

UNIVERSITY OF CAPE COAST

**SOCIO-CULTURAL DIMENSIONS OF BURULI ULCER INFECTION IN
THE
UPPER DENKYIRA DISTRICT**

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AGNES-RITA ADOMAH

**A THESIS SUBMITTED TO THE DEPARTMENT OF GEOGRAPHY
AND TOURISM OF THE FACULTY OF THE SOCIAL SCIENCES,
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DEGREE IN GEOGRAPHY**

JUNE, 2003

CANDIDATE'S DECLARATION

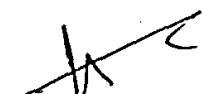
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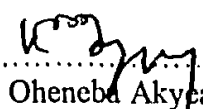
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SUPERVISORS' DECLARATION

We hereby declare that the preparation and presentation of the thesis were supervised in accordance with the guidelines on supervision of thesis laid down by the University of Cape Coast.


.....
Prof. Kofi Awusabo-Asare
Principal Supervisor
(Name and Signature)

Date.....28/06/04.....


.....
Dr. Oheneba Akycampong
Co-Supervisor
(Name and Signature)

Date.....23rd June 2004.....

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DEDICATION

This work is dedicated to the glory of God
and to all Buruli ulcer patients

ABSTRACT

Buruli ulcer, a disease of the skin is endemic in some parts of Ghana and currently has no cure. Researches are still being conducted to get more information on the disease. This study assessed the perception of and reactions to the disease, the coping and supporting mechanisms among affected persons and other members in the households of affected persons. It also explored the socio-cultural dimensions of predisposing factors to the disease in the study area using a modified proximate determinants model.

Data were collected through focus group discussions and field observation and interviewing 100 Buruli patients (51 females and 49 males), 100 relatives of patients and eight opinion leaders. Six hundred and sixty three (663) members from the households of 100 relatives (142 patients and 521 without the disease) were also interviewed. Results from the study indicated that intermediate factors such as injury, environmental contamination, nutrition, personal illness control, household size, education, occupation and income influence the contraction of the disease. The disease affected more women aged between 20-49 than men in the same age category. This is because by their traditional role, women were more exposed to the element of injury, making them more vulnerable to the disease. It was also observed that children less than 10 years of age were less at risk of Buruli ulcer infection as compared to those 10 years and above, as a result of differential contact within the physical environment. Peoples' perception of what constituted the causative agent influenced health-seeking behaviour. About 90

percent of the Buruli patients and their relatives have accepted the Buruli situation and were adopting innovative measures to treat it. The family (especially parents and sisters) is a major source of support to Buruli patients.

As a disease of the environment, health education is very important in dealing with the spread and treatment of infection. To this end, audio-visual aids and demonstrations on preventive and treatment measures are needed to enhance health education. The Ministry of Health should implement concerns of Buruli ulcer in its policies and should monitor the implementation of free treatment of the disease in order to ease the burden of purchasing drugs outside the hospital. The District Assembly should take steps to ensure that funds from the Government's Poverty Reduction Strategy Programme are made available to assist endemic communities with poor access to health facilities. A proposed Buruli Ulcer Fund Initiative (BUFI) should be set up and contributions from religious bodies, Non Governmental Organisations (NGOs), companies and individuals put into it in the bid to assist Buruli patients.

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CHAPTER ONE

INTRODUCTION

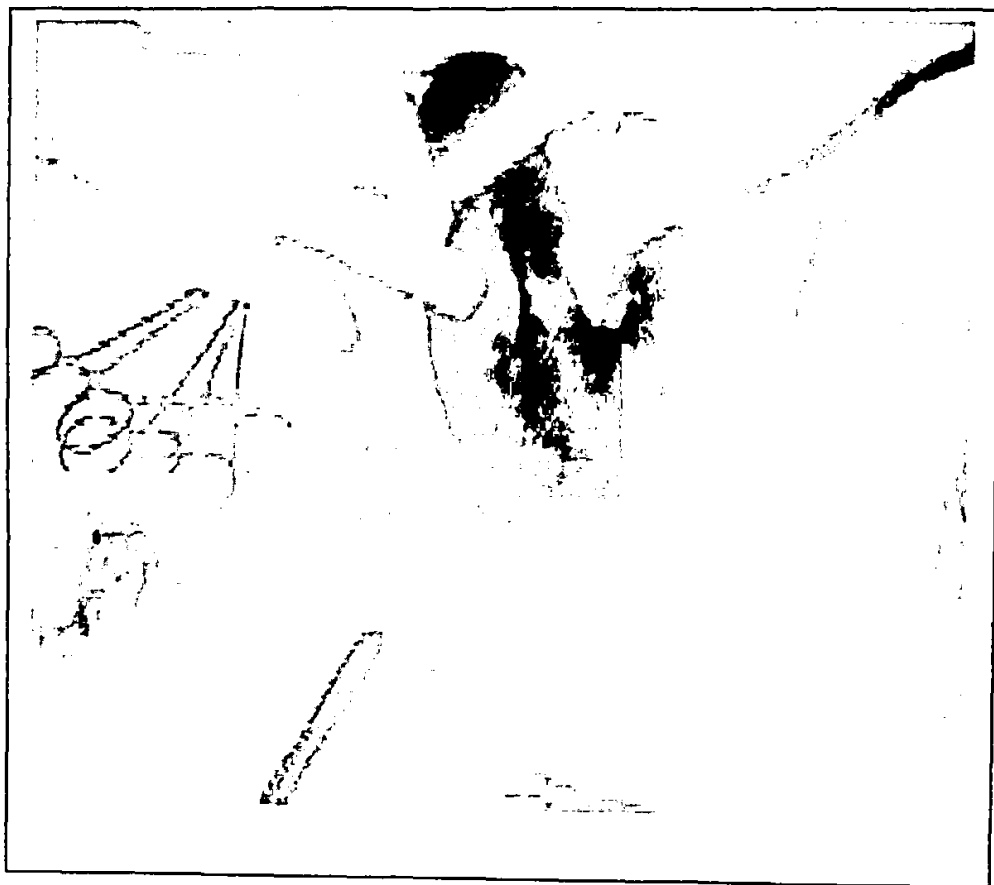
1.1 Background

In any defined ecological region, humans face biological, physical, social and health challenges. At different points in time, various diseases have affected humans. For instance, there is evidence that spinal tuberculosis existed in Neolithic skeletons and early Egyptian remains (Lankinen et al., 1994). And there are references to leprosy in the Bible (Leviticus 13: 1). However, it took over a century to get a cure for leprosy and tuberculosis which were discovered in 1887 and 1882 respectively (Lankinen et al., 1994).

There is also the problem of obtaining effective chemotherapy at the onset of a number of diseases in the world. Ebola and Acquired Immune Deficiency Syndrome (AIDS) are conditions that have no effective drugs for treatment at present. Buruli ulcer is another disease of which little is known and has no effective chemotherapy and cure (WHO, 2002). Buruli ulcer is a disease of the skin that is caused by an organism called 'mycobacterium ulcerans'. It is the third most common mycobacterium infection of humans after tuberculosis and leprosy. Mostly affecting the limbs, it starts as a painless swelling (called nodule) in the skin and causes severe deforming ulcers if it is not detected and treated on time (WHO, 2000). It is known that the causative organism enters the skin through abrasion or a cut. However, it is yet to be confirmed whether the disease can

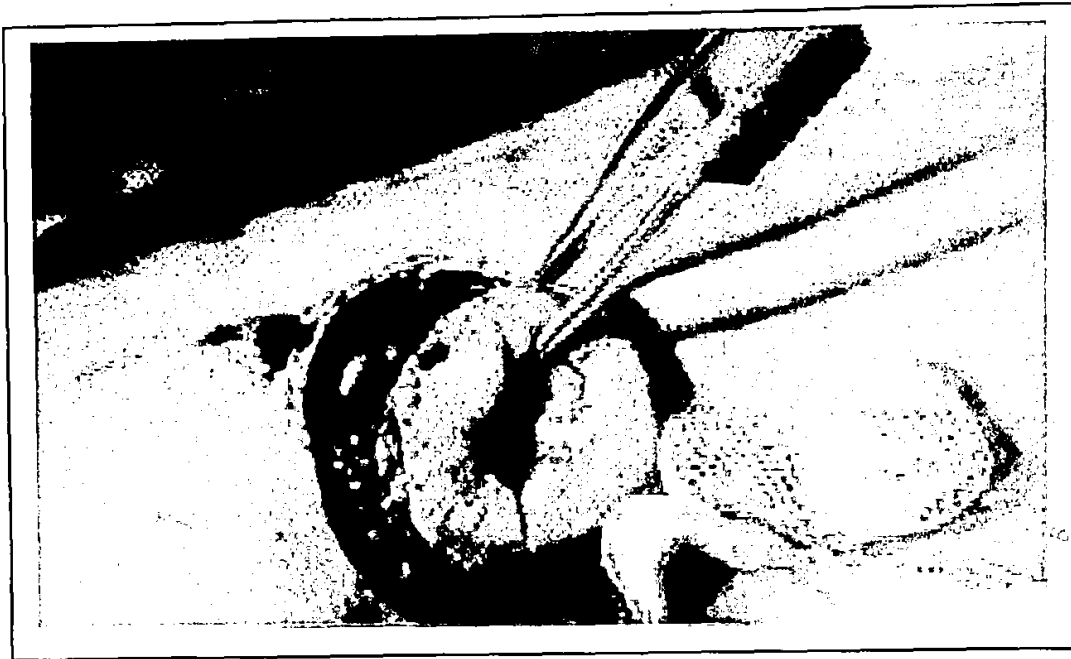
spread through contact from person-to-person or through insect bite. At present, the most effective treatment is through excision as shown in Plates 1.1 and 1.2. Therefore, there is the need for more studies into the nature, spread and treatment of the disease. According to the World Health Organization (WHO, 2000), an organism of the same family causes Buruli ulcer, leprosy and tuberculosis.

Plate 1.1: Excision of a nodule



SOURCE: Extracted from WHO, (2000)

Plate 1.2: Excision of an early ulcerative lesion



SOURCE: Extracted from WHO, (2000)

Buruli ulcer reaches an advanced stage when it is not treated early (Plates 1.3 and 1.4).

Plate 1.3: Late ulceration



SOURCE: Extracted from WHO, (2000)

Plate 1.4: Post ulcerative sequelae (amputation of the upper limb as a result of Buruli ulcer)



SOURCE: Extracted from WHO, (2000)

McCullum discovered the disease in a child from Bairnsdale in Australia in 1940. So in Australia, the disease is commonly referred to as 'Bairnsdale Ulcer'. In 1948, the first clinical description of the disease was published (Tjip S. Van der Werf et al, 1999). But before this time, Sir Robert Cook had observed the disease in 1897 in a region near the Nile River in Uganda. A Ugandan Group studied the disease extensively and opted for the term 'Buruli Ulcer' because large numbers of cases were first detected in the district of Buruli near Lake Kyoga in Uganda

(WHO, 2000). Globally, Buruli ulcer is endemic in at least 25 countries in Africa, Western Pacific, Asia and South America (WHO, 2001) as shown in Table 1.1

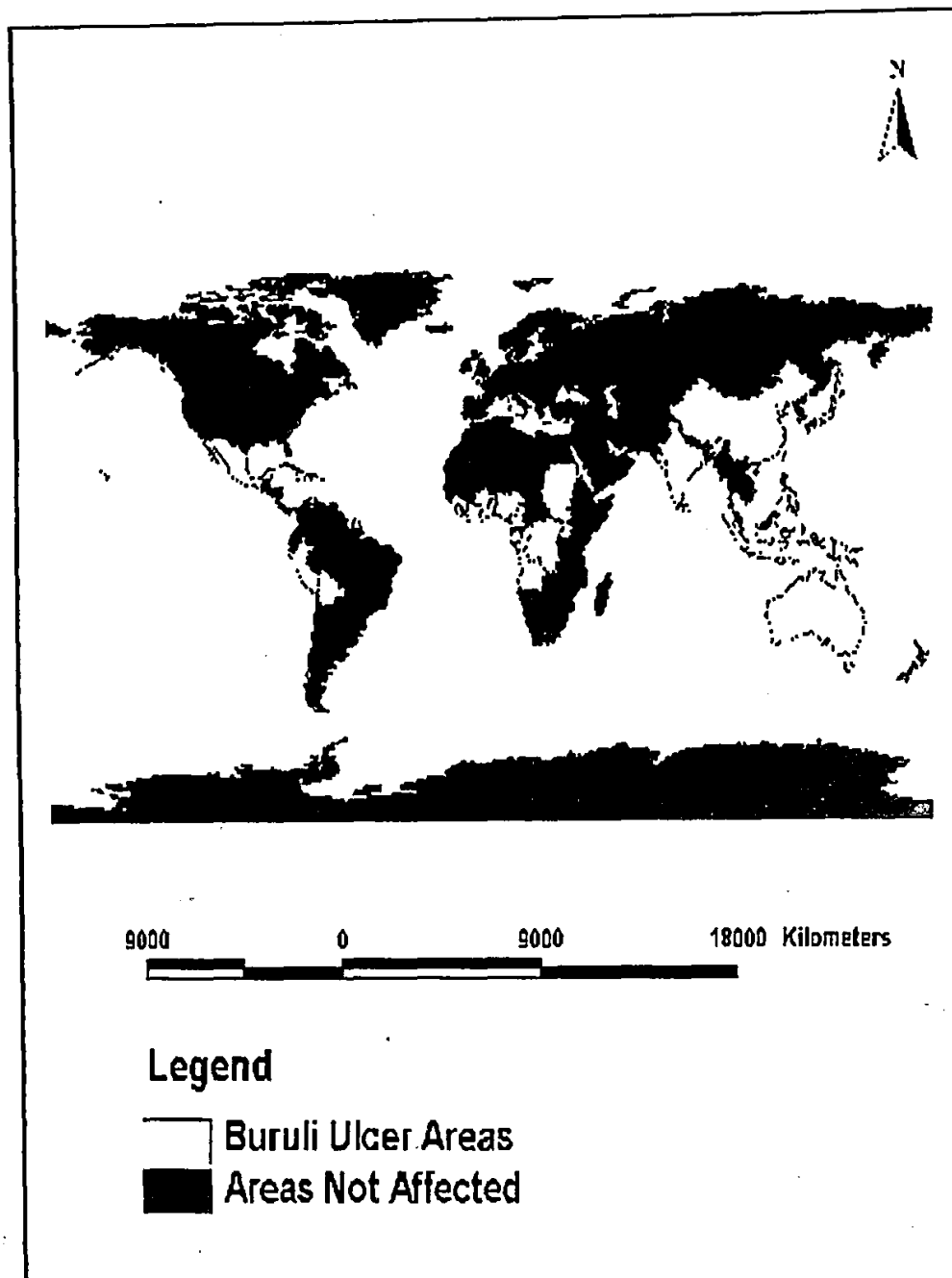
Table 1.1: Buruli Ulcer Endemic Countries

West Africa	Central Africa	Asia	South America	West Pacific
Benin	Angola	China	Bolivia	Australia
Burkina Faso	Cameroon	India	French Guiana	Papua New Guinea
Ivory Coast	Congo	Indonesia	Mexico	Kiribati
Ghana	DR. Congo	Sri Lanka	Peru	
Guinea	Gabon	Japan	Surinam	
Liberia	Sudan			
Nigeria	Uganda			
Togo				
Sierra Leone				

SOURCE: WHO, 2000

Map1.1 is a world map showing the distribution of global endemic countries.

Map 1.1: Buruli Ulcer Endemic Countries



SOURCE: Adapted from WHO, 2002

Buruli ulcer endemic countries lie mostly within the tropics. It is however a puzzle why a predominantly tropical disease flares up occasionally in Australia and why a tropical disease appears in a temperate region (Dobos and King, 1999). It is possible that several insect-related vectors from tropical areas could spread their range into temperate areas as temperatures rise (Bethrem, 1992) or through migration.

Buruli ulcer is prevalent in wetlands in marshy humid areas. The nature of Buruli ulcer's association with water bodies is, however, not very clear. For instance, in Uganda, the disease is common along the Nile River. In Cote'd Ivoire, the first case was reported from Lake Kossou and in Liberia, cases were reported from swamp rice fields (WHO, 2000). In Ghana, the disease is endemic along rivers such as Offin, Pra and Tano (Ennin, 2000). In 1998, the disease was reported in Ashanti, Eastern, Central, Volta, Brong-Ahafo and Greater Accra Regions of Ghana. As at 1999, the Ashanti Region was leading with 2,080 reported cases (Table 1.2).

In Ghana, local names such as 'Odonte hela' describing the cotton wool appearance associated with the fatty necrosis is given to the disease. It is also called 'Aboa gbonyo' (dreadful disease) and 'Asante asane' implying the disease might have originated from the Ashanti Region (Ennin, 2000). People in the Upper Denkyira District refer to the disease as 'Mpompo bone' (dangerous boil).

Table 1.2: National Case Search for Buruli Ulcer, Ghana, 1999

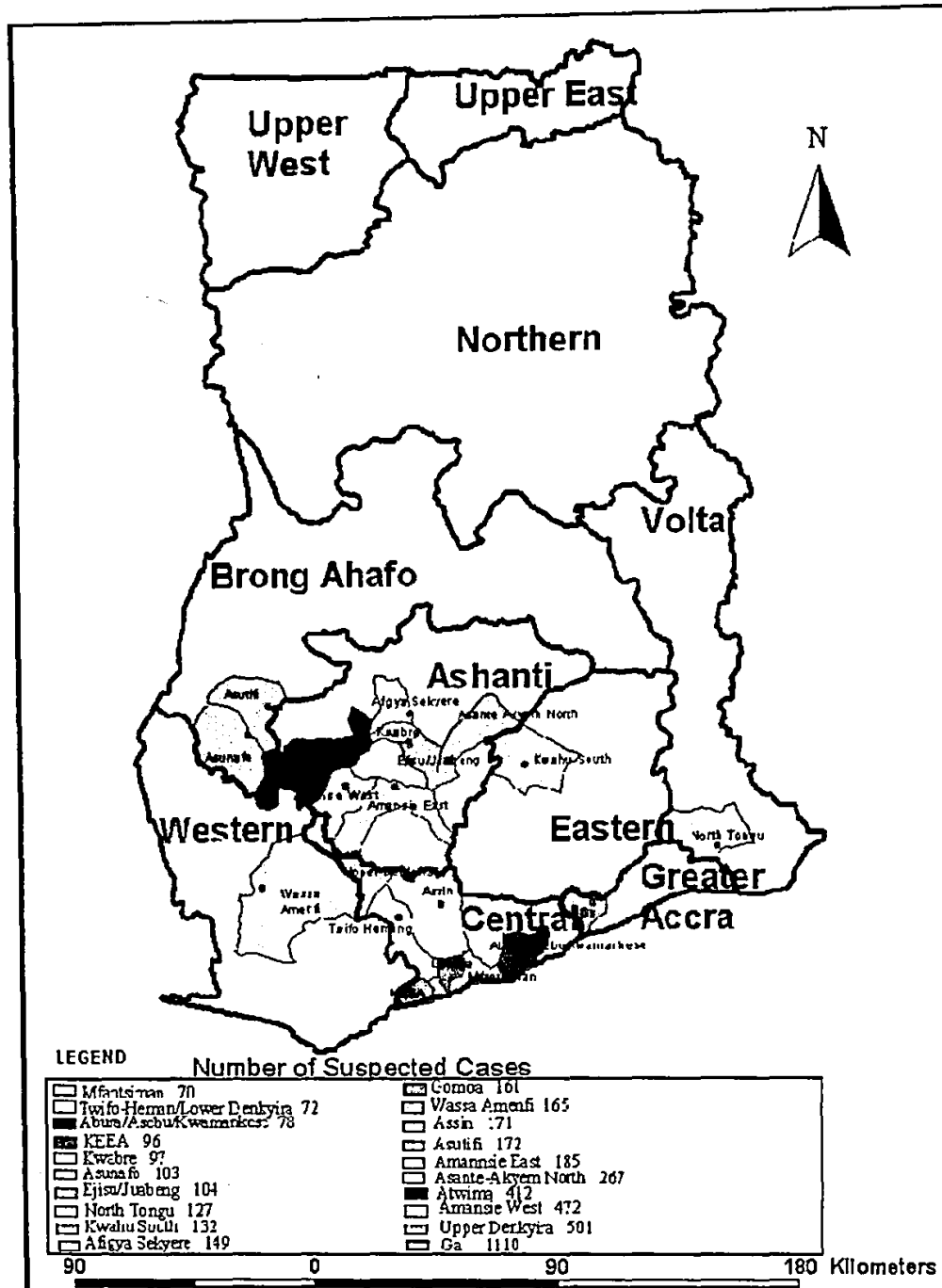
REGION	TOTAL
Ashanti	2, 080
Central	1, 395
Greater Accra	1, 164
Eastern	410
Western	360
Brong-Ahafo	340*
Volta	203
Northern	155
Upper East	97
Upper West	94
TOTAL	6, 301

*The Table does not portray what actually pertains on the ground. For example, Brong Ahafo Region reported 550 cases at the end of 1999 (Disease Control Unit - MOH, Sunyani).

SOURCE: Ministry of Health (MOH), 1999

The Amansie West District in the Ashanti Region was reported to be the most affected district (GTV, 1998). But available statistics from the health authorities show that the Ga District of the Greater Accra Region is now the most affected area in Ghana (Map 1.2). Upper Denkyira District (the study area) has the second highest recorded cases of 510. In 2002, 168 new Buruli cases were reported in the area and 201 more cases in 2002 (Quaicoo, 2002). And in 2003, about 20 endemic communities were identified in the District (Quaicoo, 2003).

Map 1.2: Twenty most Endemic Districts of Buruli Ulcer in Ghana (1999)



SOURCE: MOH, (1999)

Currently, research on Buruli ulcer has been geared mostly towards the clinical detection and treatment. There are about 14 scientific studies on it recorded at the WHO website as against about five on socio-economic aspect of the disease (WHO, 2001, 2002). These researches have yielded new and important insights into the disease. For instance, the organism causing the disease has been identified, but the mode of transmission is not entirely known. There is the need, therefore, to study more of the socio-cultural aspects such as, societal perception of the disease, the nature of coping and supporting mechanisms adopted by individuals, communities and the society in general as well as the behavioural determinants of the disease and how it can be prevented and the incidence reduced.

1.2 Statement of the problem

The mode(s) of transmission of Buruli ulcer is not entirely known. It is, however, known that the disease is prevalent in wetlands and that women and children are the most vulnerable (WHO, 2000). It is not clear what makes women and children particularly prone to the disease. The study sought to examine factors (especially socio-cultural) that make the two groups of people vulnerable to the disease using the Upper Denkyira District of the Central Region as a case study.

Society and individuals tend to react to an unpleasant phenomenon such as the outbreak of a disease in a number of ways in what Davis (cited in Awusabo-Asare and Agyeman, 1993) refers to as the 'multi-phasic response to phenomenon'.

Since Buruli ulcer causes severe deformity and can lead to loss of organs such as the eye, breast or amputation of limbs, there is the problem of some people panicking and attributing the cause of the disease to the supernatural. Others may be angry and blame others for cursing them. With such perceptions, people may seek cure from sources such as fetish priests, herbalists and spiritualists. But Buruli ulcer is a disease, which at present is best treated through surgery (WHO, 2000). There was the need therefore to examine how people perceive the disease and how this affects health-seeking behaviour, the gender-specific roles that expose males and females differentially to the risk of contracting the disease and how individuals react to the incidence of the disease and the strategies individuals and groups adopt to cope with the disease.

1.3 Objectives of the study

The general objective of the study was to assess the socio-demographic and cultural dimensions of Buruli ulcer in Ghana. Specific objectives were to:

- (i) explore the socio-cultural factors predisposing people to the disease in the Upper Denkyira District;
- (ii) assess the perceptions of and reaction to the disease among individuals in the study area and
- (iii) examine the coping and supporting mechanisms adopted by individuals and households to the disease.

1.4 Rationale of the study

According to the WHO (2000), the Buruli ulcer disease was detected in 1940. However, not many studies have been conducted in the public health and social dimensions of the infection. One reason could be that the disease has affected a small proportion of people. Given that the impact of the disease on the affected people is so devastating and stigmatizing, examining the social dimensions of Buruli ulcer has become crucial. This study was an attempt to contribute to the information and knowledge about the geography of the disease in Ghana. Moreover, the study sought to document the challenges faced by Buruli ulcer patients, their caretakers and health-care providers. The outcome may be a useful input for policy and decision-making at all levels of the health delivery system (i.e. the District Assembly and the Ministry of Health). Additionally, the study would be a means to draw the attention to the state of affected communities. Findings and recommendations of the study might be useful for designing practical intervention programmes in the treatment and management of the Buruli disease. Finally, the study would also create avenues for further research and act as a reference for other researches.

1.5 Hypothesis

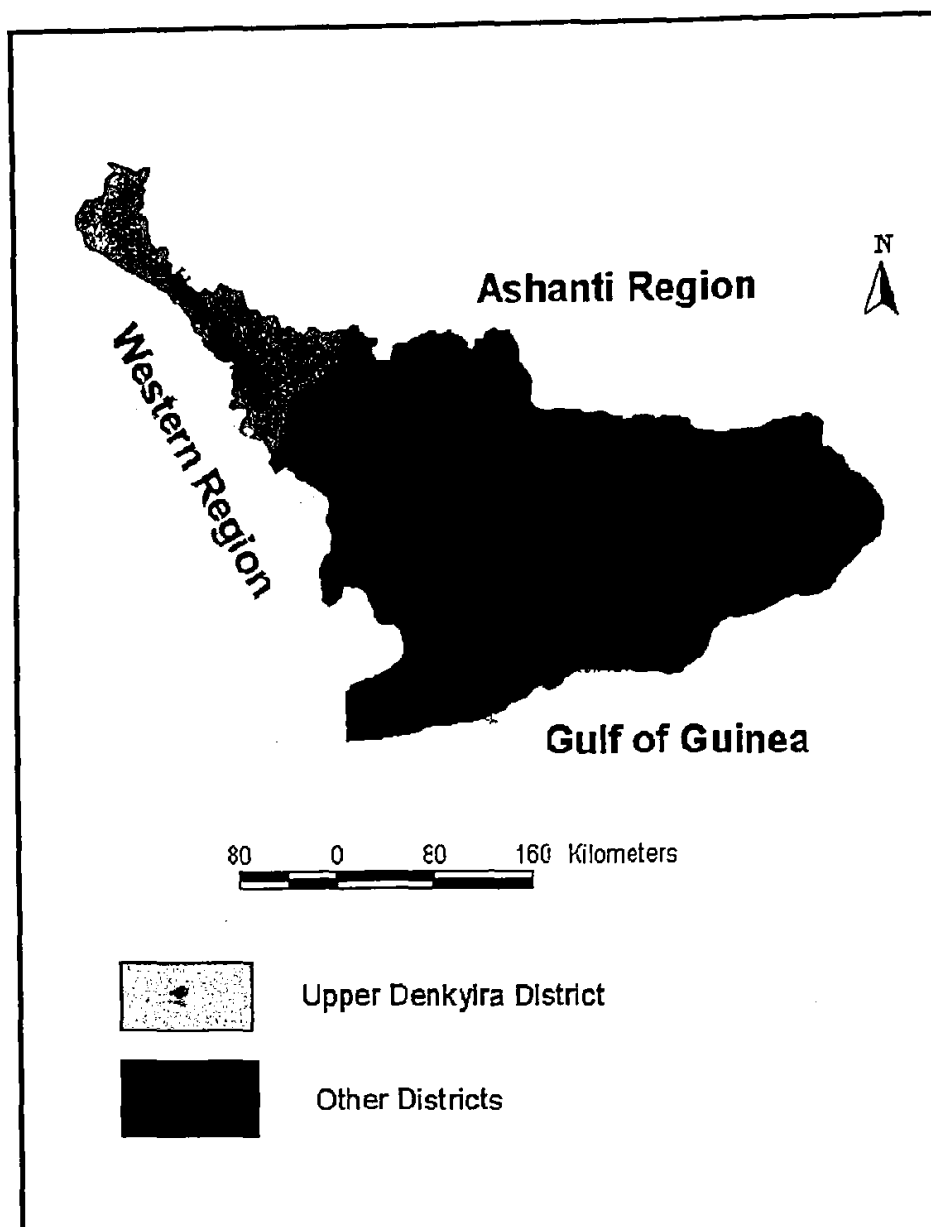
The research is based on the hypothesis that: there is no relationship between socio-demographic and economic conditions (such as age, sex, education, marital status, religion, household size, occupation and income) of an individual and the contraction of the disease.

1.6 Profile of Study Area

Upper Denkyira District is the study area. The district shares boundaries with Amansie West District of the Ashanti Region, a region that until 1999, was believed to have recorded the highest cases of Buruli ulcer in the country but now is the third highest (MOH, 1999). The Upper Denkyira District is one of the twelve administrative districts and is located at the north-western corner of the Central Region. It is bounded in the north by the Ashanti Region (See Map 1.3). In the south and west, it is bounded by the Western Region, in the south-east by Assin District and in the south-west by the Twifo Hemang-Lower Denkyira District. It covers an area of 1,700 sq. km, about 17 percent of the total land area of the Central Region. It lies between Latitudes $5^{\circ} 30'$ and 11° north of the equator and Longitudes $1^{\circ} 12' E$ and $3^{\circ} 15' W$ of the Greenwich Meridian (Fredua-Antoh, 1998). Pedologically, the area consists of forest ochrosols which are rich for crop production. Rivers including Pra and Offin with the tributaries Subin-Ninta, Aponopon, Huremi, Tuatian, Dia, Afiefi and Subin, dissect the district.

Climatologically, the district falls within the semi-equatorial zone. The vegetation of the area is of the semi-deciduous forest. The main economic activities include farming, mining and trading and the main agricultural products are cocoa, oil palm, citrus, cowpea, maize, plantain, cassava, yam and pineapple.

Map 1.3: Study Area- Upper Denkyira District of the Central Region



SOURCE: Extracted from Survey of Ghana, 2002

Roads leading to rural areas in the district are in poor condition especially in the rainy season and this hampers accessibility.

The district has 158 settlements with a population of about 108,444 (Ghana Statistical Service, 2002). Social facilities include a post office at Dunkwa on-Offin, 107 pre-school facilities, 122 primary schools, 73 junior secondary schools (JSS) and three senior secondary schools as at 2002. Only three settlements have pipe-borne water. There are three health centres, five clinics and one hospital (Fredua-Antoh, 1998).

1.7 Organization of the study

The write up consists of six chapters. Chapter One discusses background issues, statement of the problem, objectives, rationale, hypothesis and profile of the study area. Concepts and theories concerning disease and health are discussed in Chapter Two. The third Chapter examines issues concerning the methodology of the study and issues from the fieldwork. Chapter Four discusses socio-cultural and economic issues and the incidence of the disease in the study area. Chapter Five discusses individuals' and societal reaction to the disease and medical, social and international responses. The last Chapter, the conclusion, includes recommendations based on the findings and conclusions from the study.

CHAPTER TWO

CONCEPTUALIZING DISEASES AND ILL-HEALTH OF PUBLIC HEALTH IMPORTANCE

2.1 Introduction

Health and ill-health are issues that involve the social, economic and physical environments. This is because ill-health affects the whole human environment. Various viewpoints have emerged to explain the malfunctioning of the body and mind and these include older and less scientific theories such as the demonic and divine, humoral, magnetic and miasmatic theories. There are also more recent and more scientific theories such as Christian Science, stress, psychogenic, germ and ecological theories. Disease and ill-health therefore cannot be attributed to any one cause. As Vogel, (cited in Kumfaa, 1996) puts it, a disease that afflicts a person or a community does not often come from one cause. The discussions of these issues bring to focus the multi-dimensional approach needed for the understanding of disease causation and ill-health.

This chapter examines basic concepts and viewpoints on the aetiology of diseases and ill-health. It focuses on some of the relevant theories of diseases, culture, values and perception of diseases within the context of public health. Analytical frameworks for the study are also explained in this chapter.

2.2 Health and disease

Etymologically, health is derived from the Anglo Saxon word 'haelth' meaning safe, sound or whole. Conventionally, health was generally accepted to mean a condition of the body free from physical disease. The WHO came out with a broad definition embodying the physical, mental and social well-being of the human person. WHO defined health as 'a state of complete physical, mental and social well-being of the individual and not merely the absence of disease or infirmity' (WHO, cited in Galli, 1978). This, of course, is significant since a diseased state is as a result of not only the physical environment, but, all other environments. However, from the analytical and objective point of view, this definition does not address the degree to which one is healthy or not healthy. Secondly, health is viewed as a condition, a state that implies a static or fixed circumstance. But individuals can get well after falling sick. Health is not only a condition, it is an adjustment and it is not only a state it is a process. It is through this adjustment that humans can fit into their environment. Although humans will continue to adjust to their environment, it is a goal that can never really be achieved. This is explained by the fact that each adaptation produces new problems that demand solution. For example, the introduction of vehicles replaced horses and eliminated stables and unclean streets that produced harmful bacteria but brought about polluted air and decrease of bodily exercise (Galli, 1978).

Disease has been defined as disorder (in an organism) with a specific cause and recognizable signs and symptoms (Martin, 1994). Simply, disease can be defined as any state of malfunctioning of the body or mind and can be the product of a

number of factors. The presence of a disease agent does not imply that one will or will not contract the disease. Disease agents are necessary but not sufficient to initiate a disease process. There are, therefore, intermediate factors that influence disease causation. Ill-health on the other hand, does not necessarily involve disease (Taylor et al, 1998). For instance, one with a broken arm is in a state of ill-health but the arm may not be necessarily diseased. The health of populations is inextricably bound up with development.

2.3 Health and development

Health and development defy concise definitions. Health as defined earlier (in 2.2), is more than the absence of a physical disease. It is perceived as a state of complete physical, social and mental well-being. Development on the other hand, has not only a quantifiable fiscal element of rising per capita and gross national product, but fair distribution of resources, access to opportunities and political human dignity (Phillips and Verhasselt, 1994). Development is seen as a means of increasing aspects of human dignity. Development is generally understood as the process of improving the quality of all aspects of human life (WHO, cited in Phillips and Verhasselt, 1994).

Health and development are, therefore, interrelated. For example, poor health can have implications for capacity to work and lead to low productivity. Similarly, economic development can positively aid health programmes, such as immunization, health education and sanitation. Again, improved social development in education and literacy can lead to improved health status via

improved nutrition, hygiene and reproductive health. There is also considerable impact of development policies on health, what Phillips (cited in Phillips and Verhasselt, 1994) refers to as 'health by-products' of industrialization. For example, policies to increase industrialization may eventually lead to more exposure to toxic substances, traffic pollution, industrial noise and waste in the environment with their concomitant health hazards. It is therefore important for governments to consult health technicians and environmental experts on most developmental policies who would provide counter measures to the outcome of such policies in order to avert possible dangers to the health of the population. It is likewise significant to study the health of the people to come out with pragmatic solutions or recommendations for policy and decision-makers. Health and ill-health have been explained in diverse ways and the next section examines some of these explanations.

2.4 Theories of disease and ill-health

Various explanations have been given to the aetiology of diseases. This is because various factors come into play in disease causation. These range from spiritual to the physical.

2.4.1 The Divine and Demonic Theories of Disease

In the divine theory, disease is explained by refusal to obey God's word or commandments. For example in Deuteronomy, the Bible reports "... if you do not obey the voice of Yahweh your God nor keep and observe all those

commandments and statutes of His.... then, all the curses that follow shall come upon you and overtake you....Yahweh will inflict you with the plaque until it has consumed you.... Yahweh will strike you down with fever inflammation, burning fever, ...Egyptian boils with swellings in the groin, with scurvy and the itch for which you will find no cure (Deuteronomy: 28:15, 21-22, 27).

Diseases were explained as penalties received in violation of God's laws. God punished people for violations of His laws. Specific offences required specific penalties. It is therefore not uncommon for God to inflict small pox or leprosy on someone who disobeyed His laws. In the Greek philosophy, offending the gods (hubris) also resulted in punishment or 'nemesis' (Tomlinson et al., 1997). But suffering in general was explained as God's way of ensuring human humility. An example of such suffering was Job's case in the Bible (Job: 1-42). The divine theory has a modern version in the determinist view, which explains events as 'God's will'. Destiny is predetermined and there is nothing one can do about it. People therefore use fate as an excuse for living in unhealthy conditions.

The demonic theory on the other hand, is an explanation that the devil afflicts people with disease in order to cause harm. Many cultures such as the Navaho Indians, Mexican Americans and Africans believe that spirits are the aetiological source of disease and infirmity (Brown, 1992; Lankinen et al., 1994). The demonic approach to disease causation is particular in Ghana. For instance, the belief system is so entrenched that people who are by all standards enlightened rationalize witchcraft as cause of death and ill-health. People believe that enemies, curses and envy can bring about morbidity and mortality. Another issue

on the demonic viewpoint relates to modern surgical technique. In the past, a possessed individual with an evil spirit had holes drilled in the skull for the evil to escape. Today, a similar technique is adopted in a condition such as encephalitis (an accumulation of fluid between the brain and skull) for the fluid to escape (Galli, 1978). Although in modern times these explanations are too simplistic and deemed unscientific, some people worldwide attribute the cause of diseases to the supernatural. This is part of the critical issues to be examined during the study.

2.4.2 Miasmatic and Contagious Theories of Disease

In the seventeenth century, it was the belief that diseases were caused by inhaling infected air caused by poisonous vapour from decomposed flora and fauna. Naturalists at the time therefore, believed in a telluric (arising from the earth) explanation of disease causation (Tomlinson et al., 1997). Malaria for instance derived its name from this explanation of disease causation. Malaria, literally translated from Italian, is 'bad air', meaning when a healthy person inhales infected air, the disease is contracted (Claude, 1968). In the scientific world, cancer and cardio-vascular disorders are attributed to modern day miasmas (Galli, 1978).

The Miasmatic theory influenced preventive measures of the public health at the time. For example, swamps were drained, effective sewage systems were developed and programmes to control insects and vectors responsible for transmitting diseases were initiated. In this case, the right health measures were taken although the theory behind these actions was not sound. The miasmatic

view helped to attribute diseases to specific causal agents. The contagious theory on the other hand explained that disease could be brought about by spread from person to person. However, this theory fails to explain how the first person contracted the disease.

2.4.3 The Humoral and Magnetic Theories of Disease

The Humoral theory originated from Greece and was elaborated by the Arabs and brought to Spain and later to the United States of America. It assumes that the body is regulated by four body fluids that is blood, phlegm, black and yellow biles. Each was characterized by hot-cold, wet-dry properties, for instance black bile was cold and dry. It was believed that equilibrium of these humors was necessary for good health (Tomlinson et al. 1997). Curing of disease then involved correcting the imbalances by applying or reducing heat, cold, dryness and wetness.

Health was viewed in terms of the harmonious balance of body chemistry (Claude, 1968). Therefore, the humoral theory can be expanded to include a balance of the physiological, metabolic and nutritional components of the body and not only to the four humors.

Fredrick Mesmer formulated the magnetic theory which is similar to the humoral theory. In this theory, ill-health was attributed to metallic dysfunction in the body. That is, the human minerals (iron, copper, potassium, calcium and phosphorus) acted according to the laws of magnetism and have effect on the nerves and muscles of the body. To cure diseases then, a metal tractor (Perkins

Patent Tractor which was a magnetized object) was used to establish metallic balance in the body (The New Encyclopaedia Britannica, 1993). This practice has been discarded in modern treatment of diseases. Both theories identify the disequilibrium of body humors and metallic disfunction in the body as causal agents of disease.

2.4.4 Christian Science and Disease

Christian Science does not attribute disease to supernatural powers but teaches that disease is an illusion of the mind that can be destroyed by prayer and spiritual understanding (The Hutchinson Encyclopedia, 2001). Mary Baker Eddy founded this practice in 1866 and is mainly among adherents in the United States of America. A Christian scientist will not seek treatment at a hospital but will pray and seek counselling. This, of course, leaves many questions unanswered such as diseases that can be cured through this medium and those that cannot and the effectiveness of the practice.

2.4.5 The Psychogenic Theory of Disease

Etymologically, psychogenic is derived from 'psyche,' meaning mind, and 'gene' meaning beginning. Psychogenic, therefore, means beginning or originating from the mind (Martin, 1994). This viewpoint explains that disease is caused by individuals' emotional disturbance. Unlike Christian Science, disease is real. Spiritualists therefore claim to heal as a result of some diseases being emotionally induced.

Diseases that are classified organic (resulting from an organism) can bring about emotional conflicts. The patient may be anxious about possible deformity and social stigmatization. The emotional impact of the disease therefore may be more devastating than the physical illness. It is therefore necessary that in treating diseases, other services such as counselling should be considered in order to remedy the psychogenic dimensions as well.

2.4.6 Subluxation Theory of Disease

The subluxation (partial dislocation of a joint) viewpoint postulates that disturbances caused by dislocations of the spinal chord initiates many illnesses. It is on this basis that chiropractic therapy is practiced. Chiropractic is a non-medical, non-surgical form of therapy developed by Daniel Palmer in 1895. It is a system of treating diseases by manipulation mainly of the vertebrae of the backbone. The practice is based on the principle that nearly all diseases can be traced to the incorrect alignment of the bone with consequent malfunctioning of nerves and muscle throughout the body (Martin, 1994). Although this view may be used to explain certain diseases, its application to the causative agent in some diseases such as Buruli ulcer is not quite possible since mycobacterium ulcerians is identified as the external causative agent.

2.4.7 The Germ Theory of Disease

The development of the germ theory is attributed to people such as Girolamo Fracastoro who in the sixteenth century postulated that a living contagious particle called 'semanaria' caused human illness. In 1674, Anton Von Leeuwenhoek developed a crude microscope and these living particles were observed, but he named them 'animalcules'. Louis Pasteur and Robert Koch are credited with the establishment of the germ theory (Claude, 1968). The former showed the cause-effect relationship between disease in humans and micro-organisms while the latter discovered the tubercle bacillus, cholera vibrio and streptococcus. These demonstrations proved that specific organisms caused specific diseases. But the mere presence of a pathogen does not automatically result in ill-health. For example, although a person may carry tubercle bacilli, the conditions may not favour the onset of tuberculosis. For a disease to be produced, the interaction of a causative agent, a susceptible host and the natural environment for the interaction of agent and host is needed. Therefore, the germ theory alone is not comprehensive enough to explain the cause of diseases.

2.4.8 Stress Theory of Disease

Generally, human beings undergo stress. Stress can be defined as the wear and tear on the body or any factor that threatens the health of the body or has any effect on its functioning (Martin, 1994). When the body encounters stress it reacts to it and this reaction is what is referred to as the general adaptation syndrome (GAS). It is not the mere presence of a stress that causes diseases. It is when the

adaptive mechanism is broken down due to excessive stress that disease is initiated. Hans Selye developed the stress theory (The World Book Encyclopedia, 1996). The psychogenic theory that emphasizes mental and emotional stress and the germ theory in which organisms cause stress can be said to support Selye's theory. Although the stress theory can be used to explain health conditions such as high blood pressure, palpitation and heart attack, in the field of Buruli ulcer, stress may develop after the disease has been initiated. Stress therefore becomes the product and not the cause of the disease.

2.4.9 Ecologic Theory of Disease

Ecology is defined as the study of the relationship among organisms and the environment in which they live (The World Book Encyclopedia, 1996). The ecologic theory therefore assumes that health is the interaction of the physical, social, mental, genetic and personal experiences. Consequently, a negative interaction brings about a diseased state. This is a broad theory that accommodates other theories of disease as the germ (from the physical environment), psychogenic (social, mental), the miasmatic (physical environment) and stress (all the environments) as a result of its basic assumption.

Disease causation has multiple factors. As is evident in the ecological viewpoint, disease is the consequence of the physical, social, mental and genetic environments. Analysis of disease causation should therefore include the socio-cultural dimensions. The next section discusses the part that the social and

cultural environments play in influencing peoples' perception of diseases and health-seeking behaviour.

2.5 Socio-cultural dimensions of disease causation

A human disease occurs within social systems. Therefore, issues concerning diffusion of diseases within social systems are equally as important as the study of disease agents (McGlashon, 1971). Health and disease are determined by biological as well as psychological, social and cultural factors. In this case, disease causation goes beyond the germ theory. The socio-cultural dimensions of Buruli ulcer, therefore, refer to social and cultural factors of disease causation and their implications to health care and social organizations. It is useful to understand key social variables that affect health status (Brown, 1992). Therefore, the social dimensions involves the organization of space (who does what, where and when?). Questions that arise here include whether an individual's role as a wife or husband or child makes him or her vulnerable to a disease. The organization of space is influenced by the culture of a place. Cultural variables that influence disease causation include values, beliefs and attitudes.

2.5.1 Culture, Values and Beliefs

Culture can be defined as the integrated way of thinking, understanding, evaluating and communicating that makes possible shared ways of life (Calhoun et al., 1997). Zandan (1993) defines culture as the social heritage of a people -

those learned patterns of thinking, feeling and acting that are transmitted from one generation to the next. Simply put, culture is the way of life of a people.

Values are collective conceptions of what is considered good, desirable and proper or bad and improper in a culture (Carroll, 1998; Marshall, 1994). Beliefs are ideas/reasons assigned to the occurrence of events. Values and beliefs influence peoples' behaviour. If people value traditional medicine or spiritualism or there is a belief that the disease is caused by supernatural powers then, health-seeking behaviour may be skewed towards alternative health care. People's way of life, values and beliefs in turn influence their perception. And individual/societal perception of diseases is vital in health-seeking behaviour.

2.5.2 Perception of Diseases

To a large extent, people's perception of a disease may influence their health-seeking behaviour. Perception can be defined as 'the process whereby the brain interprets sensations it receives giving them order and meaning' (Wortman et al., 1992, p 97). The perceptual organs are expectation, motivation, physiological needs, personality and attitude. Several factors influence the way one perceives issues/events. An individual will take action to avoid disease if he/she believes that he/she is susceptible to the disease. That is if the one feels a real danger of contracting the disease. Again, if there is perceived severity of the disease (that is, if the disease is viewed as having a severe impact on some aspect of the individual's life), then, the individual will seek treatment. In this study, it is vital

to assess people's perception on the cause of the disease since health-seeking behaviour is influenced by what an individual perceives as the cause of disease.

The nature of the study demands the application of an analytical framework that seeks to explain the vulnerability of women and children. The next section discusses the Proximate Determinant Model as one of the frameworks for the study.

2.6 An analytical framework for the study

2.6.1 Introduction:

According to Laframboise (1973), the causative factors of a disease are many. The physical, biological, social and the individual environments combine to give rise to the state of well being of an individual. Although all the environments combine to determine the health of someone, it is possible to isolate one and explain its influence on the individual, the family and the society in general. For example, Iyun, (1983) used socio-economic factors to explain morbidity patterns in Ibadan. Following Iyun, this study explores the influence of socio-cultural factors on Buruli ulcer using the Upper Denkyira District of Ghana as a case study. The frameworks adopted for this work are the Proximate Determinants and the Event/Stimulus-Response Paradigm models, which are explained below.

2.6.2 Proximate determinants of disease

Originally proposed by Davis and Blake, the proximate determinants model was extended by Bongaarts (1978) and later used by Mosley and Chen (1992) to explain child survival in developing countries. According to the model, proximate determinants directly influence the risk of morbidity and mortality and they form the chain through which socio-economic determinants and environmental conditions affect health and disease.

Mosley and Chen identified these proximate determinants:

- (1) demographic factors (maternal): age, parity and birth control;
- (2) environmental contamination: air, food/water/fingers; skin/soil/inanimate objects; insect vectors;
- (3) nutrient deficiency: calories; protein; micronutrients (vitamins and minerals)
- (4) injury: accidental and intentional
- (5) personal illness control: personal preventive measures; medical treatment.

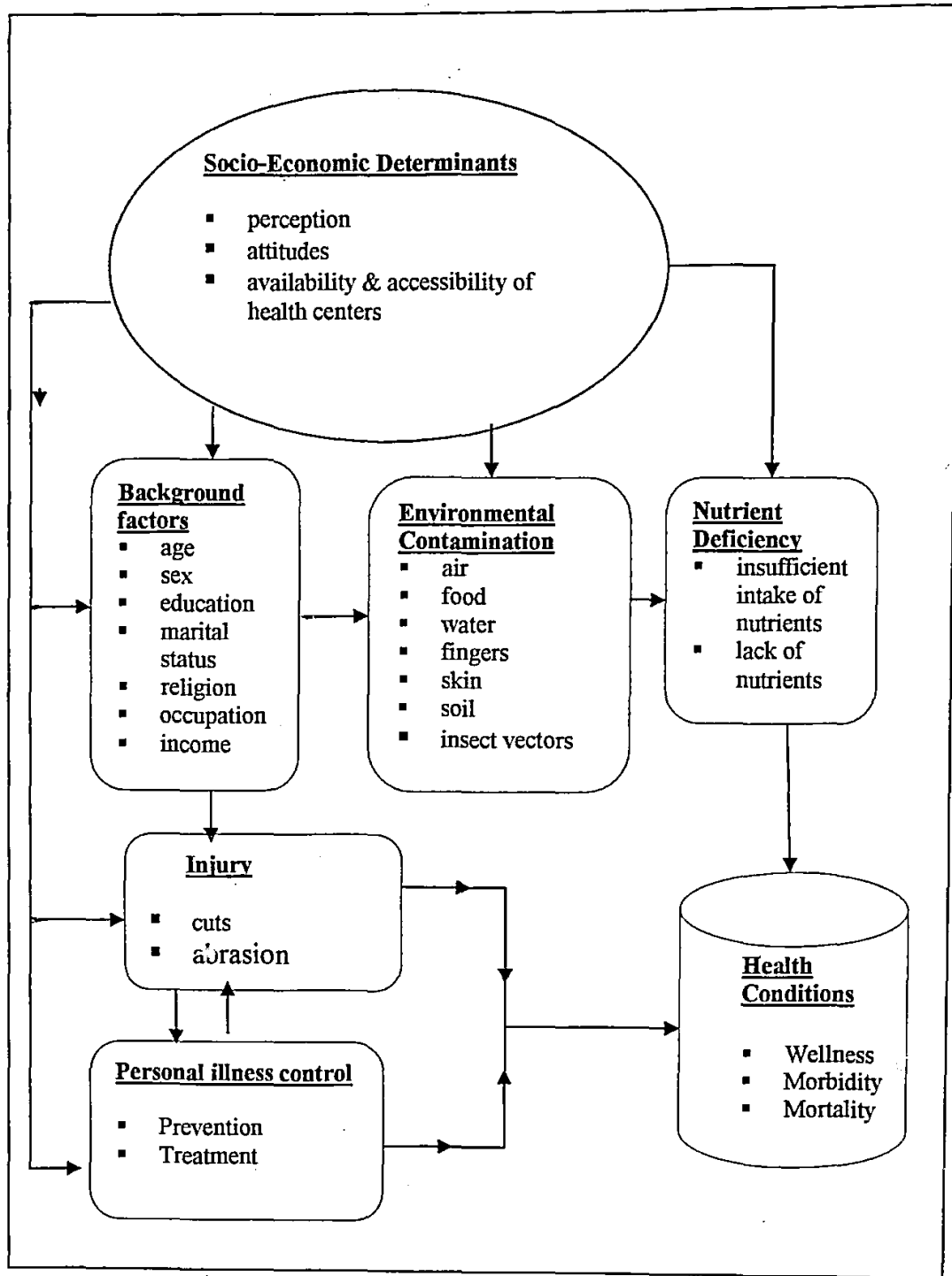
The socio-economic factors were grouped into three. The first group is the individual-level variables such as education, age and sex. The second is the household-level conditions such as income, water, food, clothing, housing and hygiene. The last group is the community-level variables including climate, rainfall, temperature and altitude, political economy and health systems. According to Mosely and Chen, these socio-economic factors work through the

proximate determinants to lead to outcomes. Although the original model was used to explain fertility, Mosely and Chen (1992) also used it to explain child mortality, indicating the versatility of the model in its application to vital events. Another advantage is that it incorporates both social and medical science methodologies into a coherent analytical framework of explaining morbidity and mortality. The model has been modified for this study (Figure 2.1). Under the modified framework, socio-economic determinants identified to be relevant in the study are perception, attitudes, availability and accessibility of health centres. The proximate determinants are:

- (i) background factors: age, sex, educational and marital status, religion, occupation and income.
- (ii) environmental contamination includes air, food, water, fingers, skin, soil and insect vectors.
- (iii) nutrient deficiency implies insufficient intake of nutrients or lack of it.
- (iv) Injury could be cuts or abrasions.
- (v) Personal illness control refers to how one tries to prevent diseases and seek treatment when disease is contracted.

The interaction of the socio-economic determinants and the proximate determinants influences the health status of the individual which would lead to one being healthy, morbid or to death (See Figure 2.1).

Figure 2.1: Modified Proximate Determinants of disease



SOURCE: Adapted from Mosley and Chen (1992)

Age and sex dimensions are vital in the study of diseases (Brown, 1992; Iyun, 1978). In the case of Buruli ulcer, it appears that patients under fifteen years and women are more vulnerable to the disease than any other group (WHO, 2000). Environmental contamination as used in disease causation refers to the physical environment that is infested with the causative organism.

The general belief is that nutritional level aids in one's health status. Nutritional status directly affects an individual's resistance to infection since protein malnourishment impairs the production of circulating antibodies (Barret, 1996). Injury as applied here includes any cut, abrasion or a prick from a thorn or needle that opens the skin for contact with the causative organism. Personal illness control factors (based on knowledge, value and attitude) influence both the rate of illness through prevention and the rate of recovery through treatment (Mosely and Chen, 1992).

Any attempt to assess factors that expose more women and children to the disease than men needs to be built on an explanatory model such as the proximate determinants of disease. Two components that are relevant are environmental contamination and injury. The degree of exposure to 'contaminated' environment and the risk of injury may play a vital role in determining the level of disease causation among sub-populations. The essence of applying the model to the study is that the presence of a disease organism alone does not guarantee the contraction of a disease. There needs to be intermediate factors (Galli, 1978).

The proximate determinants and socio-economic determinants can be measured directly or indirectly in a population. Individual factors such as age, sex, education, occupation, income, marital and religious status and socio-economic determinants of perception, attitudes, availability and accessibility of health centres can be ordinarily measured directly by interview. Environmental contamination was measured more practically by counting the number of Buruli ulcer affected persons in selected communities in the study area. Alternatively, environmental contamination that reflects various rates of spread of disease may be measured directly by carrying out microbiological examination of samples of air, water, soil and food. Also, levels of nutritional intake by individuals can be measured directly by biochemical analysis of food samples before consumption, but, these were beyond the scope of the study. A crude measure that was useful, easy and was adopted was the observation of food that is consumed or by a recall history of diet. Injury or any form of abrasion of the skin that exposes one to the contraction of Buruli ulcer was measured by observing individuals who took part in specific activities that were injury prone and measured the percentage that had contracted the disease. Personal illness control was assessed by observation of protective clothing, personal hygiene and type of health care treatment received.

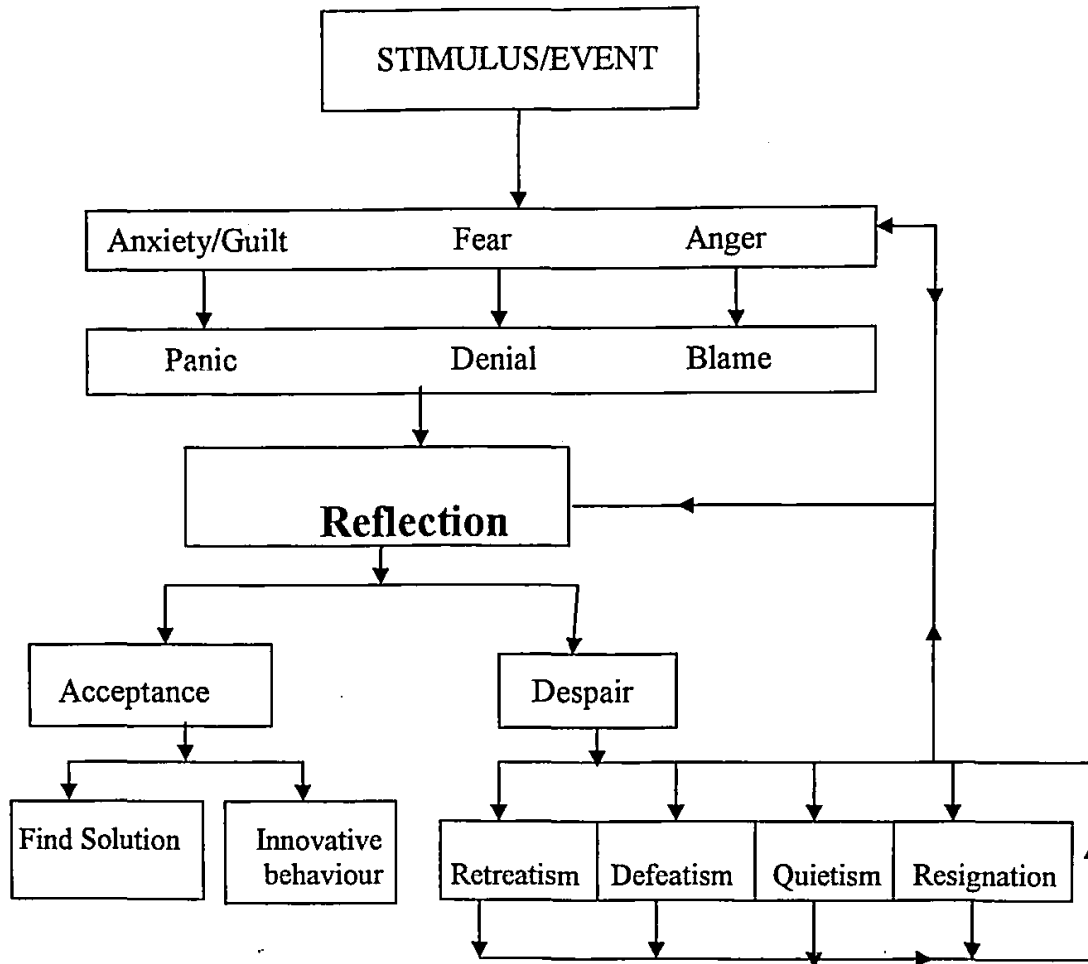
The proximate determinants model explains the multi-phasic nature of disease causation. It does not explain the reaction/response of people after the combined force of socio-economic and intermediate factors effect a disease state. There is therefore, the need to use an additional model that seeks to explain the reaction of people to an event/stimulus.

2.6.3 The Event/Stimulus-Response Paradigm

The Event/Stimulus-Response Paradigm is a model that explains reactions of individuals and society to a disease or a phenomenon. According to it, fear, anxiety and anger characterize the initial stage. The next stage is panic, denial and blame. The third stage is reflection, where probably, more information is available and a rational decision is taken (Figure 2.2). After reflection, the individual accepts the phenomenon or despairs. 'Acceptance' brings about the desire to seek solutions while the state of 'despair' leads to retreatism, defeatism, quietism and resignation (Figure 2.2).

The order of responses may not be strictly followed. For instance, it is possible for someone to panic and accord blame at the initial stage. And when adequate information is given about the disease/event, a person can still be angry and blame someone/self after the reflection stage. According to Pred, (cited in De Souza, 1990), information provided does not imply its total usage. Knowledge alone is insufficient to motivate behavior (Galli, 1978). However, the main strength of the model is its confirmation of a general notion that human reactions are unpredictable. The model is an important guide to analyzing the way an individual or society reacts to events, such as Buruli ulcer that appears very debilitating and physically disabling. Awusabo-Asare and Agyeman (1993) used the model in assessing the reaction of individuals towards HIV/AIDS.

Figure 2.2: Event/Stimulus-Response Paradigm



SOURCE: Awusabo-Asare and Agyeman (1993).

2.7 Summary and conclusion

Historically, humans have been concerned with health and disease. This is because, health or the complete physical, social and mental well being of populations is closely related to development; a process of improving the quality of all aspects of human life. Disease causation is multi-dimensional in nature.

That is, the causative factors are many and the complex interplay between and among them gives rise to the disease process (Kumfaa, 1996).

Various viewpoints have been used to explain disease causation. For instance, disease can be viewed as an illusion that can be erased through prayers and counselling as is the stance of Christian Science. On the other hand, emotional disturbance (psychogenic: anxiety, stress and pain) is believed to cause disease. Furthermore, it is assumed that dislocation of ones spinal cord (subluxation) and imbalances in humors (Humoral) and metallic dysfunction in the body can as well initiate a disease process. Other causative factors include poisonous vapour from decomposed debris, supernatural powers, microorganisms and the entire ecology.

Some of these explanations such as the germ, ecological, and the stress viewpoints appear more scientific since they can be proved scientifically, others such as the divine and demonic humoral, psychogenic and subluxation seem less so. In spite of this, people continue to attribute disease causation to supernatural powers. No matter their deficiencies, these explanations aid in the understanding of disease causation.

Physical, social, biological and individual factors that combine to produce a healthy or otherwise a disease state work through what Mosely and Chen refer to as intermediate determinants. According to Galli (1978), disease agents are necessary but not sufficient to initiate a disease process. Proximal factors

influence disease causation at any point in time. Environmental contamination, nutrient deficiency, injury and personal illness control, age, sex, education, marital status and religion, form a network which work through bio-social factors such as attitudes and perceptions to effect a state of ill-health.

CHAPTER THREE

THE STUDY AREA AND RESEARCH METHODOLOGY

3.1 Introduction

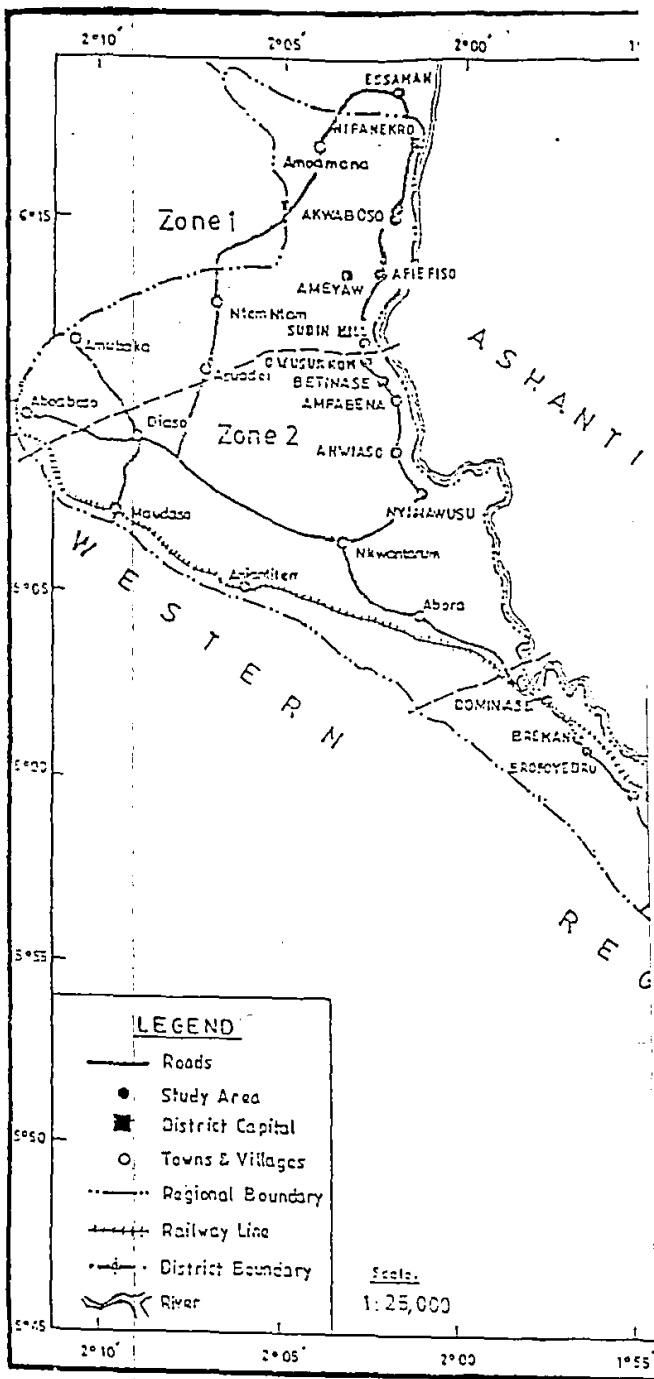
This chapter focuses on research techniques employed in the study. It justifies the choice of study area and highlights sources of data, methodology of data collection. Throughout the study, Buruli patients are also referred to as affected persons while those who have not contracted the disease are termed unaffected or non-affected persons. This is to refrain from calling Buruli patients 'victims' or 'infected people', names that seem to have negative connotations.

3.2 Sources and methods of data collection

The study used data from interviews, focus group discussions and field observations. These were supplemented with secondary data from the District Hospital at Dunkwa, the National Disease Control Unit of the Ministry of Health, the WHO and the Internet.

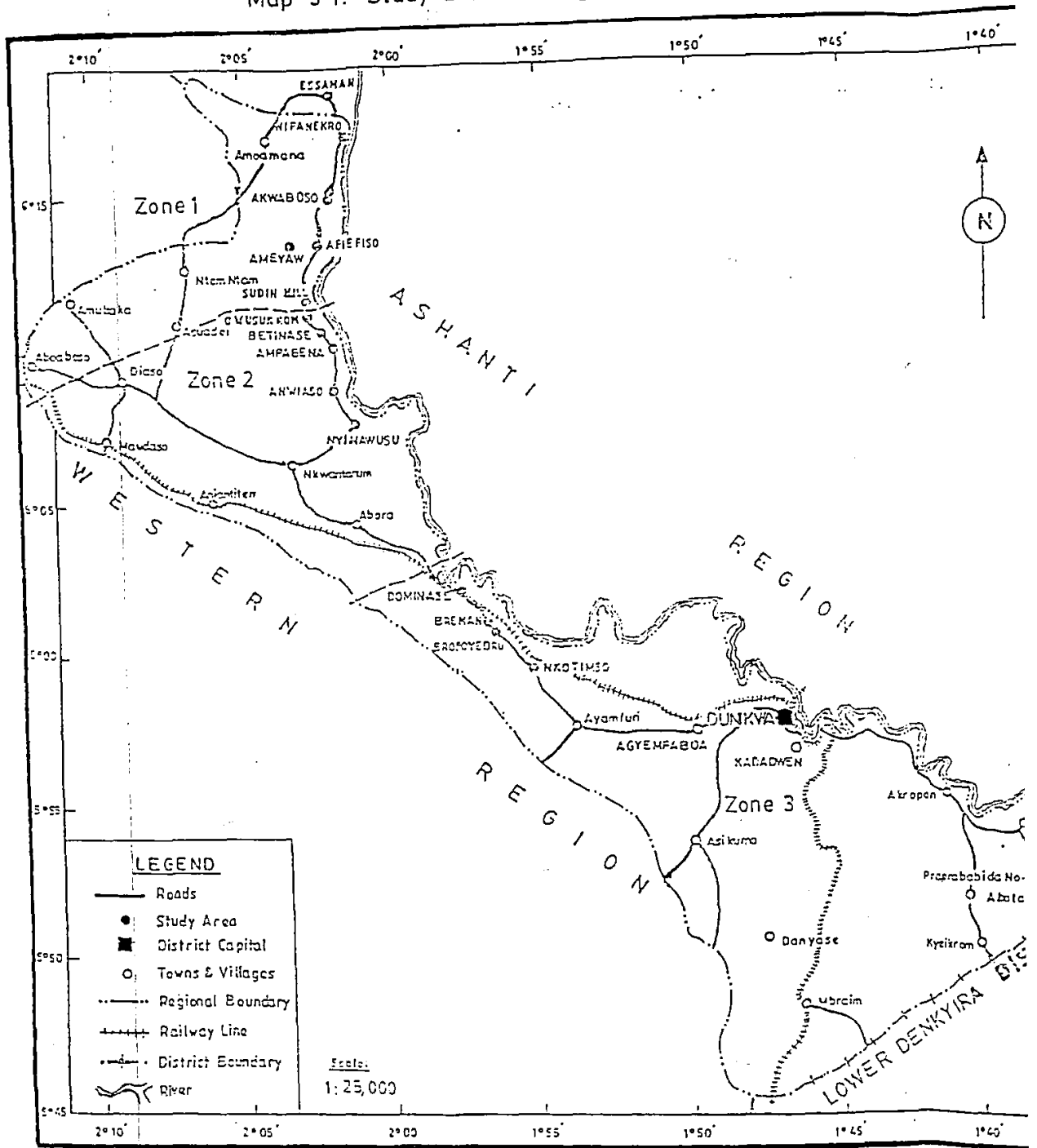
The choice of the study area, Upper Denkyira District (See Maps 1.3 and 3.1), was based on the fact that it had recorded the second highest reported Buruli ulcer cases in Ghana (MOH, 1999). Moreover, 14 endemic communities have been identified in the district (Ennin, 2000) and therefore the area is considered to be of public health interest. A preliminary survey was undertaken from January to February 2001 in the area.

Map 3.1: Study area st



SOURCE: Adapted from Town and Country Planning De

Map 3-1: Study area showing the three zones



SOURCE: Adapted from Town and Country Planning Department (2001)-Dunkwa

The district hospital and the District Health Management Team (DHMT) Office at Dunkwa were contacted for data on endemic communities. Permission was sought from the District Director of Health Services to conduct interviews with Buruli patients (see Appendix One). Based on the data and maps from the District Assembly and Town and Country Planning Department, the district was zoned into three (See Map 3.1).

Before beginning the survey, permission was also sought from the political and traditional authorities in the district. Twelve people from the study area were identified and trained out of which 10 were employed as field assistants. These ten field assistants were volunteers already working with the DHMT and knew virtually every Buruli case in the area. They were first given a brief training on how to undertake the exercise. Two forms were used: one form was for the enumeration of patients under 10 years and the other for those of 10 years and above. The idea was to categorize Buruli ulcer patients into two groups, those who were 10 years and above who formed the basis for selection of respondents for interview and those under 10 years that indicated the population of affected persons who were children. Items on the forms included name of locality, house number, sex, and age of affected people. With the form, all the Buruli ulcer patients in the eight villages were enumerated (See Appendix Two). In all, 233 Buruli patients were counted, out of which 56 were less than 10 years of age and 177 were 10 years and above (Table 3.1). Data on those less than 10 years was used to analyze Buruli ulcer cases in the district. The list of Buruli affected

persons 10 years and above was used as a basis for the selection of respondents for the interview since data provided at the district hospital could not be used to trace the affected persons.

Table 3.1: Affected Persons in the selected communities

VILLAGE	AFFECTED PERSONS 10 YEARS AND ABOVE				LESS THAN 10 YEARS		
	M	F	TOTAL	Selected for interview	M	F	TOTAL
Nkotumso	27	24	51	24	10	7	17
Dominase	5	6	11	5	1	1	2
Ampabena	10	9	19	10	3	1	4
Betenase	4	3	7	5	5	0	5
Ameyaw	11	10	21	16	1	3	4
Owusukrom	5	5	10	8	3	2	5
Akwaboso	18	21	39	23	4	7	11
Nipankro	12	7	19	9	5	3	8
TOTAL	89	88	177	100	32	24	56

SOURCE: Fieldwork, 2001

A multi-stage sampling procedure was used to select individual units for the enquiry. First, fourteen endemic communities identified in the study area by Ennin, (2000) were used to zone the endemic communities into three, based on the geographical location, accessibility and provision of health facilities. Zones one and two had five communities each, while zone three had four communities. In the next stage, three communities each were randomly selected from zones one and two while two communities were chosen in zone three. The communities

selected were Nipanekro, Akwaboso and Ameyaw in zone one and Owusukrom, Ampabena and Betenase in zone two (Table.3.2)

Table 3.2: Endemic Communities in the Study Area

ZONE 1	ZONE 2	ZONE 3
Essaman	Owusukrom *	Dominase *
Nipanekro *	Betenase*	Breman
Akwaboso*	Ampabena *	Brofoyedru
Ameyaw *	Anwiaso	Nkotumso *
Afiefiso	Nyinawusu	

*Selected communities

SOURCE: Compiled from Ennin, (2000).

Communities selected in zone three were Dominase and Nkotumso. Thirdly, 100 out of the 177 affected persons aged ten years and above were selected through a simple random sampling (ballot type) for interview. In addition, one hundred heads of households that were not affected by the disease but who were family members of the hundred selected Buruli ulcer patients were purposively selected and interviewed to solicit their views on how households cope with affected relatives and problems faced in managing the disease. Where the disease had affected the head of the household, other members were consulted until someone without the disease was randomly selected and interviewed and this person represented the head of the household. Heads of households/representatives also provided information on the socio-demographic and economic profile of their household members who were absent at the time of interview, on perception and

coping strategies. Opinion leaders such as the District Chief Executive, the Doctor at the District Hospital, were purposely selected. In addition, leaders of various religious denominations, a nurse, a health worker and a chief were selected. They were interviewed to solicit information on the society's response to the disease, how the society regarded the patients, whether there were programmes in place to help reduce the incidence of the disease, problems encountered and expectation from government and NGOs.

Four main data collection instruments were used. These were structured and unstructured interview schedule, a focus group discussion guide and an observation guide/checklist. The unstructured interview schedule (Appendix Five) was used for opinion leaders. The structured interview schedule was administered to the selected Buruli patients and heads of households/representatives through a face-to-face interview. There were separate interview schedules for Buruli patients and non-affected relatives of affected persons. Questions considered on the two schedules were based on that of the Ghana Demographic and Health Survey (1998).

Issues raised were:

- (i) household characteristics (i.e., age, sex, occupation, income level, marital status, household size, religious affiliation and educational level);
- (ii) household economic conditions;

- (iii) perception of the disease (i.e., causes and where to seek help when one is sick);
- (iv) assessment of health services and
- (vi) response to the incidence of Buruli ulcer (it includes whether the person is afraid, angry or blame oneself or the society; coping and supporting mechanisms).

In order to cut cost and to have representative respondents, six focus group discussions were held in three randomly selected communities (Table 3.3) with the aim to soliciting information on the role of women, men and children. Through FGDs, the coping and supporting systems in the society for affected persons were discussed. The observation guide was used to assess the physical environment and living conditions of affected persons including personal hygiene, place of convenience and source of drinking water among others. Details on the observation and FGD guide are provided as Appendices four and six. The interview schedule was pre-tested on five (5) Buruli patients and five (5) relatives in one endemic community in the area (Nkotumso). After the pilot survey, there was the need to rephrase certain questions to make them explicit. For example, the term 'last infection' was introduced after the pilot survey, (Appendix Three 'B', D 1) to differentiate between previous infections.

3.3 Fieldwork

The fieldwork began on first May and ended on twenty-first August 2001. The administration of the interview schedule took place simultaneously in the eight villages by the team. Individual respondents were asked for their verbal consent before the interview started. However, parents/household heads gave consent for minors to be interviewed. Respondents were assured of confidentiality and were made to understand that they could back out anytime they felt to do so. As it was the beginning of the farming season, about 50 percent of respondents were only available in the evenings. School children were available only after four o'clock in the afternoon (consent was needed from parents/guardians). Field assistants were provided with torch lights in order to conduct interviews into the night. A day's interview therefore consisted of a maximum of 4 hours and a minimum of 2 hours. As a result, only one person could be interviewed a day on the average.

The observations were done during the questionnaire administration. However, the FGDs were held after the administration of questionnaires. In every zone, two FGDs were held separately for ten male and ten female affected and unaffected persons as indicated in Table 3.3. Editing of questionnaires began in the field. This helped to detect errors in recording responses and where necessary, respondents were re-interviewed.

Table 3.3: Focus Group Discussions in the Zones

Zone	Community	FGD Members				Total
		Male		Female		
		Affected	Unaffected	Affected	Unaffected	
ONE	Ameyaw	5	5	5	5	20
TWO	Ampabena	5	5	5	5	20
THREE	Nkotumso	5	5	5	5	20
TOTAL		15	15	15	15	60

SOURCE: Fieldwork, 2001

3.4 Problem from the field

The fieldwork coincided with the farming season therefore, respondents were out on their farms during the day. This resulted in a number of callbacks before respondents could be contacted. Moreover, the earliest time respondents were available was after four o'clock in the afternoon. This meant that most of the fieldwork was done in the evening. This prolonged the duration of the survey.

3.5 Data processing and analysis

Data from interviews were edited to ensure consistency. It was later keyed into the computer and analyzed using frequency distributions, cross tabulations and the Statistical Package for the Social Sciences (SPSS). Logistic regression model was employed to determine the likelihood and probability of the incidence of the disease. The choice of this technique was based on the fact that it is appropriate for estimating odds ratios for each factor to ascertain how much more likely each explanatory variable influenced an event (Kinnear and Grey, 2000) in this case, Buruli ulcer. The technique has been used by Nuro (1999) to assess determinants of brain drain in Ghanaian Universities.

Individual reactions on Buruli ulcer and health-seeking preferences were described using the Event/Stimulus-Response Paradigm and salient issues were depicted by graphs and pie charts. Views from Focus Group Discussions and opinion leaders were collated under the following headings: Reasons for women and children's vulnerability, causes of the disease, how it is treated by individuals, the family and societal response, preventive measures and expectations from government. These viewpoints were later used to support issues raised in the study. Results from observation were also collated under physical and socio-economic conditions and were used in discussions in the study.

3.6 Conclusion

The study used data mainly from the field. Purposive and simple random samplings were used in selecting sample units and individuals for interview. The study area was selected as a result of high prevalence of Buruli cases in the area. FGD, structured and unstructured interview schedules and observation guide were the research instruments used to collect data. Field data collection took about four months to complete instead of the planned three months due to difficulty in getting respondents during daytime. The next chapter discusses possible factors contributing to the incidence of the disease and the likelihood of one contracting the disease.

CHAPTER FOUR

DETERMINANTS OF BURULI ULCER IN THE UPPER DENKYIRA DISTRICT

4.1 Introduction

This chapter examines possible factors that contribute to the incidence of the disease within sub-populations. Analysis of findings was based on interviews, FGDs and observations made during the period of data collection. Socio-demographic and economic characteristics such as age, sex and occupation are believed to influence morbidity and mortality (Brown, 1992; Iyun, 1983). Exposure to the environment is also a basic requirement for the contraction of the disease (WHO, 2000), since the causative organism is found in the environment. According to Tjip et al., (1999) the organism enters the body through a cut or abrasion. Where people do not wear protective clothing in their daily activities, the possibility of a cut or abrasion on the limbs and the body is inevitable and this exposes a person to infection. But, there can be a scenario where only one person may contract the disease, even though two people who take part in the same activity may be exposed to the environment. This may be as a result of one not receiving any abrasion or cut or the absence of the causative organism at the time of injury. Therefore, exposure to the environment, the presence of the causative organism, injury, socio-demographic and economic conditions are basic factors in Buruli ulcer contraction.

4.2 Socio-demographic and economic characteristics of respondents

In all, one hundred heads of households were interviewed. Within these households were 663 persons, out of whom 142 were Buruli ulcer patients and 521 non-affected persons. Out of the 142 Buruli patients, 38.7 percent (55) were between the ages of ten and nineteen while only 4.2 percent (6) were less than 10 years of age. Male and female populations of affected persons were 49.3 percent and 50.7 percent respectively. The non-affected population consisted of 272 males and 249 females. Female affected persons dominated in the active age groups of 20-29, 30-39 and 40-49 (Table 4.1). These are the groups that are involved more in out door activities such as snail and crab hunting, fetching water, digging for clay and for foodstuffs, activities that expose people to the environment. Paradoxically, males within the same age group were not as much affected by the disease. The observed difference may be attributed to the fact that males interact less with the diseased environment than their female counterparts.

Educational status in the study area could be said to be generally low as only 1.4 percent (2) of 142 affected persons and 1.3 percent (7) of 521 unaffected persons had received education up to the secondary level. Among female affected persons, the highest level of education attained was up to JSS level (36.1% out of 72). Affected males who had received secondary, commercial, vocational or, technical education were 2.9 percent out of 70. Out of the 142 affected persons in the 100 households, 27.5 percent had no formal education. Of the 249 non-affected females, only 0.4 percent (1) had up to secondary level of education.

Table 4.1 indicates that 26.7 percent of non-affected persons had received Middle or JSS education, 35.9 percent had Primary education and 36.1 percent received no formal education. As education has the capability to reduce ignorance, it is expected that it would influence the contraction of the disease.

Household size was grouped into three categories, households with less than 6 members, 6-10, and 11 and above. There were few households (19) with members more than ten which had about 13 percent Buruli patients while the one with 6-10 members had about 58 percent patients. The size of one's household could play an important role when sharing economic resources because the larger the size of that household, the smaller could be the share of the individual. Both married (40.1%) and never married (50.7%) were equally affected by the disease. Marital status therefore seemed to have no influence on the incidence of the disease.

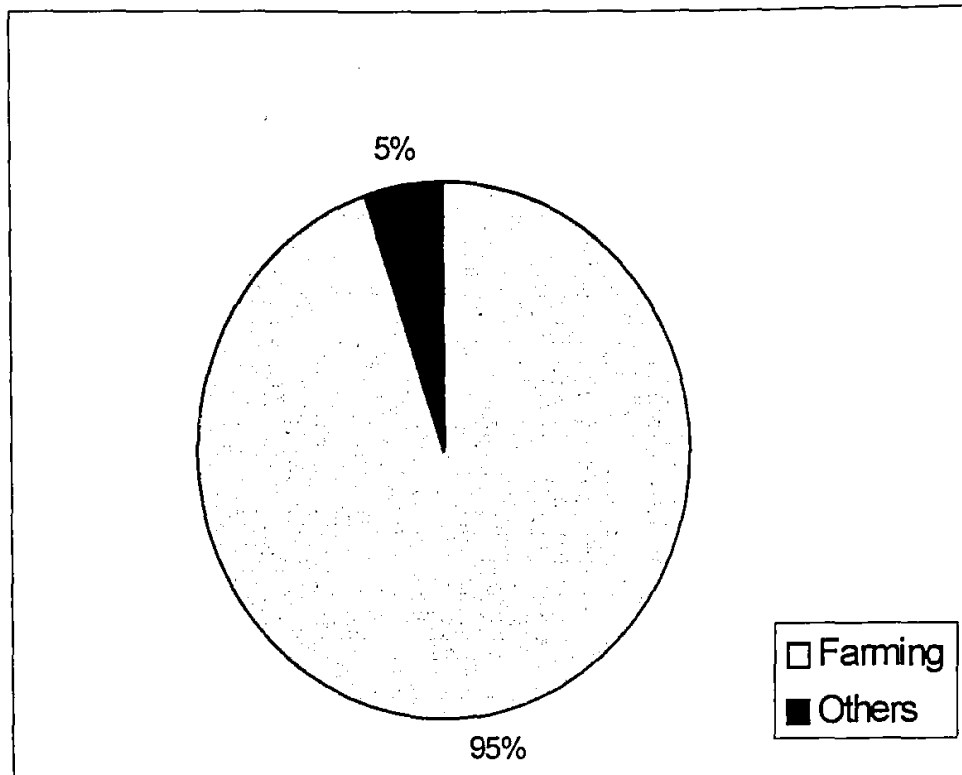
The main economic activity in the study area was farming, which occupied 57.8 percent affected persons and 48.3 percent unaffected persons (Table 4.1). Out of 72, female affected farmers constituted 72.2 percent and of 70, male affected farmers were only 42.9 percent. The population of affected pupils/students was 37.3 percent out of 142. Cross tabulation from SPSS data indicated that out of 100, the proportion of parents of pupils/students who were farmers was 95 percent (Figure 4.1). Farming is an activity that exposes the individual to the environment, injury and disease contraction. It is therefore expected that the type of occupation should be correlated to contraction of Buruli ulcer.

Table 4.1: Socio-demographic & economic characteristics of Household members

Age	Disease			Status		
	Affected			Unaffected		
	Male	Female	Total	Male	Female	Total
	%	%	%	%	%	%
Under 10	8.6	-	4.2	30.9	-	26.9
10 - 19	48.6	29.2	38.7	27.2	6.5	25.1
20 - 29	18.6	20.8	19.7	12.5	4.3	16.5
30 - 39	4.2	23.6	14.1	11.8	17.4	13.0
40 - 49	7.1	13.9	10.6	8.8	19.6	7.5
50 - 59	4.3	4.2	4.2	4.0	32.6	5.6
Above 60	8.6	8.3	8.5	4.8	19.6	5.4
N	70	72	142	272	249	521
Education						
No Formal Education	11.0	43.1	27.5	28.3	44.6	36.1
Primary	32.9	20.8	26.8	37.9	33.7	35.9
Middle/JSS	52.9	36.1	44.3	31.6	21.3	26.7
Sec/Comm	2.9	-	1.4	2.2	0.4	1.3
N	70	72	142	272	249	521
Household size						
Less than 6	21.4	36.1	28.9	16.6	18.5	17.5
6 -10	62.9	52.8	57.7	57.7	62.2	59.9
11 and above	15.7	11.1	13.4	25.7	19.3	22.6
N	70	72	142	272	249	521
Marital Status						
Never married	68.6	33.3	50.7	69.1	48.6	59.3
Married	30	50	40.1	26.5	41.4	33.6
Other	1.4	16.7	9.2	4.4	10.0	7.1
N	70	72	142	272	249	521
Occupation						
Trading	2.9	1.4	2.1	0.7	1.2	0.9
Farming	42.9	72.2	57.8	42.0	55.4	48.3
Student/Pupil	50	25	37.3	39.3	32.1	35.9
Children with no schooling	4.2	1.4	2.8	18.0	11.2	14.8
N	70	72	142	272	249	521
Income						
< ₦100,000.00	-	12.5	6.3	6.2	10.4	8.2
₦100,000.00 -₦199,000	45.7	56.9	51.5	35.3	45	39.9
>₦200,000.00	-	4.2	2.1	1.1	0.4	0.8
No Income	54.3	26.4	40.1	57.4	44.2	51.1
N	70	72	142	272	249	521
Religion						
Catholic	20	13.9	16.9	17.6	20.9	19.2
Protestant	48.6	58.3	53.5	38.2	49.0	43.4
Moslem	4.3	-	2.1	3.6	2.4	3.1
Traditional	14.3	11.1	12.7	22.8	10.0	16.7
Other	12.8	16.7	14.8	17.6	17.7	17.6
Total	100	100	100	100	100	100
N	70	72	142	272	249	521

SOURCE: Fieldwork. 2001

Figure 4.1: Pie Chart showing Occupation of Parents' of Pupils



SOURCE: Fieldwork, 2001

Yearly income of respondents was used in calculating monthly incomes since some respondents reported that they did not receive monthly incomes. Table 4.1 indicates that about 58 percent affected persons received monthly incomes of less than ₱200,000.00 while about 40 percent received no income. Of the unaffected, 51.1 percent received no income. Only 2.1 percent affected persons received incomes above ₱200,000.00 and these were females. It can be said therefore that monthly incomes were generally low. Those who received no income were all pupils/students. As income plays a vital role in determining the ability to pay for medical services and also provide adequate nutrition and protective clothing, it

follows that pupils who had no incomes would depend on parents or heads of households for their needs. In this case, a large household with many dependents would be worse off since the meager incomes of households had to be shared among dependents. Income is therefore expected to influence the incidence of the disease.

Table 4.1 suggests that 53.5 percent affected persons were Protestants while 16.9 percent were Catholics and 2.1 percent Moslems. This of course does not imply that Protestants were the group most at risk. It just happened that Protestants appeared to be in the majority in the area. With respect to non-affected respondents, majority were Protestants (43.4%) and Catholics (19.2%). Some of these socio-demographic and economic conditions are contributory factors to Buruli ulcer infection.

4.3 Factors contributing to Buruli ulcer infection

4.3.1 Gender roles, environmental contamination, injury and the incidence of the disease

In exploring risks to women and children, their movement through space was considered as they performed their roles in the household. Through FGDs, the study revealed that multiple roles and responsibilities of women and children expose them more to the physical environment than men leading to the high injury rate and the risk of contracting Buruli ulcer. Culturally, adult females and children are responsible for household chores as part of their duty. Male and

female children normally fetch water but female children perform extra duties (like adult female) such as sweeping the house and compound, washing utensils and clothes, cooking meals, and painting the kitchen and rooms with red and white clay and nursing the sick (e.g. Buruli patients). By the nature of their duties, women and children are more predisposed to the physical environment. For instance, FGDs revealed that apart from household chores, women and children were more involved in hunting crabs and snails and traditional fishing whereas few men were involved in such activities. Again, FGDs revealed that in the family, the man, wife and children (if any) prepare the land for farming. In most cases, when the land is prepared, the woman sows the crops. Both husband and wife do the first weeding of the undergrowth (after the crops have been sown), but subsequent weeding is left to the woman alone to do. Although, the man may help his wife to gather foodstuff in the farm, it is the role of the woman to gather food crops and firewood. In the farm, some men may set traps to catch animals or may go hunting or may cut palm branches for weaving baskets but these activities are not done on daily basis. On the other hand, gathering of food crops is a routine responsibility for the woman anytime the couple goes to the farm. As women perform their routine roles, their constant interaction with the environment exposes them to factors that put them at risk of contracting the disease more than their male counterparts.

Young males (10-19 years) were noted to be constantly involved in activities (such as bird and grasscutter hunting, playing in marshy and bushy places and on

refuse dumps) that exposed them to injury, a factor that enhances contraction of the disease. This explains why males in this age group were highly infected (48.6%; Table 4.1). Generally, there was a consensus that women and children 10 years and above were the most at risk of the disease by reason of their constant contact with the environment. For example, an affected woman stated *'It is only God who protects women and children in this village otherwise all of us would have been infected by now because we are constantly in contact with the environment where I believe the germ dwells'*. Another said *'I am not surprised that we (women) are the victims because, we are more exposed to the environment'*. A man also said that *'Owing to their daily chores, women and children are always in contact with the environment and this increases their chances of contracting the disease since the disease is definitely in the environment'*.

4.3.2 Personal hygiene, nutritional deficiency and incidence of Buruli ulcer

There is a general view that personal hygiene and nutritional status of an individual aid the prevention of diseases (WHO, 2000). In the case of Buruli ulcer, if one gets an abrasion, it is perhaps possible that infection could be averted if the affected part is washed immediately with soap or disinfectant. But, by observation, many children (and perhaps adults) took their baths without soap. Upon inquiry it was learnt that some people could not afford it. Again, it was realized that the majority of individuals in the study area did not take personal hygiene seriously. Some children did not take their baths for a day or two while

others roamed about half clothed and appeared to be unkempt. As they work and play in an environment that harbours the causative organism and where injury is a possibility, the risk of contracting the disease would be high.

Nutritional level also influences the health status of an individual. Nutritional status directly affects an individual's resistance to infection since protein promotes the production of circulating antibodies (Barret, 1996). Furthermore, a balanced diet aids in any healing process and increases the resistance mechanism of the body in combating infection. In terms of diet, more than half (52%) of the 200 respondents were observed eating boiled yam/plantain or cocoyam without stew/sauce or any protein. When asked why there was no sauce with their food, some (52.9%) said they were in a hurry to go to their farms while others (47.1%) explained that they could not afford it. For supper, respondents mainly ate pounded plantain and cassava or pounded cocoyam with cassava with soup without meat or fish (locally called 'nkwanto', 'tuku' and 'tohwire' or 'Jbedoo'). This was partly because fish and meat were very expensive in the villages. Poverty and ignorance were also key elements contributing to poor diet intake in the communities.

4.3.3 Socio-demographic and economic conditions and the incidence of Buruli ulcer

In order to identify socio-demographic and economic factors that significantly influence contraction of Buruli ulcer in the area, the logistic regression model was employed. In the model, disease status (affected) = 0, (unaffected) = 1, was considered as the dependent variable while variables such as age, sex, educational and marital status, household size, religion, income and occupation represented the independent variable. The rationale for choosing these variables was based on the fact that they have been found to influence morbidity and mortality (Brown, 1992; Iyun, 1978) and were used as background factors in the proximate determinant model. Applying the logistic regression model to the data gave the results in Table 4.2

Table 4. 2: Explanatory variables on the likelihood of the incidence of Buruli ulcer

Explanatory variables	B	SE	Sig. (P value)	Odds ratios (Exp. B)
Household size	0.107	0.035	0.002	1.113
Sex	-0.178	0.211	0.398	0.837
Education	-0.340	0.127	0.007	0.711
Age	-0.013	0.010	0.196	0.988
Marital status	0.045	0.260	0.864	1.046
Religion	0.074	0.072	0.302	1.077
Occupation	0.467	0.235	0.047	1.595
Income	-0.480	0.231	0.038	0.619
Constant	0.116	1.336	0.931	1.123

-2 log likelihood 653.912
Sig. Level = 0.05

SOURCE: Fieldwork, 2001

To predict the probability of the incidence of Buruli ulcer and to test the hypothesis that there is no relationship between demographic and economic conditions and Buruli ulcer, the 'P' value was used. It was observed that at 0.05 significance level, household size (0.002), education (0.007), income (0.038) and occupation (0.047) were significant factors. The 'P' values for the four explanatory variables were less than 0.05 (Table 4.2). Hence the hypothesis which states that there is no relationship between socio-demographic and economic characteristics and the contraction of Buruli ulcer is rejected, implying that there is relationship between the contraction of the disease and education, household size, occupation and income.

The -2 log likelihood indicates the fitness of the model. According to Kinner and Grey (2000), the smaller the value, the better the fitness (the value should be proportional to the sample size. The -2 log likelihood in Table 4.2 therefore is said to be fitting.

The co-efficients of the explanatory variables with the disease were examined to determine whether they were the expected. The coefficient 'B' (Table 4.2) indicated that education, age and income were inversely correlated with the incidence of the disease while household size and occupation were positively correlated with the disease. The inverse relationship of education and income with the disease was expected since education helps to reduce ignorance and enlightens

one on preventive measures. Income on the other hand enables an individual to afford better health services, diet and protective clothing. The positive relationship of occupation and household size was also expected. Since the causative organism is found within the physical environment, it is more likely for those who interact more with it to contract the disease. For example, farmers who interact frequently with the environment would be more susceptible to the disease than tailors or hairdressers. Again, a large household with meager economic resources and many dependents (pupils/students) stands the risk of not providing effective preventive measures to the disease (in terms of balanced diet, protective clothing and medical care) thereby increasing the risk of disease contraction. Measures for managing the disease should therefore target improvement in the standard of living of the people and ensuring the use of protective clothing.

The odds ratios (Exp. B) were used to predict the likelihood of contracting the disease (Table 4.2). It was observed that occupation (1.595), household size (1.113), religion (1.077) and marital status (1.046) were the main factors determining the likelihood of disease contraction. Considering the high percentage of the population of farmers in the study area, the presence of the causative organism and the possibility of injury as people go about their work, people should be encouraged to wear protective clothes in order to reduce the incidence of the disease.

4.4 Perception and health-seeking behaviour

Where and when an individual seeks treatment when infected is as vital as the treatment itself. The choice of place of treatment and time at which treatment is sought depend on several factors. Among these is the individual's perceived cause of the disease, where he/she thinks constitutes effective treatment centre that is also influenced by the ability to pay. If an individual thinks that the disease is caused by supernatural powers then, such a person would seek treatment from sources other than the hospital. Analysis of the survey indicates that what people thought to be the cause of the disease might have influenced their choice of health treatment centre.

One hundred Buruli patients were asked to indicate whether they agreed or disagreed to a set of statements, which portrayed their perception of the causes of the disease. Table 4.3 shows the results of their responses.

Table 4.3: Affected persons' perceptions of the disease

Do you agree that the following cause the disease?	Males (%) (N=49)				Females (%) (N=51)			
	Strongly agree/ agree	Strongly disagree/ disagree	No Opinion	Total	Strongly agree/ agree	Strongly disagree/ disagree	No Opinion	Total
Gods/ spirits	59.2	36.7	4.1	100	58.8	35.3	5.9	100
Environment	40.8	49.0	10.2	100	51.0	37.2	11.8	100
Enemy	55.1	40.8	4.1	100	56.9	37.2	5.9	100
Curse	61.2	30.6	8.2	100	62.8	33.3	3.9	100

SOURCE: Fieldwork, 2001

Table 4.3 indicates that both males (59.2%) and females (58.8%) equally believed that gods/spirits cause the disease. Belief in curses ranked high in both sexes, with 61.2 percent of the males and 62.8 percent of the females. While less than half of males (40.8%) believed that the environment causes the disease, more than half (51%) of females believed otherwise.

Perceptions of relatives of affected persons were also analysed in order to compare views about the cause of the disease. Results of their responses are shown in Table 4.4

Table 4.4: Perception of Relatives

Do you agree that the following cause the disease?	Males (%) (N=53)				Females (%) (N=47)			
	Strongly agree/ agree	Strongly disagree/ disagree	No Opinion	Total	Strongly agree/ agree	Strongly disagree/ disagree	No Opinion	Total
Gods/spirits	66.0	24.5	9.5	100	63.8	25.5	10.7	100
Environment	62.3	22.6	15.1	100	42.6	42.6	14.8	100
Enemy	56.6	34.0	9.4	100	59.6	29.8	10.6	100
Curse	54.7	34.0	11.3	100	70.2	27.7	2.1	100

SOURCE: Fieldwork, 2001

Irrespective of sex, over 60 percent of the relatives of affected persons were found to relate the disease to gods and spirits (Table 4.4). However, more females (70.2%) than their male counterparts (54.7%) associated the disease with a curse. The idea that the environment causes the disease was high (62.3%) among males, but less than half of the female relatives (42.6%) believed otherwise. On the

whole, Tables 4.3 and 4.4 indicate that both relatives and affected persons linked the cause of the disease to supernatural forces.

Related to respondents' perception about the disease is their health-seeking behaviour. About 57.1 percent of affected males and 43.1 percent of affected females first sought treatment at the herbalist (Table 4.5), while only 26.5 percent of the males and 37.3 percent of the females went to a health centre/hospital during the last infection.

Table 4. 5: Sequences of Health Seeking Centres (during the last event)

Choice of Treatment Centres	MALE (%)			FEMALE (%)		
	First Centre	Second Centre	Third Centre	First Centre	Second Centre	Third Centre
Health Centre	26.5	63.3	24.5	37.3	53.0	15.7
Herbalist	57.1	30.6	22.4	43.1	33.3	13.7
Fetish	12.3	4.1	40.8	7.8	5.9	51.0
Spiritualist	4.1	2.0	12.3	11.8	7.8	19.6
TOTAL	100	100	100	100	100	100
N	49	49	49	51	51	51

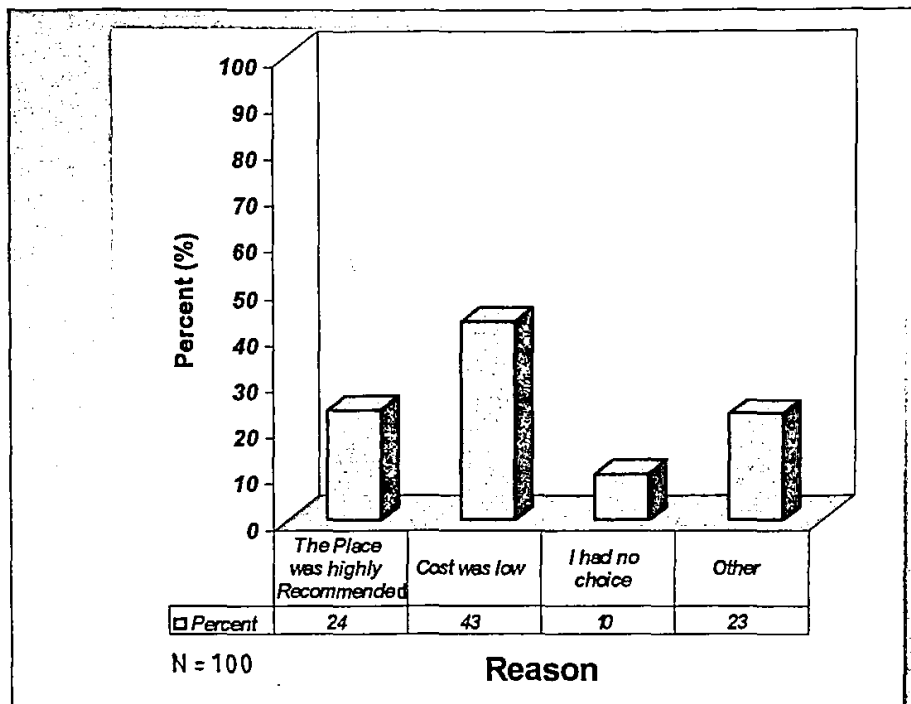
SOURCE: Fieldwork, 2001

The second highly patronised treatment centre was the health centre/hospital indicating 63.3 percent for males and 53.0 percent for females. The fetish place was the third most preferred treatment centre (40.8% males and 51.0% females).

To understand the health-seeking behaviour of affected persons, affected respondents were asked to indicate their reasons for selecting the herbalist's place

as the most preferred treatment centre. Figure 4.2 suggests that cost, followed by high recommendation were the main motivating factors for selecting the herbalist as the first line of treatment.

Figure 4. 2: Reasons for going to the Herbalist



SOURCE: Fieldwork, 2001

These responses were expected since in the absence of a hospital in the immediate vicinity, the next avenue was an alternative treatment centre. On the choice of treatment centres, people believed that herbalists have hidden 'powers' besides the administration of herbs and could confront evil spirits, moreover, they were accessible. But, a herbalist in an interview said herbs were the only items used in treatment and nothing else. When questioned further why the hospital became the second choice, the majority of respondents mentioned that they were advised by

community volunteers to do so, while others replied that they would have gone to the hospital first but, due to financial constraints and the distance involved, it was not possible. Of course, the disease is not considered a 'hospital case' (meaning the cause is supernatural and needs some form of spiritual healing) until complications occurred that people went to hospital for treatment. This partially explains why people get deformities since delayed treatment of the disease results in complications (See Plates 1.3 and 1.4). Others insisted that they believed the herbalist could give them the best treatment.

Two socio-economic variables that were identified to influence health-seeking behaviour were availability of health services and the ability to pay for health services. From observation, it was noted that 10 endemic communities were about 60 kilometres from the district hospital (Table 4.6)

Table 4.6: Distance from the District Hospital

Endemic Communities away from the Hospital			Hospital
Communities < 60 Km.	Communities > 60 Km.		
Dominase	Essaman	Owusukrom	Dunkwa on-Offin
Breman	Nipanekro	Betenase	
Brofoyedru	Ameyaw	Ampabena	
Nkotumso	Akwaboso	Anwiaso	
	Afiefiso	Nyinawusu	

SOURCE: Fieldwork, 2001

Roads in the endemic communities were third class roads and in the rainy season, some of them were inaccessible. It was also difficult getting transport to the district hospital. Transport cost was relatively high for the people. One paid about ten thousand cedis or fifteen thousand cedis in and out of Dunkwa district hospital. Relating transportation cost to the average monthly income of one hundred and twenty five thousand cedis (¢125,000.00), it became obvious that people could not afford to attend hospital at the district capital. Apart from transportation cost, those who managed to visit the district hospital complained of high cost of treatment, especially cost of drugs outside the hospital. Although drugs were supposed to be free, it appeared that some Buruli ulcer patients were given drug prescriptions to purchase them. Enquiries with the doctor in charge of the hospital showed that such situations occurred when the drug in question was not in stock. Despite the explanation given, it was gathered that no refund was made to patients when those drugs become available. On the other hand, treatment received from herbalists was virtually free. Results from the interview revealed that most of the time nothing was paid and when something was paid, it was less than ¢10,000.00. A herbalist confirmed this when she said that as tradition demanded, what was required were two eggs, a cola-nut or a white chick but most often nothing was paid.

Interviews conducted with health personnel revealed that when Buruli ulcer patients were admitted at the hospital, lunch and supper were provided free.

However, breakfast was to be borne by the patients, but visits to the hospital revealed that some were too poor to afford this. Moreover, patients were unable to maintain a relative that helped to nurse them in hospital. The practice at the hospital is that one relative should stay with the patient to help cater for personal needs. Feeding this 'help-hand' poses a problem thereby discouraging patients that would otherwise have wished to attend the hospital. This concern made the chiefs and people of the endemic communities request a health-care centre in the endemic area. *'All these costs would not be necessary if there is a health-care centre near us'* said a chief.

Secondary data on the study showed that the total cost of treatment of the disease is around seven hundred and eighty three U. S. dollars (\$783), approximately ₦6,812,100.00 (₦7,000.00 per dollar as at June, 2003). The patient bears 49 percent of the cost and the government bears the rest (Asiedu and Etuaful, 1998). Considering the low financial situation of patients in endemic communities, this poses a great constraint on meager resources.

4.5 Observations and Conclusion

Secondary data on the study area revealed that there have been over 500 Buruli cases since 1999. This suggests that *Mycobacterium ulcerans* (the causative organism) is present in the environment. The physical environment plays a vital role in determining the incidence of the disease. Factors that seem probable in contributing to the incidence of the disease were identified as the presence of the

causative organism in the environmental, exposure to that environment without adequate protective clothing, occupation and activities that are Buruli risk-prone, lack of personal hygiene and nutrition. Analysis from the logistic regression model showed that the likelihood that the type of occupation influences the contraction of the disease was about two times higher as compared to other socio-demographic and economic variables.

Cultural, social and economic factors were considered to influence the incidence of the disease. The way of life of people in the study area predisposes them to injury and the risk of contracting the disease. Traditional roles of women and children such as fetching water, sweeping the compound, digging clay for aesthetic purposes and playing in muddy areas expose them to Buruli ulcer infection.

Generally, personal illness control is vital in the prevention and management of the disease. Personal illness control involves the observance of personal hygiene and where and when one seeks effective treatment. Personal hygiene is important in preventing disease contraction. But personal hygiene was observed to be poor in most households. This coupled with poverty made it difficult for people to provide soap and other disinfectants. Poor personal hygiene could lead to the contraction of Buruli and other diseases.

Seeking treatment at the right time aids the management of the disease. The study revealed that perceptions of the disease influenced health-seeking behaviour. More than half of the two hundred sampled population did not consider the environment as the cause of the disease. They would therefore not go or send their relatives first to the hospital for treatment when the disease was contracted. Rather, people would go to the herbalist as a result of the belief systems about the cause of the disease and also as a result of inability to afford cost of treatment at the hospital. It is when treatment fails at the first treatment centre that individuals turn to the hospital. But by then, the disease would have reached its peak (as shown in Plate 1.3), therefore there is not much the hospital can do, but, to treat the ulcer to heal which takes three months to two years, depending on the extent of the ulcer. It is clear that despite efforts by the DHMT and community volunteers to sensitize the people about the presence of the disease-causing organism in the physical environment and the need for personal hygiene and protective clothing, some people believe otherwise. This belief partly explains the high attendance at herbalist treatment centres.

Poverty was also observed to play a vital role in the choice of treatment centres. Since transportation cost to the only hospital is relatively high, and vehicles were difficult to get, coupled with high treatment cost (when asked to buy drugs or on admission) patients sought alternative health centres within their locality where they knew cost was relatively low.

Nutritional status also directly affects an individual's resistance to infection since protein mal-nourishment impairs the production of circulating antibodies (Barret, 1996). Antibodies fight disease organisms and their existence depends on good nutritional intake. Due partly to poverty and ignorance, some people could not afford to provide meat or fish in their meals. Others could not provide them on regular basis. When this happens, children and women are the most affected. Traditionally, the best of meat or fish goes to the 'man' (normally the father) of the household. Children have low resistance to diseases and the African woman by virtue of her traditional position (as mother and 'family provider') does extra work that requires replacement of calories and protein. It is therefore expected that these two groups of people in the study area would be the most affected by the disease.

Analysis of the study showed that, education, household size, occupation and income were closely related to the incidence of Buruli ulcer. Level of formal education acts as a proxy for command over such resources as medical care, sanitary facilities, water supply, food, clothing and shelter. And most socio-economic factors influence morbidity and mortality (Brown, 1992; Iyun, 1983).

The logistic regression model did not show that age-sex had any influence on contracting Buruli ulcer. But age composition of sampled cases showed that of Buruli affected persons, 38.7 percent were between the ages of 10 and 19. Children, because of their low resistance and high exposure to disease agents and

unsanitary living conditions, would be particularly prone to the most common diseases such as diarrhoea, measles, pneumonia and malnutrition and of course to Buruli ulcer. Again, the study showed that women (aged 20+) and children (aged 10-19) were the most vulnerable to disease contraction. FGDs also indicated that since the nature of their activities expose them more to the environment and injury (factors that enhance the incidence of the disease), women and children are considered most at risk of Buruli contraction. Therefore, if age and sex did not show much significance in the contraction of the disease then, there might be some confounding factors not portrayed from available data.

Occupation of affected persons showed that, approximately 58 percent were farmers. This was followed by a 40.1 percent of school and non-school children, a group that was found to be highly exposed to the physical environment due to its activities. Ninety-eight (98) percent of these children had parents who were farmers, which meant that these children followed their parents to the farm and thereby exposed them to the causative organism. It appears that the greater one is in close contact with the physical environment, the greater the risk of contraction of the disease. Analysis from the logistic regression showed that the likelihood of occupation influencing the contraction of the disease was twice as high.

In terms of income, about 46 percent of affected persons received below one hundred thousand cedis a month. Pupils who received no incomes (40.1 percent) had parents who received less than one hundred thousand cedis. Another 51.5

percent had incomes between one hundred and two hundred thousand cedis. Considering the current economic situation in the country, this by all standards is quite low. The level of income influences the ability to provide basic human needs and provide adequate medical care.

In sum, socio-cultural, economic characteristics, perceptions, age-sex dimensions, accessibility and affordability greatly influence prevention and treatment patterns of Buruli ulcer. The next chapter examines the issue of coping with the disease and supporting systems by individuals and households in the community.

CHAPTER FIVE

COPING STRATEGIES AND SUPPORTING MECHANISMS

5.1 Introduction

Reaction to a disease defines how individuals, society and the nation cope with diseases. In the study, both the affected and their unaffected relatives were interviewed on their coping mechanisms. This chapter examines coping strategies and supporting mechanisms adopted by individuals and the society.

5.2 Reaction of affected persons and relatives

Buruli affected persons were asked to indicate their reactions when they observed that they had contracted the disease. Table 5.1 indicates that female reactions relating to panic (86.3%) and fear (78.4%) were much higher than their male counterparts (panic, 67.3%) and (fear, 46.9%).

Table 5.1: Reaction of affected persons

Reactions when the disease was contracted	Males (%) (N=49)				Females (%) (N=51)			
	Strongly agree/ agree	Strongly disagree/ disagree	No Opinion	Total	Strongly agree/ agree	Strongly disagree/ disagree	No Opinion	Total
Fear	46.9	49.0	4.1	100	78.4	17.7	3.9	100
Panic	63.4	28.6	4.1	100	86.3	9.8	3.9	100
Anger	73.5	26.5	-	100	56.9	43.1	-	100
Blame	51.0	49.0	-	100	60.8	31.4	7.8	100

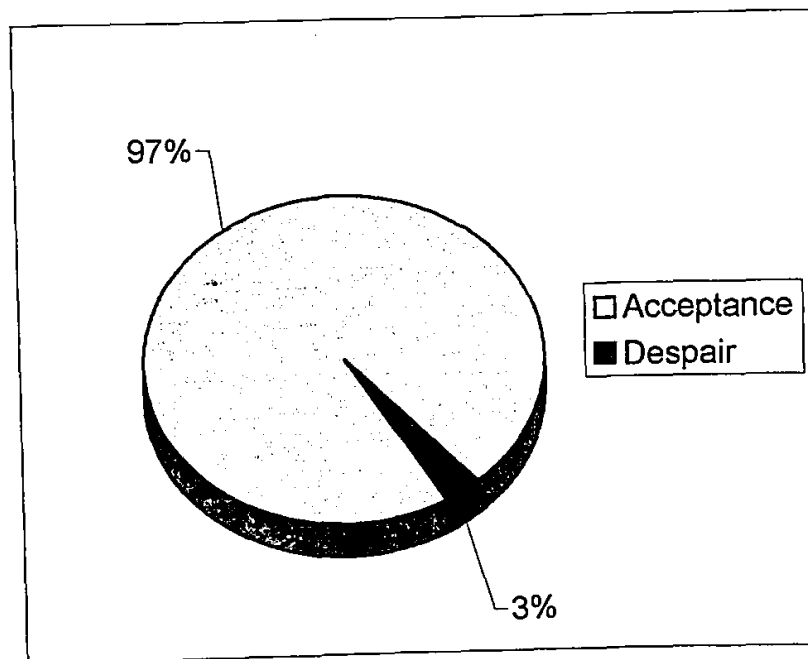
SOURCE: Fieldwork, 2001

Out of fear, some said they consulted a herbalist since that was the immediate help available and affordable. On the other hand, more males (73.5%) than females (56.9%) were found to be angry when the disease was contracted. Those who indicated that they showed anger explained that they were angry because despite all the health education given them, they failed to protect themselves against the disease. Others directed the anger at their enemies. More females (60.8%) than males (51%) indicated that they blamed their enemies for the disease. More females reported that they were afraid, panicked and blamed others as compared to males. This follows a general belief that females are prone to fear, panic and are ready to assign blame more than their male counterparts. The issue of males showing more anger than females is consistent with the societal view that women are deemed as mothers who have the attribute of patience and have more capacity to handle difficult situations than males.

To ascertain how affected persons reacted to the situation with time, they were asked to indicate their reactions to the disease. Figure 5.2 shows that majority of them (97%) had accepted the situation. The high acceptance rate and modification of reactions may be attributed to health education provided by the DHMT and counselling received from friends, relatives and religious leaders. Acceptance is a great step towards innovative behaviour or finding solutions. When probed further to find out what actions were taken when they reached the reflective stage, all respondents indicated that they sought treatment. However, a small number (3%) made up of one female and two males showed despair. This happened to be

among those with severe deformities due to the disease. They indicated how they wore clothes to cover the affected areas where possible. These also showed signs of 'retreatism' and 'defeatism' by staying away from people. In the Event/Stimulus-Response Paradigm, people change their reactions when more information on the event is available. The three respondents who indicated that they did not understand why the disease should affect them because they thought they took necessary precautions were still angry with whatever or whoever might have 'brought the disgraceful disease' to them. Figure 5.1 shows reactions after reflection.

Figure 5.1: Reaction of affected persons after reflection



SOURCE: Fieldwork, 2001

None of the respondents denied the existence of their condition because Buruli ulcer is a dichotomous variable; one is either affected or not affected so the concept of denial in the Event/Stimulus-Response Paradigm was not applicable. Another issue was the level of openness to which respondents discussed their feelings. It was evident that respondents wanted to talk to someone about their feelings and problems. This is a condition that would be favourable for community participation in controlling the disease.

Associated with the reaction of affected persons to the disease was the reaction of close relatives. Relatives of affected persons were asked to indicate whether they agreed or disagreed to a set of statements (Appendix Three B). Table 5.2 shows results of their responses.

Table 5.2: Reaction of relatives

Reaction when the disease was contracted	Males (%) (N=53)				Females (%) (N=47)			
	Strongly agree/ agree	Strongly disagree/ disagree	No Opinion	Total	Strongly agree/ agree	Strongly disagree/ disagree	No Opinion	Total
Fear	62.3	30.2	7.5	100	91.5	8.5	-	100
Panic	66.0	32.1	1.9	100	95.7	4.3	-	100
Anger	56.6	18.9	24.5	100	46.8	40.4	12.8	100
Blame	50.9	47.2	1.9	100	85.1	12.8	2.1	100

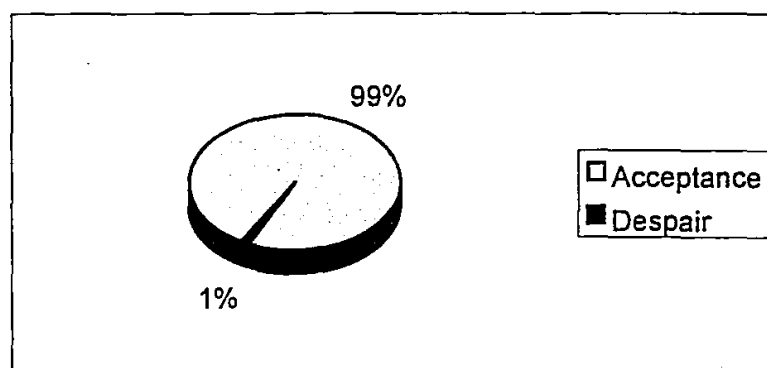
SOURCE: Fieldwork, 2001

Table 5.2 indicates that 62.3 percent and 66 percent of male relatives said that they were afraid and panicked while over 90 percent of female relatives showed similar reactions. Of those who showed fear and panic, females were in the

majority. More of the males (56.6%) showed anger than their female counterparts (46.6%) and 85.1 percent of the females showed blame as against 50.9 percent of the males. The pattern of reaction of relatives is not different from that of affected persons. Fear and panic were dominant reactions when the disease was contracted. All but one unaffected relatives indicated that their reactions changed with time, when they reflected on the situation based on information received on the disease through health workers on how to cope with the disease.

Figure 5.2 shows reactions of relatives after reflection. Ninety-nine percent accepted the condition of their relatives (Figure 5.2). This is a positive sign for innovative behaviour. Therefore, relatives showed great support for Buruli patients as indicated in Table 5.3

Figure 5.2: Reactions of relatives after reflection



SOURCE: Fieldwork, 2001

There were other ways that individuals coped with the disease. Through FGDs and observation it was gathered that preventive measures that the community

adopts were to engage in communal labour to clean the villages as well as cleaning sources of drinking water and places of convenience. It was also gathered that the majority of respondents understood that the disease was inevitable, that the probability of contracting the disease was high. As a result, love and respect were shown to affected persons. But this did not rule out a few deviants that deride Buruli ulcer patients especially where there was enmity between and among people. The disease then became a stigma in such circumstances. For example, in the interview, 33 percent of affected persons said that relatives despised them and nine percent said they were divorced as a result of contracting the disease. Affected persons indicated that they went through difficulties in dealing with the disease. For instance, about 80 percent indicated that the disease had negatively affected their work/schooling. Asked how the disease had affected them, 37 percent indicated that they could not perform effectively at their workplaces, while 22 percent said they were incapacitated to do any work. Relatives also indicated that the household went through financial difficulties as they tried to seek treatment for affected patients, to the extent that some had mortgaged their cocoa farms.

5.3 Coping strategies and supporting systems

How an individual and the society try to prevent and treat a disease is significant in determining the health status of the individual. Analysis of responses from patients revealed that the main support for a Buruli patient comes from parents, sisters, brothers and friends (Table 5.3).

Table 5.3: Providers of needs of affected persons

Needs of affected persons	Providers of Needs								
	Pts (%)	Srs (%)	Brs (%)	Cous (%)	Chn (%)	Sp (%)	F (%)	Other (%)	Total (%)
Social needs									
1. Go on errands for you	47	28	10	5	6	3	-	1	100
2. Sends you to hospital	67	9	9	3	5	3	1	3	100
3. Brings you news	18	36	15	3	8	1	17	2	100
4. Stays around with you	32	28	13	7	5	3	10	2	100
5. Nurses you	51	20	11	3	6	4	2	3	100
6. Plays with you	25	26	20	4	3	1	19	2	100
Economic needs									
1. Pays your bills	75	6	2	3	2	4	1	7	100
2. Gives money for your upkeep	66	8	7	7	3	5	-	4	100
3 Gives you money for transportation	68	14	2	5	3	5	-	3	100
Psychological needs									
1. Prays with you	35	27	14	-	3	2	3	16	100
2. Converses with you	43	23	13	4	2	2	10	3	100
3. Counsels you	56	19	7	5	1	2	2	8	100

(N = 100)

*KEY: Pts = parents, Srs = sisters, Brs = brothers, Cous = cousins,

Chn = children, Sp = spouse, F = friends

SOURCE: Fieldwork, 2001

Parents were found to be the key individuals who responded to the critical needs of affected persons. For example, 67% of parents sent patients to hospital and 75 percent paid bills. Sisters (63%) and brothers (20%) played with patients while 19 percent of friends played with them. Reliance on the family was confirmed when affected persons responded to further questions during the interview.

Interviews with opinion leaders and data from secondary sources showed that additional support came from religious bodies, NGOs and the government. The DHMT in the study area has also employed and trained community volunteers to assist in detecting and reporting Buruli cases to the hospital. One problem encountered in this direction was that patients detected to have the disease could not be taken to hospital immediately due to financial difficulties. In an interview with the DCE at Dunkwa it was revealed that the district assembly provided assistance to the district hospital to deal with Buruli ulcer. For instance, the Assembly provided accommodation and transport for the Humanitarian Aid Relief Team (HART) whenever the team came to perform excision and skin grafts. Asked if Buruli ulcer patients received direct assistance from the Assembly, the DCE indicated that in the past, no such assistance was available due to financial constraint. But he gave the assurance that the Assembly would work out some strategy with the welfare section and perhaps religious bodies in the town to come up with funds for patients.

The Church of Pentecost Area Social Services presented used clothing to all Buruli patients in the endemic communities in the year 2000. Also, the Sisters of Charity of St. Anne, a religious order in the Catholic Church donated used clothing to Buruli patients in the study area. The Franciscan Community in Ghana, another religious body in the Catholic Church, has built a Buruli ulcer hospital at Amasaman, a deprived community in the Ga District (Marcoli, 2001).

In the Ashanti Region, the St. Martins Hospital of the Catholic Church at Agoroyesum caters for Buruli ulcer patients in that locality.

Furthermore, the Health Foundation Ghana (HFG) an NGO, in collaboration with the DHMT in Dunkwa, launched the Phenytoin powder, a drug known to be effective in healing Buruli ulcer wounds at Subin in the endemic community (This drug had earlier been recommended by doctors in Ghana, GTV, (2001). The HFG would also help to rehabilitate affected persons. The Ministry of Health (Ghana), in collaboration with the Nippon Foundations (Japan), did a pilot survey on 'tissue engineering' (a process of duplicating normal skin using donated skin) at the Korle-Bu teaching hospital. It was reported to have been successful, because the skins of eight people were restored (GTV, 2002). This new technology would be beneficial to patients with all kinds of skin problems when it is possible to apply it on a large scale.

The WHO established a Global Buruli Ulcer Initiative (GBUI) in 1998 to advocate support for endemic areas and co-ordinate control and research. The GBUI set up a Buruli ulcer Task Force in 1998 to guide the organization's work related to the disease. In Ghana, the Task Force has treated cases in the Amansie West District and the Upper Denkyira District in Ghana, mainly by excision and skin grafting. These are all efforts to help in the management of the disease. NGOs and agencies assisting in strengthening health services and research in Buruli ulcer control, include, the HART, Sassakawa Memorial Health

Foundation, Nippon Foundation, Belgium Cooperation, Institute of Tropical Medicine in Antwerp-Belgium, Pharmacies Sans Frontieres and St. Michael Health Centre in Zoukargben (WHO, 2000). Assistance from NGOs goes a long way to support government's efforts in providing health care services to the population.

5.4 Conclusion

Due to its debilitating effects, Buruli ulcer generates fear in people. Majority of respondents indicated that they showed fear and panicked when they realised that they or their relatives had contracted the disease. Affected persons (51% males and 60.8% females) and relatives (50.9% males and 85.1% females) indicated that they blamed others for the disease. This is of great concern, since it is a fact that the disease originates from the physical environment. If people initially blame others for disease contraction, then, there is more room for sensitising people on Buruli ulcer and the need for preventive measures. Considering that these feelings may lead to seeking treatment at places that may not help the individual patient, there is urgent need to strengthen health educational programmes using appropriate strategies. Although majority (over 90%) of respondents had reached the acceptance stage, arrival at this level may be speeded through counselling.

At present, treatment of the disease is through surgery and the use of phenytoin powder for healing the ulcer/wound. Skin grafts are applied in some cases. With the development of tissue engineering, it is hoped that a great number of Buruli

ulcer patients would regain their lost skins. If the rehabilitation programme planned by the HFG in the Upper Denkyira District of the Central Region materializes, it would aid Buruli ulcer patients who are disabled to live normal and fruitful lives again. The new Buruli ulcer Hospital at Amasaman would help patients to access hospital services in that locality if other logistics are also provided for the hospital. In treating Buruli ulcer, governments bear drug and treatment cost. But, in the case where hospitals give prescription to be purchased outside the hospital, the cost is borne by the patient or the family. All other costs in connection with the treatment are also borne by the patient. As a result, some have sold or mortgaged properties to meet the cost.

At the international level, the WHO has taken great steps to sensitize countries and governments and endemic communities on the disease and the need for prevention and early treatment. It has set up the GBUI and the Buruli ulcer Task Force, all in a bid to control and treat the disease. It has printed brochures on Buruli ulcer in three languages for free distribution to endemic communities. Three books have also been published on the disease (as at 2003). Currently, the WHO has set up Buruli ulcer research priorities and provides funding, in the management of the disease.

The next chapter discusses research findings and provides recommendations.

CHAPTER SIX

CONCLUSION

6.1 Introduction

Buruli ulcer is a disease that is coming to the forefront or gaining public health concern. Little is known about its mode of transmission and treatment (WHO, 2000). Researchers are therefore probing for more information on this dreadful disease. Currently, there is no cure and the main treatment is by excision when the disease is at the early stage. This is the disease whose socio-cultural dimensions the study set out to explore.

In the current literature it is reported that women and children are the most vulnerable to the disease (WHO, 2000, 2001, 2002), but it is not clear what makes these two groups of people more susceptible to infection. The study investigated possible factors that might account for this assertion with the aid of a modified proximate determinant model.

Since the disease is within the environment (WHO, 2000), it follows that the more one is exposed to it, the higher the risk of its contraction. According to the Memorias do Instituto Oswaldo Cruz (1999), the disease is soil-borne. If this is the case, then, people whose activities bring them into contact with the soil are at high risk of contracting Buruli ulcer.

6.2 Discussion of findings

Results from the study confirmed existing viewpoints (WHO, 2000) that women and children are the most affected group. Women by their roles were considered to be more exposed to the environment and to disease contraction than their male counterparts. Apart from farm-work and household chores, women in the study area were engaged in other activities such as food gathering, fishing, crab and snail hunting and digging for clay for painting bedrooms and kitchens. These activities were identified as possible risk factors to Buruli ulcer contraction. By this, women who did not or were less engaged in such roles/responsibilities might not be at high risk of contracting Buruli and this might explain why not all women in the study area were affected. Like most diseases, the mere exposure to the physical environment is not a guarantee for the incidence of a disease since the presence or otherwise of the causative organism is an important proxy for disease contraction (Galli, 1978). This highlights the inadequacy of explaining diseases only by the Germ theory (2.4.7). In the case of Buruli ulcer, another significant factor is the element of injury when the skin is exposed. Generally, women in rural farming communities in Ghana and elsewhere in Africa have similar domestic, social and economic roles to play. But for a generalization to be made that gender roles of rural women in Buruli ulcer endemic communities increase the risk of contracting the disease, there is the need for cross-sectional studies of women's activities in those communities.

At present (2003), the general viewpoint is that children under 15 years of age are the most Buruli affected group. However, in the study area, children aged 10-19 years were the most at risk of Buruli ulcer (38.7 %) while children below 10 years were the least at risk by the disease (4.2%). One reason may be that people under ten years of age are normally not involved in activities that exposed them to the physical environment. Another reason might be that in those selected households, there were a few children under 10 years of age. Age seems to play a vital role here, but the logistic regression model did not indicate that age has the likelihood of influencing the incidence of the disease. Therefore, there is the need for a detailed comparative study of children 0-9 and 10-19 in other Buruli endemic communities to reaffirm or reject the study's observation.

The hypothesis that there is no relationship between socio-demographic and economic conditions and the incidence of the disease was rejected after testing the relationships. Education, household size, income and occupation showed strong relationship with the likelihood of contracting the disease. This outcome was expected since these variables were believed to influence morbidity and mortality (Brown, 1992; Iyun, 1983). For example, education acts as a proxy for command over resources or it is expected to equip the individual to make the best use of resources to his/her advantage. Again, formal education is supposed to reduce ignorance, a factor that was observed to contribute to poor personal hygiene and failure to wear protective clothes in the study area. Concerning occupation, exposure to the physical environment and injury were considered as risk factors to

Buruli contraction. In this regard, occupation has a strong relationship with the disease since the type of one's activity would define the space within which an individual would spend most time. Since majority of the people were farmers, it was likely that many were at risk of contracting the disease. The findings regarding occupation and its influence on disease contraction confirm that the causative organism is within the physical environment (WHO, 2000; Memorias do Instituto Oswaldo Cruz, 1999). The relationship of occupation and the incidence of the disease is also a developmental issue. Productivity would be negatively affected since time used in production would be spent in getting treatment and economic resources would be channeled into treatment instead of saving to acquire capital for investment. Moreover, the individual's productivity would be greatly reduced when the one is handicapped (if limbs are severely deformed or amputated). It is therefore important that the economic cost of the disease is determined as proposed by the WHO, (2000).

The size of household might play a significant role when sharing economic resources in the bid to prevent contracting Buruli. Whereas a large household with many dependants and meager economic resources tend to suffer in terms of basic necessities, a large household with sound economic standing could mobilize resources to support one another. Incomes empower the individual to acquire basic human needs and be able to provide protective clothes, adequate nutrition and access health facilities, all in a bid to prevent contracting the disease. But as

40.1 percent of the study's population was without monthly incomes, health status was expected to be negatively affected.

The logistic regression analysis suggests that marital status and religion have the likelihood of influencing the contraction of the disease. But the proportion of never married affected persons was nearly the same as affected married persons (50.7% and 40.1% respectively). Although more Buruli affected persons were Protestants, empirical evidence shows that there is no significant difference in the way people worship that could predispose someone more to the disease than others. In the same vein, marital status does not seem to have any direct relationship with the incidence of the disease. It was observed that the way of life of the two groups could not lead to any significant difference in disease contraction. Therefore, the statistical likelihood of the two variables might be out of chance or there might be some confounding factors that available data could not reveal.

Sex was noted to have no significant relationship (P value = 0.398) with the disease because the distribution of the affected populations by sex was 70 percent for males and 72 percent for females. This was consistent with the results published by the MOH, (1999), which showed little variation in sex distribution in the National Case Search for Buruli ulcer in Ghana. However, important sex variation existed when sections of the age groups in the study were considered as

in the case of women in the age groups 20-29, 30-39 and 40-49; which could be explained by their exposure to the environment.

The majority of respondents (both affected and non-affected persons) believed in the supernatural cause of the disease, a view common in African tradition. To most Ghanaians, there is no separation between natural and supernatural events (Awusabo-Asare and Agyeman, 1993). The Azande of Sudan who explain every incident by witchcrafts would not agree less to this viewpoint of disease causation. In a recent paper Ymkje Stienstra et al., (2002), maintained that magico-religious explanations of the aetiology of the disease were common among some respondents. Since Buruli ulcer is a disease about which little is known, it is expected that people would attribute its cause to supernatural powers and ignore hospital treatment at the initial stage of the disease. Explaining diseases in terms of spirits/gods, enemies and curses is consistent with the demonic concept of disease (Galli, 1978; Lankinen et al., 1994; Sofowara, 1993; Tomlinson et al., 1997).

More than half of Buruli patients and their relatives blamed others for the disease since they believed that the disease could be caused by enemies/witchcraft. This should be a concern, since this affects health-seeking behaviour. If people blame others for the disease, then, there is the need to provide more education on the mode of its transmission and the need for preventive measures.

Fear and panic are expected responses to a disease or event at its initial stage where little information exists about it. Reactions of people in respect of HIV/AIDS are not different from that of Buruli ulcer (Awusabo-Asare and Agyeman, 1993).

Nearly all the respondents indicated that they had reflected on the initial reaction with the help of household members, friends and health education programmes and tried to live with the disease situation. With time, as a result of being informed on the disease, people's reactions changed and they sought solutions. This process is consistent with people's response described in the Event/Stimulus-Response Paradigm (Awusabo-Asare and Agyeman, 1993).

Affected persons, non-affected persons and FGD members seemed to have had a built-in mechanism to absorb the difficulties associated with the disease as 97 percent affected persons and 99 percent relatives had reached the acceptance stage described by the Stimulus/Event-Response Paradigm. It suggests adaptation to the disease as a result of long duration of existence of the disease in those communities and a positive sign for innovation.

6.3 Recommendations

It was observed in the study that, one's involvement with the environment and the presence of injury were most significant direct factors that place individuals at high risk of contracting Buruli ulcer, but these two most vital proximal factors

were indirectly measured. Therefore, there is the need to carry out microbiological examination of samples of air, water, soil, food and insects in the study area to measure the level of environmental contamination. Also, physical examination of individuals for injury in a controlled group before and after contraction of the disease may make more explicit the use of these proximal factors in Buruli ulcer contraction in endemic communities.

It was also observed that children below ten years of age were less exposed to the physical environment as against those of ten years and above. To reaffirm or reject this observation, it is recommended that a detailed comparative study of children 0-9 and 10 years and above in other endemic communities be conducted. It is also recommended that the DHMT intensifies health education and the use of protective clothing and observance of personal hygiene in an effort to reduce the incidence of the disease.

The DHMT has made tremendous impact in sensitising people on the disease. However, there is still room for improvement. New methods such as audio-visual aids on the cause of the disease, its prevention and treatment have to be adopted in health education programmes in addition to the normal mass education on disease prevention and where to go for treatment. It was observed that patients could not afford cost of transportation to hospital. To deal with this problem, the DHMT should improve its outreach programmes and be more regular in the communities. Where this is not possible, it is recommended that Buruli ulcer volunteers already

trained by the DHMT should be provided with adequate materials in dressing ulcers in their localities. It is recommended that District Assemblies in endemic communities implement the Government's Poverty Reduction Strategy in order to help alleviate poverty and ensure affordability of health services. Since the study observed general poverty in the study area, it is recommended that any strategy to prevent or reduce the incidence of the disease should aim at providing free protective clothing, disinfectants, soap and transport to members in one selected community in the study area on pilot basis. This should include monitoring of the use of these facilities by Buruli volunteers in the area.

Since herbs may be efficacious in treating the disease and many patients believe in this treatment, there should be research into the efficacy of local herbs used by herbalists in treating the disease and incorporate them into current treatment at the hospital.

The study revealed inadequate logistics at the district hospital in dealing with the disease. It is therefore suggested that the Ministry of Health, the Government and other NGOs should support the hospital, for example, by renovating Buruli ulcer wards and providing transport to health personnel for use in outreach programmes. The Ministry could also provide in-service training for doctors and nurses in the area of Buruli ulcer treatment and control, since interviews with health personnel revealed that not all health professionals could readily identify Buruli ulcer infection. The government should assist the Ministry to put up Buruli

ulcer health centres at vantage points in endemic areas. Subin Hill in the study area is recommended for a health centre since it has a large catchment area. The Ministry of Health needs to incorporate the concerns of Buruli ulcer in its policies. A document entitled; *'The Health of the Nation-Reflections on the First Five Year Health sector priorities of Work 1997-2001'*, (MOH, 2001), did not mention Buruli ulcer anywhere although emerging diseases were discussed. Page 16 of the document dealt with some key public health issues, but Buruli ulcer was missing. This raises a lot of questions. If the Ministry was silent on the disease, it follows then, that budget allocation for various sectors of the Ministry in dealing with diseases would equally be silent on Buruli ulcer. It is therefore recommended that the Ministry of Health reviews that document and make necessary amendments in order to address more practically the concerns of Buruli patients in Ghana.

At the first international meeting on Buruli ulcer (Yamoussokro Declaration, 1998), it was agreed that the treatment of the disease should be free. This directive seems not to be fully complied with. It is therefore recommended that the government fulfils her obligations while hospitals endeavour to comply with the Ministry of Health's directive to provide free treatment to Buruli ulcer patients. The Ministry of Health should monitor the implementation of this policy in all hospitals and health centers in endemic communities in the country. For example, personnel from the National Buruli ulcer Control Unit could pay unannounced visits to government hospitals in endemic communities and interact with Buruli

patients and health care providers to ascertain the compliance of government's order of free treatment of the disease. Also personnel from the Global Buruli Ulcer Initiative can equally do the same to make sure the directive is executed. When this is done, it may ease the burden on Buruli patients from poor rural communities to access health facilities.

Religious bodies are assisting Buruli patients. As the basic aim of these bodies is to assist the sick and needy, it is in line that all religious bodies provide assistance for Buruli patients. Contributions can be put in a central fund and part of this used for projects that could yield profit to ensure sustainability of the fund. Again, yearly appeals could be made to all individuals, companies and NGOs to contribute to a Buruli Ulcer Fund Initiative (BUFI). The fund may be used to assist in paying transportation to and from the hospital. Protective clothing such as Wellington boots and long sleeve shirts and blouses or simple canvas shoes could be purchased for the people in the endemic communities to use in their activities. The fund can also be used to defray some of the debts Buruli patients incur during treatment period. In the long term, a bus could be purchased from the fund to assist in conveying Buruli patients to the hospital. Some NGOs are already assisting Buruli patients as indicated in the study. However, more help is needed in the area of the rehabilitation of patients.

6.4 Conclusion

The study aimed at analysing the socio-cultural dimensions of Buruli ulcer in Ghana, an aspect of the disease about which little is known in the current literature. Applying an explanatory model for morbidity and mortality, the proximate determinants framework was used to explain possible factors exposing women and children to the risk of Buruli contraction in the study area.

It was observed that socio-cultural and economic roles of women and children make them vulnerable to contracting Buruli as a result of their constant interaction with the physical environment. With the probability that one's close contact with the physical environment could lead to a higher risk of contracting the disease, it can be hypothesized that in endemic communities, the closer the contact with the physical environment, the higher the risk of Buruli contraction.

The disease generates fear and panic in most people due to the difficulty in treating it and the fact that people know virtually nothing about its transmission. Various ministries, departments, agencies and communities should be involved in sensitising and providing social, economic and psychological support for Buruli endemic communities. In Ghana and elsewhere, serious attention is directed to the prevention and treatment of HIV/AIDS. Similar attention could be given to Buruli ulcer since the disease is also a public health concern and a developmental issue. It is hoped that more insights into the socio-cultural dimension may aid policy-

making, health professionals and NGO's in handling the disease in endemic communities.

REFERENCES

Asiedu, K. and Etuaful, S. (1998), '*Socio-Economic Impact of Buruli Ulcer in Ghana, A Three Year Review*' **American Journal of Tropical Medicine and Hygiene**, Vol.59, No. 4, pp 1015 - 1022

Awusabo-Asare, K. and Agyeman, D.K. (1993), '*Social Science Research and the Challenge of the AIDS Epidemic*' **International Population Conference, International University for the Scientific Study of Population**, Montreal, pp 357 - 367.

Barret, H. R. (1996), **Population and Geography Conceptual Frameworks in Geography**, Longman, Singapore Publishers Ptc Ltd, Singapore.

Bethrem, G. (1992), '*Global Environmental Change and Health*' in Phillips, D. R., Verhasselt, Y. (eds.) (1994) **Health and Development**, Routledge, London, pp 33-49

Bongaarts, J. (1978), '*A Framework for analyzing the proximate determinants of fertility*' **Population and Development Review** 4, No.1, pp 105-132

Brown, P. (1992), **Perspectives in Medical Sociology**, Waveland Press, Inc., New York

Calhoun, C. et al. (1997), **Sociology**, MacGraw-Hill Inc., New York

Carroll, M. P. (1998), **Introduction to Sociology: A Canadian Focus**, Prentice Hall Inc., Canada, p 45

Claude, A. V. (1968), **Biology**, Sounders Company, London

De Souza, (1990), **Geography of developing Economies**, Macmillian Publishers, New York

Disease Control Unit MOH, (1999), **Hospital statistics** (Unpublished), Sunyani

District Health Management Team (DHMT), (1998) **Hospital records**, (Unpublished) Dunkwa on-Offin),

Dobos, K. M. and King, C. H. (1999), '*Emergence of a unique group of necrotizing mycobacterial diseases*', **Emerging Infectious Diseases**, <http://www.who.int/gtb-buruli>

- Ennin, M. (2000), **Buruli Ulcer in Upper Denkyira District**, Long Essay submitted to the Department of Community Health School of Medical Sciences - Kumasi
- Fredua-Antoh, E. (1998), **Upper Denkyira District five-year Development Plan**, pp 2- 4, 8-10
- Galli, N. (1978), **Foundations and Principles of Health Education**, John Wiley and Sons Inc., New York
- Ghana Demographic and Health Survey (1998)**, Ghana Statistical Service, Accra
- Ghana Statistical Service (2002), **2000 Population and Housing Census Summary Report of Final Results**, Billy-Harm Press Ltd., Accra
- Ghana Television (1998), June, 21st, 7 O'clock, Evening News, '*Amansie West District records high cases of Buruli ulcer*'
- Ghana Television (2001), December 8th, 7 O'clock Evening news, '*A new drug for Buruli ulcer*'
- Ghana Television (2002), May 4th and 5th, 7 O'clock, Evening News, '*New technology for helping Buruli patients*'
- Iyun, B. F. (1978), **Spatial Analysis of Health-Care Delivery in Ibadan**, PhD. Thesis, University of Ghana, Legon, pp 36-61, 112-114
- Iyun, B. F. (1983), '*Determinants of Disease-Risk Cell Areas in Ibadan City*', **Geoforum**, Vol. 14, No. 2, pp 211-221
- Kinner, P. R. and Grey, C. D. (2000), **SPSS for Windows Made Simple**, Release 10, Psychology Press Ltd., U. K.
- Kumfaa, E. Y. (1996), **Sustainable Rural Health Services through Community-Based Organisations; Women Groups in Ghana**, Spring Research Series 16, Dortmund, U.K.
- Laframboise, H. (1973), '*Health Policy: breaking the problem down into more manageable segments*', **Canadian Medical Association Journal**, No.108, pp 388-391
- Lankinen, K. S. et al. (1994), **Health and Disease in Developing Countries**, Macmillan Education Ltd., London

Marcoli, V. (2001), '*Church in Ghana: Franciscan Community builds a hospital for Buruli ulcer*', **Catholic Messenger**, Franciscan Publications, Takoradi, pp 26-27

Marshall, G. (1994), **Oxford Concise Dictionary of Sociology**, Oxford University Press, Oxford, p 552

Martin, A. E. (1994), **Oxford Concise Medical Dictionary**, Oxford University Press, Oxford

McGlashon, N. D. ed. (1971), **Medical Geography Techniques and Field Studies**, Methuen, London

Memorias do Instituto Oswaldo Cruz (1999), '*Buruli ulcer in Ghana*' **The Weekly News Magazine of Science**, Vol. 92(1), p 31-32

Ministry Of Health (1999), Epidemiological Division, '*National Case Search for Buruli Ulcer*', (Unpublished)

Ministry Of Health (2001), **The Health of the Nation, Reflections on the First Five Year Health Sector Programme of Work 1997-2001**, MOH, Ghana

Mosley, H. W. and Chen, L.C. eds. (1992), '*An Analytical Framework for the Study of Child Survival in developing Countries*', **Population and Development Review**: No. 9, pp 25-41

Nuro, A. E. (1999), **Brain Drain from Ghana. Case of University lecturers**, M. Phil. Thesis submitted to the Department of Geography and Tourism, University of Cape Coast, Cape Coast

Phillips, D. R. and Verhasselt, Y. eds. (1994), **Health and Development**, Routledge, London

Quaicoo, S. (2002), '*Upper Denkyira records 168 Buruli Cases*' **Daily Graphic**, March 15, No. 148470, p 32

Quaicoo, S. (2003) '*Buruli ulcer affects 20 Communities in Upper Denkyira*', **Daily Graphic**, February 7, No. 148742, p 24

Sofowora, A. (1993), **Medical Plants and Traditional Medicine in Africa**, Spectrum Books Ltd., Ibadan, pp 26-28

Survey of Ghana (2002), **District Map of Ghana**, adapted by the Geographic Information System (GIS) Unit, Dept. of Geo. & Tourism University of Cape Coast, Cape Coast

Taylor, D. J. et al. (1998), **Biological Science**, Cambridge University Press, Cambridge

The Bible, (1968), Deuteronomy 28:15, 21-22, 27, **The Jerusalem Bible**, Darton, Longman and Todd Ltd., London, p 217

The Bible, (1968), Job 1-42, **The Jerusalem Bible**, Darton, Longman and Todd Ltd., London, pp 216-217, 631-674

The Bible, (1968), Leviticus 13:1, **The Jerusalem Bible**, Darton, Longman and Todd Ltd., London, p 118

The Hutchinson Encyclopedia (2001), Helicon Publishing Ltd., United Kingdom p 197

The New Encyclopaedia Britannica (1993), Vol. 8, Encyclopaedia Britannica Inc., Chicago pp 46-47

The World Book Encyclopedia (1996), E Vol. 6, World Book Encyclopedia Inc., Chicago pp 53, 297

The World Book Encyclopedia (1996), SO-SZ Vol. 18, World Book Encyclopedia Inc., Chicago pp 296-927

Tjip, S.van der Werf, et al. (1999), '*Mycobacterium Ulcerans Infection*' **The LANCET**, Vol. 354, pp 1013-18

Tomlinson, S. et al. eds. (1997), **Mechanisms of Disease: an Introduction to Clinical Science**, Cambridge University Press, Cambridge

Town and Country Planning Department (2001), **District Base Map-Dunkwa**, Upper Denkyira District, Plan No. TCP/CEN/DUN

Travis, J. (1999), '*Africa's Latest Scourge*', **The Weekly Newsmagazine of Science**, Vol.156, No 3. p 40

World Health Organisation (2000), <http://www.who.int/gtb-buruli> at 2000

World Health Organisation (2000), **Mycobacterium Ulcerians Infection**, Global Buruli Ulcer Initiative WHO/CDS/CPE/2000.1

World Health Organisation (2001), <http://www.who.int/gtb-buruli> at 2001

World Health Organisation (2002), <http://www.who.int/gtb-buruli> at 2002

Wortman, C. B. et al (1992), **Psychology**, McGraw Hill Inc New York

Yamoussoukro Declaration (1998), '*An International Conference on Buruli ulcer*' held in the Ivory Coast, in World Health Organisation, (2000) **Mycobacterium Ulcerians Infection**, Global Buruli Ulcer Initiative WHO/CDS/CPE/2000 1, pp 77-83

Ymkje, Stienstra et al (2002), '*Beliefs and Attitudes towards Buruli ulcer in Ghana*' **American Journal of Tropical Medicine and Hygiene**, 67 (2), pp 207-213

Zandan, J. W. V (1993), **Human Development**, McGraw-Hill Inc , New York

APPENDIX ONE: Permission letter

Department of Geography and Tourism
University of Cape Coast
Cape Coast.
9th March 2001

The District Health Administrator
Dunkwa District Hospital
Dunkwa On-Offin

Thro.
The Head
Department of Geography and Tourism
University of Cape Coast
Cape Coast.

Dear Dr. Klutse,

**PERMISSION TO CONDUCT INTERVIEW WITH BURULI PATIENTS
IN THE DISTRICT**

I am writing my M. Phil thesis on an aspect of Buruli ulcer and have chosen Upper Denkyira District as my study area. I would therefore be grateful if you could grant me permission to interview selected patients in the district.

Counting on your co-operation.

Yours faithfully,

(Rev. Sr. Agnes-Rita Adomah)

APPENDIX THREE 'A': Interview schedule for affected persons

**UNIVERSITY OF CAPE COAST
DEPARTMENT OF GEOGRAPHY AND TOURISM**

**SOCIO-CULTURAL DIMENSIONS OF BURULI ULCER INFECTION
IN THE UPPER DENKYIRA DISTRICT**

INTERVIEW SCHEDULE FOR AFFECTED PERSONS

This interview is conducted purely on academic basis. Your co-operation is needed to make it successful. You are however free to back out at any point in time. Confidentiality is guaranteed.

- MODULE A:** Perception on Buruli ulcer
- MODULE B:** Assessment of Health Services
- MODULE C:** Response to the Disease

HOUSEHOLD NUMBER
AGE (in completed years)
SEX
NAME OF INTERVIEWER
ZONE

NAME OF LOCALITY

DATE: **D** **M** **Y**
 () () () () () ()

TIME STARTED: **H** **M**
 () () () ()

TIME COMPLETED: () () () ()

A: PERCEPTIONS ABOUT THE BURULI DISEASE

A1 When did you first hear about the disease? 1. 1 yr. ago 2.. 2 yrs. ago 3. 3+ yrs ago.	[] JA1
A2 Did you hear about it before your infection? 1 YES 2 NO	[] JA2
A3 Did you know somebody who has been infected before your own infection? 1 Yes 2 No	[] JA3
A4 What do others generally think is/are the cause(s) of the disease?	[] JA4
1 gods/spirits	[]
2 environment	[]
3 an enemy	[]
4 a curse	[]
5 I don't know	[]
6 Other, specify	[]
A5 Who do most people consult first when they contract the disease?	[] JA5
1 herbalist	[]
2 spiritualist	[]
3 fetish	[]
4 doctor/nurse/health worker	[]
5 other, specify.....	[]
A6 Who did you consult first, when you last contracted the disease (See answers in A6)	[] JA6
A7 Who did you consult second when you last contracted the disease (See answers in A6)	[] JA7
A8 Who did you consult third when you last contracted the disease (See answers in A6)	[] JA8
Please, listen to Questions A10 – A15 and in each case indicate if you: (1) Strongly Agree (2) Agree (3) Disagree (4) Strongly Disagree (5) No Opinion	
A9 The gods and spirits cause Buruli ulcer.	[] JA9
A10 Our enemies can cause the disease on us	[] JA10
A11 The disease is caused by a curse	[] JA11
A12 The environment causes the disease.	[] JA12
A13 Women contract the disease more than men.	[] JA13
A14 Spiritualists, herbalists, and fetish priests/priestess have great insight into this strange disease.	[] JA14

B: ASSESSMENT OF HEALTH SERVICES

<p>B1 When was the last time you visited a hospital/clinic? 1. Less than a yr 2. 1yr. 3. 1 yr.+</p>	<p>[] B1</p>
<p>B2 What were you treated for? 1. Buruli 2. Malaria 3. Diarrhoea 4. Other, specify.....</p>	<p>[] B2</p>
<p>B3 What did you think about the treatment you received? 1. Good 2. Very good 3. Poor 4. Very poor 5. other, specify.....</p>	<p>[] B3</p>
<p>B4 Did you pay anything when you visited the health facility? 1 YES 2 NO</p>	<p>[] B4</p>
<p>B5 If yes, how much did you pay per treatment/consultation? 1. Less than c20, 000 2. More than c20, 000 3. Other, specify.....</p>	<p>[] B5</p>
<p>B6. When you attended the health facility by what means did you go there? 1. On foot 2. By bicycle 3. Vehicle 4. By boat 5. Other, specify.....</p>	<p>[] B6</p>
<p>B7 How much did you pay for transport? (In & Out). 1. Less than c10, 000 2. More than c10, 000 3. Nothing</p>	<p>[] B7</p>
<p>B8 By what means did you return? 1. On foot 2. By bicycle 3. Vehicle 4. By boat 5 other, specify.....</p>	<p>[] B8</p>
<p>B9 (a) Have you sought treatment in an alternative health centre? 1. Yes 2. No (b) If yes when? 1. Less than a yr. 2. More than a yr.</p>	<p>[] B9a</p>
<p></p>	<p>[] B9b</p>
<p>B10 Why did you go there? 1. I had no choice 2. The place is highly recommended 3. Cost is low 4. Other, specify.....</p>	<p>[] B10</p>
<p>B11 By what means did you go there? 1. On foot 2. By bicycle 3. Vehicle 4. By boat 5. Other, specify.....</p>	<p>[] B11</p>
<p>B12 How much did you pay for transport? (In & out) 1. Less than c10, 000 2. More than c10, 000</p>	<p>[] B12</p>
<p>B13 How much did you pay for treatment? 1. Less than c20, 000 2. More than c20, 000 3. Eggs/chick 4. Nothing 5. other</p>	<p>[] B13</p>
<p>B14 How do you rate the services you received there? 1. Good 2 Very good 3 Poor 4. Very poor 5. Other, specify.....</p>	<p>[] B14</p>

C: RESPONSE TO THE DISEASE

C1 Has the disease affected your schooling/work? 1. Yes 2.No [] C1

C2 If Yes, how has it affected your schooling/work? 1. Missing working hours 2. Can't perform well. 3. I have been sacked 4. Incapable to work at all 5. Other, specify..... [] C2

C3 If No, why not? 1. I am accepted to do what I can 2.I don't mind what people say, I go about my work 3. Relatives/people help me in the work 4 Other, specify..... [] C3

C4 Has the disease affected your life in the family? 1. Yes 2. No [] C4

C5 If Yes, how has it affected your life in the family? 1.Relatives despise me 2. Spouse despises me 3. I can't contribute financially 4. I am divorced 5.Other, specify..... [] C5

C6 If No, why not? 1.The family accepts me 2. I don't mind anybody, I live my life 3. I live alone 4. Other, specify.....[] C6

C7 Has the disease affected your life in the community? 1. Yes 2. No [] C7

C8 If Yes, how has the disease affected your life in the community? 1. I can't go in public 2. I am not respected 3. I can't get a marriage partner 4. Other, specify..... [] C8

C9.What are you doing to support yourself financially? 1.Working 2. Begging [] C9
3. Nothing 4. Depending on relatives 5. Other, specify.....

C10 How do you manage to cope in financial difficulty? Rely on: 1. Parents 2. Friends [] C10
3. Church members 4. Self 5 Other, specify.....

C11 Is the family doing anything to support you? 1. Yes 2. No [] C11

C12 If yes, what is the family doing to support you? 1. Remits me 2. Provides all my needs
3. Other, specify.....[] C12

C13 Does the community support you? 1. Yes 2. No [] C13

C14 If Yes, what has the community done for you? 1. Supports me financially 2. Supports me
in kind 3. Accepts me 4. Other, specify..... [] C14

C15 Does the Government support you? 1. Yes 2. No [] C15

C16 If yes, what is the government doing to support you? 1. Supports me financially 2.Provides
free medical care 3. Provides used clothes 4. Other, specify.....[] C16

C17 What other groups support you? (If any) 1.Churches 2. NGOs 3. Individuals 4. Nobody
5. Other, specify..... [] C17

C19 What is the attitude of the following to you? Use the following to fill in (1-7)

1. Good 2. Very good 3. poor 4. very poor 5. No father/mother/sister/brother

- 1. Father.....
- 2. Mother.....
- 3. Brother(s).....
- 4. Sister(s).....
- 5. Friends.....
- 6. Church members.....
- 7. Community members.....

C20 WHO PROVIDES THE FOLLOWING NEEDS? Use the following to fill in (a) – (c)

1. Parents 2. Sister(s) 3. Brother(s) 4. Cousin 5. Nephew 6. Aunt

7. Uncle 8. Other, specify.....

- (a) **SOCIAL-** (I) go on errands for you
- (ii) sends you to hospital
- (iii) brings you news
- (iv) stays around with you
- (v) nurses you
- (vi) plays with you
- (b) **PSYCHOLOGICAL**
- (i) prays with you
- (ii) converses with you
- (iii) counsels you
- (c) **ECONOMIC-**
- (I) pays your bill
- (ii) gives you money for your upkeep
- (iii) gives you money for transportation

**PLEASE, Indicate (1) Strongly Agree (2) Agree (3) Disagree (4) Strongly Disagree
(5) No Opinion (21-26)**

C21 I was so much afraid that I had contracted the disease [] C21

C22 I did not know what to do, I was panicky [] C22

C23 The disease has maimed/incapacitated me. I was really angry. [] C23

C24 I knew somebody had caused this on me [] C24

C25 I stayed away from people because of the disease [] C25

C26. I did not think that there was anything I could do in life. I was in despair [] C26

C27 Did your feelings change with time? 1 Yes 2. No [] C27

APPENDIX THREE 'B': Interview schedule for relatives of affected persons

**UNIVERSITY OF CAPE COAST
DEPARTMENT OF GEOGRAPHY AND TOURISM**

**SOCIO-CULTURAL DIMENSIONS OF BURULI ULCER INFECTION IN
THE UPPER DENKYIRA DISTRICT.**

INTERVIEW SCHEDULE FOR RELATIVES OF AFFECTED PERSONS

This interview is conducted purely on academic basis. Your co-operation is needed to make it successful. You are however free to back out at any point in time. Confidentiality is guaranteed.

- MODULE A:** Household Register
- MODULE B:** Household economic conditions
- MODULE C:** Perception on Buruli ulcer
- MODULE D:** Response to the disease

HOUSEHOLD NUMBERSIZE.....
NAME OF INTERVIEWER.....
ZONE
NAME OF LOCALITY:.....

DATE: **D** **M** **Y**
 () () () () () ()

TIME STARTED: **H** **M**
 () () () ()

TIME COMPLETED: () () () ()

A. HOUSEHOLD ROSTER

NO.	AA Please, indicate the first name of all the persons who belong to this household.	AI Sex: 1.Male- 2.Female	A2 Highest educational level: 1.No formal Education. 2.Primary 3. Middle/JSS 4.Secondary/comm./Voc	A3 Age: (in completed years).
1	[]	[]	[]
2	[]	[]	[]
3	[]	[]	[]
4	[]	[]	[]
5	[]	[]	[]
6	[]	[]	[]
7	[]	[]	[]
8	[]	[]	[]
9	[]	[]	[]
10	[]	[]	[]

	AA	A4	A5	A6	A7
	Please, repeat the order of names in A1 above.	Occupation: 1.Farming 2. Student/pupil 3.Children not attending school. 4.Other	Marital status: 1.Never married 2.Married 3.Other (separate, widow, divorced)	Religion: 1. Catholic 2. Protestant 3. Moslem 4.Traditional 5.Other	Income 1. >€50,000.00 2. €50,000.00-€99,999.00 3. €100,000.00-€199,999.00 4. €200,000.00+ 5. No income
No					
1.	[]	[]	[]	[]
2.	[]	[]	[]	[]
3.	[]	[]	[]	[]
4.	[]	[]	[]	[]
5.	[]	[]	[]	[]
6.	[]	[]	[]	[]
7.	[]	[]	[]	[]
8.	[]	[]	[]	[]
9.	[]	[]	[]	[]
10.	[]	[]	[]	[]

B. HOUSEHOLD ECONOMIC CONDITIONS	
B1 The main economic activity of the household is: (1) Farming (2) Trading (3) Fishing (4) Other, specify.....	[]
B2 The main source of income to the household is: (1) Farming (2) Trading (3) fishing (4) Other, specify.....	[]
B3 Does the household have some assets? (1) Yes (2) No	[]
B4 If yes, what are the main assets? (1) Cash deposit (2) Land (3) Livestock (4) Building (5) Other, specify.....(Tick those that apply)	[]
B5 Does the household obtain economic support from any other sources? (1) Yes (2) No	[]
B6 If yes, from what sources? (1) Extended family (2) Loans from banks (3) Loans from banks/Credit unions 3) Other, specify.....	[]
B7 The approximate monthly net income of head of household is: 1. Less than ₦50, 000.00 2. ₦50, 000.00-₦99, 999.00 3. ₦100, 000.00-₦ 199,999.00 4 ₦200,000.00+ 5.No income (Please, underline appropriate answer)	
B8 What is the overall financial situation of the household to provide all basic needs? 1. More than sufficient 2. Sufficient 3. Barely sufficient 4. Insufficient 5. Other, specify	[]

C: PERCEPTION ABOUT THE BURULI DISEASE	
Please, listen to the following statements and in each case indicate if you: (1) Strongly agree (2) Agree (3) Disagree (4) Strongly disagree (5) No Opinion	
C1 Gods and spirits cause Buruli ulcer	[] C1
C2 Our enemies cause the disease.	[] C2
C3. The disease is caused by a curse	[] C3
C4 The environment causes the disease.	[] C4
C5 Women contract the disease more than men.	[] C5
C6. Spiritualists, herbalists and fetish priest/priestess have great insight to this strange disease.	[] C6
C7 Hospitals cannot treat Buruli ulcer patients well.	[] C7

D: RESPONSE/COPING STRATEGIES

D1 Reported household Cost of treatment since infection started. Use the ff. to fill in (i-vi)
1. c10, 000-c39, 000 2. c40, 000-c69, 000 3. c70, 000-c99, 000 4. c100, 000+

LAST INFECTION

- (i) transportation cost
- (ii) herbal medicine cost
- iii) spiritual donations
- (iv) hospital drugs cost
- (v) special food cost
- (vi) household items lost/sold to meet needs since infection started

**Please, indicate: 1 Strongly agree 2 Agree 3 Disagree 4 Strongly disagree
5 No opinion to the following questions. (D2-D8)**

- D2** I was so much afraid that he/she had contracted the disease. [] D2
- D3** I did not know what to do, I was panicky [] D3
- D4** The disease has maimed him/her. I was really angry. [] D4
- D5** Somebody has caused this on him/her [] D5
- D6** I stayed from people because of the disease [] D6
- D7** I did not think there was anything I could do about this situation.
I was in despair [] D7
- D8** I have accepted his/her condition so I will do my best to help him/her [] D8
- D9** Did your feelings change with time? 1. YES 2 NO [] D9

APPENDIX FOUR: Observation Guide

ZONE.....
NAME OF SETTLEMENT.....
SURBURB.....

I. THE PHYSICAL ENVIRONMENT

(a) Location of settlement(s) and sitting of buildings: e.g. is the place wet or dry environment?
.....

(b) Observe Site of children's playground.....

(c) Observe (i) sources of drinking water;

(ii) surroundings of water.....

(iii) people responsible for fetching water.....

(d) Observe General cleanliness around homes.

i. weeds cleared around surroundings.....

ii stagnant water near houses.....

iii. solid waste around houses.....

iv. other, specify.....

(e) Observe state of houses. (i) Type of material used in building.....

(ii) Type of roofing.....

(iii) Nature of walls (painted? with what?).....

II. THE SOCIO-ECONOMIC ENVIRONMENT

(a) Observe accessibility within the community: road networks, footpaths etc.....

(b) Observe facilities available for the treatment of the disease.....

(c) Observance of personal hygiene: Clean i. Feet..... ii. Hands.....

iii. rest of the body..... v. Clothes.....

(d) Observe quality of dressing generally in the performance of routine activities.....

(e) Observe Children's dressing to i. Farm.....

ii play iii. School

iv. social functions.(e.g. Church/mosque).....

(f) Observe Women's and men's dressing to: i. work

(ii) social functions.(e.g. Church/mosque).....

(g) Observe food eaten for lunch and supper.....

APPENDIX FIVE: Interview guide for Opinion leaders and Health workers

1 STATUS OF RESPONDENT (e.g. Doctor, nurse, chief, herbalist, etc.)

.....

2 (FOR HERBALIST/SPIRITUALIST/FETISH ONLY). What do you consider to be the cause(s) of the disease? (For Herbalists)

.....

(ALL

3 How does the society regard someone who contracts the disease?

.....

4 What are some of the problems in dealing with the disease in this area?

.....

5 What are some of the programmes in place to help reduce the incidence of the disease.....

6 What specific interventions could be undertaken to improve Buruli ulcer control efforts in the District?

(a) for people in the community.....

(b) patients

(c) health care providers.....

7 What is the Government doing in relation to the disease?

.....

8 What do you expect the Government to do in relation to the disease?

.....

9 Are there NGO's involved in assisting Buruli patients?.....

10 What are they doing in relation to the disease?.....

11 What do you expect them to do?.....

APPENDIX SIX: Focus Group Discussions (Checklist)

1. What are the main activities of women and men in this community?
2. Has there been a change in the role of women and men the past 10, 20 years? (Probe for answers)
3. How long has this disease been known or affecting people in this community?
4. Any beliefs associated with its presence? (Probe)
5. What are the groups most affected, mothers, fathers or children? (Probe, ask for reasons for the differences in infection)
6. Generally, what do you consider to be the cause(s) of the disease?
7. What is the local name for the disease?
8. Where do people go first to seek treatment and why? (Probe for sequence)
9. How have people managed to contain the situation?
10. How do families react to a relative who has contracted the disease?
11. How does the local community react to an affected person?
12. Do families support affected relative? In what way? (Probe for different relations)
13. What can the community do to assist affected individuals?
14. What does the society expects the Government to do in relation to the disease?