, to examine the spatial pattern and coverage of PHC services, as well as determine the impact of socio-cultural and traditional health care beliefs system on its utilisation. The research outcome contributes to at least three main issues in the literature. First, is the literature on the spatial pattern of PHC facilities; secondly, it also contributes to the literature on health care utilisation, specifically PHC in Nigeria, and thirdly, is the contribution to the literature on impact of socio-cultural and traditional health care beliefs system on healthcare utilisation. Therefore, an understanding of these findings would assist healthcare policy planners, decision-makers and health workers alike on how to appropriately provide and deliver primary healthcare services in a given location.

Nature of Contribution to Knowledge:

In addition to affirming some theoretical positions such as the effect of distance, population size, and some behavioural and cultural factors on utilisation of health care facilities, the study found that access decreased differentially with distance in different settings. This calls for nuance in theorising the effect of distance on utilisation. From a policy standpoint, this underscores the need to not use the same template for all places in designing the spatial organisation of lower-order health care facilities.

8.4 Limitations of the Study and suggestions for potential Research

Perhaps the greatest problem we confronted in this study is the quality and availability of hard data. For instance, the absence of hard data on key aspects of PHC services such as distances travelled by consumers from their residence to PHC centres compelled us to use map

distances. Also, lack of score card for the provision of essential equipment in PHC centres completely limits analysis in this aspect of PHC programme. However, whilst recognizing the limits of this study, the findings underline the need for further research into the nature of the interplay between provision of orthodox PHC facilities and the availability and ease of access to indigenous medicine. Essentially, there is need for an in-depth study of customary or traditional beliefs that often-time prevent patients, most especially women, from timely utilisation of orthodox healthcare services. Also, there is the need to examine in detail the health problems for which patients often prefer indigenous medicine. Furthermore, a detailed survey of essential drug procurement and distribution, as well as the provision of essential equipment in the various PHC centres across the State needs to be carried out. Another issue worth researching is the problem of unfriendly opening hours and absenteeism of health staff which have contributed to low utilisation of services. This becomes necessary because there are occasions when for days some PHC centres remained completely shut and or out of service to the people due to lack of necessary manpower.

In all, the application of both spatial and non-spatial models such as the central place theory, gravity model and health beliefs model (HBM) stands to benefit researchers and the decision-makers by providing them access to methods that enable the determination of the spatial pattern, distance threshold and its impact, as well as the impact of socio-cultural beliefs on choice of healthcare. There is no doubt that detail examination of these factors would, in the long run, ensure a better understanding of the interplay between the provision and utilisation of orthodox PHC services vis-à-vis the availability and ease of access to indigenous medicine, particularly, the influence of spatial and non-spatial factors on them. This would allow the generalisation of findings in the health sector across the states in the country.

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APPENDIX: A-1

GEOGRAPHY DEPARTMENT
FACULTY OF THE SOCIAL SCIENCES
UNIVERSITY OF IBADAN
NIGERIA

SPATIAL PATTERN AND UTILISATION OF PRIMARY HEALTH CARE FACILITIES IN EDO STATE, NIGERIA

SURVEY QUESTIONNAIRE

A. A. J. // S. I. 63055 // SUPERVISOR: PROF. S. I. OKAFOR

Dear respondents,
You are implored to please diligently complete this questionnaire given your honest truth as the outcome would go a long way in presenting areas that need policy improvement in our primary health care (PHC) planning and management system.

Thank you for the anticipated co-operation.

SECTION / A. / SOCIO-DEMOGRAPHIC AND ECONOMIC CHARACTERISTICS

1.	Name of the Village/Town?	
2.	If a town, mention the name or part of town you live	----------
3.	Age cohort	15 – 24 yrs [ ] 25 – 34 yrs [ ] 35 –44 yrs [ ] 45 Above [ ]
4	Sex	Male [ ] Female [ ]
5.	What is your marital status?	Single [ ] married [ ] widow/widower [ ] Divorced [ ]
6.	Number of children	None [ ] One [ ] Two [ ] Three [ ] Four [ ] Five [ ]
7.	What is your present educational level?	No schooling [ ] Primary [ ] Secondary [ ] NCE/OND [ ] HND/B.Sc. [ ] M.Sc /above [ ]
8.	What is your religious affinity?	Islam [ ] Christianity [ ] Traditional [ ]

		Others [ ]
9.	Your occupational status	Farmer [ ] Trader [ ] civil servant [ ] professional [ ] Student [ ]
10.	What is your monthly income?	N100 – N3500 [ ] N3501 – N7500 [ ] N7501- N11000 [ ] N11001 – N14500 [ ] N14501- N18000 [ ] N18001 – N21500 [ ] N21501 –N25000 [ ] N25001 above [ ]
11.	What is your means of daily mobility?	Personal car [ ] Public buses [ ] Walking [ ] Company/ Institutional provision [ ]
12.	Is there electricity power supply in this place?	Yes [ ] No [ ]
13.	What is the source of your daily water consumption?	Pipe borne water [ ] Well [ ] Stream/River [ ] Tanker lorry hawkers [ ] Bole hole [ ]
14.	What is your house made of?	Brick laid and zinc roofed [ ] Mud laid and thatched roofed [ ] Mood laid and zinc roofed [ ]
15.	What toilet facility do you use?	Open field [ ] Pit latrine [ ] Flush water System [ ]
SECTION /B/ TRADITIONAL HEALTHCARE BELIEF IMPACT ON PHC UTILIZATION		
16.	Is the culture of traditional medicine and treatment practiced in your area?	Yes [ ] No [ ]
17.	Do you use traditional medicine/herbs treatment when ill?	Yes [ ] No [ ] Sometimes [ ]
18.	Is it true that your traditional customs requires a married woman **MUST** seek permission from the husband or in-laws before seeking a medical doctor or utilizing any means of health care?	Yes [ ] No [ ] Sometimes [ ]
19.	Do your native customs allow married	Yes [ ]

	women to be examined or treated by a male medical doctor?	No [ ] Sometimes [ ]
20.	Could you, a married adult male be examined or treated by a female doctor/nurse	Yes [ ] No [ ] Sometimes [ ]
21.	Would you rather use traditional treatments instead of a stranger doctor to examine you naked?	Yes [ ] No [ ] Sometimes [ ]
22.	Do you believe traditional medicine is better for you than orthodox or hospital based treatments?	Yes [ ] No [ ] Sometimes [ ]
23.	In your very opinion would you first use native treatments before medical or orthodox (hospital) treatments?	Yes [ ] No [ ] Sometimes [ ]
24.	Do you use or patronize traditional medicine because it is the only option of health care in your community?	Yes [ ] No [ ]
25.	Would you have preferred orthodox (hospital) treatments were it available in your community?	Yes [ ] No [ ]
26.	In your opinion which of these methods of treatment is more easily accessible and affordable in your community?	Hospital treatment [ ] Native treatment [ ] Religious treatment [ ]
27.	Are you aware of the disease called AIDS?	Yes [ ] No [ ]
28.	Do you know that tribal marks-cut and traditional circumcision methods could at times cause HIV/AIDS?	Yes [ ] No [ ] Not sure [ ]
29.	AIDS has no cure. Do you believe or think that traditional medicine may cure it?	Yes [ ] No [ ] Maybe [ ]
30.	Any native doctor who claims to cure AIDS in your community?	Yes [ ] No [ ]
31.	Please list the **five** most common ailments/sickness in your community:	(1)……. (2)…….. (3)…… (4)…… (5)……..
32.	Which of these ailments do you know are better treated with traditional medicine? List three:	(1)……. (2)…….. (3)…….
33.	Which are better treated in PHC centre (orthodox medicine)? List three:	(1)……. (2)…….. (3)…….

SECTION /C/ PHC AWARENESS AND UTILIZATION		
34.	Do you know or aware of the Primary Health Care (PHC) programme in your Community?	Yes [ ] No [ ]
35.	What is your source of information or awareness?	Newspapers [ ] Radio [ ] Television [ ] Neighbours/relatives [ ] Public campaign [ ]
36.	Do you or your children utilize the services of PHC programme?	Yes [ ] No [ ]
37.	If your answer to question 36 is **No,** why?	Due to long distance and transportation problems [ ] Because no qualified nurse [ ] Lack of drugs in the clinics [ ] Due to time waiting or wasting [ ] Lack of money to pay for services [ ] Because I can use native or traditional medicine [ ] No PHC services in my community [ ]
38.	If the answer to 36 above is **yes** which of the PHC centres do you prefer using?	Name and place……
39.	State reason(s) for your choice	……..
40.	Mention two important problems or sickness you have treated in PHC centre in the last six months.	1. ---------- 2. ----------
41.	As a member of your community, do you know or aware of the PHC village or Community development committees (VDC/CDC)?	Yes [ ] No [ ]
42.	Is there any form of community health care centre provided by the members of your community in this town?	Yes [ ] No [ ]
43.	Do PHC official/workers sometimes organize seminars, symposium or open public rally or campaign in this town/community on health issues as in:	**A.** Environmental sanitation? **Yes** [ ] **No** [ ] **B.** Sources of domestic water supply and use? **Yes** [ ] **No** [ ] **C.** Adult/children immunization? **Yes** [ ] **No** [ ]

