MEASURING EQUITY IN ACCESS TO HEALTH CARE:

A CASE STUDY OF MALARIA CONTROL INTERVENTIONS

IN THE KASSENA-NANKANA DISTRICT OF NORTHERN GHANA

Thesis submitted to the University of Cape Town
for the Degree of Doctor of Philosophy

By

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Thesis Title: Measuring Equity in Access to Health Care: A Case Study of Malaria Control Interventions in the Kassena-Nankana District of Northern Ghana

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ABSTRACT:
This thesis develops a methodology for measuring equity in access to health care. The thesis deconstructs the concept of access into dimensions that represent the supply and demand side of health care and tests each of these dimensions by using the example of access to malaria services in the Kassena-Nankana district of northern Ghana. An innovative framework and a disadvantage index are developed herein, and are used to analyse the primary factors of access and to measure inequities in such access.

A cross-sectional survey of 1880 household heads, focus group discussions, in-depth and key informant interviews with community members and health providers were used to explore issues in respect of malaria management, health care access and perceptions of poverty. The principal component and factor analysis statistical methods were then applied to estimate access factors and to compile a disadvantaged index of access.

The key findings indicate that the dimensions, availability, affordability, information and acceptability primarily determine access to health care. On the availability dimension, physical distance to health care, provision of primary and inpatient care and travel distance are significant factors. The primary factors of affordability are associated more with the socio-economic characteristics of the household than with direct user costs. The information dimension is determined primarily by knowledge to treat levels of severity of malaria and the source of information for treatment. The acceptability of health care is related to methods and services for managing severity of levels of malaria at home as well as using qualified health care providers.

The disadvantage index and poverty maps show significant disparities in health care access between geographic areas and socio-economic groups, with areas in the outskirts of the Kassena district being the most disadvantaged in terms of availability, acceptability and information. These areas are however not economically disadvantaged. The poorest households have the lowest accessibility scores across all dimensions.

Whereas the Ghanaian health system places more emphasis on the supply side of health care, these findings show that access is strongly determined by both the demand and supply side. In order to achieve the goal of equitable access, both sides of health care access have to be addressed, with particular attention devoted to improving access for the poorest of the poor.

DEDICATION

Dedicated to the Akweongo and Cassoma Families

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ABBREVIATIONS

BHI	Bulletin of Health Information
CHFP	Community Health and Family Planning
CHPS	Community-based Health Planning Services
CHO	Community Health Officer
FA	Factor Analysis
FGD	Focus Group Discussion
GDP	Gross Domestic Product
GIS	Geographic Information System
GLSS	Ghana Living Standards Survey
GPS	Geographic Position System
GSS	Ghana Statistical Services
IDI	In-Depth Interviews
ISEqH	International Society for Equity in Health
ITN	Insecticide Treated Nets
KII	Key Informant Interview
KND	Kassena-Nankana District
MIM	Multilateral Initiative on Malaria
MOH	Ministry of Health
NDSS	Navrongo Demographic and Surveillance System
NHRC	Navrongo Health Research Centre
OOP	Out-Of-Pocket
PCA	Principal Component Analysis
SES	Socio-economic Status

TDR	Tropical Disease Research
UNICEF	United Nations Children and Emergency Fund
US	United States
WHO	World Health Organization

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EXECUTIVE SUMMARY

This thesis develops a methodology for measuring equity in access to health care. The thesis deconstructs the concept of access into dimensions that represent the supply and demand side of health care and tests each of these dimensions by using the example of access to malaria services in the Kassena-Nankana district of northern Ghana. An innovative framework and a disadvantage index are developed herein, and are used to analyse the primary factors of access to health care and to measure inequities in such access.

Access is a multi-dimensional concept and both quantitative and qualitative research techniques were employed to explore perceptions about health care and to fully understand the complex factors that determine access to malaria control interventions. Using structured questionnaires for a randomly selected sample of 1880 households in the Kassena-Nankana district, the study gathered information on socio-demographic and socio-cultural characteristics, indicators of economic welfare, supply of health services, geographic information on distances to health care, and health seeking behaviour of households. The study specifically explored the perception of households regarding the causes and treatment of malaria, and their perceptions of poverty and general wellbeing using focus group discussions and in-depth interviews. Semi-structured interviews were used to obtain information on service provision from both public and private health providers. A total of 86 qualitative interviews were conducted to supplement the quantitative survey. The principal factor analysis multivariate technique was used to extract the primary factors that determine access and to compile a disadvantage access score.

The four dimensions-availability, affordability, health information and acceptability primarily determine access to health care. Households tend to value health facilities that provide inpatient care, physical distance to health care and travel time on the availability dimension of access. The average distance to a health centre and the community health nurse was 6km and 4.6 km respectively, with over 50% of households living further away from them than these average distances. The availability dimension technically describes the supply of health care.

Affordability is determined most importantly by the economic status and size of the household, the gender and marital status of the household head and less by direct user fees, which emphasizes the importance of the demand side of access to health care.

The health information dimension is found to be very critical in determining how appropriate households manage malaria at the home and more importantly who is the source of that health information. Households do, however, continue to rely on information from relatives resulting in delays and more complicated malaria cases which primary health care facilities that are closest to them cannot effectively managed. Over 56% of malaria cases were treated at the district hospital. Primary health care facilities are being underutilized and the promotion of primary health care as the key to improving access is being defeated. Acceptability was significantly influenced by how households manage malaria at home and obtain services for different severity levels of malaria.

The disadvantaged area and poverty maps showed great inequities in respect of health care access. Areas and households that benefit least from available health care and health information were also the areas that are in the more remote parts of the Kassena-Nankana district but these areas were certainly not disadvantaged economically. These areas have high affordability scores yet use fewer formal health

services. Over 50% of areas in the district are disadvantaged areas, as they have the lowest access to health care on more than two dimensions of access. This implies that health care is not significantly available and affordable in the district, with very low health information access greatly impeding access to health care.

The poor thus have the lowest access to malaria interventions and yet they carry the greatest burden of malaria. Identifying the poor is therefore critical if their access to malaria interventions is to improve. Using the disadvantage access scores, consumption and wealth index measures to develop poverty maps serves as a first step to identifying disadvantaged communities. In these rural communities, poverty was associated with the lack of food stock to last the entire year, the lack of animals, social exclusion and being an orphan or single parent. Communities have considerable knowledge of poverty and wealth indicators, which knowledge could be harnessed to provide guidelines for exempting the poor from paying for health care services under the recently implemented mutual health insurance schemes in Ghana.

Health care access overall, is very low with great inequities in access manifesting within the district and with the poorest of the poor being the worse hit. The various areas of the district have different needs in respect of access to health care; areas that lack available health care may not be disadvantaged economically, and thus the use of disadvantage area and poverty maps for planning health service delivery offers the potential of targeting those who are most in need of health care. Doing this however requires a policy focus on the demand side of access, as the socio-economic characteristics of the household are central to access to health care. Overemphasizing service provision without using accompanying policies to influence the demand for health care would not yield the necessary health service uptake to go along with current investment in both physical and financial access to health care.

Chapter 1: Malaria Burden and Access to Health Care

1.1 Introduction

Malaria has devastating effects on the health of people across the world, and the consequences for scarce economic resources are grave. The global toll of malaria is estimated at 2.7 million deaths annually, with over 90% of the disease burden in sub-Saharan Africa. Over 75% of these deaths occur among African children (MIM/TDR, 2001), and the poor are often the worst affected. About 58% of malaria cases occur among the poorest who make-up 20% of the world's population and yet evidence shows that the poor benefit least from public health malaria control interventions (Gwatkin and Guillot, 2000; Barat et al., 2004).

In Ghana, malaria accounts for 42% of outpatient visits and children account for 50% of the 192,000 annual malaria deaths, even though they make-up less than 20% of the Ghanaian population (MOH, 2001a). In the Kassena-Nankana district, which is the area of focus for this research, malaria is the major cause of morbidity and mortality and continues to feature as the number one disease of concern. Malaria accounts for 60% of admissions and 41% of all deaths at the district hospital (MOH, 1999).

Malaria often leads to days of ill health contributing to substantial losses in labour productivity in addition to expenses that households incur in seeking health care. The average economic growth for countries with high malaria endemicity is estimated at 0.4% in contrast to 2.3% for countries with low endemicity. The overall economic cost of malaria in sub-Saharan Africa is estimated to be US$3.15 per capita per year, which is

equivalent to 0.6% of the region's GDP in 1999 prices (Gallup and Sachs, 2000). Likewise, households' total annual costs of malaria range between 9-18% and 7-13% of annual total incomes for low-income households and small farmers in Kenya and Nigeria respectively (Leighton and Foster, 1993). Considering the fact that most households in sub-Saharan Africa live on less than US$1.00 per day, malaria treatment constitutes a substantial proportion of household expenditure and further impoverishes households with its debilitating effect on economic production. Substantial health losses due to malaria continue to place malaria high on the public health agenda with efforts being made to halve the malaria burden by 2010 (WHO, 1998). However, in order to make a greater impact on malaria control, especially for the poorest of the poor, effective malaria control interventions are required as are methods of ensuring that the poor benefit the most from these.

Current malaria control measures rely on both preventive measures and treatment of infected persons, as there is as yet no vaccine. Personal protection measures such as insecticide treated nets (ITNs) are advocated for use in areas where mosquitoes feed indoors at night. Case management of malaria, which includes prompt access to health care, accurate diagnosis and effective treatment, however, remains the cornerstone of malaria control. Efforts to control malaria have been less successful due to a failure to deliver appropriate health services to infected persons especially at the periphery of health systems. Furthermore, treatment provided by health centres and health posts has had little impact on reducing childhood malaria deaths because severe falciparum malaria often occurs so rapidly that mothers are unable to act quickly and children die before

reaching these facilities (Kidane and Morrow, 2000). Prompt access to health services is also compromised by delays due to the widespread use of anti-malarials for fevers as well as incorrect prescription of recommended dosage (Tavrow, Shabahang and Makama, 2003; McCombie, 1996). The greatest challenge is that of reaching the poor who often live in remote areas and are socially marginalized with regard to access to malaria control interventions.

Thus, more recently, emphasis is laid on how to deliver effective malaria control interventions at the household level. Home management of malaria is one such strategy that is promoted by the World Health Organization to enhance effective treatment of malaria at home (WHO, 2002). As a result, there is extensive literature on the healthseeking behaviour of the household in terms of their knowledge of malaria symptoms, where they seek health care and their reasons for the choice of provider. However, there is little information about how to unravel the myriad factors that affect access to malaria control interventions (McCombie, 1996; Heggenhougen et al., 2003; Nyamongo, 2002). This is compounded by the fact that the health system's emphasis on health care delivery is often on how to make health services available and less on how to influence the factors on the demand side that affects the household's access to malaria control interventions. It is well documented that prompt access to effective malaria treatment is affected by both economic, socio-cultural factors and the structural organization of health services (Heggenhougen et al., 2003; Dzator and Asafu-Adjaye, 2004; Daniels et al., 2000). Thus in order to address the factors that have an impact on household access to malaria control interventions, factors on both the demand side and

the supply side of health care need to be addressed. However, policymakers often only associate access to health care with the supply side of health care, and most health care systems therefore prioritise the provision of health services (Mooney, 1994; Birch and Abelson, 1993; MOH, 2001b). Overemphasizing the supply side, though, has not provided sufficient insights into the factors that constitute access to health care.

This study therefore seeks to develop a framework and a methodology for measuring access to malaria control interventions based on both supply and demand side factors, using a sample size of 2000 households from the Kassena-Nankana district. The household has been chosen as a unit of study in this research because the characteristics of the household potentially influence the demand side of access to health care, and because the objective of health systems is to provide health care, that meets their demands. Thus, access to health services is central in ensuring that factors that determine households' needs for health services are met through the provision of health care.

1.2 Rationale for Research

Efforts at improving access to malaria control interventions and health care in general have been of paramount importance to the Ghanaian government and to organizations such as the World Health Organization. Malaria severely affects the poor, who ironically do not have the same access to health care as those who are not poor. Thus, access to health care remains high on the Ghanaian health policy agenda, with government spending more on its primary health care infrastructure as well as on easing financial

constraints for the poor and vulnerable in the last 15 years (MOH, 2001c). Spending in such supply-oriented areas has however not translated into increased access to health services though, as the following findings indicate, thus raising questions on what access to health care is. For instance, according to a World Bank report, full access to health care is only available to 25% of the total Ghanaian population (World Bank, 1997), and a recent evaluation of trends in access to health care indicates that only 20% of the Ghanaian population actually have access to health services whenever they need it (BHI-MOH, 2001). With access rates being low nationally and the malaria burden falling on the poor, the poor have been marginalized, because of inequities in access between geographic areas and the widening of the gap between socio-economic groups (MOH, 2001c).

Access to health care is often conceptualised as the supply of health care, which implies that the health system has the responsibility of making health services equally available to all and ensuring that all who need health services have an equal opportunity to use health care (Goddard and Smith, 2001; Mooney, 1994; Donaldson and Gerard, 1993; Culyer, 1998). From this point of view, equal access is equated with the supply side, rather than with the demand side. On this basis, most health systems overemphasize the role of the delivery of health services to the detriment of factors on the demand side of health services. Much of the focus of ensuring equity of access is thus on reducing price at the point of health service or providing free services and reducing geographic barriers to access (Birch and Abelson, 1993; Bin Juni, 1996; MOH, 2001c), which assumes a very narrow perception of access. The term access itself as applied to health is used in many

senses. Usually it refers to the quality and variety of health services provided, waiting time, referral mechanisms, physical accessibility and user charges (Martin et al., 2002; Goddard and Smith, 2001; Olivier and Mossialos, 2004).

The concept of access is, however, very broad and covers several dimensions. In the literature, the following dimensions are often reported: accessibility, availability acceptability, affordability and accommodation (Guagliardo, 2004; Puentes-Makides, 1992; Donabedian, 1976; Penchanksy, 1981). Gulliford et al. (2002) consider the first four dimensions to require an evaluation of access to health care, and the dimensions that have received much attention include affordability, accessibility and availability. Acceptability and accommodation, however, have received very little focus with regard to precisely what access factors constitute these dimensions and the direct measures that can be associated with them.

The role of information in access to health care is well acknowledged, and using information to make an informed choice makes it possible to measure whether differences in access to health care between population subgroups are considered fair or not (Mooney, 1994; Whitehead, 1992). For example, clients that are less informed about health and health care due to their socio-cultural and socio-economic circumstances and ignorance, would have unequal access that are clearly unfair. In the malaria literature, difficulties in implementing effective drug and preventive measures of malaria arise as a result of knowing little or having no information as to the characteristics of the households at which these interventions are aimed (Heggenhougen, 2003). Despite the

significant role of information on access, very little of the research as mentioned above has attempted to examine information as a dimension of access.

The inability to define clearly what factors constitute each dimension of access has resulted in much of the work on access being concentrated on measuring factors such as financial issues, physical distance to care, waiting time, with little or no attention being directed at all to addressing factors that might affect other dimensions of access (Rosero-Bixby, 2004; Martin et al., 2002; Pannarunothai and Mills, 1997; Alberts et al., 1997). Furthermore, even those factors that have received some attention, these are often addressed in separate studies as if they were independent of each other. For instance, a service point may exist but its geographical distance from the people it serves may affect access to the facility; conversely, a facility might be within reasonable distance, but it might not be financially accessible. Also, it is often the case that where financial accessibility does not impede access, inequities in access still exist as a result of non-economic factors such as gender and cultural beliefs.

Furthermore, attempts to highlight which access factors directly result from health service provision or demand for health care, have not been of considerable concern, yet in malaria control interventions it is critical to understand the role of the supply and demand factors of health care (Barat et al., 2004). This is probably because the supply side of health care is frequently seen as most important in pursuing equal access to health care but, as observed, demand side factors such as the income of the household, knowledge, indirect service costs (transportation), the opportunity cost of clients' time and so on all

consistently affect access to health care for malaria. Thus the health system should attempt to address these as well (Olivier and Mossialos, 2004; Sauerborn et al. 1996). The health system can only attempt to consider the demand side if it is demonstrated that demand factors affecting access and more especially for malaria can be identified and measured to assess which of these factors are critical in determining access to health care.

In addition to the fact that there is less attention on the demand side of access, attempts to measure access to health care have been marred by what is actually the right measure. Some are of the opinion that access cannot be measured by the mere existence of a facility alone but rather by actual utilisation of the service and that access is achieved when the patient enters the health system (Donabedian, 1976; Thomas and Penchanksy, 1984). Proponents of the concept of access to health care as a supply side phenomenon on the other hand base their expectations of the health system to be to supply health services and provide equal costs to using health services but that actual utilisation of health care is immaterial (Goddard and Smith, 2001; Mooney, 1994; Culyer, 1998). Many empirical studies have however tended to use health service utilisation as a proxy for access to health care (Olivier and Mossialos, 2004; Waters, 2000; Guagliardo, 2004; Ricketts et al., 2001). Doing so does not take into account the use of other therapeutic and preventive measures that are effective in treating ill health and may not provide adequate information on which dimensions of access should be the focus of health policy. As in the case of malaria, the disease can be effectively treated with anti-malarials in the recommended dosage as well as by using insecticide treated nets to reduce morbidity and mortality, and both of these can be obtained outside the formal health system.

Furthermore, information on utilisation does not take into account the characteristics of the clients seeking health care although these are necessary in understanding the health seeking behaviour of clients in order to provide services that meet their needs. The importance of having an appropriate measure of access cannot be overemphasized if the effectiveness of health care is to be evaluated.

1.3 Aim and Objectives

The aim of this thesis is therefore to develop a methodology to measure access to health care with the goal of providing reference points on which to monitor equity in access to malaria control interventions and to evaluate the overall performance and equity of health systems based on household level data from the Kassena-Nankana district of northern Ghana.

The objectives of the study are

- To deconstruct access to health care into dimensions consisting of several individual access factors. The dimensions of access as adopted in this thesis include availability, affordability, acceptability and information. A model is developed for each dimension and is used to explain the total variance in access for each dimension.

- To identify a combination of factors (common factors) that determine each dimension of access. Common factors describe and provide an interpretation of each dimension of access. The common factors may be associated with either the supply of health care or the demand for health care. The former for example, will be related to physical distance to a provider and type and range of health services. The latter, in contrast, are associated with the personal characteristics of the household, such as the household size and composition, sex and religious beliefs, all of which may potentially influence the household's ability to use health services.
- To examine geographic disparities in access to health care for each access dimension using a disadvantage index;
- To explore community perceptions of poverty and criteria of poverty for individuals and households in rural communities;
- To explore the use of poverty maps in identifying poor areas and households for health care interventions.

The secondary objectives include

- To measure equity in the access to ITNs for the prevention of malaria;
- To compare a wealth index and a household consumption variable in discriminating among different economic groups.

1.4 Key Definitions

The thesis explores the demand and supply side of access and deconstructs access into several broad and relevant dimensions that are useful for policy evaluation. It highlights the critical access factors of the supply and the demand side of health care for malaria, which provides insightful information for policies aimed at reaching the poor with malaria control interventions. The conflicting definitions of access as well as the choice of factors measuring access often leave policy makers unprepared and with little information on how to tackle priority factors of access. The thesis thus addresses this problem by first clarifying the definition of equity and access and the respective approaches adopted herein to measure these. Subsequently, it highlights the access factors that constitute each dimension, and categorizes these factors under clearly defined dimensions in order to develop a framework and test the methodology for measuring access.

At this stage, it is critical to provide clarifications for some of the important conceptual terms used in this thesis. Access as a complex concept has characteristics that are peculiar to the health system and the household. Demand side factors are those access factors that are directly associated with the characteristics of the household; specifically, they refer to the socio-cultural, demographic and economic characteristics of the household. Supply side access factors relate to the organization of the health service in terms of personnel, geographical location of health facilities, type and quality of health services and financing mechanisms. Dimensions of access refer to branches under which the access

factors are organized in order to provide an overall picture of the access factors that fall under each dimension. Dimensions are a composite of access factors as used here.

In the factor analysis approach used in Chapter 3, the term factor refers to a subset of access factors or determinants of access that correlate highly together to explain that dimension. These common factors allow one to ascertain whether highly correlated access factors are associated with the demand side or the supply side of health care. Throughout the thesis, common factors are used to refer to the factors derived through the factor analysis approach.

1.5 Outline of Thesis

Following the introductory chapter, the thesis is organized into eight additional chapters. The literature review (Chapter 2) extensively examines the theories of equity with particular focus on equal access to health care. It discusses the appropriateness of concepts of equity and provides a framework of equity that allows the analysis of each concept and the objective behind the choice of an equity goal in any health care system.

The objective of improving equity in access to health care can only be achieved if we have an appropriate definition and understanding of the concept of access itself and of how to measure it. The literature review thus explores the various definitions and the dimensions of access to health care, how these definitions have lent themselves to empirical interpretation and investigation, to what extent we know about the factors that

determine access, the models that have been used in attempts to measure access to health care and how individual access factors have been measured. It summarises the gaps, which this research intends to fill.

Measuring equity and inequities in access to health care ideally requires the choice of a rigorous socio-economic status (SES) indicator. Hence, Chapter 2 also explores methods that have been applied in measuring households' SES, and the issues pertaining to the use of these as measures of SES. This review provides a background to methods, such as the wealth index compiled by using assets and consumption in measuring equity in access to health care. It reviews the methodological strengths and weaknesses of the factor and principal component analysis techniques used in estimating the coefficients of access factors and in compiling the wealth index and other indices introduced in the conceptual framework.

Chapter 2 provides information on the equity objective of health care and the concept of access and its dimensions. The conceptual framework and access models in Chapter 3 build on this by identifying distinct dimensions pertaining to access to health care, the factors that determine each dimension, and the interrelationships between the dimensions and the factors of access with particular reference to malaria. Models of access to health care that distinctly measure access on the basis of these dimensions by using the factor analysis statistical technique are introduced in the conceptual framework (Chapter 3). The chapter also discusses the access factors used in each model and their expected outcomes or the possible prediction in respect of these access factors.

In Chapter 4, the methods used in collecting and analysing the empirical data to test the conceptual framework, are discussed. This chapter also gives a detailed overview of the Kassena-Nankana district and ongoing research activities that have influenced the design of the study. It discusses in detail the study design, the limitations of the methods employed as well as the actual methods used for analysing the data. Results of these analyses and possible prediction of the goodness of fit of the conceptual framework in Chapter 3 are presented in chapters 5, 6 and 7.

Chapter 5 begins with a description of the socio-economic profile of the Kassena-Nankana district, followed by an evaluation of the various measures of SES. It gives an extensive comparison of the consumption and wealth index and the implication of using either consumption or wealth in measuring equity in access to health care. Chapter 6 describes how households actually manage different severity levels of malaria, as well as methods of managing malaria and socio-economic disparities in access to malaria control interventions. In Chapter 7, results of the different access factors and their distribution in relation to socio-economic status are presented. Results of the factor analysis of the dimensions of access and the critical roles played by these factors in measuring equity in access to health care are also presented and discussed in this chapter. A detailed discussion of the management of malaria and the results of the factor analysis in Chapters 5, 6 and 7 and the policy implications of these findings is provided in Chapter 8. This discussion compares and contrasts the findings of this study with other studies pertaining to equity in access to health care for malaria control interventions, and draws certain

policy conclusions from it. The limitations of the methods applied herein in deriving these findings are compared and contrasted as well.

Chapter 9 furnishes a detailed assessment of how the objectives of this thesis have been achieved. The chapter further provides insights into the generalisability of the study findings and the implication for policy development and implementation. The contributions of this research to improving and filling in the knowledge gaps identified earlier are discussed, with areas recommended for future research.

In conclusion, then, whilst this research provides an interpretation of the Ghanaian equity policy objectives and access to health care for malaria control interventions, it also provides an extensive review of the debates that are relevant and insightful in understanding research work on equity with regard to access to health care. The research draws a clear distinction between the different concepts of equity in health and health care and their policy implications; it provides both theoretical and empirical definitions of the concept of access, which is useful and can be adopted in other settings as well as in addressing the factors affecting access to health care in respect of other diseases.

Chapter 2: Review of Concepts of Equity in Access to Health Care

2.1 Concept of Equity as Applied to Health

There is a general notion that equity is one of the primary goals of health care policies, and although most health care systems accept that there must be fairness or some degree of fairness in the distribution of health or health care there is no consensus on a definition of equity that would apply universally (Mooney, 1994; Birch and Abelson, 1993; Olivier and Mossialos, 2004; Donaldson and Gerard, 1993). However, it is critical to have a clear understanding about equity and the current debates on equity, as whatever equity policy is adopted would have different policy implications for health and health care delivery.

Generally, equity refers to fairness in the distribution of goods such as health or health care among groups of individuals sharing some common characteristics and attributes (Williams and Cookson, 2000; Mooney, 1994). Equity is therefore not synonymous with equality as the latter emphasizes equal shares irrespective of other circumstances (Donaldson and Gerard, 1993; Pereira, 1989). In terms of the equality concept, two individuals that are both sick should receive equal treatment, whether the circumstances that led to their ill health were within their control or not. With regard to implementing the concept of equity however, it could be considered fair to be unequal by providing unequal access to people of different socioeconomic backgrounds, whereas this cannot be done within the concept of equality.

In formulating an operational definition of equity, Whitehead (1990:5) writes, "inequities refer to differences which are unnecessary and avoidable but, in addition, are considered unfair and unjust". Differences in health considered as avoidable are those arising from social status, gender and the environment, and are related to differences in health and health care that a change in policy would reduce or eliminate. The International Society for Equity in Health (ISEqH) sums this up by defining equity as "the absence of potentially remediable, systematic differences in one or more aspects of health across socially, economically, demographically, or geographically defined population groups or subgroups" (Macinko and Starfield, 2002:3). Therefore the existence of inequities always implies a possibility to improve the distribution of health and health care.

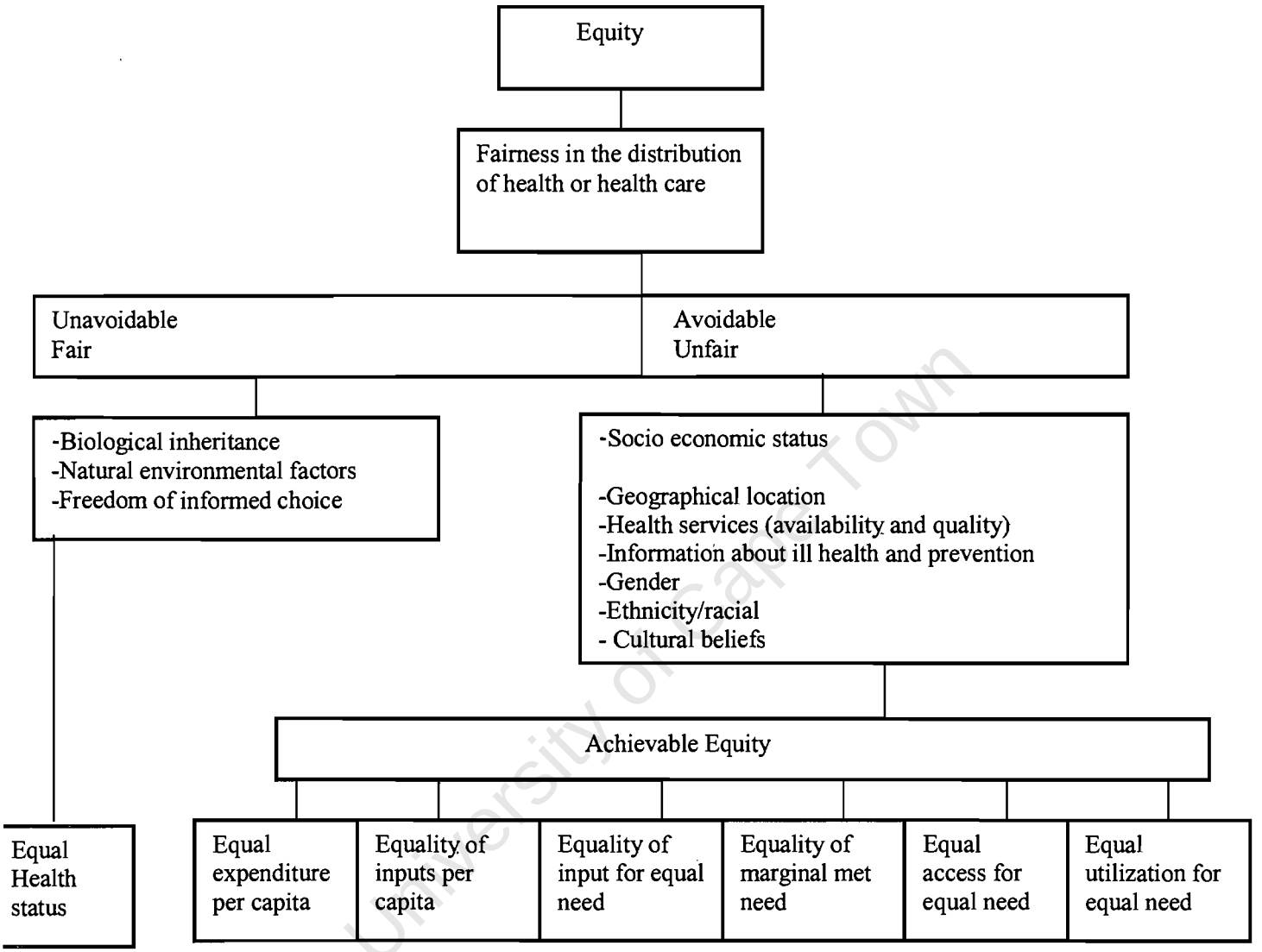
Differences in health that result from personal choice of a particular lifestyle though the individual involved is aware of the dangers in doing so, are however considered fair. The introduction of choice in the definition of equity provides a reference point on which society can determine an equitable situation. For instance, if an individual's ill-health results from leading an unhealthy lifestyle like smoking, which is within his control, this situation cannot be said to be inequitable. However, where the person's ill health is beyond his control, such as being ill because one has been born into a poor home or is living in poor environmental conditions, then this ill health is said to be inequitable (Whitehead, 1992). The introduction of choice and factors beyond the individual's control form the basis of current definitions of equity and the platform on which to assess what is equitable and what is not.

Nontheless, it is still a contentious issue whether equity should be pursued in the interest of health or in the interest of health care. It is argued that the aim of every health policy is to improve everyone's health and that health care is pursued in order to achieve this goal (Culyer, 1998; Mooney, 1994). This argument suggests that an equitable distribution of health care cannot be pursued as an independent objective.

In order to understand this line of argument further, the framework below summarises the different arguments in favour of the different equity concepts and the issues to be considered when choosing an equity goal for any health care system. The discussion of the concepts draws attention to difficulties in practical implementation of equity policies. Mooney (1983) has discussed seven interpretations of the concept of equity as it applies to health and health care. Each of the equity concepts outlined by Mooney is reflected in Figure 1. Some of the more intriguing concepts are then discussed in line with what their aims and objectives are and how practical it is for a particular equity objective to be achieved.

The framework discussed herein is based on the operational definition of equity as reducing inequalities that are considered unnecessary and unfair, bearing in mind that some health situations that result from one's own informed choice of a lifestyle or genetic problems are considered fair.

Figure 1: Framework of Health Equity



Source: Whitehead, 1992; Mooney, 1983

Two alternative objectives are reflected in this framework: whether the interest in equity is about health outcomes or about the distribution of health care. In pursuing either of these two objectives of equity, it is necessary to consider whether existing inequalities could have been avoided or not. Generally, it is accepted that differences due to SES, gender, religious, cultural beliefs and physical distance, all of which may impede access

to health care can be remedied through policy intervention. On the other hand, there are differences that by their nature cannot be remedied through policy and hence are not regarded as inequitable.

There are essentially three situations in which differences in health can be equitable. The first situation arises if, due to genetic malformations, an individual's health is affected and it is impossible to restore the health levels of the individual to what is normal, this would not constitute inequity in health. Secondly, if people live in a natural environment such as in the desert or mountains and if living there leads to certain health risks that are not man-made and which results in ill-health, such health differences cannot be considered as being unfair. However, if people live in poor environmental conditions such as slums, because they are poor, these differences are unnecessary as policies can be put in place to improve their living conditions and thus to improve their health. The third situation has to do with an individual's choice of lifestyle. Tastes and preferences differ, and thus where people deliberately choose a particular lifestyle, such as smoking even though they are well informed about the potential harm of smoking, inequalities of this kind are considered just and fair.

On the basis of these arguments as to what is judged fair or unfair, in Figure 1, six of the alternative equity objectives fall under the category 'avoidable differences' whereas the objective of equal health status would be better placed under 'unavoidable circumstances'. Two of the concepts: equal utilisation for equal need and equal access for equal need have however featured more prominently in the literature as issues of policy

concern and are thus the primary focus in this study. These concepts are discussed in the next section, with their limitations acknowledged in the pursuit of equity.

2.2 Different Notions of Equity

Equal utilisation of health care and equal access to health care for equal need are concepts often used interchangeably as if they might mean the same, but utilisation is conceptually different to access. The concept of equal utilisation of health care for equal need states that individuals who have equal needs for health care (where need is usually expressed as the individual's level of demand for health care for a health condition or the capability to benefit from a particular treatment), should in fact consume the same levels of health care irrespective of their preferences and tastes for health care (Goddard and Smith, 2001; Mooney, 1994; Culyer and Wagstaff, 1991). Thus the adoption of equal utilisation of health care for equal need as a universal equity concept would require restrictions on the types of lifestyles chosen by people. Tastes and preferences, for instance, are personal characteristics of people, and might lead to people with the same health care needs having different health outcomes, simply because one person might choose to comply with treatment and another might not. Thus, even though health services might be available, it might not be possible to achieve equal use (Mooney, 1994).

Different levels of utilisation also may not indicate inequalities if people who are well informed are in fact not using health care because of certain lifestyles or because they

adhere to certain religious beliefs. Acceptable reasons such as these may lead to differential use of health care. Inequity in the rate of utilisation of health care only exists, though, if the differences are due to the person having a low income, living farther from the point of health care or is less informed about the existence of health services (Whitehead, 1990). In the light of this discussion to the effect that people with equal health care needs and equal opportunities to access such health care may not equally make use of these opportunities because of differences in tastes and preferences, it is argued that a more appropriate goal of health care services would be to ensure equal *access* to health care and not to ensure equal *use* of health care for equal need.

An equity goal such as equal access for equal need therefore implies that all that is required of an effective health care system is to make health services available and to give equal opportunity to all those in need of health care and that it is acceptable for rates of utilisation to vary between people with equal needs for health care for acceptable reasons (Donaldson and Gerard, 1993; Mooney, 1983). It requires conditions whereby those with equal needs for health care have an equal opportunity to access health care (horizontal equity), and consequently, those with unequal needs for health care should have unequal opportunities to access health care (vertical equity). Equal access for equal need is therefore established if two individuals or communities with the same needs for health care face the same personal costs for seeking care, the same geographical factors, the same waiting times to receive health care, as well as being equally well informed about ill health and available effective services (Donaldson and Gerard, 1993; Mooney, 1983).

The need for incorporating informed choice, as the basis for judging what is fair or unfair is central to how we attempt to measure equity in access to health care. This is because, empirically, defining access to health care as ensuring that all those equally in need of health care face the same costs can be violated and may not create a situation of inequity in access to health care. A case in point is where people make a personal choice not to use a health care system within reach that is equally endowed to meet their needs and instead choose to travel further for the same level of care for the same need. A situation of this kind cannot be considered to result in unequal access to health care because the individuals are equally informed of the availability of health service but due to different preferences take the option to seek the same service elsewhere.

There are also practical problems in measuring what we mean by the same costs for health care. Issues have been raised about whether personal cost should be assessed as direct cost for treatment or indirect costs resulting from waiting for treatment. In other words, should it be in terms of the monetary cost involved in treatment or the opportunity cost forgone for waiting for treatment (Mooney, 1994; Donaldson and Gerard, 1993)? In practice, assigning value to such opportunity costs is difficult and even the values that two individuals place on the forgone alternatives may be considerably different (Mooney, 1994; Donaldson and Gerard, 1993). For the purposes of this thesis, only direct costs to health care are considered in attempt to measure the factors that determine equal access to health care.

Despite the conceptual difficulties discussed above with regard to the principle of equal access for health care, in practice this concept is indeed found in most policy documents, as it is regarded as possible to redistribute health care through acts of policy to improve access to health care. The elimination of differences due to social status, geographical location and socio-cultural factors as stated in the health policy goals of Ghana, all point more towards the application of the concept of equal access to health care (MOH, 2001b). The concept of equal access acknowledges that it is acceptable to have differences in the rates of utilisation that result from personal informed choices, whereas this is not possible under the concept of equal utilisation for equal need. The tenet of this thesis is to provide a framework and methodology for which this objective of equal access for equal health care can be achieved effectively.

2.3 Access to Health Care

2.3.1 Introduction

Access to health care is a multi-dimensional phenomenon that encompasses characteristics of the health system, behaviour of health professionals and characteristics of the population seeking health care. The characteristics of the health system relate to how health services are organized, financed and distributed among populations. In Ghana, for instance, primary health facilities like clinics and health centres are located on the periphery of the towns, and offer basic primary health care for minor ailments, whereas higher levels of health care for acute illnesses such as complicated malaria are provided by the hospitals, which are located in the centre of the major towns. The cadres

of staff that work in the primary health facilities are medical assistants and nurses whereas the hospitals have medical doctors, specialists and different categories of nursing staff, pharmacists and laboratory technicians. Health services are provided on a fee for service basis, although there are exemptions for certain categories of people such as the aged, children less than five years of age, pregnant women and theoretically the poor (MOH, 1999; Garshong et al., 2001; BHI-MOH, 2001). This organizational structure is thus likely to affect people's perceptions of quality of health care, where they choose to seek health care and equitable access to health care. Furthermore, the attitude of health personnel, in particular in how they relate to clients, and the kinds of information they exchange with clients, all have the potential of influencing future access to health services (Thiede, 2004; Sorell, 2003). Also, certain characteristics of the population seeking health care, specifically their cultural beliefs and norms regarding the causation of disease (such as malaria) and how they manage ill-health, their gender roles and socio-economic status, all co-exist with the structure and organization of the health system to affect access to health care. The diversity of the factors affecting access to health care has led to problems of defining what access is and what minimum set of factors together define adequate access to health care. While this constitutes a major problem, health policy makers are also confronted with how to measure individual factors such as physical access identified as constraints to access to health care.

The remainder of Section 2.3 explores the aims and objectives of access to health care, as stated in most policy documents, the definition and scope of access, and the problems in measuring access to health care. This review draws on extensive research work on access

in the literature and identifies the relevant knowledge gaps. Access as a multi-dimensional concept has to be understood in terms of its dimensions and what factors broadly represent each dimension. Understanding the dimensions and the diversity of the factors affecting access will help shape how access is measured in the future. The next section thus starts with a review of the definitions of access to health care, as this has shaped what dimensions have been examined and how access has subsequently been measured. The different debates about the right definition of access to health care, as discussed below, points to the fact that there is no one generally acceptable definition of access, and that the need to have a clear understanding on this issue is very important in order to judge the appropriateness of health care policies.

2.3.2 Definitions of Access

Access has been subject to several interpretations. The first interpretation of access is related to the utilisation of health care. The proponents of the use of utilisation argue that access is not achieved until utilisation is exercised. For example, Donabedian (1976) states that the 'proof of access is use of services and not necessarily the presence of a facility'. Donabedian and Penchansky (1976, 1981) further describe access as the 'degree of fit' between clients and the health system, which may be interpreted as the place where demand for health services coincides with the supply of health services. The definitions above refer more to the utilisation of health services, where the client or the patient must have contacted the health system, without which access cannot be said to have occurred.

The second interpretation of access is similar to access being equal to utilisation, but it is also different because access does not necessarily have to take place within the health system but can also occur outside it. The second definition thus states that access is an encounter between the client and the health system whether it is through the patient's contact with the health facility or through the use of information to attain better health (Puentes-Markides, 1992). This latter definition acknowledges the fact that health care needs may not only be curative but preventive as well, and that one can equally obtain services outside the formal health system. These definitions and descriptions of access differ significantly from the definition of access as the right or opportunity to use health care (Mooney, 1994).

More recently, access to health care has been defined as generally involving the ability to secure a specified set of health care services at a specified level of quality, subject to a maximum level of personal inconvenience and cost, while in possession of a specified level of information (Olivier and Mossialos, 2004; Goddard and Smith 2001). This last definition introduces a set of minimum conditions, which is required for determining access within the resource constraints of the health service. This implies that access to health care has to be considered within a given context and that it will vary according to the resources available to the health system and the household respectively. The clarification has however been made that equal access is about the opportunity to use health care and that, due to informed choice, it is acceptable to have different rates of utilisation between individuals; thus utilisation cannot be substituted for access to health care. Unfortunately, in much of the empirical work on access, utilisation has often been

used to measure access even among those who have written extensively about the differences between the two concepts (Olivier and Mossialos, 2004).

2.3.3 Measuring Access to Health Care

A review of the literature on access indicates that utilisation is used as a proxy to measure access even though the two are conceptually different. Using utilisation, as a proxy for access often poses a problem because it does not acknowledge informed choice as a point that might lead to differences in rates of utilisation, and which cannot be considered as inequitable.

Furthermore, where utilisation data is used to measure access, it excludes contacts with health care providers outside the formal health system, as well as the use of preventive measures of health care and the use of effective therapies. Utilisation also does not include the quality or quantity of care provided (Burstrom, 2002; Goddard and Smith, 2001; Puentes-Markides, 1992). To use preventive measures for malaria as an example, these will include the use of insecticide treated nets, repellents and other anti-malarials for prevention, in addition to the use of curative care, which can also be obtained outside the formal health system. Thus under-utilisation of health services may be as a result of the use of other alternative therapies or providers outside the formal health system, and as long as these choices are informed ones, it is acceptable to have variations in rates of utilisation (Goddard and Smith, 2001; Puentes-Markides, 1992). Hence, using utilisation

produces a narrow measure of access and is unable to explain the set of related behaviours that impact on access to health care.

For instance, the Ghanaian health system has not been able to assess the performance of the system (MOH, 2001b), nor to determine the percentage of the population that effectively does not have access to health services, because it relies on the use of utilisation data as a measure of access. Service uptake from the utilisation data has not been on a par with the level of investments made by the government in health facilities and personnel provision, nor with exemptions from fee payments that are all aimed at eliminating geographical and financial barriers to health care (MOH, 2001c). These issues suggest that the need for an objective measure of access is key in evaluating health policies geared at promoting equitable access to health care. An examination of the models that have been developed for estimating access further highlights the inadequacy of these models as appropriate measures of access to health care.

2.3.4 Models of Access to Health Care

An extensive literature on the demand for health and care exists (Grossman, 1972; Andersen and Newman 1973; Gertler, 1985; Dor et al., 1987; Gertler, Locay and Sanderson, 1989; Gertler and van der Gaag, 1990; Bolduc, Lacroix and Muller, 1996; Deolalikar, 1998; Bundell and Windmeijer, 2000; Richardson, 2001). Grossman's model for demand for health as presented in his seminal article (Grossman, 1972) considered a utility function where utility depends on both the flow or number of healthy days one has

at his/her disposal as well as from the stock of health available in any given period and the consumption of other commodities, which are produced at home by combining purchased goods and time. The model considers the change in health stock to be the net result of gross investments in health and the depreciation of the health stock, which occurs with age. Grossman's model draws a clear distinction between health and medical care services based on the background that consumers combine their own time with medical resources to produce health. Individuals weight the costs and benefits of investment in health to determine how to maximize their health, subject to time and resource constraints. Grossman also argues that education increases efficiency in producing health and reduces the shadow price of investment at any given age. It is assumed that education facilitates the production of health, as education enables one to earn income and also to have access to information to improve one's health. More educated people are more likely to engage in health producing activities that are time-consuming such as exercise compared to those without education (Simoes et al., 1995). The demand model for health production is therefore a function of time and income and education. This model has been used extensively to study the variations in the demand for health and the production of health (Leibowitz, 2004).

The Grossman model has been extended to include not only medical inputs but also non-medical inputs into health production. The argument proposed for the expansion of the original model stems from the fact that non-medical commodities compete with health investments of an individual's time and money and other consumption may directly have an effect on health. For instance, tobacco consumption may increase one's satisfaction in

the short term but may be expected to increase the number of unhealthy days in the future. In contrast, dieting may decrease one's level of utility in the short term but the health gains may increase discounted lifetime utility by increasing the number of healthy days in later periods. The expanded view of the health production model of Grossman not only treats net investments in health in a given period as a function of medical inputs and time to medical care but also takes into account choices about time spent on other consumption and other non-medical choices. Similarly, time spent on labour market participation may bring positive or negative effects on health. In addition to education, the expanded model also considers environmental inputs that are beyond the control of the individual.

The literature inspired by Grossman's model has focused on the demand side of access to health care where the individual seeks to maximize utility given a level of health stock and time. The focus of this strand of research on the demand for health care has been exploring factors that explain the volume of health utilization and choice of providers with regards to issues such as price, distance, perceived quality, insurance status and similar determinants. The decisions to seek health care and the choice of a type of provider are often modeled using standard economic tools. Empirically, this literature has focused on estimating the elasticity of demand with respect to prices as well as on examining the determinants of health care utilization using household survey data. One of the shortcomings of these approaches is that they hardly address access to health care with its multifaceted dimensions.

Andersen and Newman (1973) first conceptually modelled access to health care as a behavioural process. This behavioural process is assumed to combine predisposing characteristics of the population seeking health care with enabling resources in the environment with perceived or professional evaluation of the need to yield use of health care. In a later study, