Thesis

By

ORANYE NELSON

OSITADIMMA

THE DEPARTMENT OF SOCIOLOGY / ANTHROPOLOGY, UNIVERSITY OF NIGERIA NSUKKA

SOCIO - ECONOMIC AND CULTURAL FACTORS IN THE INCIDENCE AND PREVALENCE OF WATER-BORNE DISEASES AMONG RIVERINE COMMUNITIES OF ANAMBRA STATE

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TITLE PAGE

SOCIO – ECONOMIC AND CULTURAL FACTORS IN THE INCIDENCE AND PREVALENCE OF WATER – BORNE DISEASES AMONG RIVERINE COMMUNITIES OF ANAMBRA STATE.

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BY

ORANYE NELSON OSITADIMMA

REG. No PG /PhD/98/24873

SUPERVISORS: (1) PROFESSOR DAN.S.OBIKEZE

(2) DR JOSEPH. OKEIBUNOR

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APPROVAL PAGE

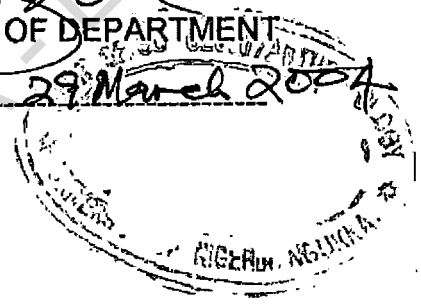
This is to certify that this dissertation on "Socio-economic and Cultural Factors in The Incidence and Prevalence of Water-Borne Diseases among Riverine Communities of Anambra State" is an original research of Nelson Ositadimma Oranye. It has been read and approved in partial fulfilment of the requirements for the award of Ph.D degree in Sociology and Anthropology of University of Nigeria, Nsukka.

SUPERVISOR

DATE ----------

HEAD OF DEPARTMENT (DR. E. U. M. IGBO)

DATE 29 March 2004



DEAN OF FACULTY

DATE----------

EXTERNAL EXAMINER

DATE----------

DEDICATION

In memory of my late father Chief Onowu Oranye Nzekwe Achike who joined his ancestors on 8th July 1986.

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Abstract

In recent times, infectious diseases have been regarded as diseases of underdeveloped world. World Health Organization (1998:44) has reported that "of more than 50 million deaths world–wide in 1997, about one–third were due to infectious and parasitic diseases". In Nigeria, "outbreak of water-borne diseases such as cholera, yellow fever, dysentery, diarrhoea, and guineaworm occur periodically resulting in fatality" (Egboka et al. 1989:64). An estimated 650,000 Nigerians are known to suffer from guineaworm infections alone every year. This study focused on those infectious diseases that are transmitted through oral consumption of contaminated water (WBDs). The general objective was to specifically examine those socio–economic and cultural factors in the incidence and prevalence of such diseases among riverine communities in Anambra state.

The study was based on sample survey of 600 households drawn from three riverine LGAs in Anambra state, indepth interview of 18 Key Informants and 12 Focus Group Discussions. Data was analysed using descriptive statistics, statistical tables and charts. Four hypotheses were formulated and tested using Analysis of variance. The major findings are: that greater majority of the respondents did not perceive the water they drink as possible source of diseases. Majority of the households (69.17%) do not treat the water they drink. It was found that 69.67% of the households were using open and unprotected toilet systems, which includes Open Pit Toilet, Bush Method, and Use of Rivers. Incidence of WBDs differed significantly among different occupational groups being higher among Farming/Fishing groups; WBDs tended to reduce with increased level of education of the household heads. It also differed significantly between the communities probably because some of the communities had better social and economic facilities than others. Seasonal variation was also observed, as in the upsurge of WBDs during early rains. Sanitary condition was generally poor, refuse disposal and toilet system still primitive in the area. These were congenial for the epidemiology of WBDs.

The conclusion of this study is that although the cultural beliefs and practices of the people may be important in understanding the incidence and prevalence of WBDs, but given their poverty level and the peasant nature of their economy, it is important to examine the plight of these rural riverine people within the context of the general political economy within which they live, rather than blaming their cultural beliefs and attitudes alone.

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CHAPTER ONE

INTRODUCTION

1.1 Background To The Study

Today infectious diseases, which used to wreck havoc in Europe, till mid 19th century, are being regarded as diseases of the underdeveloped world. In western countries, infectious diseases and nutritional problems no longer dominate infant mortality and morbidity. However, in developing countries the reverse is the case. Mortality attributable to communicable diseases, maternal and perinatal conditions and nutritional deficiencies is reported to be more than five times as frequent in low and middle income countries as compared with high income countries (Alvarez-Dardet and Ashton, 2000). Also, the World Health Organization (1998:44) reported that "of more than 50 million deaths world – wide in 1997, about one–third were due to infectious and parasitic diseases such as acute respiratory diseases, tuberculosis, diarrhoea, HIV/AIDS and malaria". These infectious diseases still remain leading causes of premature death among adults in much of the developing world.

The above facts, to a reasonable extent, underscore the importance of infectious diseases in understanding morbidity condition in a developing country like Nigeria. Furthermore, with the emergence of new infectious diseases which are resistant to even well known antibiotics, and the HIV / AIDS scourge for

which an effective cure is yet to be found, the need for greater attention to be paid to preventive health care has more than ever become very urgent.

Several studies have shown that disease occurrence and distribution in a population is not a random event. They are primarily influenced by genetic constitution and by exposure to agents in the environment. This fact has been attested to by several classical epidemiological studies and modern research findings. The process of transmission of water related diseases has been found to be influenced by several factors relating to the host, the individual, and the environment. Multi – level researches have been conducted in recent times to describe environmental (ecological) effects and individual level effects on transmission of diseases. Most of them have implicated "social class" or "socio–economic status" in the epidemiology of infectious diseases.

In this study, the attention is on water–related diseases generally, but with specific focus on those that are transmitted through oral consumption of contaminated water. Several of such diseases are known to exist in our society today. They include typhoid, cholera, intestinal worms, dysentery, guineaworm, hepatitis A, poliomyelitis, dysentery and diarrhoea diseases. A greater concentration of outbreak of such diseases has been reported among riverine communities. The pandemic nature of such diseases among riverine communities, the increasing death toll and the widespread ignorance about the process of occurrence and spread of water–related diseases inspired this research.

This research looked at the proportion of morbidity in the riverine communities that is attributable to water borne diseases. It examined the present and possible future trends of such diseases among socio–economic groups; as well as the role of socio–cultural beliefs and practices in influencing the epidemiology of water–borne diseases.

1.2 Statement of the problem

Morbidity experience is a universal phenomenon, but its pattern of distribution is known to vary from one country to another, and even within countries (Sanders and Carver, 1985). Several factors ranging from genetic, physical environmental to socio–cultural are noted to influence the pattern of distribution of diseases.

This study is primarily concerned with the problems of infectious diseases, which in recent times have been regarded as diseases of underdeveloped world. The high incidence of infectious diseases in Third World countries has often been described as symptoms of under development (Sanders and Carver, 1989). Perhaps, such predisposition derive from the fact that before the "great sanitary awakening" of mid 19th century, in England, infectious diseases such as tuberculosis, cholera, typhoid and the likes, were the major causes of disease and death. The ravage of infectious disease was due mainly to numerous social and environmental problems created by the industrial revolution. "The revolution led to creation of slums, overcrowding with all its ill–effects, accumulation of filth in cities and towns, high sickness and death rates especially among children ..." (Park, 1997:4).

Nigerian society today appears to be reliving the experience of 19th century Europe. Accodinding to WHO (1998), infectious diseases, meanwhile, still remain leading causes of premature death among adults in much of the developing world. Egboka et al (1989:64) observed that in Nigeria, "outbreak of water-borne disease such as cholera, yellow fever, dysentery, diarrhoea, and guineaworm occur periodically resulting in fatality". Guineaworm is reported to be widespread in many rural districts throughout central and southern Nigeria. An estimated 650,000 Nigerians suffer from guineaworm infections every year (Kinley, 1989; Egboka, 1989;). Kinley (1989:5) reported that 'guineaworm is a natural, if not normal part of life' in some part of Benue state. He noted that 80% of the population in some villages in Benue is afflicted each year.

The serious, devastating outbreak of Cholera in Ohozara Local Government Area of Imo state in 1981-1984 led to its selection by the Federal Government, for the Rural Water and Sanitation Project (WATSAN) in Nigeria (Rooy, 1987; Egboka,1989; Kinley, 1989).

This problem of predominance of infectious diseases in underdeveloped world, is collaborated by Mera, (1997:184), who reported that:

> *In developed countries, improvements in sanitation and general living conditions have reduced the burden of illness and deaths from infectious diseases. In the less developed countries, the prevailing economic circumstances have impaired improvements in living conditions and the means to prevent or treat life – threatening infectious diseases. Diarrhoeal diseases, tuberculosis, malaria,*

measles, amoebiasis, pertusis (Whooping cough), schistosomiasis, poliomyelitis and HIV / AIDS are the main causes of illness and death in less developed countries.

The above references and numerous others would go a long way to show the threats to life and future of Third World Countries, which we are, a part of. The reason being that tropical forests, the animals and the general environment including rivers, streams and ponds are quite congenial for breeding these infectious microbes.

In Anambra state, several cases of outbreak of Cholera and Diarrhoeal diseases have been reported, especially among the riverine communities. The establishment of WATSAN office at Amaku General Hospital Awka is a collaborative effort by UNICEF and Anambra State Government to deal with this life-threatening situation, through the provision of potable water to the communities, to prevent the spread of water-borne diseases.

In Anambra State, South–Eastern Nigeria, majority of the riverine people are rural people. Apart from problems of poverty, illiteracy and ignorance, which seem to pervade their whole life pattern, their social practices, beliefs and sentiments are shrouded deeply in systems of traditional cultural beliefs. Also important, is the conspicuous absence of basic social amenities, especially water, roads, electricity and hospital services. The socio-economic and cultural environment predisposes them the more to the danger of these infectious diseases, against which they are quite defenceless.

This study is therefore concerned with the problem of high incidence and prevalence of water–borne diseases among riverine communities of Anambra State. It is concerned with finding out those socio – economic and cultural factors that drive the epidemiology of such diseases. Efforts would be made to ascertain the availability of health care facilities and their use; how much the people know about the association between such diseases and their life – style. This study is also concerned with the morbidity burden of water–borne diseases on households.

While so many research works have been conducted in western countries on the problems of water–related diseases, so much still need to be done with regard to our own cultural milieu. The bulk of the problems regarding the existence of water–related diseases, their incidence, prevalence and pattern of distribution are still unravelled. The socio-cultural and environmental factors influencing the occurrence and distribution of these diseases are still predominantly unknown. Since the demographic characteristics of the victims are still shrouded in mystery and armed chair assumptions, only inferred from western research findings, preventive programmes would continue to be ineffective. The problem of inadequate morbidity statistics must therefore be tackled urgently through regular surveys by the governments, private agencies and individuals.

1.3 Research Questions

The following research questions were formulated to guide this research.

1. How many people in the community are suffering from any of the following water – borne diseases: typhoid, cholera, diarrhoea, hepatitis (Hepatitis A) and poliomyelitis etc.
2. How many of the people depend on water from streams for drinking, cooking, bathing, washing and other household's activities?
3. What is the relationship between diseases and socio-economic groups?
4. Is morbidity from WBDs influenced by cultural habits and practices of the people?
5. What are those factors that affect general susceptibility to water-borne diseases?
6. Does morbidity experience from water-borne diseases vary with such demographic variables as age, sex, educational level and so on?
7. How do the people feel, think or act towards water, and the diseases that result from it?
8. Do they really associate those diseases with the water they use?
9. Does the incidence of diseases vary from one community to another, or in the same community?
10. What preventive health care systems exist in the communities?
11. Do they have functional medical centres and or hospitals?
12. To what extent do the people make use of such facilities where they exist?

13. Do the people see hospitals, pipe – borne water, immunization e.t.c as important facilities?

1.4 Objectives of The Study

The general objective of this study was to find out the extent of the existence of water–borne diseases in the riverine communities of Anambra State, and to determine the influence of socio-economic and cultural environment on the occurrence and distribution of such diseases.

The specific objectives include:

1. To find out the frequency of water–borne diseases such as typhoid, cholera, diarrhoea, dysentery, infectious hepatitis and poliomyelitis.
2. To find out the extent of the people's exposure to untreated or unhealthy water sources in the study area.
3. To identify those socio–economic and cultural beliefs and practices that influence the susceptibility of the people to water borne diseases.
4. To make a comparative study of the occurrence of such diseases within and between the communities of study.
5. To determine the extent of availability and use of medical services in the communities.

1.5 Delimitation or Scope of the Study

This research falls within the scope of population studies with specific focus on morbidity. The field of morbidity is quite vast comprising the occurrence

and distribution of both chronic and infectious diseases in a population. This study however deals with infectious diseases.

Even then, it is considered that the field of infectious diseases is too vast for a single study. Infectious diseases are traditionally classified based on patterns of their transmission (Bernard Campbell 1983: 174: Sander and Carver 1985; Steven Mara 1997). Those that are transmitted through water are referred to as water related diseases. Even the water related diseases are classified further according to the mechanism of the transmission (Cairncross and Feachem 1983; Colin and Balt, 1991), into water–borne, water–wash, water–base and water–related insect vectors.

Considering the limitations in time, personnel and financial resources this study focused only on water borne diseases, in three riverine local government areas of Anambra State. As already stated in the objectives, this study concentrates on prevalence and incidence rates of occurrence of these diseases. Efforts were made to uncover the socio–economic and cultural variables that influence the epidemiology of these diseases.

1.6 Significance of the Study

The whole essence of living is to be happy and healthy. One cannot be happy if he or she is unhealthy. Disease condition especially when it is severe, protracted and chronic makes people feel frustrated and often wish to terminate their lives. This fact among others makes the continuous study of disease condition in human society inevitable.

The findings of this study shall therefore be significant in different ways, and to different people. The significance can be looked at both from practical and theoretical aspects.

(a) Practical Significance

As already noted, infectious diseases are commonly perceived as diseases of Third World or simply as tropical diseases. The presence of such diseases has been attributed to the practical condition of living, in the developing countries. A UNICEF Bulletin, The Progress of Nations, 1999 reported that half the children of Africa are already suffering from illness caused by unsafe drinking water, poor sanitation, and a degrading environment. It is a well-known fact that those diseases are preventable. Infectious diseases especially those resulting from inadequate water supply pose the greatest threat to health in Nigeria, and particularly to those in the riverine areas. The significance of such studies on the condition of living and health cannot therefore be overestimated.

Most people are still ignorant of the implications of so many of their activities with regard to sanitary condition which includes their mode of faeces disposal, eating habits, treatment of water and so on. Most of the time, diseases that result from unsanitary actions are attributed to witchcraft and other evil forces. There is therefore the need to investigate the socio–economic and cultural conditions, in other to find out where the problem lies. This will not only help to re – educate and re – orientate the people, but will help the government and donor agencies know how best to care and support such communities. Most

often, health care services are provided without any impact on the life of the people. This is often because such provisions are not based on the people's perceived need, or the people have not been given appropriate orientation.

Thus, the practical significance of such a study is indeed inestimable. It is generally believed that a high level of morbidity is bad. Hence, knowledge of morbidity is a sine qua non for effective planning and implementation of national health programmes. This research is quite significant in the sense that until we know the type of diseases people suffer, and the causes, we cannot effectively plan for their medical need.

It is also pertinent to point out that in this era of re-emergence of infectious diseases, there is the greater need to carry out regular survey of microbial infectious diseases, their incidence and prevalence, in addition to continuous diseases surveillance and monitoring to avoid sudden health disaster. This research is motivated by this need, and it is hoped the findings will make significant contributions in this regard.

Since late 1970s, the world has come to appreciate health as a fundamental human right. If one must speak of human rights, social justice and equity, the health of the people must be given prior consideration. Moreover, health is today seen as essential to the satisfaction of basic human needs and to an improved quality of life. This is why health was adopted as an integral part of socio–economic development by the United Nations in 1979 (WHO, 1980). This research finding shall therefore be very useful for socio–economic planning, and any development programme for riverine communities.