44.	Where in your opinion do you think the PHC facility (clinic) in your town or Community should have been located (built) for easy accessibility?	Name the place: ……..
45.	Comment freely or list services your PHC centre could not provide when you sometimes consulted them	……
46.	Could this problem stop you from going to utilize their services again?	Yes [ ] No [ ]
47.	PHC to some people means a way of reducing population through birth control and immunization. Do you agree?	Yes [ ] No [ ]
48.	How would you rate the general relationship between patients and doctors in your Health care centres?	Very poor [ ] Fair [ ] Good [ ] Very good [ ]
49.	Rate the nurses' attitude towards patients.	Very poor [ ] Fair [ ] Good [ ] Very good [ ] Excellent [ ]
50.	How much does it (transportation) cost you to get to the **nearest** Primary Health Care centre in your community?	N20 – N90 [ ] N100 – N150 [ ] N150 above [ ]
51.	Tick any 4 of these problems you know is hampering the success of Primary Health Care in your place.	(1) Long distance and transportation to hospital [ ] (2) No doctors and qualified nurses [ ] (3) Long waiting and wasting time [ ] (4) Drugs and cost of service are expensive [ ] (5) Available native drugs to use [ ] (6) No primary health care centre (PHC) in my place [ ]
52.	How far away is the Primary Health Care centre (PHC) from your residence?	This variable was measured using aggregate map distance.

APPENDIX: A-2

GEOGRAPHY DEPARTMENT
FACULTY OF THE SOCIAL SCIENCES
UNIVERSITY OF IBADAN
NIGERIA

SPATIAL PATTERN AND UTILISATION OF PRIMARY HEALTH CAREFACILITIES IN EDO STATE, NIGERIA

PHC PERSONNEL SURVEY QUESTIONNAIRE

A. A. J.// SI. 63055 // SUPERVISOR: PROF. S. I. OKAFOR

Dear respondents,

This questionnaire is aimed at soliciting your information regarding PHC programme in Edo State. As a personnel in the department we implore you to please with utmost sincerity assist us in completing this questionnaire regarding areas of PHC programme that require urgent attention.

Thank you for the anticipated cooperation.

SECTION A: SOCIO-DEMOGRAPHIC CHARACTERISTICS		
1.	Please, state your official rank or status in your office	……..
2.	Age cohort	15 –30 Yrs [ ] 31 – 45 Yrs [ ] 45 above [ ]
3.	Sex	Male [ ] Female [ ]
4.	What is your marital status?	Single [ ] married [ ] Others [ ]
5.	What is your highest educational qualification?	……..
6.	What is the name of your serving LGA	……..
SECTION B: SOME TOPICAL PROBLEMS MILITATING AGAINST THE ATTAINMENT OF PHC SET GOALS		
7.	How many health districts are there in Edo State?	
8.	And how many health districts in your LGA?	

9.	Are the health districts the same as political wards?	Yes [ ] No [ ]
10.	As PHC officer/personnel, list three major problems you think are hindering the attainment of the set objectives of the programme.	A)…… B)……. C)……
11.	State three reasons why you think the public are not making maximum use of PHC programme.	A)…… B)……. C)……
12.	Rank these problems 1-6 in the order in which you think they affect or draw back the development of PHC programmes in our communities in Edo State.	No adequate PHC facilities [ ] No qualified personnel to man PHC centres [ ] Lack of transportation facilities to reach the communities [ ] Bad roads [ ] Government not releasing enough funds for PHC Projects [ ] Lack of water and electricity energy to sustain PHC cold chain [ ]
13.	Rank according to their order of importance the following sources of health care financing in the LGAs. Simple ranking 1-6.	-Government allocation…… -User charges…… -Donor/NGOs contributions… -Health insurance…… -Community groups…… -Fund raising……
14.	Rank these problems as you think they hinder the communities from making full utilization of PHC system?	(a) No drugs in PHC centres… (b) Communities have no money to pay for services… (c) Good PHC centres are far from the majority of the populace due to logistic factors such as water and power supply to keep the system working……..
15.	Given your assessment of PHC programme in Nigeria today, which would you advice, should manage the programme?	(a) LGAs only [ ] (b) Federal government only [ ] (c) State government [ ] (d) Should be independent body of itself [ ] (e) Federal, State and local government together [ ]

16.	In my opinion there seems to be too many PHC centres without adequate facilities, in our communities. Therefore, it could be suggested that a bigger, well equipped PHC centres funded in the form of General/Specialist hospitals to serve a larger area or number of communities would be better appreciated by users.	Do you think so? (a) Yes [ ] (b) maybe [ ] (c) No [ ]
17.	Researchers and other health workers have noted that some districts or LGAs do not return on time or at **all,** HMIS forms to the central coordinating pool. State/list three (3) factors you think are responsible for this trend or delay.	(A)…… (B)…… (C)……..
18.	In your very **best of opinion**, would you advice that the PHC programme been:	(a) Scraped [ ] (b) Merged with Federal/State ministries of health [ ] (c) Or rather reorganized in larger forms to optimize cost and maximize utilization [ ]
19.	How would you rate the inter-sectoral contribution of other sectors such as ministry of agriculture, information and social development, environment and sanitation et cetera to the enhancement and promotion of PHC programmes?	(a) Excellent [ ] (b) Good [ ] (c) Poor [ ] (d) Very poor [ ]
20.	Tuberculosis and Leprosy are today curable. Why do you think the incident rate is still growing in Edo State? Please state **TWO** reasons.	(a) …… (b) ……

Appendix B:

QUADRANT COUNT ANALYSIS OF SPATIAL PATTERN OF PHC FACILITIES IN EDO STATE

HYPOTHESIS: There is a random distribution of PHC facilities in Edo State.

Step One:

Calculation of PHC points per quadrant using probability function.

Appendix B: Table 4.1: PHC Facilities per Quadrant in Edo State, 2005.

PHC PER QUADRANT	PHC OBSERVED FREQUENCY	CUMULATIVE FREQUENCY
0	45	0
1	6	6
2	4	8
3	7	21
4	8	32
5	7	35
6	3	18
7	2	14
8	5	40
9	2	18
10	1	10
11	4	44
12	0	0
13	3	39
14	1	14
15	1	15
16	1	16
Total	100	330

Given 330 PHC centres distributed among 100 quadrants:

Then, $M = \sum \mathbf{X/N} = 330/100$

= 3.30, meaning an average of 3.30 PHC points per quadrant.

Calculations:

Mean density = 3.30

Therefore, probabilities equal to:

P (X = 0) $= e^{-m} = 1/e^{m} = 1/2.7183^{3.30}$ = 0.04

P (X = 1) $= M.\ e^{-m} = 3.30 * 2.7183^{-3.30}$ = 0.122

P (X = 2) $= M^2/2! * 0.04$ = 0.218

P (X = 3) = $M^3/3! * 0.04$ = 0.240

P (X = 4) = $M^4/4! * 0.04$ = 0.198

P (X = 5) = $M^5/5! * 0.04$ = 0.130

P (X = 6) = $M^6/6! * 0.04$ = 0.072

P (X = 7) = $M^7/7! * 0.04$ = 0.034

P (X = 8) = $M^8/8! * 0.04$ = 0.014

P (X = 9) = $M^9/9! * 0.04$ = 5.116

P (X =10) = $M^{10}/10! * 0.04$ = 1.688

P (X = 11) = $M^{11}/11! * 0.04$ = 5.065

P (X = 12) = $M^{12}/12! * 0.04$ = 1.393

P (X = 13) = $M^{13}/13! * 0.04$ = 3.536

P (X = 14) = $M^{14}/14! * 0.04$ = 8.334

P (X = 15) = $M^{15}/15! * 0.04$ = 1.833

P (X = 16) = $M^{16}/16! * 0.04$ = 3.781

Step Two:

Determination of difference between observed and predicted number of PHC points using Chi-square statistics.

Appendix B: Table 4.2: X^2 calculation

$\mathbf{X^2 = {}^k\sum_{i=1}}$	$\mathbf{(O_i - E)^2/E}$	**Predicted values**
Cells	Observed	Expected
0	45	4
1	6	12.2
2	4	21.8
3	7	24.0
4	8	19.8
5	7	13.0
6	3	7.2
7	2	3.4
8	5	1.4
9	2	511.6
10	1	168.8
11	4	506.5
12	0	139.3
13	3	355.6
14	1	833.4
15	1	183.3
16	1	378.1

$$\mathbf{X^2} = \sum \frac{(4-4)^2}{4} + \frac{(6-12.2)^2}{12.2} + \frac{(4-21.8)^2}{21.8} + \frac{(7-24.0)^2}{24.0} + \frac{(8-19.8)^2}{19.8}$$

$$+ \frac{(7-13.0)^2}{13.0} + \frac{(3-7.2)^2}{7.2} + \frac{(2-3.4)^2}{3.4} + \frac{(5-1.4)^2}{1.4} + \frac{(2-511.6)^2}{511.6}$$

$$+ \frac{(1-168.8)^2}{168.8} + \frac{(4-506.5)^2}{506.5} + \frac{(0-139.3)^2}{139.3} + \frac{(3-355.6)^2}{355.6} + \frac{(1-833.4)^2}{833.4}$$

$$+ \frac{(1-183.3)^2}{183.3} + \frac{(1-378.1)^2}{378.1}$$

$$X^2 = \sum (420.25 + 3.15 + 14.53 + 12.04 + 7.03 + 2.77 + 2.45 + 0.58 + 9.26 + 507.61 +)$$

$$(+ 166.81 + 498.53 + 139.30 + 349.62 + 831.40 + 181.30 + 376.10)$$

Computed $\mathbf{X^2}$	=	**3522.73**
Table value $\mathbf{X^2}$	=	**26.296 at 0.05%**
Degree of freedom (d/f)	=	**16**

Result: There is significant difference between the observed and predicted number of PHC facilities. Therefore, PHC facilities are not randomly distributed in Edo State.

Step Three:

Determination of the spatial pattern using Variance/Mean Ratio. To determine the spatial pattern of PHC facilities, we compute the Variance/Mean Ratio. The mean of course is already known as 3.30. To obtain the variance, we use the formula:

$\sum_{i=1} \mathbf{(X - x)^2 / n-1}$ the numerator is obtained thus:

For quadrants with:

0	PHC	=	$(0 - 3.30)^2 * 45$	=	490.05
1	PHC	=	$(1 - 3.30)^2 * 6$	=	31.74
2	PHC	=	$(2 - 3.30)^2 * 4$	=	6.76
3	PHC	=	$(3 - 3.30)^2 * 7$	=	0.63

4	PHC	=	$(4– 3.30)^2 * 8$	=	3.92
5	PHC	=	$(5 – 3.30)^2 * 7$	=	20.23
6	PHC	=	$(6 – 3.30)^2 * 3$	=	21.87
7	PHC	=	$(7 – 3.30)^2 * 2$	=	27.38
8	PHC	=	$(8 – 3.30)^2 * 5$	=	110.45
9	PHC	=	$(9 – 3.30)^2 * 2$	=	64.98
10	PHC	=	$(10 – 3.30)^2 * 1$	=	44.89
11	PHC	=	$(11 – 3.30)^2 * 4$	=	237.16
12	PHC	=	$(12 – 3.30)^2 * 0$	=	0.00
13	PHC	=	$(13 – 3.30)^2 * 3$	=	94.09
14	PHC	=	$(14 – 3.30)^2 * 1$	=	114.49
15	PHC	=	$(15 – 3.30)^2 * 1$	=	136.89
16	PHC	=	$(16 – 3.30)^2 * 1$	=	161.29
			Total	=	**1566.82**

Variance = $\frac{1566}{100- 1}$ = $\frac{1566}{99}$

Variance = **15.826**

Variance/Mean Ratio = $\frac{15.826}{3.30}$ = **4.79**

VMR = 5.0

Results interpretation: In a completely random pattern the value of VMR is a unit (1). A ratio greater than 1 as it is in our case of **5.0** indicates a clustered pattern, while a ratio less than 1 is indicative of regular pattern of distribution.

Therefore, with regard to PHC distribution in Edo State, we conclude that with the VMR of 5.0 the spatial pattern of PHC facilities in the State is highly clustered. This means that there are particular areas in Edo State where the distribution of PHC facilities are clustered or concentrated.

APPENDIX C-1:

REGRESSION OF DISTANCE ON ACCESS TO PHC LOCATIONS

HYPOTHESIS: Access to PHC services decreases differentially with increasing distance from facilities in different communities.

ETSAKO WEST

Dependent Variable: X1
Method: Least Squares
Date: 09/23/08 Time: 12:58
Sample: 1 6
Included observations: 6

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	31.40484	7.381283	4.254659	0.0131
Y	-1.884477	0.764406	-2.465284	0.0693

R-squared	0.603081	Mean dependent var	16.66667
Adjusted R-squared	0.503851	S.D. dependent var	15.05545
S.E. of regression	10.60473	Akaike info criterion	7.821680
Sum squared resid	449.8415	Schwarz criterion	7.752266
Log likelihood	-21.46504	F-statistic	6.077623
Durbin-Watson stat	2.522013	Prob(F-statistic)	0.069297

ETSAKO CENTRAL

Dependent Variable: X2
Method: Least Squares
Date: 09/23/08 Time: 13:00
Sample: 1 6
Included observations: 6

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	41.96540	16.94034	2.477247	0.0684
Y	-3.234787	1.754341	-1.843875	0.1390

R-squared	0.459450	Mean dependent var	16.66667
Adjusted R-squared	0.324313	S.D. dependent var	29.60856
S.E. of regression	24.33829	Akaike info criterion	9.483180
Sum squared resid	2369.409	Schwarz criterion	9.413767
Log likelihood	-26.44954	F-statistic	3.399877
Durbin-Watson stat	1.231912	Prob(F-statistic)	0.138973

ETSAKO EAST

Dependent Variable: X3
Method: Least Squares
Date: 09/23/08 Time: 13:01
Sample: 1 6
Included observations: 6

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	42.57492	20.76096	2.050720	0.1096
Y	-3.312723	2.150005	-1.540798	0.1982

R-squared	0.372456	Mean dependent var	16.66667
Adjusted R-squared	0.215570	S.D. dependent var	33.67739
S.E. of regression	29.82740	Akaike info criterion	9.889934
Sum squared resid	3558.696	Schwarz criterion	9.820520
Log likelihood	-27.66980	F-statistic	2.374057
Durbin-Watson stat	1.563693	Prob(F-statistic)	0.198216

ESAN NORTH-EAST

Dependent Variable: X4
Method: Least Squares
Date: 09/23/08 Time: 13:02
Sample: 1 6
Included observations: 6

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	37.19077	7.547666	4.927454	0.0079
Y	-2.624286	0.781636	-3.357427	0.0284

R-squared	0.738088	Mean dependent var	16.66667
Adjusted R-squared	0.672610	S.D. dependent var	18.95169
S.E. of regression	10.84378	Akaike info criterion	7.866261
Sum squared resid	470.3500	Schwarz criterion	7.796848
Log likelihood	-21.59878	F-statistic	11.27231
Durbin-Watson stat	1.513230	Prob(F-statistic)	0.028373

ESAN WEST

Dependent Variable: X5
Method: Least Squares
Date: 09/23/08 Time: 13:04
Sample: 1 6
Included observations: 6

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	36.78442	9.671629	3.803333	0.0190
Y	-2.572329	1.001594	-2.568235	0.0621

R-squared	0.622493	Mean dependent var	16.66667
Adjusted R-squared	0.528116	S.D. dependent var	20.22787
S.E. of regression	13.89529	Akaike info criterion	8.362178
Sum squared resid	772.3162	Schwarz criterion	8.292765
Log likelihood	-23.08653	F-statistic	6.595833
Durbin-Watson stat	1.869740	Prob(F-statistic)	0.062095

UHUNMWONDE

Dependent Variable: X6
Method: Least Squares
Date: 09/23/08 Time: 13:05
Sample: 1 6
Included observations: 6

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	10.43561	7.163280	1.456821	0.2189
Y	0.796725	0.741829	1.074000	0.3433

R-squared	0.223825	Mean dependent var	16.66667
Adjusted R-squared	0.029781	S.D. dependent var	10.44829
S.E. of regression	10.29153	Akaike info criterion	7.761721
Sum squared resid	423.6622	Schwarz criterion	7.692307
Log likelihood	-21.28516	F-statistic	1.153477
Durbin-Watson stat	1.808734	Prob(F-statistic)	0.343294

OVIA NORTH-EAST

Dependent Variable: X7
Method: Least Squares
Date: 09/23/08 Time: 13:06
Sample: 1 6
Included observations: 6

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	39.12094	10.77913	3.629322	0.0222
Y	-2.871084	1.116287	-2.571995	0.0618

R-squared	0.623180	Mean dependent var	16.66667
Adjusted R-squared	0.528975	S.D. dependent var	22.56472
S.E. of regression	15.48644	Akaike info criterion	8.579009
Sum squared resid	959.3199	Schwarz criterion	8.509595
Log likelihood	-23.73703	F-statistic	6.615159
Durbin-Watson stat	1.708131	Prob(F-statistic)	0.061848

OVIA SOUTH-WEST

Dependent Variable: X8
Method: Least Squares
Date: 09/23/08 Time: 13:07
Sample: 1 6
Included observations: 6

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	40.33999	13.11377	3.076154	0.0371
Y	-3.026957	1.358062	-2.228879	0.0897

R-squared	0.553965	Mean dependent var	16.66667
Adjusted R-squared	0.442456	S.D. dependent var	25.23225
S.E. of regression	18.84064	Akaike info criterion	8.971111
Sum squared resid	1419.879	Schwarz criterion	8.901697
Log likelihood	-24.91333	F-statistic	4.967902
Durbin-Watson stat	1.382824	Prob(F-statistic)	0.089723

EGOR
Dependent Variable: X9
Method: Least Squares
Date: 09/23/08 Time: 13:08
Sample: 1 6
Included observations: 6

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	41.55905	15.93333	2.608309	0.0595
Y	-3.182829	1.650055	-1.928923	0.1260

R-squared	0.481915	Mean dependent var	16.66667
Adjusted R-squared	0.352394	S.D. dependent var	28.44585
S.E. of regression	22.89151	Akaike info criterion	9.360611
Sum squared resid	2096.085	Schwarz criterion	9.291197
Log likelihood	-26.08183	F-statistic	3.720743
Durbin-Watson stat	1.251889	Prob(F-statistic)	0.125971

OWAN WEST
Dependent Variable: X10
Method: Least Squares
Date: 09/23/08 Time: 13:09
Sample: 1 6
Included observations: 6

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	42.37175	17.97168	2.357696	0.0779
Y	-3.286744	1.861147	-1.765978	0.1522

R-squared	0.438098	Mean dependent var	16.66667
Adjusted R-squared	0.297622	S.D. dependent var	30.80855
S.E. of regression	25.82002	Akaike info criterion	9.601379
Sum squared resid	2666.694	Schwarz criterion	9.531965
Log likelihood	-26.80414	F-statistic	3.118678
Durbin-Watson stat	1.219133	Prob(F-statistic)	0.152152

Results interpretation

Generally, it is clear from the analyses that for five of the ten LGAs examined distance does not significantly explain variations in access to PHC services. This is because not only are the levels of explanation ($\boldsymbol{R^2}$) low, the regression equations are not significant at the *0.01* and *0.05* levels. Nevertheless, the models for Etsako West, Esan North-East, Esan West, Ovia North-East and Ovia South-West are all significant. Specifically, the levels of explanation ($\boldsymbol{R^2}$) across the LGAs did show that distance effect accounts for between 22 and 67 percent of the variations in access to PHC services in the study area. Thus, a distance-decay effect was apparent in consumers' access to PHC services as access decreases differentially with increasing distance from the facilities in different communities.

APPENDIX C-2

CORRELATIONS OF DISTANCE ON ACCESS TO PHC LOCATIONS

	Y	X1	X2	X3	X4	X5	X6	X7	X8	X9	X10
Spearman's rho y	1.000										
Sig. (2-tailed)	.										
X1 correlation coefficient	-.812*	1.000									
Sig. (2-tailed)	.050	.									
X2 correlation coefficient	-.928**	.647	1.000								
Sig. (2-tailed)	.005	.165	.								
X3 correlation coefficient	-.926**	.628	.984**	1.000							
Sig. (2-tailed)	.008	.183	.000	.							
X4 correlation coefficient	-.986**	.824	.955**	.939**	1.000						
Sig. (2-tailed)	.000	.044	.003	.005	.						
X5 correlation coefficient	-.928**	.765	.893*	.939	.941**	1.000					
Sig. (2-tailed)	.008	.077	.016	.005	.005	.					
X6 correlation coefficient	.116	-.074	.092	-.031	-.015	-.250	1.000				
Sig. (2-tailed)	.827	.890	.862	.953	.978	.633	.				
X7 correlation coefficient	-.880*	.585	.935**	.984**	.893	.955**	-.154	1.000			
Sig. (2-tailed)	.021	.222	.006	.000	.016	.003	.771	.			
X8 correlation coefficient	-.941**	.647	1.000	.984**	.955**	.893*	.092	.935**	1.000		
Sig. (2-tailed)	.005	.165	.	.000	.003	.016	.862	.006	.		
X9 correlation coefficient	-.941**	.647	1.000	.984**	.955**	.893*	.092	.935**	1.000	1.000	
Sig. (2-tailed)	.005	.165	.	.000	.003	.016	.862	.006	.	.	
X10 correlation coefficient	-.941**	.647	1.000	.984**	.955**	.893*	.092	.935**	1.000	1.000	1.000
Sig. (2-tailed)	.005	.165	.	.000	.003	.016	.862	.006	.	.	.

* Correlation is significant at the .05 level (2-tailed)

** Correlation is significant at the .01 level (2-tailed).

APPENDIX C- 3
CORRELATIONS OF DISTANCE ON ACCESS TO PHC LOCATIONS

	Y	X1	X2	X3	X4	X5	X6	X7	X8	X9	X
Distance **Pearson** Correlation	1.000										
Sig. (1-tailed)	.										
X1 correlation coefficient	-.778*	1.000									
Sig. (1-tailed)	.034	.									
X2 correlation coefficient	-.670	.817*	1.000								
Sig. (1-tailed)	.073	.024	.								
X3 correlation coefficient	-.603	.772*	.982**	1.000							
Sig. (1-tailed)	.103	.036	.000	.							
X4 correlation coefficient	-.855*	.825*	.939**	.909**	1.000						
Sig. (1-tailed)	.015	.022	.003	.006	.						
X5 correlation coefficient	-.786*	.863*	.950**	.955**	.973**	1.000					
Sig. (1-tailed)	.032	.013	.002	.002	.001	.					
X6 correlation coefficient	.475	-.180	-.035	-.095	-.187	-.235	1.000				
Sig. (1-tailed)	.171	.366	.474	.429	.361	.327	.				
X7 correlation coefficient	-.783*	.737*	.945**	.932**	.986**	.959**	-.157	1.000			
Sig. (1-tailed)	.033	.047	.002	.003	.000	.001	.383	.			
X8 correlation coefficient	-.737*	.788*	.986**	.970**	.976**	.968**	-.098	.986**	1.000		
Sig. (1-tailed)	.047	.031	.000	.001	.000	.001	.427	.000	.		
X9 correlation coefficient	-.687	.812*	.999**	.982**	.949**	.957**	-.049	.957**	.992**	1.000	
Sig. (1-tailed)	.066	.025	.000	.000	.002	.001	.463	.001	.000	.	
X10 correlation coefficient	-.654	.820*	.999**	.981**	.928**	.943**	-.022	.934**	.980**	.997**	1.0
Sig. (1-tailed)	.079	.023	.000	.000	.004	.002	.483	.003	.000	.000	

* Correlation is significant at the .05 level (1-tailed)
** Correlation is significant at the .01 level (1-tailed).

The results of the zero-order correlation analysis also support that of the regression model. Again, except for Uhunmwonde LGA with a positive relationship, there was an inverse relationship between distance and respondents' access to PHC facilities in all of the LGAs. Accordingly, at the 0.05 significant level, the correlation coefficient of distance on access to PHC in Etsako West is -0.812; the values for Etsako Central, Egor, Ovia South-west and Owan West is -0.941 respectively. In the same vein, the coefficients for Etsako East is -0.926; Esan North-east, -0.986; Esan West, -0.928, and Ovia North-east, -0.880.

Generally, both analyses indicate that access to PHC services decreases differentially with increasing distance from the facilities in different communities.