This research will help in understanding the pattern of distribution of infectious diseases generally, and water–borne diseases in particular; and to keep one abreast of the demographic, socio–economic, and cultural variables that influence their occurrence and distribution. Such knowledge will be useful in public health planning for the people; and also to properly educate them on certain cultural factors that are inimical to their health.

(b) Theoretical significance

This research finding shall also be significant in the validation and reconstruction of existing theories. So much debate has been going on about the nature of diseases in Africa, the type of solutions they need, or what approach is most suitable. It is hoped that this research will help to provide more information about disease in Nigeria and Africa in general, by way of broadening the existing knowledge and understanding of the diseases, whether they are purely "tropical diseases" or they are symptoms of underdevelopment.

It is also worthy of note that most of the reasons given for the re-emergence of infectious diseases (see Demany, 1996), obviously may not apply to the environment of the riverine communities of Anambra State. They are derived from Western cultural research findings. There is therefore the need to conduct a community-based study of this nature in African environment, so as to uncover those variables that are specific and probably peculiar to the region. This will help in formulating and reformulating middle range theories of sociology of health and demography.

This research shall be significant both to the government, its agencies, institutions and private organizations. It will provide a guide in the practical area of health policy formulation, implementation and monitoring, as well as in area of theoretical construction and reconstruction as basis for policy formulation.

1.7 OPERATIONAL DEFINITION

This section is divided into two parts, which includes:

A) Operational Definition Of Terms: Here, the following concepts are defined as they are used in this research work.

Amoebic Dysentery: is caused by a parasite called Entamoeba histolytica. It occurs when an encysted form of the organism is swallowed, either through contaminated water or food.

Cholera: is a bacterial infection spread from man to man by direct faecal contamination of water or food, which is then ingested.

Disease: is usually regarded as an abnormality in health. It is used here to mean any biological or clinically identified abnormality, which is considered pathological by medical practitioners.

Environmental intervention strategy: It is a strategy for the control of infectious diseases through environmental health engineering. It seeks to modify the human environment in such a way as to prevent or reduce transmission of infectious diseases.

Epidemiology: is the study of the incidence and distribution of diseases and conditions that influence their spread and severity.

Hepatitis A (infective hepatitis): is a virus infection, mainly spread by food, milk and contaminated water.

Household is a co-residential economic unit. It could be a family, non-family, or single-person household.

Incidence Rate: refers to the proportion of a defined population group developing a health condition within a stated period.

Infectious disease: is one which can be transmitted from one person to another or, sometimes, to or from an animal.

Medicine men: is used here to refer to native doctors or traditional healers. They are those health care practitioners whose knowledge and skill were not acquired through western education or training.

Morbidity: refers to the presence of diseases or disease conditions. Murray and Chen (1992) used it to denote such attributes of sickness like "illness, handicap, and other compromised states of well-being – physical, social, and mental". In this research, morbidity is used to refer to illness and disease conditions in a population.

Poliomyelitis: is water related and excreta – related infection. It is controlled mainly through vaccination.

Population at risk: This refers to that segment of the population that is disproportionately threatened by a particular type of disease to the extent that something needed to be done urgently, to remedy the situation.

Prevalence rate: measures the number of cases of disease in a given population in existence at a point or period in time.

Traditional medicine is used here to refer to those unorthodox practices directed towards bringing respite to the health problems of the people, whose practice derive from the traditional cultural beliefs and practices.

Typhoid: is a water-borne disease, caused by a germ called Salmonella Typhi, which enters the body through the oral route, as a result of swallowing of contaminated food, water or milk.

Water–based diseases: are those in which the pathogen spends a part of its life cycle in a water snail or other aquatic animal.

Water–borne diseases: are those infectious diseases that are transmitted by drinking contaminated water or by any route which permits faecal material to pass into the mouth. It will include classical infectious diseases such as cholera, typhoid, infectious hepatitis, diarrhoea, amoebiasis, poliomyelitis, intestinal worms and dysentery.

Water–related disease: is one, which is in some way related to water or to impurities in water

Water-washed diseases: are those diseases whose transmission depends on the quantity of water used, rather than its quality.

B) Concept Clarification and measurement

The concern here is to clarify salient concepts in each hypothesis, and to show questionnaire items that were used to test each hypothesis.

Prevalence in hypothesis one, measures the number of water-borne diseases present in the communities at the time of study. Questionnaire items h and 2 were used to test the hypothesis.

Incidence refers to the number of new cases, which emerge within a community over a period of time. Questionnaire items 4 and 14 were used to test hypothesis two.

Questionnaire items g and 4 were used to test hypothesis 3.

Items 2 and 24 in the questionnaire were used for testing hypothesis 4.

CHAPTER TWO

LITERATURE REVIEW

In this chapter, the concern is to provide empirical as well as theoretical foundation for this research, by reviewing theories and relevant research. It is hoped that at the end of this exercise, relevant conceptual issues would have been clarified.

2.1 EMPIRICAL RESEARCH REVIEW

Numerous research works have been done on various factors as they relate to specific diseases. Some of these findings are presented here, under sub – headings that are considered appropriate.

2.1.1 DISEASE AND ENVIRONMENT

There is a widespread belief that environmental quality is a major determinant of health and well –being (Graham and Reeder, 1979; Moos, 1976; Mosley, 1980; Moriyama, 1980; Cairncross and Feachem, 1983; Colin and Bell, 1991; Pickford et al., 1995; Osuafor, 1997). Moos, (1976) noted that "wide range of environmental variables (e.g. water, air, pollution and weather) are believed to influence health and health related behavior".

The environment is usually seen as a composite phenomenon. Hence, each research tends to emphasize one aspect or the other. It is usually

dichotomized into physical and social. Although there are several other classifications, this study shall observe this dichotomous scheme.

The social environment is made up of several features, each of which is related to certain kinds of diseases (Graham and Reeder, 1979). Some of the environmental features as they affect morbidity condition are discussed below.

2.1.2 DISEASE AND POLLUTED WATER

The relationship between polluted drinking water and spread of cholera was established by an epidemiologist, John Snow in his study of the epidemiology of cholera in London, from 1848 to 1854. In 1856, William Bud studied the outbreak of typhoid fever in the rural north of England. He concluded that the spread was by drinking water, and not by miasma and sewer gas as was speculated. These findings gave rise to a comprehensive legislation of the Public Health Act in 1875. By early 20th century, broad foundation of public health – clean water, clean surroundings, wholesome condition of houses, control of offensive trades, etc were laid in all the countries of the western world (Park, 1997:5; Cairncross and Feachem, 1983). In this same quest for public health, UN declared 1981 – 90 as international drinking water supply and sanitation decade.

Water related diseases have been traditionally presented in four categories:

(i) Water–borne: are faecal orally transmitted, through contaminated water or food. Examples are cholera, typhoid, diarrhoeas, poliomyelitis, etc.

(ii) Water–washed: are due to insufficient quantity of water used e.g. Trachoma, scabies etc.

(iii) Water–based: the pathogen spends a part of its life cycle in a water snail or other aquatic animals, e.g. Schistosomiasis, Guinea worm.

(iv) Water–related insect vector: spread by insects which either breed in water or bite near water. E.g., Malaria, Onchocerciasis. (Park, 1997; Mera, 1997; Sanders and Carver, 1985; Cairncross and Feachem, 1983; Campbell, 1983; Jellife, 1974).

Several studies have shown relationship between certain diseases on one hand and water pollution, and contamination on the other hand (Cairncross and Feachem, 1983; Colorado, 1986; Walton, 1986; Hinrichsen, 1989; African Farmer 1990; Fulkenmark, 1990; 1990; Colin and Ball, 1991; Stretch and Southgate 1991; Kendall, 1991; IPPF, 1992; Bugri, 1994).

2.1.3 SOCIO–ECONOMIC STATUS AND MORBIDITY

The level of socio–economic development as measured in terms of per capita income, education, housing, employment and others have been identified as the primary determinants of the health status of most people. (Federici and Terrenato, 1980; Elwood et al., 1992; Obermeyer, 1993; WHO, 1999; Trinder et al., 2000; Trinder et al., 2000; Evans et al., 2000).

Park (1997:6) reported that, "the unemployed usually show a higher incidence of ill health and death." It is believed that the economic progress in

many developing countries has been a major factor in reducing morbidity, increasing life expectancy and improving the quality of life.

Syme and Berkman (1976) hypothesized that "life in the lower social classes increases vulnerability to illness in general, and they suggest a generalized susceptibility to illness". It is known that low SES and elevated systolic blood pressure were found in males more than females, and blacks more than whites. So, "the lower the SES the higher the blood pressure level" (Graham and Reeder, 1979:75).

2.1.4 LIFESTYLE AND MORBIDITY

Lifestyle is a composite word for cultural and behavioural patterns and life long personal habits such as smoking, alcoholism and so on, that have developed through socialization, among social categories like the family, peer groups, schools etc. (Evans et. al., 2000). Many diseases of "modern societies" such as coronary heart disease (CHD), obesity, lung cancer, have been linked to lifestyle (Bitton and Mckea, 2000) some lifestyles (healthy lifestyle) like adequate nutrition, enough sleep, sufficient physical activity, promote health (Park, 1997).

2.1.5 CROWDING AND MORBIDITY

Epidemiological studies suggest that crowding increases the risk of infectious and non – infectious diseases. Early research findings in the 1940s and 1950s, "indicate higher rates of crime, disease, mental disorder, social disorganization and mortality for urban than rural areas, and indicted rural –

urban differences in population density. However, recent scholars tend to believe that probably, differences in sanitation, health care, and population composition are responsible for these disparities (Cohen, 1979; Mera, 1997).

Although studies of crowding in animals show a wide range of pathological behaviour; contemporary research on human populations have been less conclusive. Freedman (1975), Fischer et al. (1975), and Lawrence (1974) had concluded from their review of literature, that human population density is not related to physical pathology, mental disorder, or emotional instability.

2.1.6 MIGRATION AND MORBIDITY

Research reports have shown that increased human intrusion into tropical forest for purpose of mining, farming, settlement, and tourism increases the likelihood of their contact with infected animals carrying microbes that cause diseases in humans. For instance, HIV, which causes AIDS, is believed to be a zoonotic pathogen, which was transmitted to humans from non- human primates (Demany, 1996: 176).

The chances of geographical transfer of disease are increased by foreign trade and expanded markets for imported foods, which occasionally contain bacterial or viral contamination (Demany, 1996; Graham and Reeder, 1979:Mera, 1997).

2.1.7 ETHNICITY AND MORBIDITY

Ethnicity is believed to be related to epidemiology of a number of diseases. This is due to the fact that ethnic background implies group homogeneity of dietary, hygiene, education, religious and other customs that influence human health (Vallin and Behm, 1980). Some research reports in this area are Gorfon, (1957); Marnot (1975); and Marmot and Syme (1976) who presented data suggesting that acculturation into American life was significant in the high prevalence rates of heart diseases among Japanese men living in California than those in Japan.

2.1.8 SOCIO–CULTURAL FACTORS AND MORBIDITY

Social factors such as geographical and other forms of mobility; job–associated involvement (e.g. competitiveness), smoking; daily stress; and diet have been shown to be related to various diseases. Graham and Reeder (1979) have recommended that "investigations of the aetiology of disease that consider behaviour patterns and culture give promise of shedding light on the cause of diseases as disparate as coronary disease and cancer of the cervix, lung, and stomach". They illustrated the impact of cultures in protecting against or producing disease, with Vietnam, where many inhabitants were found to be protected from malaria, by housing built on stilts, higher than ground levels that mosquito files. On the other hand, the culture exposes them to cholera and other diseases through the custom of work in rice – paddies flooded with sewage-laden water.

Obermeyer (1993) also indicated relationship between culture and health. Cultural background has been found to affect the level and kind of utilization of existing health care services, though clinical medicine is known to have greater acceptance and confidence of the people irrespective of regional origin, age of sufferer and so on (Caldwell, et al., 1973; Banerjee, 1973; Lieban, 1977; Basu, 1990).

2.1.9 UNDERNUTRITION AND MORBIDITY

Under-nutrition has been implicated as a vital factor in morbidity occurrence. Solimano and Vine (1980) examined the interaction between under-nutrition, infection and infant mortality. The problem of under nutrition was invariably found to be deeply rooted in the socio–economic conditions and cultural patterns of the people. Nutritional miasmas and kwashiorkor are known to result from extreme cases of protein energy mal-nutrition (PEM). Other scholars that have investigated this relationship are Gordon (1976); Puffer and Serrano (1973); Sanders and Carver (1985); Lartson et. al (1978); Masawe, (1975); Ramalingaswarn (1974).

2.1.10 HEALTH AND DEVELOPMENT

It is widely acclaimed that health is essential to socio-economic development. In the 1960s, it was commonly thought that socio-economic progress was not essential for improving the health status of people in developing countries and that substantial and rapid progress could be made

through introduction of modern public health measure alone. (Halstead et. al., 1985; Caldwell, 1986; Basu, 1990; Park, 1997). In 1970s, it became increasingly clear that economic development alone couldn't solve the problem of poverty, hunger, malnutrition and disease. Hence, non-economic issues like education, productive employment, housing, equity, etc became major objectives of development. Since health is an integral part of development, it is believed that all sectors of society have an effect on it. As such, health services are no longer seen as "a complex of solely medical measures but a subsystem of an overall socio-economic system" (Park, 1997).

Several other factors such as age, sex and stress are known to influence morbidity differentials (Ramalingaswani, 1994; Basu, 1990; Koenig et al, 1988; Boerms, 1987; Caldwell et al., 1983; Chan et all., 1981; Miles, 1991; Osuafor, 1997).

Occupational exposure to chemicals affects mortality (Moriyama, 1980; Goldsmith, 1980; Hoover and Fraumeni, 1976; Blot et al., 1978; Blot and Fraumeni, 1975). Federia and Terrenato (1980) found that biological factors which includes bio-demographic factors like sex, maternal age, parity, plurality, interval since previous birth, and the more strictly biological ones – birth weight, length of gestation, determine early life mortality.

2.1.11 SEASON AND MORBIDITY

Miles (1991) observed that "in countries with dry and rainy seasons, each season brings a different disease pattern". In Britain, mortality has been found to

increase during winter. Several studies have associated certain diseases with climatic changes (Bainton, et al., 1977, Kendall, 1991; Osuafor, 1997; Macey et al., 2000).

2.1.12 EMERGENCE AND RE-EMERGENCE OF INFECTIOUS DISEASES

The problem of re–emergence of old infectious diseases even in those countries where the war was thought to have been won, and the emergence of new infectious diseases have continued to pose serious challenge to epidemiologists, medical sociologists and medical scientists. The Lyme disease, legionnaire disease, and Hantavirus Pulmonary Syndrome (HPS) in US in the late 20th century, and the emergence of Ebola virus in Zaire are examples of emerging infectious diseases (Demany, 1996). The HIV / AIDS epidemics are now of global concern. As Demany, (1996: 76) has put it:

> *In fact, there has been a general resurgence of infectious diseases throughout the world, including significant outbreaks of cholera, malaria, yellow fever, dengue, and diphtheria, as well as illnesses caused by antibiotic – resistant bacteria. There has also been a resurgence of fungal infections for which there are very few treatments. Furthermore, the incidence of AIDS is increasing in many countries.*

The problem here is not just that "new microbial threats are appearing in significant numbers, while well–known illnesses thought to be under control are re – emerging", but the fact that most of these infectious diseases are regarded

as tropical diseases. One is thus compelled to question, whether these diseases are not really symptoms of underdevelopment?

2.1.13 WATER AND SANITATION PROGRAMME IN NIGERIA

The history of planned provision of water supply to rural populations in Nigeria probably dates back to 1950s, when some oil companies such as Shell Development Company constructed scattered boreholes in the delta region of their operations. In early 1970's planned water supply schemes, which made use of hand pumps, were introduced in rural areas. Also the 1980's witnessed larger organised, mechanised borehole schemes in the rural areas by the Federal Government (1982 to 1984), ADP (starting in 1977) and UNICEF WATSAN project started in 1981(see Rooy,1987).

The zeal for the provision of water in the 1980's may not be unconnected with UN resolution/declaration of 1980's as the International Water and Sanitation Decade. In pursuit of this programme UNICEF Nigeria Country Office decided to embark on a pilot Rural Water Supply and Sanitation Project. In 1982 Imo state was selected by Federal Government for Pilot project in water and sanitation due primarily to serious outbreak of cholera in 1981 in Ohaozara area of the state.

Certain practices were identified as vital for the survival of WATSAN project in Nigeria. As Rooy (1987) noted, "Some aspects such as village level maintenance, village level taxation, distribution of spare parts and management of the system at Federal, State, LGA and village level remain to be sorted out"

and still remain predominantly so today. In the area of health/hygiene practices, UNICEF Project Officer, Carel de Rooy (1987:3) noted that apart from the north, there is the need to convince the people of the need for improved excreta disposal and environmental sanitation. In line with this vision, the Federal Government of Nigeria in 1986 through DFFRI programme demonstrated greater interest in low cost technologies such as the Ventilated Improved Pit (VIP) latrines and hand pump equipped shallow boreholes.

The UNICEF WATSAN Project in Nigeria was designed to achieve the following objectives:

1). Improve health and reduce the incidence of infant mortality and morbidity due to water-borne and excreta-related diseases;

2) To promote behavioural changes with respect to water use, personal hygiene and efficient means of waste disposal;

3) To generally improve the standard of living in remote rural areas;

4) To generate higher productivity of the rural masses

5) To mobilise communities and train artisans at village level for subsequent proliferation of adequate excreta disposal technology as well as financial and operational maintenance of water supply schemes.

The numbers 1, 2 and 5 objectives are directly related to the mainstream objectives of this study and are yet to be fully realised in the communities of this study.

2.2 THEORETICAL REVIEW

From time immemorial and in all societies, men have had to contend with the problem of morbidity and mortality. The Medicine man, the Priest, the Herbalist, the Magician, and today's Medical Scientists, Epidemiologists and Social Scientists have all undertaken in various ways to cure man's diseases. In a broad sense, the field of medicine can be seen as involving all forms of human activities and philosophies directed towards disease prevention, control and cure.

Park (1997) has noted that in the course of its evolution, "medicine has drawn richly from the traditional cultures of which it is a part, and later from biological and natural sciences and more recently from social and behavioural sciences". The above fact has enormously enlarged the volume of literature as well as theoretical framework relating to medicine. However, only those socio–demographic theories considered quite relevant to the present research shall be reviewed.

For long, man was groping in darkness about the causation of disease. This gave rise to several theories such as the supernatural theory of disease; theory of humors by Greeks and Indians; theory of contagion; the miasmatic theory which attributed disease to noxious air vapours and so on.

2.2.1 THE GERM THEORY

This theory was advanced in 1873, by a French bacteriologist, Louis Pasteur, who had discovered the presence of bacteria in the air. The germ theory is predicated upon "single factor causation" of disease.

There is no doubt that with the knowledge derived from bacteriology, man was able to control so many diseases that ravaged mankind. Specific disease control measures like blocking the channels of transmission through quarantine, water purification, pasteurisation of milk, protection of foods, proper disposal of sewage, destruction of insects and disinfections became widespread. Also, advancement in laboratory technology for early detection of disease contributed immensely (Park, 1997). With the control of acute infectious diseases in the 20th century, and the emergence of the so called modern diseases like cancer, diabetes, CHD e.t.c as leading causes of mortality, especially in industrial countries, the germ theory could no longer sufficiently explain the aetiology of diseases.

2.2.2 THE DEMOGRAPHIC TRANSITION THEORY

Warren Thompson first developed this theory in 1929 as a description of demographic changes that had taken place over time in advanced nations. It is "an attempt to explain the shift from high to low birth and death rates in the course of industrialization in western nations" (Potts and Selman, 1979).

Various attempts have been made to apply the theory to modernization process in developing countries. It relied on the sentiment that "what is good for the goose is good for the gander", as such, it has been described as ethnocentric. Later demographic data tends to suggest that cultural factors rather than socio–economic factors could be much more relevant in understanding the character of the transition. It was found that some European societies with similar

socio–economic level of development did not experience the same transition, while others with less similar socio–economic development did. The inconsistency of demographic transition in the face of emerging demographic data repudiated its efficacy as a universal theory of population changes.

2.2.3 EPIDEMIOLOGICAL TRANSITION

It is a version of demographic transition, concerned with prescribing a universal pattern of morbidity and mortality changes through which every society must pass. The transition is from a period of high rate of infectious plague epidemics to an era of low infectious disease, and high chronic diseases. This describes the experience of industrialized countries and expects that developing societies would move from high mortality from preventable infectious diseases to low infectious and high chronic diseases. (Graham and Reeder, 1979; Benedicto, 1987; Murray and Chen, 1992). With the emergence of new infectious diseases and re – emergence of old infectious disease, even in developed societies, unilinear epidemiological transition has been called into question.

2.2.4 MULTIFACTORIAL CAUSATION THEORY

With the epidemiological transition, following the successful control of acute infectious diseases in the 20th century, and the emergence of modern diseases such as cancer, cardiovascular disease, mental illness and accidents as leading causes of mortality in industrialized countries, germ theory became unsatisfactory.

"Diseases of civilization" could not be explained in terms of "single factor causation"; rather, factors such as social, economic, genetic, environmental, cultural and psychological, most of which are linked to man's life – style and behaviour, became recognized in aetiology of disease (Park, 1997; Mera, 1997). The multifactorial theory has it that the factors that influence health lie both within the individual and externally in the society. This belief gave rise to social medicine, which was popularised by Alfred Grotjahn in 1911. This was made possible by the realization that man is not only a biological animal, but also a social being, and disease has social causes, social consequences and social therapy (Park, 1997).

The implication of this theory is that social environment, which includes the life-style of the people, their belief systems, values, type of food they eat, their conceptions about the aetiology of disease and so on are quite crucial in understanding disease causation in human society.

2.2.5 SOCIO – ECONOMIC DEPRIVATION THEORY

Socio – economic status is regarded as the most predominant determinant of health. Low socio – economic status is said to be accompanied by poor housing and environmental amenities, insufficient income to provide nutrition and unhealthy behaviour such as smoking and alcohol consumption. It has been found that life expectancy increases with greater personal access to economic resources (Mera, 1997:42).

The deprivation model holds that many of the causes or predisposing factors for disease, such as cold, dampness, filthy conditions, malnutrition, starvation and overcrowding are more prevalent among the socio – economically disadvantaged and are accompanied by increased frequency of disease and premature death.

2.2.6 ETIOLOGICAL CHAIN OF EVENTS

This theory developed from Sir Percival 1775 study of chain of events leading to contraction of scrotal cancer. It provides that "understanding the aetiology of disease requires identifying the whole process of causation to the disease" (Graham and Reeder, 1979: 73). This will require data on biosocial, biochemical and biophysical factors relating to the disease. It suggests that certain specific behaviours are frequently peculiar to certain segment of the population; hence it might be useful to investigate the relative incidence of disease in different social groups. If a particular group shows a singularly high incidence of a disease, further investigation may be carried out to reveal specific behaviour peculiar to that group that might account for their contact with the disease.

2.2.7 EPIDEMIOLOGICAL TRIAD

This arose as a reaction to certain limitations of germ theory. It derived from the knowledge that not everyone exposed to a disease agent (e.g. tubercle bacillus) develops the disease (tuberculosis). Susceptible persons such as the

undernourished are likely to manifest clinical signs when exposed to such disease conditions. Epidemiologists of this school of thought believe that there are several factors relating to the host and environment that influence the occurrence of disease. The theory thus, describes the triadic relationship between the host, environment and the disease (see Park, 1997:28).

2.2.8 AJZEN'S THEORY OF PLANNED BEHAVIOUR

This theory takes human intention as a construct representing one's motivation towards adoption of a behaviour, with the development of personal motivation being seen as the first step towards the adoption of any social behaviour. Also the theory sees personal motivation as the result of three constructs: attitude towards the behaviour (Aact); perceived social norm (SN) regarding the adoption of this behaviour; and the perceived control (PBC) over the adoption of this behaviour (B) (see Hounsa, Assomption .M, Gaston Godin, Eusebe Alihonou, Pierre Valois and Jecques Girard 1993);.

According to this theory, treatment of an illness is usually specific to the perceived causes of the illness. Many scholars have applied this theory to their study of people's behaviours towards the use of medical treatments. A good example is Hounsa et al. (1993) referenced above.

2.2.8 HEALTH BELIEF MODEL (HBM)

HBM is one of the health–specific models that grew out of Health Education Model (HEM). It identifies as key components individual's perceived

susceptibility to a problem, perceived severity of the problem, and perceived cost/benefit of adopting a given health behaviour (Becker, 1974; Janz and Becker, 1984 reported in Treadwell, 1995). HBM is based on certain variables, which are related to health behaviour. These variables have been investigated by several scholars (Lux and Petosa, 1995).

The theory looks at peoples' reaction to health situations, based on their perception of the health condition as constituting a serious threat to their lives and also based on their perceived benefits from a health project or programme.

Health Belief Model considers a health condition – be it disease condition, treatment, or health facilities from the point of view of the people's belief and perception. It has been adopted in several researches by scholars in social medicine, public health, health education and other related areas (Al Winder, 1995). It was applied by Okeibunor, et al. (1995) in their study of factors influencing mothers' use of SSS in the management of diarrhoea in children in Nsukka zone. Also, Kathleen and Petosa (1995) used it to describe health beliefs and safer sex intensions of incarcerated youths between the ages of 13 to 18 years residing in state supported training schools within Ohio.

Health Belief Model is concerned with identifying factors that are associated with a people's health practice. It provides a framework for discussing the relationships between a people's use and practice of certain recommended health activities and their health beliefs or perceptions. In several situations, the likelihood of taking recommended action, according to HBM would be directly influenced by beliefs about the threat, that is perceived seriousness and

susceptibility to the dangers of illness (see Okeibunor et al. 1995). The theory suggests that these perceptions may be modified by social and demographic factors as well as knowledge. Perceived benefits and barriers may mediate intended action, while information from others could serve as cues to action (Okeibunor, et al. 1995).

It is a major assumption of the theory that risky behaviours reflect lack of knowledge, misinformation or deficiencies in understanding, which can be eliminated through education.

2.2.9 POLITICAL ECONOMY OF MORBIDITY

This is a broad theoretical framework. It focuses on "many economic, political, and socio-historical forces, which shape contemporary health problems and our approaches to these problems" (Minkler, et al. 1995:111). Minkler et al. (1995) also noted that the theory pays attention to "the dynamics of race, class and gender as these interact to effect the lives of individuals and broader social groups". The theory has been acclaimed as an important supplement, as well as complement to other macro and micro health theories of health education.

Political economy of health has been defined as "a critical, historical and interdisciplinary perspective, which examines the political, economic and social context within which health and illness are defined, treated and managed" (Minkler, 1995:114). Political economy is not a single theory but a broad theoretical framework, which emphasizes how the structure of the economy and society affects the lives of the individuals. It examines how political, economic

and socio-cultural factors interact to determine the unequal distribution of wealth, power and life chances in society. It focuses on the patterns of social inequality in the society (in the distribution of resources).

Its root is usually traced to Marx's critic of classical economics. As Minkler, et al. (1995:113) argued, "political economy views topics such as health status and health promotion as dependent on the economic and social system rather than solely on the actions of self directed individuals". The theory highlights the importance of social and political causes of ill health, above social-psychological factors. Political economic philosophy is central to many broad theoretical perspectives of today, especially those that talk about the empowerment of the citizenry.

Its importance has been highlighted, in the works of Minkler, et al. (1995:112) when they pointed out that "political economy can play a special role in helping health education sort out the increasingly complex world of public health." They also noted that "it can provide a comprehensive conceptual framework within which to organise thought and action by providing guidelines for understanding and approaching health within a broad structural context."

2.2.10 SOCIOLOGICAL THEORIES OF MORBIDITY

Traditional Sociological theories such as the Functionalist, Conflict and Interactionist perspectives have been successfully applied in discussing health and illness issues in society. These sociological theories are briefly reviewed as they apply to health and morbidity (see Oranye, 2002).

2.2.10.1 The Functionalist Perspective

Generally, functionalists look at any thing in the society from the perspective of those functions, which it performs for the survival of the society at large (Haralambos and Heald, 1980; Radcliffe-Brown, 1969)). From the point of view of health and illness, functionalists believe that some level of health is very essential for both the individual and society, to function effectively. If human society must function effectively, there must exist a reasonable number of productive members, who will carry on the vital tasks necessary for the survival of the society. Health institutions therefore emerged to help society provide for the health of the people (Oranye, 2002; Cockerham, 1978).

In a situation where large number of the people suffer from diseases especially of the acute infectious types as is common in Third World societies, and as such are unable to carry out their normal life activities, this will certainly affect general productivity of the people and survival of the society as a whole. High degree of morbidity affects the individual's vitality, ability to work and play. Hence, every society evolves a medical institution to address the health problems and help the society to ensure a high level of health, through prevention of disease and illness, and where they occur, offer restitution through cure (Cockerham, 1978; Oranye, 2002).

2.2.10.2 Conflict Perspective

The functionalist viewpoint assumes that health care services are available to everybody irrespective of social class, race, religion, age, gender and other social differences. However, what we observe in human society, especially in societies like ours, is a magnitude of inequality in health care delivery. Some people have greater access to health care services and other resources that contribute to good health, while some others live in conditions that are in sharp contrast to this. This is therefore a product of social conflict, which is endemic in society (Oranye, 2002).

As Oranye, (2002:29) noted:

> *The Conflict viewpoint challenges this postulation of the functionalist. They see health as something that is desired by everybody in society, but not everyone is able to have it. No one actually prefers to be ill. What happens is that some people have better health than others because they have access to those resources that keep them in good health and to recover quickly if they fall sick.*

In Nigeria today health just like many other important resources are unequally distributed among the population. People in the rural areas when compared with their counterparts in the urban setting do not have access to adequate health care delivery. Some rural communities do not only lack health care facilities but also lack access to basic social amenities such as roads. Aside from the absence of health care facilities in rural areas, most rural dwellers live in

abject poverty and as such cannot afford balanced diet. This has serious consequences on their ability to stay healthy and to recover quickly when sick (see Oranye, 1997).

The inequality in health between the poor and rich is made worse by the glaring contrast in the conditions of their living. Most poor people live in the rural areas, and those who live in the urban areas live in squatter settlements most often characterised by absence of tap water, electricity, poor housing and sanitary conditions, and so on (Sanders and Carver, 1985; Cockerham, 1978; Oranye, 2002) .

2.2.10.3 Interactionist Perspective

Symbolic interactionists contend that sickness is culturally created meanings we attach to certain conditions. "In order for a condition to be seen or interpreted as a sickness the members of society must define it as such" (Clark, 1983 qouted in Oranye, 2002). The definition is frequently negotiated in the process of interaction. An individual does not assign meanings to a particular condition. He usually tries to validate such interpretation of symptoms by checking with others. Usually the people from whom the individual seeks to validate the symptom constitute the 'significant others', such as the doctor, mother, father, a senior relative, intimate friend, an experienced person and so on (Oranye, 2002; Haralambos and Heald, 1980).

A particular illness condition may exist within a community, without the people seeing it as a problem or unusual. In some societies, certain conditions

are so widespread that they are not considered threatening. The medical profession plays a very important role in interpreting a condition as morbid and as such requires medical attention, even where the people do not see it so. Such definition will obviously influence public perception and reaction toward such condition (Oranye, 2002; Cockerham, 1978)

Sickness is therefore a social creation, which members of the society create in their interaction, and it begins to control their behaviour. For any condition to be regarded as a disease that requires medical attention, members of the society must recognise it as such and then react towards it with such seriousness, otherwise it could just be seen as normal.

2.3.1 THEORETICAL FRAMEWORK

There are several theories that could be useful in explaining the character and pattern of morbidity in a rural community such as the ones under investigation in this study. However, theories of Multifactorial Causation, Political Economy and Economic Deprivation are considered most appropriate for this study.

The Multifactorial Causation recognizes that disease predisposition is influenced by several factors, which are linked to socio–economic status, cultural, genetic and environmental factors. Most of these factors are linked to man's life style and behaviour patterns. This view led to the concept of social medicine, that medicine has much to do with social science. Disease is seen as having social

causes, social consequences and social therapy. In this study morbidity is investigated from multifactorial causation perspective, with an eye on the social, cultural and economic background of the people.

The Economic Deprivation viewpoint is applied to reject any attempt to looking at morbidity from the so-called "blaming the victim" stance. The socio-economic status, which is mostly determined by societal forces that are transcendental, in turn, determine health condition of the individual. In Nigerian society, the social structure plays a primary role in social placement. Those at the lower social strata are likely to experience greater health problems. The system, which creates this social inequality and socio-economic deprivation, should be blamed rather than the individuals who involuntarily found themselves in this pitiable condition.

A people's as well as individuals' beliefs and actions may play vital roles in their health status, but the socio-political economy of their existence plays more primary and deterministic role. The theory suggests that "the possible range of health statuses and health behaviors of individuals is limited by their location in the social and economic system. As a result, a significant change in the health behaviour of any group of individuals is seen to require altering the social and economic context within which they live" (Minkler, et al. 1995:113). The near total eradication of Guineaworm pandemic situation in Abakiliki area through the activities of international and national agencies such as UNICEF is a good lesson here.

As Minkler et al. (1995:113) argued, "political economy can be conceptualised as being the outermost force in a set of forces that affect the health of individuals. At the centre are the psychic (attitude, knowledge, personality) aspects of health behavior". To be able to get to the centre and to interpretatively understand it, one needs to decipher this outermost force – the political economy. As Minkler et al. (1995:113) argued, "it is possible that some people could continue to engage in health damaging behaviors even when they have adequate knowledge of the consequences, concern about their health, and the resources to engage in healthy behavior...many people find themselves constrained by the environment which promotes health risks".

Since the political economy intervenes in health problem by influencing both individuals and organisations and institutions, it provides a more balanced recipe to health problems of the individual and the community.

This study takes a broad perspective on the issue of Water-borne diseases in the riverine areas of Anambra state. As Miller argued "what is important is that we avoid narrow frames of reference and that we do not neglect broader issues of how political and economic forces affect daily life" (Miller, 1976 quoted in Minkler et al. 1995:113).

2.4.1 RESEARCH HYPOTHESES

The following hypotheses will form the basis for this study.

1. Prevalence of water-borne diseases decreases as the level of education of household heads increases.
2. Communities with safe potable water experience lower incidence of water-borne diseases than those that rely on unsafe water sources.
3. Some occupational groups experience higher incidence of water–borne diseases than others.
4. There are fewer cases of water-borne diseases in households where modern health care service is used for water-borne disease than in households where traditional medicine is used for it.

CHAPTER THREE

METHODOLOGY OF RESEARCH

Different methods of securing knowledge and providing solutions to problems exist in human society. This study was designed to follow the scientific research process of obtaining information as is found in the social sciences. The procedure is outlined below:

3.1 STUDY DESIGN

This is a cross sectional survey developed to specifically investigate water-borne disease experiences of the riverine communities from November 2000 to October 2001. The choice of twelve months is to ensure that the respondents who are predominantly rural dwellers are able to recall clearly their experiences. This research is designed to obtain a sample survey of morbidity experiences of households in the riverine communities of Anambra State. Since it was not possible to study all the households in the communities, given the available time, resources, and other constraints, data was collected from a random sample of households in the study area.

3.2 STUDY AREA

This study was carried out in three Local Government Areas of Ogbaru, Anambra East and Anambra West of Anambra State, South - Eastern Nigeria. These three Local Government Areas are designated riverine areas because they are located along two major rivers, River Niger and River Anambra. The Local Government Areas are not just located along the two major rivers, but the people are known to be culturally tied to the river. Most of their life activities and occupation centre or revolve around the river.

It is pertinent to point out that not all the communities in each of these Local Government Areas are typically riverine, since a good number of them are located in upland areas. In Ogbaru Local Government Area, there are fifteen communities out of which twelve are typically riverine; Anambra East Local Government Area has eleven communities and only four are typically riverine, and Anambra West Local Government Area has nineteen communities, eighteen of which are typically riverine. List of the Local Government Areas and the name of the communities are provided in Appendix D. "R" is used to indicate which community is typically riverine. Since some of the communities in the three Local Government Areas were not typically riverine, it was considered unnecessary to study all the communities. This study therefore focused only on those communities that are considered typically riverine.

3.3 POPULATION OF STUDY

Nigerian Population Commission, NPC, projected the total populations of the three Local Government Areas selected for this study at 386, 342 in 1996. The communities in these LGAs were considered too many to be covered in a single study of this nature. As a result, only six communities were sampled from the three LGAs. The populations of the six communities were also projected by NPC in 1996 as follows: Otuocha, 36, 382; Nneyi Umuleri, 11, 922; Nzam, 11, 474; Oroma Etiti, 9, 778; Atani. 12. 324 and Ogbakuba, 5, 756 in 2000 AD. This gives a total of 87, 636.

This study was based on the projected population of these six communities, which was collected from Nigerian Population Commission Office. In essence, sampling was based on the projected population of the six communities of this study.

3.4 SAMPLE SIZE

This study was designed to use a sample size of 600 households, which were drawn from the six communities of study. From each household the man and his wife were selected, except in households where only one household head existed. For such situations, another household in the same building or in the next building was sampled. This was done in such a way to ensure that the

projected number of respondents were sampled. This gave a total sample size of 1,200 respondents.

In addition to the 600 households, a total of 300 cases were collected from hospital records in the communities of study. The plan was to collect 100 cases from each Local Government Area. The hospitals from which the cases were collected included one public hospital and one private hospital in each LGA.

3.5 SAMPLING TECHNIQUE

This is the process of selecting each individual subject, or case, for study. For a population-based study of this nature, which involves many communities in different Local Government Areas, the sampling technique was not simple. To ensure that the communities, households and persons, as well as cases selected, are unbiased and truly representative of the population of study, a rigorous sampling technique was adopted, which combined a number of techniques.

First, the three Local Government Areas of Ogbaru, Anambra east and Anambra west were selected because they are well known riverine areas in Anambra state. It was observed that the Local Government headquarters of the Local Government Areas are riverine communities. Consequently each of them was selected for study. Another reason for choosing the Local Government headquarters is the researcher's conviction that hospital records are more likely to be available in them. This enhanced the collection of hospital cases. From the

remaining communities, which were identified as riverine in the three Local Government Areas, one community each was selected from each Local Government Area, using the fish-bowl technique of simple random sampling. This brought the number of communities from each of the Local Government Areas to two. As such, six communities namely Atani, Ogbakuba, Otuocha, Nneyi Umuleri, Nzam and Oroma Etiti were selected for study.

The next level of sampling was on selection of the 600 households. From each of the six communities 100 households were sampled. Each of the six communities is made up of villages. Each village was considered as a cluster, and it was from these clusters that buildings were randomly selected to ensure representation of all the areas within the communities. The 100 households were spread proportionately across the villages in each community. First, the buildings in each community were numbered to facilitate sampling, and systematic random sampling technique was applied to sample buildings from each village. From each building, one household was sampled. Only the heads of the households (which included husband and wife) were sampled. Where there were more than one household in a building, availability of the household heads, willingness to cooperate and also completeness of the household determined the selection of a household.

3.6 INSTRUMENT FOR DATA COLLECTION

The following instruments were used for data collection. They are:

(1) Documents: Data on outbreak of water-borne diseases are usually collected and stored by the population, and disease surveillance units in the department of public health, Anambra State Ministry of health. Similar records were also reported to exist at Amaku General Hospital, Awka, under Water, Environment and Sanitation Agency (WATSAN). The origin of these data were mainly from local government health departments. Morbidity data were as such collected from department of health in the local government headquarters. Also, data from hospital records in the communities of study was collected. Data from these sources were used to complement data from the field survey that was carried out in the communities of study.

(2) Questionnaire: A uniform set of questionnaire was administered to respondents by the researcher, with the assistance of two research Assistants who were employed and trained for this purpose. Two local guides were also used in each of the six communities. The questions were well structured, to make for standardization. This did not only guarantee uniformity in the questions asked and responses elicited, but on the other hand enhanced comparability of information.

(3) Ethnographic Method: This method was introduced to capture salient cultural factors in the beliefs, values, attitudes and experiences of the people, which influenced the incidence and prevalence of water-borne diseases in the riverine communities. Here, two qualitative research tools were applied to complement data generated through the structured questionnaire and documentary methods. The two techniques are:

(a) **In-depth Interview of key informants:** Three key informants were interviewed in each of the communities of study. The key informants chosen for this purpose were: community leaders, religious leaders, teachers, and health officers.

(b) **Focus Group Discussion:** Two FGDs were organized in each community. One FGD was organized for unmarried male and female youths of age 15-30 years, and the other for male and female adults, who were married with children. Each FGD, was composed of 9 to 15 members with proportionate representation of male and female sexes.

3.7 VALIDATION AND PRE-TESTING OF RESEARCH INSTRUMENT

The questionnaire was administered to a sample of 10 household heads in Ohita community in Ogbaru LGA, which is one of the LGAs selected for this study. The FGD and Key Informant Interview tools were also pre-tested in the

same community. Ohita is a riverine community and shares common cultural systems with other riverine communities in Anambra state. The respondents understood the questions very clearly with minimal errors and misconceptions. The problematic questions were fine tuned to remove traces of ambiguity.

3.8 ADMINISTRATION OF INSTRUMENT

The questionnaire was administered to the heads of the 600 households in the six communities of study. The heads of the households are the man/husband and the woman/wife. For each respondent, one questionnaire was administered. 1200 copies of the questionnaire were properly administered and returned. The questionnaires were administered with the help of two research assistants who were recruited and trained. In addition, two local guides were employed in each community. Only pen or pencil was used for filling the questionnaires, after the answer/response has been clarified.

The researcher himself personally conducted the Key Informant Interviews, while the two research assistants took up the FGD sessions, with periodic supervision by the principal researcher. During these sessions, extensive and intensive note taking was done using field notebooks.

3.9 LIMITATIONS OF THE STUDY

So many factors operate in one way or the other to diminish the validity of this study and the generalisability of findings. However, necessary steps were

taken in the research design to take care of these limitations. Some of the major sources of limitation to this study are:

- That the selection of only two communities from each Local Government Area is too few compared with the total number of communities in the LGAs. However, considering the cost implications in terms of time, human and material resources required to cover all the communities, and in view of the fact that a well-drawn sample would appropriately approximate the population characteristics, random sampling techniques were used. Moreover, these communities have common geographical and cultural background, which makes random sampling proper.
- The random process adopted in the selection of the communities of study excluded some communities, which were revealed in the course of the field investigation to have had recent outbreak of cholera, such as Akili Ogidi in Ogbaru LGA and Enugu Otu in Otuocha area. It would have been nice and more revealing to visit such communities with recent history of outbreak of cholera, but they fell outside the sampled area for this study.
- The above limitations were made imperative by the limited resources both material and personnel available to the researcher. Given sufficient fund, time and personnel the validity of this study would have been enhance by increasing the number of communities and households surveyed. Just as is quite obvious, a total population study can always be better than any study of the sample.

3.10 METHOD OF DATA ANALYSIS

In data analysis, two sets of statistics were employed. The first set was used for descriptive analysis; and the second set for testing the hypotheses.

For descriptive analysis, frequency distribution tables, percentages, and bar charts were used. In testing the hypotheses, Analysis of variance was used to analyse the degree of variation between and within groups.

Data from the qualitative tools (In-depth Interview and FGD) were analysed using Ethnographic Method. The Ethnographic Method helped us to relate interpretatively the findings to the cultural milieu.

CHAPTER FOUR

DATA PRESENTATION AND ANALYSIS

INTRODUCTION

Several researches have been carried out on the epidemiology of infectious diseases, including those that we get through water. Diseases we contract through water are traditionally classified into *Water–borne*, *Water–washed, Water–based, and Water–related insect vector* diseases. This study is concerned with the socio-economic and cultural factors in the incidence and prevalence of those diseases that are contracted through oral consumption of contaminated water (water-borne). In doing this, three major data collection instruments were used. This chapter is concerned with the presentation and analysis of data from the three major instruments of Questionnaire, Hospital data and qualitative tools of Key Informant Interview and Focused Group Discussion.

4.2 Demographic Characteristics of Respondents

This section is primarily concerned with showing the major characteristics of the respondents as is shown in the Table 4.1 below.

Table 4.1

Demographic Characteristics Of Respondents

Sex	Frequency	%
Male	582	48.5
Female	618	51.5
Total	1200	100
Occupational Categories	Frequency	%
Farming	572	47.67
Fishing	239	19.92
Trading	168	14.00
Civil Servants/private company employees	121	10.08
Artisans	84	7.00
Professionals (Doctors, Lawyers etc.)	16	1.33
Total	1200	100
Religious Affiliation	Frequency	%
Traditional Religion	462	38.5
Christianity	738	61.5
Islam	-	-
Total	1200	100
Level of Education	Frequency	%
No Formal Education	598	49.83
Primary Education	408	34
Secondary Education	140	11.67
Tertiary Education	54	4.5
Total	1200	100

Table 4.1 shows the distribution of respondents according to major demographic characteristics. First, the sex distribution of the respondents shows that 51.5% are females, while 48.5% are males. There were very few households being headed by females, either as a result of the death of the man, or his absence on a relatively permanent basis, as in a situation where the man was working outside the town but decided to have his family located in the village.

This accounts for the greater percentage of female household heads over the males. It is quite glaring from the result that majority of the respondents were employed in the agricultural sector. Over sixty percent (67.59%) of the respondents were engaged in either farming or fishing. Only 11.4% were civil servants or professionals. This is a typical characteristic of rural communities, which these represent. It was also found that 61.5% of the respondents were Christians, while 38.5% belonged to the Traditional Religion. The last part of the table shows the distribution of respondents by the highest level of education attained. It shows that greater percentage of the respondents, 49.83% had no formal education. This is followed by 34% with primary level education as their highest level of education. The implication of this especially when combined with the earlier section on major occupations is that the population of this study can be described as a rural, illiterate and agricultural one. This status most obviously influences their economic status, lifestyle and possibly their health status, and as such holds a lot of implications for this study.

ii) Disease Experience Of Respondents

Figure 4:1

Frequency of Sickness as Reported by Household Heads

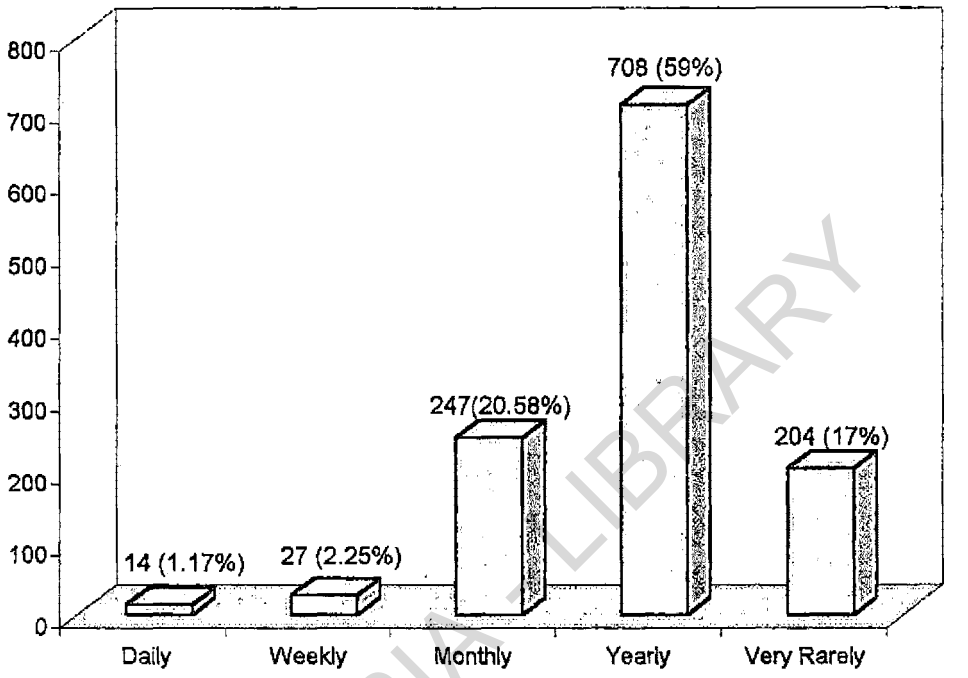

Figure 4:1 above shows that only 3.42% of the respondents reported experiencing sickness on daily or weekly basis. This most likely will be referring to chronic diseases, which are not quite common in these rural areas except among the aged people. Majority reported illness to be a yearly experience, and this was indicated by 59% of the respondents. When this is merged with those who see sickness as a rare event in their life representing 17%, we would see that disease condition is not permanent but is most often seasonal and related to life style. The facts will become more glaring as the report unfolds.

Table 4:2

Reported Cases of Water-Borne Diseases by Household Heads

Categories of WBDs	Number of Cases	%
Typhoid	84	25.38
Dysentery	51	15.41
Infectious Hepatitis	12	3.63
Cholera	7	2.11
Gastroenteritis/Diarrhoea	110	33.23
Intestinal Worms	64	19.34
Poliomyelitis	3	0.91
Total	331	100

From the Table 4:2 Diarrhoea diseases are the most frequent, with a percentage distribution of 33.23, followed by Typhoid and Intestinal Worms with 25.38% and 19.34% respectively. Another disease that appears to be quite significant among the WBDs Dysentery with 15.41%. Poliomyelitis had the least percentage frequency of 0.91%.

iii) Perception and Attitude of Respondents Towards WBDs and Sanitation

Table 4:3

Perception of Connection between WBDs and the Water People Drink.

Responses	Frequency	%
Yes	387	32.25
No	320	26.67
No Idea	493	41.08
Total	1200	100

Table 4:3 measures the people's perception of the connection between WBDs and the water they drink. Majority (41.08%) of the respondents did not perceive any connection between the water they drink and the occurrence of WBDs. More than a quarter (26.67%) of the respondents did not believe that the water they drink has any connection with the diseases. On the other hand 32.25% have the knowledge that some or most of the diseases could be contracted through the water they drink. When the total percentage of those who indicated no to the connection between WBDs and water people drink and those who indicated they have no idea about such connection are combined, it shows that 67.75% of the respondents have a high level of ignorance about connection between WBDs, and the water people drink.

Above findings are also shown in terms of respondents' level of education and religion both in tables and graphs below.

Table 4:4

Level of Education and Perception of Association Between WBDs and Type of Drinking Water

Level of Education	Perception of Association Between WBDs and Drinking Water			Total
	Yes	No	No Idea	
No Formal Education	93 (24.03)	205 (64.06)	300 (60.85)	598
Primary Education	117 (30.23)	109 (34.06)	182 (36.92)	408
Secondary Education	129 (33.33)	5 (1.56)	6 (1.22)	140
Tertiary Education	48 (12.4)	1 (0.31)	5 (1.01)	54
Total	387 (100)	320 (100)	493 (100)	1200

Table 4:4 shows the perception of the relationship between WBDs and type of drinking water based on the respondents' level of education. When the responses of the respondents from the different levels of education are considered across the three response options of Yes, No, and No Idea, it is found that for those who had no formal education, 60.85% of them indicated No Idea, 64.06% for No and only 24.03% indicated Yes. When this kind of comparison is made across other educational categories, it is seen that the tendency towards negative perceptions of No and No Idea decreases with increase in level of education but increases with decrease in educational level.

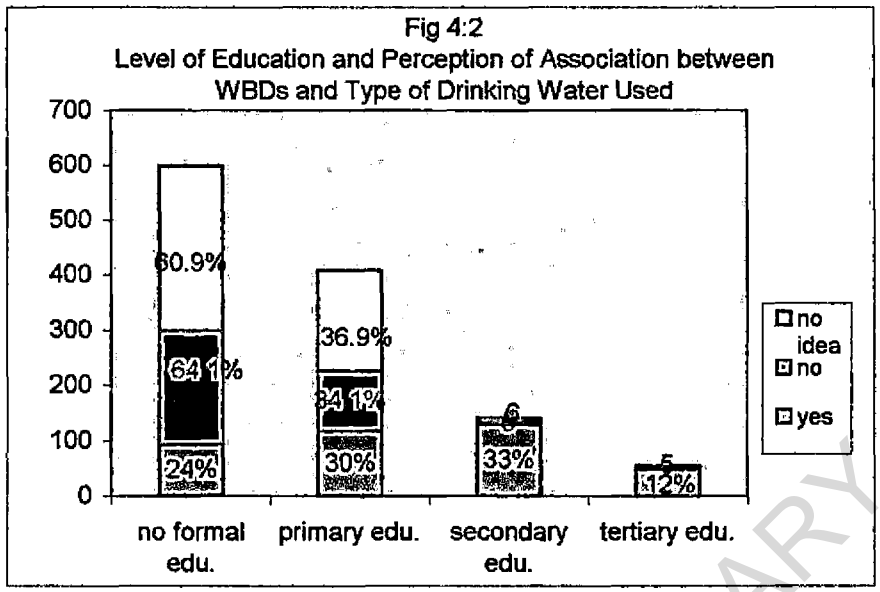

Figure 4:2 helps one to visualise in a chart form, what has already been presented in Table 4:4 above. It shows relationship between respondents' level of education and their perception of relationship between the type of water they used and incidence of WBDs. The greatest proportion of those who had no idea of such relationship between type of water and incidence of WBDs or who believe that there is no relationship fall within the no formal education and primary education levels.

Table 4:5

Religion and Perception of Association Between WBDs and Type of Drinking Water

Religious Affiliation	Perception			Total
	Yes (%)	No (%)	No Idea (%)	
Christianity	294 (75.97)	127 (39.69)	317 (64.3)	738
Traditional Religion	93 (24.03)	193 (60.31)	176 (35.7)	462
Total	387 (100)	320 (100)	493 (100)	1200

Perception of the association between WBDs and drinking water was also measured along religious line. The result shows that 75.97% of those who perceived an association between drinking water and WBDs were Christians, while only 24.03% of them were from traditional religion. Among those who did not perceive any association between the two variables, 60.31% belonged to the traditional religion, while 39.7% were Christians.

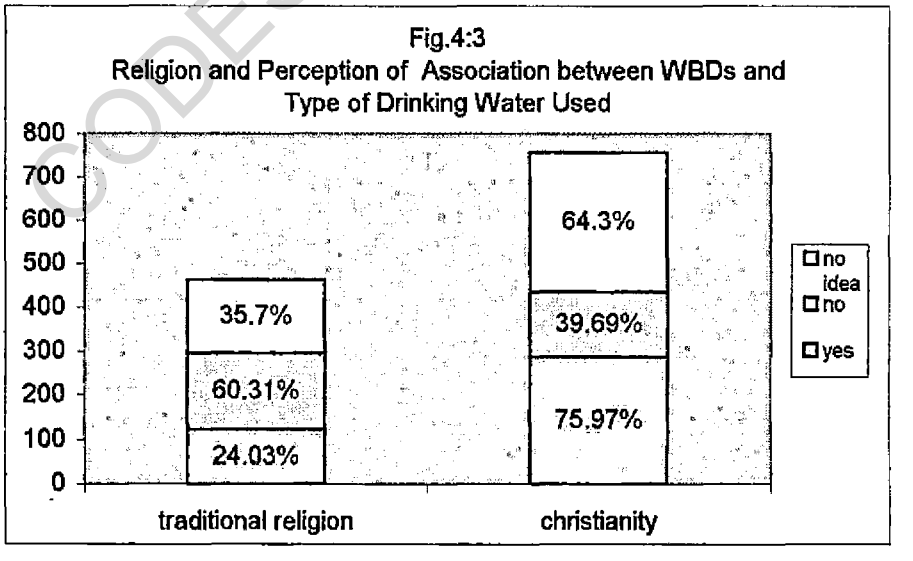

Figure 4:3 was also designed to compare perception of connection between WBDs and type of drinking water used according to religious background. The result shows that Christians had a better perception of the relationship between WBDs and type of drinking water, than those who practised Traditional Religion.

Table 4:6

Major Sources of Drinking Water Available to 600 Households at the Time of the Survey

Sources Of Drinking Water	Atani	Ogbakuba	Oroma Etiti	Nzam	Nneyi Umuleri	Otuocha	Total %
Tap water	Nil	Nil	Nil	Nil	Nil	Nil	0.00
Stream (spring water)	Nil	Nil	Nil	Nil	58	Nil	58 (9.67)
Pond	Nil	Nil	16	12	Nil	Nil	28 (4.67)
Irrigation	Nil	Nil	Nil	Nil	Nil	Nil	0.00
Rivers	40	70	44	40	Nil	26	220(36.67)
Rain water	16	20	16	18	14	15	99 (16.5)
Pure Water (sachet water)	10	6	2	4	2	4	28 (4.67)
Borehole	28	Nil	22	26	14	20	110(18.33)
Tanker water	6	4	Nil	Nil	12	35	57 (9.5)
Total	100	100	100	100	100	100	600 (100)

Table 4:6 considers the major sources of drinking water available to the 600 households. Most of the households had access to more than one sources, but the most regularly available sources were recorded. Rainwater was for instance reported by many of the households as a major source, which is

seasonal and as such not reliable. Majority of the households, 46.34% were found to rely on water from rivers and streams for their household use. This was followed by water from Boreholes, which is 18.33% of the available water source. The Table shows that none of the communities had access to pipe-borne water. Only 32.5% of the households had access to safe and protected water.

Table 4:7

Treatment of Drinking Water by Households

Responses	Frequency	%
No	830	69.17
Very rarely	204	17.00
Sometimes	112	9.33
Always	54	4.50
Total	1200	100

Table 4:7 shows that majority of the households (69.17%) do not treat the water they drink. This constitutes a high-risk group with regard to transmission of water-borne diseases. Less than five percent (4.5%) claimed to always treat their water. The remaining percentages, which very rarely or sometimes treat their water, also constitute a risk group. Considering the fact that greater majority of the people do not treat the water they drink, and considering the fact that most of the water available to them were unprotected, most of them constitute a high-risk group with respect to water-borne diseases.

Table 4:8

Methods of Water Treatment Used by Households

Methods	Frequency	%
Boiling	32	8.65
Chlorine	6	1.62
Filtering	58	15.68
Alum	274	74.05
Total	370	100

Table 4:8 above shows the methods of water treatment used by those households that treat their drinking water. It shows that majority of the households 74.05% use Alum for their water treatment. Others use Filtering, Boiling and Chlorine.

Table 4:9

Reasons for None Use of Water Treatment

Reasons	Frequency	%
It is time wasting	234	28.19
It is not necessary	30	3.61
What is in water does not kill	17	2.05
We have been using this water for years without any problem	123	14.82
It is too costly	236	28.43
I use borehole, rain etc so there is no need for treatment	190	22.89
Total	830	100

On the reasons given by different household heads for not treating their water, Table 4:9 revealed that the cost of such treatment, followed by time required for such treatment rank highest as the reasons why most of the households do not treat the water they use. These represent 28.43% and 28.19% respectively. From the above table also, 22.89% claimed that they use borehole water, pure water, rainwater and tanker water and as such do not require treatment.

Table 4:10

Types of Toilet System Used among Households

Toilet systems	Frequency	%
VIP Pit Toilet	248	20.1
Open Pit Toilet	308	25.67
Bush Method	404	33.67
River Method	124	10.33
Water Cistern	116	9.67
Farm	Nil	Nil
Total	1200	100

With respect to types of toilet used among households, Table 4:10 revealed that approximately seventy percent (69.67%) of the households were using open and unprotected toilet systems, which includes Open Pit Toilet, Bush Method, and Rivers, while almost thirty percent (30%) of the households were using protected toilet systems such as the VIP Pit Toilet and Water Cistern. It could therefore be concluded that most of the households in the communities

were using toilet systems that were open, unprotected and as such could lead to contamination of the environment with faecal materials.

iv) PROVISION OF HEALTH CARE

Table 4:11

Respondents' First Reaction to Sickness

Types of Reactions	Frequency	%
Ignore it until it becomes serious	48	4
Go to church for prayer	25	2.08
Buy drugs from chemists based on perceived symptoms	687	57.25
Take local herbs	154	12.83
Consult a medical doctor in the hospital	198	16.5
Go to traditional medicine man	88	7.33
Total	1200	100

The result of the above Table 4:11 shows that the first reaction of more than half of the respondents, (57.25%), towards a disease condition is to buy drugs from chemists (Patent Medicine Stores), based on their perceived symptoms and the chemist's advice. Only 16.5% consult a medical doctor first, before taking drugs. One-fifth (20.16%) either takes local herbs they are familiar with, or consult a traditional medicine man for treatment. The result of this is that most of the people still rely on self-medication as an initial reaction to disease condition until the situation becomes bad.

Table 4:12

Use of Health Services by Respondents for WBDs

Categories	Frequency	%
Modern health care	362	30.17
Traditional medicine	265	22.08
Patent medicine	573	47.75
Total	1200	100

Table 4:12 shows the types of health service people seek when they have any of the WBDs. The result still shows that for most of these diseases, 47.75% of the respondents still try to buy drugs from Patent Medicine Stores. About thirty percent (30.17%) would take their diseases to modern health care centres, mainly clinics for most of the communities. Only 22.1% would prefer to use traditional medicine for their water-borne diseases. The high use of patent medicine stores for health problems could be attributed to the absence of hospitals with qualified and regular medical doctors in most of the communities.

Table 4:13

Distance of Nearest Hospital/Clinic to Residence

Distance	Frequency	%
A few poles (less than 1 km)	504	42
1 to 2 km	576	48
More than 2 km	120	10
Non in my community	Nil	Nil
Total	1200	100

From Table 4:13 above, we see that most of the respondents live within 2 kilometres to health facilities. Apart from Otuocha where there are a few private hospitals, other communities do not have any resident qualified medical doctor, also, apart from Otuocha, none of the hospitals in the other communities had a laboratory centre. They relied on laboratory centres located most often in other local government areas.

V) HOSPITAL DATA

Table 4:14

Morbidity Data from Six Communities in the Three LGAs

Types Of Diseases	Atani	Ogbakub	Nzam	Oroma Etiti	Neyi Umuleri	Otuocha
Malaria	52	54	53	58	56	55
Typhoid	7	5	NA	NA	NA	9
Anemia /Sickle Cell	3	2	1	1	Nil	2
Respiratory tract infection	6	7	4	5	6	5
Hepatitis	Nil	1	NA	NA	NA	1
Pneumonia	2	1	3	2	2	Nil
Gastroenteritis/Diarrhea	14	16	17	16	14	12
RTA/Fractures, Burns etc.	2	Nil	2	1	3	5
Arthritis (Rheumatism, Joint pains etc)	1	2	1	Nil	4	1
Measles	2	1	2	Nil	Nil	Nil
Skin Diseases	1	3	6	9	8	2
Urinary tract infection	1	Nil	NA	NA	NA	Nil
Hypertension	1	Nil	NA	NA	NA	2
Appendicitis	2	Nil	NA	NA	NA	1
Internal worms	2	4	4	3	5	Nil
Cholera	Nil	Nil	1	Nil	Nil	Nil
Dysentery	2	2	4	4	2	3
Ear infections	1	Nil	1	Nil	Nil	Nil
Eye infections	Nil	Nil	NIL	1	Nil	1
Dental problems	1	Nil	1	Nil	Nil	Nil
Diabetes	Nil	1	NA	NA	NA	1
Total	100	100	100	100	100	100

*NA is used to refer to cases not being treated in the health facility and as such not available.

*Nil means that the disease being referred to was not found in the hundred cases selected.

From each of the six communities efforts were made to randomly collect 100 cases from the hospitals and/or health centres located within them. However, the type of health facilities existing in these communities threatened reliability of the use of data generated through this exercise for projections. Since most of them were health centres and as such not equipped to deal with serious health problems like Infectious Hepatitis, Cholera, Typhoid and so on, most of such suspected cases were either referred out or were taken to hospitals outside the LGAs by the patients.

However, the result generally reveals that water related diseases rank highest among other diseases. For instance, malaria, which is a water-related insect vector disease, ranked highest among all diseases found in all the communities with over 50% occurrence. Apart from malaria the next disease condition ranking high from the hospital data is gastroenteritis and diarrhoea diseases, which are purely water-borne. The conclusion from the available facts is that health care facilities were inadequate and that water related diseases posed the greatest health threat to the people of riverine communities.

Table 4:15

Morbidity Reports on WBDs from Health Departments in the L.G.As

Local Governments	Typhoid Fever	Cholera	Infective Hepatitis	Diarrhoea	Amoebic Dysentery	Poliomyelitis	Total %
Ogbaru	290 (32.3)	142 (38)	96 (34.2)	580 (32.6)	178 (33.8)	Nil	1,286 (33.3)
Anambra East	310 (34.5)	68 (18.2)	98 (34.9)	600 (33.8)	128 (24.3)	3 (37.5)	1,207 (31.2)
Anambra West	298 (33.2)	164 (43.9)	87 (31)	597 (33.6)	220 (41.8)	5 (62.5)	1,371 (35.5)
Total	898 (23.2)	374 (9.7)	281 (7.3)	1777 (46)	526 (13.6)	8 (0.2)	3,864 (100)

The above data were collected from the department of health in the LG offices of the three local government areas. The Table 4:15 shows distribution of water-borne diseases reported for all the communities in the three LGAs during the year 2000. It shows that diarrhoea diseases with 46%, constituted the greatest proportion of WBDs, in the three LGAs. This is followed closely by Typhoid Fever with 23.2%. Poliomyelitis and infective Hepatitis were the lowest with 0.2% and 7.3% respectively.

On the other hand the result shows that morbidity burden from WBDs is higher in Anambra West LGA, with 35.5%, followed by Ogbaru LGA with 33.3% and Anambra East with 31.2%. Although the percentage difference is not quite much, it could be an indication of difference in the conditions within the LGAs.

HYPOTHESES TESTING

Four hypotheses formulated in this study are hereby tested as shown below. The data used for the four hypotheses are of the same kind, except that each hypothesis tests for different variables. Hence, the analysis of variance was used to test the significance of difference observed between the variables.

Hypothesis 1

HO: There is no relationship between prevalence of WBDs and level of education

HI: Prevalence of water-borne diseases decreases as the level of education of household heads increases

Table 4:16

Relationship between WBDs and Educational level

Highest level of education	Typhoid	Dysentery	Infectious Hepatitis	Cholera	Diarrhoea	Intestinal worm	Total %
No Formal Education	37 (44.05)	22 (43.14)	5 (41.67)	5 (71.43)	43 (39.09)	25 (39.06)	137 (41.77)
Primary Education	23 (27.38)	17 (33.33)	5 (41.67)	2 (28.57)	37 (33.64)	21 (32.81)	105 (32.01)
Secondary Education	18 (21.43)	10 (19.61)	2 (16.67)	0	26 (23.64)	16 (25)	72 (21.95)
Tertiary Education	6 (7.14)	2 (3.92)	0	0	4 (3.64)	2 (3.13)	14 (4.27)
Total	84 (100)	51 (100)	12 (100)	7 (100)	110 (100)	64 (100)	328 (100)

Table 4:16 above shows the distribution of water-borne diseases among people of different educational levels. In the case of Typhoid for example, 44.05% of the disease was found among those with no formal education. When this category is combined with people whose highest level of education is primary education, it gives 71.43% of the disease distribution. This contrasts sharply with 21.43% for those with secondary education and 7.14% for those with tertiary education. When the distribution of other water-borne diseases is also compared across educational groups, the pattern is the same. It is seen from the above Table 4:16 that 76.47% of dysentery, 83.34% of Infectious Hepatitis, 100% of the Cholera, 72.73% of Diarrhoea, and 71.87% of Intestinal Worms were found among those

with no formal education and those with primary education as their highest level of education. It could be concluded from this result, that burden of water-borne diseases was higher in those households where the highest level of education for either of the household heads or both, was primary education or no formal education.

Table 4:17

Analysis of Variance (Two-way ANOVA)

Source of variation	Degree of Freedom	S.S.	M.S.	V.r.	F pr.
Incidence	5	2028.83	405.77	10.81	< .001
Education	3	1379.67	459.89	12.26	< .001
Residual	15	562.83	37.52	-	-
Total	23	3971.33	-	-	-

The result of the analysis shows that there is a significant difference in the incidence of WBDs among educational groups at F pr. 0.001. Education is therefore considered as an important factor in determining the incidence of WBDs. The conclusion here is that incidence of WBDs tend to reduce with increased level of education of the household heads. Households where the household head's level of education is up to secondary level or above, experiences lower incidence rate of WBDs compared with those with lower level of education. As we can see from table 4:5:2 above, 73.8% of the morbidity

burden falls among those households with No formal education and primary education.

HYPOTHESIS II

HO: There is no significant difference in the incidence rate of WBDs between Communities with safe potable water and those without potable water.

HI: Communities with safe potable water experience lower incidence of WBDs than those that rely on unsafe water sources.

Table 4:18

Incidence of Water-borne Diseases Among Communities

Communities	Incidence of WBDs							
	Typhoid	Amoebic Dysentery	Hepatitis A	Cholera	Diarrhoea	Intestinal Worm	Poliomyelitis	Total (%)
Atani	10	7	2	0	16	9	0	44 (13.29)
Nneyi Umuleri	14	7	0	0	18	12	1	60 (18.13)
Nzam	16	10	4	1	21	10	0	73 (22.05)
Ogbakuba	14	10	3	2	20	11	0	62 (18.73)
Oroma Etiti	18	11	2	4	23	13	2	52 (15.71)
Otuocha	12	6	1	0	12	9	0	40 (12.08)
Total	84	51	12	7	110	64	3	331 (100)

The above Table 4:18 shows the distribution of different water-borne diseases among the five riverine communities of study. The Table shows that Diarrhoea diseases followed closely by Typhoid were the most common water-

borne diseases among the riverine communities of study. However, between the communities of study, incidence of WBDs was higher in Nzam with 22.05% followed by Ogbakuba and Nneyi Umuleri with 18.73% and 18.13% respectively. Looking at these communities, one would wonder why some communities had higher WBDs incidence than others. Several factors may be relevant here, but differential in major sources of water and sanitary conditions would appear more relevant. Reference can be made to Table 4.6, which shows major sources of drinking water to communities. Also, when this is collaborated with data in Table 4.23 we would find that incidence of WBDs were higher among those exposed to unsafe water sources.

Table 4:19

Analysis of Variance (Two-way ANOVA)

Source of variation	Degree of Freedom	S.S.	M.S	V.r.	F pr.
Communities	5	107.548	21.510	9.09	< .001
Incidence	6	1733.905	288.984	122.19	< .001
Residual	30	70.952	2.365	-	-
Total	41	1912.405	-	-	-

Result of the analysis shows that there is a significant difference in the incidence of WBDs among the communities, at F pr. < 0.001. The distribution of these diseases amongst communities is not even. The highest morbidity burden of 22.1% was found in Nzam the headquarter of Anambra West LGA. This is followed closely by Ogbakuba with 18.7%. On the other hand, Otuocha has the

lowest burden of 12.1%. The result is that there is a significant difference in the incidence of WBDs amongst the six communities.

Hypothesis III

HO: Incidence Of WBDs Is Equal Among Occupational Groups

HI: Some Occupational Groups Experience Higher Incidence of WBDs than others.

Table 4:20

Relationship between Incidence of Water-borne Diseases and Occupation

Occupational categories	Incidence Of WBDs							Total (%)
	Typhoid	Dysentery	Infectious Hepatitis	Cholera	Diarrhoea	Intestinal Worm	Poliomyelitis	
Farming /Fishing	45	31	8	5	48	24	2	163 (49.24)
Trading	9	5	1	Nil	21	17	1	54 (16.31)
Civil Servants	12	6	2	Nil	16	8	Nil	44 (13.29)
Artisans	18	8	1	2	22	13	Nil	64 (19.34)
Professionals	Nil	1	Nil	Nil	3	2	Nil	6 (1.81)
Total	84	51	12	7	110	64	3	331

Table 4:21

Analysis of Variance (Two-way ANOVA)

Source of variation	Degree of freedom	S.S.	M.S.	V.r.	F pr.
Incidence	6	2079.37	346.56	7.00	< .001
Occupation	4	1921.14	480.29	9.70	< .001
Residual	24	1188.06	49.50	-	-
Total	32	5188.57	-	-	-

The result of the analysis shows that there is a significant difference in the incidence of WBDs among different occupational groups at F pr. 0.001. A look at table 4:20 shows that greatest burden of the disease is carried by those in Farming/Fishing occupation, with 49.2%, followed by Artisans with 19.3%. The least burden of WBDs was found amongst Professionals with 1.8%. So, the occupation of household heads was found to be related to the incidence of WBDs in their households. It is most likely that those who are farmers/fishermen or women are likely to involve members of their households in their farm work. Consequently, they get exposed to the same condition especially when they are in the farm. Most often, they drink from the same source, using the same utensils. Moreover, the type of water commonly available to them in the farm is pond, river or stream, which are most often unfit for consumption, i.e. they are subject to contamination.

It is also important to note that occupation is a vital aspect/factor of socio-economic status. When combined with other social class indices, it could be a good indicator of correlation between social class and incidence of WBDs.

HYPOTHESIS IV

HO: Incidence of water-borne diseases is equal in both households where modern medicine is used and where traditional medicine is used.

HI: There are fewer cases of water-borne diseases in households where modern health care services are used for water-borne diseases than in households where traditional medicine is used for it.

Table 4:22

Type of Health Care and Incidence of Water-borne Diseases

Type of Health Care Used	Incidence of WBDs							Total (%)
	Typhoid	Dysentery	Infectious Hepatitis	Cholera	Diarrhoea	Intestinal Worm	Poliomyelitis	
Modern Health Care	32	10	3	1	29	18	0	93 (28.1)
Traditional Health Care	23	26	4	4	46	9	2	114 (34.44)
Patent Medicine Store	29	15	5	2	35	37	1	124 (37.46)
Total	84	51	12	7	110	64	3	331 (100)

Table 4:23

Analysis of Variance (Two-way ANOVA)

Source of variation	Degree of freedom	S.S.	M.S.	V.r.	F pr.
Incidence	6	3521.14	586.86	10.86	< .001
Health	2	120.10	60.05	1.11	0.362
Residual	12	648.54	54.05	-	-
Total	20	4289.81	-	-	-

The result of the analysis shows that there is a significant difference in the incidence of water-borne diseases with regard to use of health care services. We can conclude that incidence of WBDs is high among those who use Patent Medicine Stores and Traditional Health Care for their treatment of WBDs than those who use Modern Health Care. The fact is quite glaring when we examine the percentage difference in the incidence of WBDs among users of different health care services in table 4:21 above. On the other hand the F probability ratio shows that there is no significant difference with regard to the type of health care used by the respondents. In other words, the three types of health care systems are commonly used in the communities. This is no doubt a function of availability of health care service available to the communities. It pertinent to point out that apart from Otuocha, most of these communities do not have adequate and functional modern health care services, hence, they resort to what ever is available to them.

Table 4:24
Incidence of water-borne diseases among different communities sources of water

Communities Communities	Typhoid						Cholera						Diarrhoea						Hepatitis B					
	Spring water	Rivers/pond	Rain water	Pure water	Borehole	Tanker	Spring water	River/pond	Rain water	Pump water	Borehole	Tanker	Spring water	River /pond	Rain water	Pump water	Borehole=	Tanker water	Spring water	River/pond	Rain water	Pump water	Borehole	Tanker
Atani	-	6	2	-	1	1	-	-	-	-	-	-	-	11	4	-	-	1	-	2	-	-	-	-
Ogbakuba	-	11	3	-	-	-	-	2	-	-	-	-	-	15	3	-	-	2	-	3	-	-	-	-
Oroma Etiti	-	8	2	-	-	-	-	3	1	-	-	-	-	18	4	-	6	-	-	2	-	-	-	-
Nzam	-	12	1	-	3	-	-	1	-	-	-	-	-	13	7	-	6	-	-	3	-	-	1	-
Otuocha	-	7	1	-	2	2	-	-	-	-	-	-	-	7	2	-	1	2	-	1	-	-	-	-
Nneyi Umuleri	8	-	2	-	1	3	-	-	-	-	-	-	5	-	6	-	3	4	-	-	-	-	-	-
Total	84						7						110						12					

Table 4:25

Latin Square Design (A Three-Way ANOVA)

Source Of Variation	Degree of Freedom	S.S	M.S	V.r	F pr.
Community	5	17.356	3.471	1.77	0.123
Incidence	5	303.301	60.660	31.02	<.001
Water	5	435.301	87.060	44.52	<.001
Comm. Incide.	25	26.171	1.047	0.54	.964
Comm. Water	25	253.171	10.127	5.18	<.001
Incide.Water	25	330.227	13.209	6.75	<.001
Residual	125	244.468	1.956	-	-
Total	215	1609.995	-	-	-

The above analysis shows that there is significant difference in the incidence of water-borne diseases at 0.001 level of significance, as is observed in the general distribution of these diseases. Also, with regard to the sources of water used, the analysis shows a significant difference at level of significance 0.001.

When interaction between different variables is measured, the result shows that there is a significant difference between communities and the water they use as well as between incidence of the different water-borne diseases and the water source available to the communities. The essence of this Latin Design type of analysis is to establish the points of interaction and the significance of such interactions between different variables.

ETHNOGRAPHIC ANALYSIS OF QUALITATIVE DATA

This section is concerned with interpretative analysis of qualitative data generated through the use of Focus Group Discussions and In-depth Interview of Key Informants.

The results from these tools are presented by taking up in sequence, issues raised during the fieldwork, as are contained in the FGD and KII schedules. The findings from the six communities revealed a lot of commonness both in the cultural beliefs and practices. On the other hand, there is some degree of variation in their levels of infrastructural development in terms of roads and water supply, which brought a lot of difference in health care delivery and access to health care. The result of these tools provided an in-depth insight into several issues as is shown below:

Major Health Problems: The prevalence of malaria and typhoid came out clearly in FGDs and personal interviews with the Key Informants. For instance, during the FGD at Nzam, one of the participants, observed that the issue of typhoid is a recent event in the area when he said that, "The disease people used to suffer here is malaria, but in recent times we began to hear about this typhoid disease which is becoming very threatening". Diarrhoea was also reported to be more rampant among children. One of the Key Informants, a Medical Director reported, "typhoid fever is endemic here but during rainy season, especially when the first rain comes there is an upsurge". This he attributed to poor sanitary condition

when he said, "refuse disposal and toilet system are so primitive in this area", so the early rains wash down the faeces and waste deposits on the land into the rivers. This he noted increases the contamination of the rivers, which at that period are more concentrated and yet appear sparkling and neat.

Beliefs About Water and WBDs: In the FGD for the unmarried youths it came out clearly that most of the people harbour the belief that what is in the water does not kill. However, they felt that this view was more especially among the adults and uneducated ones. The FGD with married adult group also confirmed this fact. As was expressed in their local dialect, *"nnu ạda atu Ohimili"*, which literally means that the taste of salt cannot be noticed when it is added to the River Niger. This is interpreted to mean that the River Niger is too big and their faeces are too small to have any appreciable impact on it. This fact was also collaborated by a primary school teacher at Ogbakuba, who informed that most people in the area do not build toilets. They use open pits, or prefer to go to the bush or in the stream. He attributed this action to the belief that what is in the water does not kill or that, "*nnu ada atu ohimili*". However, awareness about causes of WBDs was still very low, as most of the people still believe in their streams and rivers as good sources of household water.

The discussions revealed that most of the water-borne diseases exist in the communities. Cholera for instance, was revealed to exist in some communities more than others. In Ogbaru one of the Key Informants reported that some remote communities, like Akili Ogidi had an epidemic outbreak of

cholera during the December period of 2000, in which many lives were lost. The FGDs held at Atani and Ogbakuba also confirmed this outbreak of cholera around December period of 2000 in some remote communities of Ogbaru L.G.A. Also in Anambra East participants in the adult session of the FDG there was a recent outbreak of cholera in Enugwu Otu area in Otuocha. In Anambra West outbreak of cholera was also reported to have occurred in some of the communities.

Community Health Workers: All the Key Informants agreed that Community Health Workers existed in their communities. However, one can conclude from the responses that the idea of community based health workers has not been quite functional in most of the communities. The health care workers complained about poor usage of modern health care facilities. On the other hand the people complained of inefficient system of health care delivery. In the interview with one of the Key Informants, a political leader in Atani, he expressed disgust with the level of services provided at the Health Centre, where he reported that "the medical doctor operated from outside the town and was most of the time not at work. No one could rely on that hospital for serious health cases....Most of our people prefer to go to Idemili or Onitsha for their treatment".

Water Supply: The communities differ in their access to potable drinking water. Most of the communities had boreholes, which were either functional, dried up or broken down at the time of our visit. Efforts were made to visit most of the

borehole sites. In Ogbakuba for example, there was no functional borehole as the existing ones were either broken down or dried up. One of the women during the FGD reported that "during the dry season, the water coming out of the borehole in our area was coming out very slowly and as the people were constantly trying to force water out of it, it got damaged". At the time of the survey, this community had no functional potable water. They relied on River Niger. Although they complained that the boreholes had rusty colour and were tasteful they were keen to have the boreholes repaired.

Atani had a few private boreholes, a broken-down public pump, and a few public boreholes out of which only two were functional. It was also reported that the functional ones were not good enough for drinking. They were reported to have rusty colours and were tasteful as well. One of the Key Informants, a community leader observed that "we used to have tap-water in this community but for some years now it has broken down. The hand pumps that some people (which refers to government or other agencies including UNICEF) sunk for us are not useful either. Some have broken down, while the ones that are functional the water are colourful and the taste is not sweet as natural water". Supply of water by Tankers was reported to be possible only during dry seasons due to bad road. As a result of difficulty in getting regular supply of water, most of the indigenes relied on River Onuko.

In Oroma and Nzam a few boreholes existed. The water from these boreholes was also reported not to be good for drinking. Similar experience was replicated in other communities. Hence, majority of the people relied on River

Niger and pond water for their drinking water. These communities were predominantly not accessible by road during rainy seasons. This made supply of water by tankers impossible during rainy seasons. Transport to remote communities in Anambra West and Ogbaru LGAs was mainly through engine boat during the rainy season. This makes supply of water even by Tankers very difficult during this season.

In Otuocha the interviews and FGDs revealed that there was no public pump and the people relied on a few private boreholes, which were still not accessible to majority of the people. However, because of its proximity to Onitsha and Nsugbe and the existence of a good-tarred road, supply of water by Tankers was quite regular and more reliable. In Nneyi Umuleri, similar experiences were narrated. There was no borehole but supply of water by Tankers was also possible because of good roads. The FGD sessions revealed that most of the people relied on spring water and borehole in a nearby community for their household water.

Toilet Facilities: It was revealed that the commonest toilet system in the communities is pit toilet and bush. Only a few rich people who have built modern houses, and could afford Water Cistern made use of it. Use of water or river for toilet was reported to be quite common especially during rainy seasons. One of the Key informants recalled that "during rainy season, most of the environment is covered by flood. Even some people who built pit toilets would have had them covered with water, and then they would be using canoe to row into the river to

defecate. It is just inevitable for most people in this area. We have no option". Apart from this condition there are people who ordinarily would prefer going to the river for their toilet. The focused group discussions in the other communities revealed that the condition was worse in them than in Otuocha and Atani. The condition depends on the extent to which the environment is covered by water during the rainy season.

Sanitation and Hygiene Condition: Hygiene behaviour was simply described as primitive by one of the interviewees, a medical doctor. As he pointed out, "open field defecation is very common here. Many people don't build toilets". This fact was also attested to by a key informant, who was a primary school teacher in Ogbakuba, when he reported that "open pit toilet was widespread in this community. It is difficulty to get buildings with good toilet facilities". The general view was that sanitary behaviour was poorer among farmers and fishermen. A political leader in Oroma Etiti informed that "the farmers because of their occupation, which takes them away from their homes do not have access to good water when they are in the farm. When you are in the farm or you go for fishing you just drink any water available". As a result of the absence of good water while in the farm, most of them do not mind so much about the quality of water they use. Such behaviours are often carried over even to their family lives. Such sanitary behaviours like sweeping the house, washing hands after visiting the toilet were common.

It was agreed that health seeking behaviour differs from person to person. However, most of the people use modern medicine especially when the situation has become very critical. However, the first point of call is usually to buy medicine from patent medicine store. In places like Nzam and Oroma Etiti, when people have serious health problems that required seeking the doctor, they go to Onitsha, which they regard as the closest place with good hospitals. They usually travel through the River Niger. In these communities there were no hospitals either private or public. The health centres that exist did not have doctors or laboratory units.

Factors In The Prevalence of Water-borne Diseases Among The Communities

In all the six communities of study, prevalence of WBDs was not in doubt. As was reported by some of the Key Informant Interviewees, who were either medical doctors or workers in the health care units, there is usually an upsurge in the incidence of WBDs like Typhoid and Cholera during the dry seasons, and more so during the early rains. The explanation for such upsurges is that in the dry seasons, when most of the boreholes would have dried up (for areas where they exist), and rain water is no longer easily available, most of the people rely on rivers, ponds and streams for their drinking water and for other household chores. Moreover during this season, the rivers do not contain debris from floods and their colours are quite bright and attractive for drinking. But quite on the contrary, the streams, rivers and ponds are much more concentrated and most of

them no longer flow out. This makes them much more prone to contamination with faecal and other materials.

As described by a private medical doctor, who happened to be one of the Key Informants, "when the early rains come, they wash down into the rivers, streams and ponds those faecal materials deposited in and around the banks of the rivers, streams and ponds". The people being oblivious of this process keep on drinking from these streams, rivers and ponds hoping to stop only when the colour has changed. To them, the colour and taste of the water are the only proof of its fitness for drinking. This level of ignorance, coupled with environmental constraints is responsible for the incidence and prevalence of water-borne diseases among the riverine communities.

CHAPTER FIVE

FINDINGS, CONCLUSSIONS AND RECOMMENDATIONS

INTRODUCTION

This study is specifically concerned with those infectious diseases that result from domestic use of contaminated water. Water-borne diseases belong to the class of those infectious diseases that have been threatening the life and health of most people in the underdeveloped world. Such diseases are known to be quite prevalent in Nigeria today (see Rooy, 1987; Egboka, 1989; Kinley, 1989). Although the riverine people have more water in their environment than other communities that live in the upland, most of the waters available to them are ponds, rivers, and stagnant lakes. These sources of water are subject to contamination and are therefore not suitable for drinking and other household needs. Most of the streams are used for household chores, including bathing especially in the river, washing of plates, clothes and as well serve as sources of drinking water. The result of this is that the waters are most often contaminated and this leads to frequent outbreaks of water-borne diseases, often reaching epidemic levels.

This section present a summary of the research findings and shows the implications of these findings. On the basis of these findings, recommendations

were made as to how to prevent future outbreak of epidemics of water-borne diseases as well as on how to reduce the incidence and prevalence of such diseases.

5.1 Summary of findings

The major findings of this research can be summarised as follows: Water-borne diseases are quite prevalent in the riverine areas and this fact is clear both from the sample results as is contained in Table 4:2 as well as in the hospital data which is presented in Table 4:14.

The prevalence of WBDs is a source of health concern to the people and this was clearly revealed both in the FGD sessions and Indepth Interviews, as when one of the Key Informants said, "the disease people used to suffer here is malaria, but in recent times we began to hear about this typhoid disease which is becoming very threatening".

The risk of incidence of WBDs is quite high in the riverine areas due to the poor sanitary condition especially with regard to open toilet systems, which were quite common as well as the use of surface and unsafe water sources for domestic use by most of the households. These facts are already discussed in Table 4:6 and Table 4:10 as shown in chapter four.

Also, in the discussion with a medical doctor in Otuocha, who has been practising medicine in the area for a long time, he revealed that sanitary behaviour was very poor in the area and open space defecation was rampant. This he noted increases the risk of WBDs during the early rain, as the first rain

usually washes down such faeces into the streams and the people being ignorant of this risk still go to fetch water from the streams for drinking and other household uses. It would be noted that at this stage the water has dried and concentrated in an area and usually appear quite clean and attractive to the people for drinking.

This study clearly confirmed the long-standing debate and argument that incidence of diarrhoea diseases are influenced by sanitary conditions in the community at large and household in particular. As the result of the findings of this study has revealed, incidence and prevalence of WBDs vary between households, being lower where educational level of household heads is high and where modern medicine is used for the treatment of WBDs. It was also found to be higher among certain occupational groups particularly those who are engaged in farming and fishing occupations.

Incidence and prevalence of WBDs was also found to vary between communities and the difference can be explained in terms of the unequal spread of infrastructural facilities such as roads, hospital services, safe water sources and so on.

Absence of infrastructural facilities particularly good motorable roads and inadequate health services were found to constitute the greatest obstacle to provision of health in the communities.

Also vital in the prevalence and high risk of outbreak of dangerous WBDs especially cholera is the non-functional status of many boreholes in the area, and

the poor quality of water from most of the functional ones, which makes a large number of the people to resort to their traditional and unsafe water sources.

These are some of the major findings of this research.

5.2 IMPLICATIONS OF THE FINDINGS

The findings made in this study will have a lot of implications for policy formulation and implementation, medical practice as well as future research efforts in Anambra State and Nigeria in general. In the first place, the connection between diseases like typhoid, cholera, diarrhoea to mention but this few, and quality of water and hygiene behaviour of the people can no longer be in doubt. Also, the long-standing debate on the interconnection between water, dirt and diarrhoea can now be laid to rest (Robson, 1990; Egboka 1989). The findings as seen, strongly support the view that interaction between hygiene behaviour and use of surface water (rivers, ponds etc) is essentially responsible for the occasional outbreaks of cholera or dysentery as well as widely scattered cases of bacterial diarrhoeas. The pandemic nature of such diseases during the early rains as reported especially by the medical practitioners and people in these communities lend credence to this fact.

Another very important implication of this research findings to policy formulation and implementation is revealed by the very fact that despite the number of boreholes sunk in these communities by both the WHO, Federal Government of Nigeria, UNICEF, Local Government Authorities and so on, these

facilities have not yielded the desired dividends. Essentially, these boreholes were sunk to stem the widespread nature of WBDs amongst these riverine communities and to put to an end the frequent out break of cholera, dysentery and other diarrhoea diseases. There is no doubt that the incidence of most of these WBDs has reduced significantly over the years in most of the communities. However, the question is, why were these water projects not able to do the expected magic of total eradication of WBDs in these communities, come the year 2000 as was popularly propagated by the governments? Does the answer lie in the health belief and practices of the people, or do we need to look beyond the immediate environment of these people? The answers to these questions might not be so easy to adduce. There is no doubt that the cultural beliefs and practices of a people holds so much to our understanding of their health condition, but a situation where the environment of living of a people constrains them to certain primitive level of living which they are not empowered to breakout from, to blame their culture as being static, primitive and unresponsive to changes will simply amount to blaming the victims. The socio-economic and political environment of life, which most often are transcendental to the people, almost entirely determined and imposed from outside, is known to have more deterministic influence on their health than the cultural beliefs and practices. It suffices here therefore, to say that what is important is not just to award a contract for boreholes and use it as a political tool for praise singing. The people may be in a dire need for potable water, but where the people adjudged such water as unfit for consumption, and they resort to their traditional sources of

water supply, or such project does not stand the test of time, such a project can best be described as nothing but a share waste of public fund.

The sinking of boreholes, which has as its primary policy goal to provide potable water for the rural people and to attenuate the frequent outbreak of WBDs, must also ensure that at the level of implementation such boreholes are deep enough to be all seasonal and to produce quality water. It is better to have two functional and adequate boreholes than to have six broken-down and inadequate boreholes. This therefore highlights the need to vigorously pursue the fifth objective of UNICEF WATSAN programme, which was "to mobilise communities and train artisans at village level for subsequent proliferation of adequate excreta disposal technology as well as financial and operational maintenance of water supply scheme".

The findings will also help to put the peoples' behaviour in the right perspective, to avoid a situation where they are seen as primitive people who in spite of the number of boreholes sunk for them prefer to go to streams and ponds for their household water. Some strangers looking at the problem from outside may see it as the people's inability to effect attitudinal changes. This will have a lot of implications on social theory formulations, so that some subjective interpretation of social action is very important for understanding and explaining why certain actions are taken. An external and objective observation of any social action without trying to discover the meanings of such actions to the people could obviously be misleading.

Although some of these communities have not experienced epidemic outbreak of these diseases in the past few years, one cannot rule out completely the possibility of such out breaks in them. Moreover, there are still widely scattered cases of such diseases, and isolated cases even in the relatively urbanized Local Government Headquarters of these communities. It is also important to point out that most remote communities in these LGAs still experience dangerous out break of cholera, typhoid, dysentery and diarrhoea diseases. Most of these communities do not have any health centre or health post; they are never visited by any medical doctor, neither are they attractive to private medical doctors. Also, the issue of health care as we have seen cannot be isolated from the provision of other infrastructural facilities especially roads and electricity. As a result of the bad road network leading into these communities, medical doctors do not find them attractive. This is not just peculiar to medical doctors. Most young men and women prefer to settle in the urban areas, so that even common patent medicine stores and good provision stores are often conspicuously absent in most of these communities. There is the need therefore for governments to address these problems through public policies.

However, when compared generally, we see that Otuocha is the community with the highest number of private hospitals and these hospitals were better equipped. Information has it that before the Otuocha communal crises, many more hospitals were located in this community. Some of them had just returned after the war. Many more may still return when permanent peace has

finally returned to the community. A single factor that marks this community out from others is good road network.

5.3 CONCLUSIONS

The study has been quite revealing, by indicating some social, economic and cultural factors that influence the incidence and prevalence of WBDs. Economically, majority of the people in these communities were farmers and fishermen. A good number engaged in petty trading on agricultural produce. Consequently, they were predominantly low-income people. The implication of this situation is that there is widespread poverty, even though they may have enough food and fish, but when it comes to matters like building improved pit toilet systems, or water cisterns most of them could not afford it. Also, because of poverty, more than ignorance many would only go to hospitals as a last resort, when other alternatives have failed them.

Another conclusion that can be drawn, looking at the low level of education amongst them is that ignorance cannot be ruled out as a crucial factor in the incidence and prevalence of WBDs. With regard to appreciating the grave danger which certain actions or life style they exhibit can pose to them such as defecating inside the very rivers from where they drink, or around such rivers, or the common belief that the colour and taste of water is enough to decipher its fitness for consumption and so on, one cannot but blame their ignorance. So, health education especially on sanitary must in practice be an integral part of

community health care and should also accompany the frenzy efforts to sink boreholes.

But above and beyond all these internal factors, is the fact that these communities are located and operate within a wider socio-economic and political system which they have virtually no control over, but which determines their living condition. This is primarily why this study is cushioned on Multifactoral Causation theory, Economic Deprivation theory, and Theory of Political Economy, all of which calls for a broader consideration of factors beyond the cultural beliefs and practices of the people to avoid 'blaming the victim' that characterises many socio-psychological theories such as the Health Belief Model. It may be important to focus also on "many economic, political, and socio-historical forces, which shape contemporary health problems and our approaches to these problems" (Minkler, et al. 1995:111). As Minkler, et al. (1995:113) further noted, "the possible range of health statuses and health behaviors of individuals is limited by their location in the social and economic system. As a result, a significant change in the health behaviour of any group of individuals is seen to require altering the social and economic context within which they live"

In the riverine areas the people are predominantly farmers and fishermen, live in a typical rural setting, with terrible road network most of which become impassable during rainy seasons, with inadequate health facilities, broken down boreholes, with the few functional ones producing coloured and tasteful water. Most of the people cannot afford good toilet facilities, and because of widespread poverty stick to those traditional lifestyles that were less costly to them. If

provision of boreholes is made to be durable with quality water, there is no reason why the people would continue to depend on streams, ponds and rivers for their drinking water and water for their other household uses.

The riverine communities are regarded as the 'food-basket' of Anambra state, yet they are the most impoverished people in the state. Due to the very poor condition of roads in the area (with the exception of Otuocha) and absence of basic infrastructural facilities of water, electricity and in many cases housing, it is not attractive to business people. This is why most of the communities did not have private hospitals or even good business establishments.

The problem of social inequality and marginalisation in all ramifications is quite glaring in these communities. Any attempt to reduce the problems of health in the area to primitive cultural beliefs, values and practices would simply amount to blaming the victim syndrome. To borrow a leaf from Minkler, et al. (1995:119) it is important that we avoid narrow frames of reference and consider broader issues of how political and economic forces affect daily life, and consequently consider the economic, occupational and political empowerment of the people. "Understanding the dynamics of the economic and political conditions under which people live their lives can provide ..." adequate knowledge and skill for dealing with a peoples' health needs (see Minkler, et al. 1995:113).

5.4 Recommendations

If the sanitary conditions in the communities are allowed to continue as they were, the danger of serious outbreak of cholera and increased prevalence of typhoid, diarrhoea, dysentery, intestinal worms and other deadly water-borne diseases is inevitable and imminent. To ensure that this threat of possible health disaster is averted, the following steps must be taken as a matter of urgency:

- Community health education through community health workers must be taken seriously. Each community must as a matter of urgency be provided with at least a functional health post or health centre which must be manned by a competent health officer. This requires that the health officers must be well trained in Information, Education and Communication (IEC) skills.
- Construction of boreholes must not be done to fulfil all righteousness or contract agreement as appeared to be the case in the boreholes found in most of the communities of this study. Most of the boreholes were either broken-down or produced water that had colour and taste thereby making them unacceptable to the people. Those who sink such boreholes whether UNICEF, FG, State or LGA must make sure that they are deep enough to provide all season quality water. Also, adequate maintenance mechanism must be put in place. Preferably, the community should be integrated through a community committee from the construction stage so that sense of ownership will be established.

- The use of VIP toilet system must be propagated extensively and intensively by the governments, international agencies and NGOs, since it is low cost, safer and would be affordable to these poor rural dwellers. This will help to deal with the open toilet system that was widespread and poses high risk to surface water contamination. More so, since it would be difficult to completely remove the people from use of these surface waters even with the provision of boreholes.

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QUESTIONNAIRE

INTRODUCTION

Dear Sir/Madam,

The researcher is a Ph.D student of Sociology / Anthropology, University of Nigeria, Nsukka.

He is currently doing a research work on water borne diseases in six riverine communities of Anambra State. This study is purely for academic purpose. As part of this research, he will be talking to a cross section of the communities, including household heads, operators of private and public hospitals. Your household has been randomly selected, among others for this study.

We would be grateful if you would answer questions about health and related issues. If you do participate, please be assured that the information you provide will be treated with utmost confidentiality.

Thank you very much.

Yours faithfully,

Nelson Oranye

INSTRUCTION

Please mark (√) with pen or pencil, any answer of your choice, and fill the space where necessary.

SECTION A

Demographic Characteristics

(a) Village.....

(b) Town.....

(c) L.G.A.....

(d) Age: 15 – 19 ( ) 20 – 24 ( ) 25 – 29 ( ) 30 – 34 ( ) 35 – 39 ( ) 40 – 44 ( ) 45 – 49 ( ) 50 – 54 ( ) 55 – 59 ( ) 60 – 64 ( ) 65 – 69 ( ) 70 and above ( ).

(e) Sex: Male ( ) Female ( )

(f) Religion: Traditional Religion ( ) Christianity ( ) Islam ( ) Others (Specify) ( )

(g) Major occupation (i) Farming ( ) (ii) Fishing ( ) (iii) Trading ( ) (iv) Civil Servant ( ) (v) Artisan ( ) (vi) Professional ( ) (vii) Others (specify) ( )

(h) Level of Education:

(i) No formal education ( )

(ii) Primary education ( )

(iii) Secondary education ( )

(iv) NCE / OND / Higher School Certificate ( )

(v) HND / University Degree ( )

(i) Could you estimate your annual/monthly Income Level?

.....

Section B (Disease Experience)

1. When was the last time you were sick?

   (i) I am currently sick ( ) (ii) I was sick last week ( ) (iii) I was sick last month ( ) (iv) I was sick in the month of ..... (v) I have not been sick since this year ( )

2. If yes to question No. 1 above, indicate the type of sickness.....

3. What illness do you usually suffer from.....

4. Which of these diseases have you experienced since December 2000. Indicate the number of times

Type of disease	Number of times
a. Typhoid	( )
b. Gastroenteritis	( )
c. Dysentery	( )
d. Infectious Hepatitis	( )
e. Cholera	( )
f. Diarrhoea	( )
g. Intestinal worms	( )
h. Poliomyelitis	( )
i. None	( )

5. Rank in order of importance (using 1st, 2nd, 3rd,....) the following diseases, signs and symptoms in your community

   Coughing ( )

   Headache ( )

   Fever ( )

   Diarrhoea ( )

   Loss of appetite ( )

   Gastroenteritis ( )

6. How frequently do you fall sick?

   (i) Daily ( ) (ii) weekly ( ) iii) Monthly ( )(iv) very rarely ( )

7. Does your stomach usually make a lot of noise (i) very frequently ( )

   (ii) frequently ( ) (iii) Sometimes ( ) (iv) rarely ( ) (v) Not at all ( )

8. Have you or any member of your family had any problem of frequent stooling and vomiting since December 2000?

   (i) Yes ( ) (ii) No ( )

9. If yes to question 8 above, how many times can you recall?

   .....

10. How long did the sickness last?

    (i) A few days ( ) (ii) a week ( ) (iii) Two weeks ( ) (iv) more than two weeks ( ) (v) Some months ( )

11. What do you think caused the sickness?

    (i) The water I drank ( ) (ii) Some evil forces ( )

    (iii) The food I ate ( )

(iv) Some Wicked People ( )

(v) No idea ( )

Section C:(Perception and Attitude towards waterborne disease and sanitation)

12. Do you think there is a connection between the diseases mentioned in question no.4 (name them) and the water people drink or use at home

(i) yes ( ) (ii) No ( ) (iii) No Idea ( )

13. If yes, what type of connection do you think exists?.....

14. State the most common sources of drinking water in your community (i) Taps (Pump) ( ) (ii) Stream ( ) (iii) Pond ( ) (iv) Irrigation Canals ( ) (v) Rivers ( ) (vi) Rain water ( ) (vii) Pure water ( ) (viii) bore hole water ( )

15. Indicate the sources of your water and purposes for which they are commonly used in your community.

Sources	Drinking	Cooking	Washing of plates or hands	Bathing
Taps (pump) Stream or river				
Rain water				
Pond				
Irrigation canals				

16. Do you treat the water you use for drinking purposes?

(i) No ( ) If no, go to 19 (ii) Very rarely ( ) (iii) sometimes

(iv) Always ( )

17. Which of these methods of water treatment is used in your family

(i) Boiling ( ) (ii) Disinfectants (Izal,detol) ( ) (iii) Filtering ( ) (iv) Addition of alum ( ) (v) Others specify( )(vi) None of the above ( )

18. How often do you use any of the water treatments]

(i) Never ( ) (ii) very rarely ( )

(iii)Sometimes ( ) (iv) Always ( )

19.if no to question 16 above, what are your reasons?

(i) It is time wasting ( ) (ii) It is not necessary ( )

(iii) What is in water does not kill ( )

(iv) We have been using it for years without any Problem ( )

(v) It is too costly to treat water

(vi) I use tap water, so there is no need for treatment.

20. Indicate the type(s) of toilet system used in your Family

(i) Pit toilet ( ) (ii) Farm ( ) (iii) Bush ( )

(iv) River ( ) (v) Water Cistern (WC) ( )

21. Do you have the habit of washing your hands anytime you visit the toilet?

(i) Not at all ( ) (ii) Rarely ( ) (iii) Rarely ( )

(iv) Always ( )

22. How often do you bath in the stream?

(i) Never ( ) (ii) Very rarely ( ) (iii) Sometimes( )

(iv) Always ( )

SECTION D (Provision of health services)

23. What do you usually do when you start feeling sick?

(I(i) Ignore it until it becomes serious.( )

(ii) Go to church for prayer ( )

(iii) Buy drugs from chemists based on perceived Symptoms ( )

(iv) Take local herbs ( )

(v) Consult a medical doctor in the hospital ( )

(vi) Go to traditional medicine man ( )

24. Which of these health services do you usually patronize?

(i) Hospitals ( ) (ii) Clinics ( )(iii) Health centers ( )

(iv) Traditional medicine (v) Patent medicine shops ( )

(vi) Others Specify ( )

25. How close is the nearest hospital to your house

(i) A few poles away ( ) (ii) Non in my community ( )

(iii) A few kilometers away (estimate the distance in kilometers).....

26. Which of these facilities exist in your community

(i)Tap water ( ) (ii) Government hospital ( )(iii) Electricity ( )(iv) Private Hospitals ( )(v) Health care centers ( )

(vi) Patent medicine shops ( ) (vii) clinics

27. How many times have you been to hospital or clinic since December 2000?.....

28. How often do you visit a hospital doctor for medical check up?

(i) Weekly ( ) (ii) Monthly ( ) (iii) Every six months ( )

(iv) Once a year ( ) (v) I do not visit the hospital for check up ( )

29. When do you usually visit a hospital?

(i) Once I start feeling sick ( )

(ii) When the sickness is very serious ( )

(iii) After other means have failed ( )

(iv) Not at all ( )

30. Have there been immunization services in this community

(i) Yes ( ) (ii) No ( )

31. Have you ever been immunized (i) Yes ( )

(ii) No ( )

32. How many times can you recall?

.....

FOCUS GROUP DISCUSSION GUIDE

Introduction: The moderator will introduce the topic after greeting the participants telling them the objective of the study. The objective of this study is to determine those socio-economic and cultural factors that influence the incidence and prevalence of water-borne diseases among riverine communities of Anambra State, to be able to make recommendations for prevention of outbreaks of such diseases, which usually results in epidemics when occurred, as has been the situation in the past in these areas.

1. What are the major health problems in this community?
2. There are some diseases that are called water-borne diseases; we get them by drinking contaminated water. They include typhoid fever, cholera, dysentery, diarrhoea, hepatitis A, gastroenteritis, intestinal worms, and poliomyelitis. Are such diseases common in your community? Do you know any person suffering from any of them?
3. Are people aware that such diseases can be contracted from water we drink?
4. What are the major sources of water for drinking and other household chores?
5. Do people treat their water before drinking? If yes, what kind of treatment (boiling, use of alum, filtering etc.)?
6. Do you have tap water and/or borehole in this community? How many are they? Are they functional?
7. What kind of toilet system do people use in this community?
8. How would you describe hygiene behavior of people in this community?
9. Where do people usually seek solution for their health problems? What do you think are the reasons for their use or non-use of hospitals?

COMMUNITY LEADERS INTERVIEW GUIDE

1. What do you see as the major health problems in this community?
2. Are you aware that there are certain diseases that can be contracted through the water we drink or use during eating?
3. Are such water-transmitted diseases (cholera, diarrhea, dysentery, typhoid, hepatitis etc) common in your community?
4. What is the level of awareness about the causes of these diseases among your people? Do they see the water they drink as a possible source of diseases?
5. Let us talk about sources of water in this community. What are the major sources of water available to households in your community? Do you have tap water and/or boreholes in this community? If yes, how many are functional? We want to know if your people drink from these boreholes or pumps.
6. Does your community have community based health workers? If yes, how do you see their activities?
7. Do you have any government owned hospital in this community?
   If yes, how functional is it?
8. Are there problems related to health that you think government should give you urgent assistance?
9. What types of toilet system do your people use, and which of them is most common?
10. How would you describe the sanitary behaviour of people in this community?

APPENDIX

List of Key Informant Interviewees

Atani		
1	Dr N.A. Obi	Medical Director Comprehensive Health Centre, Atani
2	Chief D.A. Achike	Village head
3	Mr Emmanuel Nzeli	Councillor Atani Ward
Ogbakuba		
1	Mr T.N. Obi	Primary School Teacher
2	Miss Eunice Okoli	Nurse, Getwell Hospital and Maternity (a private maternity hospital)
3	Chief Ugboma Nwabueze	Village chief, Umuizagbo village.
Nzam		
1	Chief U.N. Obah	Community Leader
2	Mrs C. Ejoo	Health Officer, Anambra West LGA
3	Mr Vincent Chukwueme	Church Leader, (Anglican Church)
Oroma Etiti		
1	Mrs Mary Ezuko	Primary School Teacher
2	Mr Felix Chukwurah	Health Officer, Oroma Health Centre
3	Chief Julius Chinwuba	Former Councilor Oroma Ward
Otuocha		
1	Dr Anago Amanze	Medical Director, Chinedu Hospital, Otuocha
2	Mrs J. Okafor	Staff Nurse, Multi Care Hospitals Annex, Aguleri Otuocha
3	Rev. Jerome Oguegbe,	Religious Leader (Pentecostal)
Nneyi Umuleri		
1	Uderike Abokwe	Former Councilor, Nneyi Ward,
2	Chief Mike Ekweozor	Onowu of Umuleri
3	Mrs Augustina Okafor	Women Community Leader.

COMMUNITIES IN LOCAL GOVERNMENT AREAS OF STUDY

Anambra West LGA

1. nzam	R
2. Ode	R
3. Igbokenyi	R
4. Igbedo	R
5. Odekpe	R
6. Ala na Onugbe	R
7. Onon	R
8. Umueze Anam	R
9. Oroma Etiti	R
10. Umuikwu	R
11. Umudora	R
13. Nmiata	R
14. Iyiora	R
15. Umuoba Abegbu	R
16. Oroma Otu	R
17. Isiokwe Otu	R
18. Onola	R
19. Enugu Otu	R

Anambra East LGA

1. Otuocha	R
2. Umuleri (Otuocha)	R
3. Umuleri (Inland Town)	
4. Aguleri (Otuocha)	R
5. Aguleri (Inland town)	
6. Umuatulu Umuleri	
7. Nneyi Umuleri	R
8. Nnadi	
9. Abata Nsugbe	
10. Nando	
11. Igbariam	

Ogbaru LGA

1. Iyiowa Odekpe	R
2. Odekpe	R
3. Ohita	R
4. Atani	R
5. Akili Ozizor	R
6. Umu-uzu	
7. Ochuche	R
8. Ogbaku	R
9. Umunakwo	R
10. Mputu	
11. Ossomala	R
12. Obagwe	R
13. Ogwuaniocha	
14. Akili Ogidi	R
15. Ogwu-ikpele	R
16. Amiyi	R


45°
7°
STATE
ENUG
ANAMBRA
FOREST
RESERVE
Umueje
River
Otu Ifite
Ifite Ogwari
Islokwe Otu
Enugu Otu
Obodola
Igbakwu
AYAM ELUM
Afo na Onugwe
Odekpe
Inoma
Oroma Otu
Anambra
Omor
Onola
ANAKU
Igbokenyi
NZAMI
NZAM
Ivioro
Ode
Nmiata
Umuoba
Okpoga Farm Settlement
River
Igbariam
NIGER
Nkwo Oji
ANAMBRA
Umuenwelum
WEST
Nando
Aguleri
OTUOCHA
Umueze Anam
Oroma Etiti
Aguleri
Umudora
Umulkwu
River
ANAMBRA
Umuleri
Nneyi
Umuleri
Umuatulu
Umuleri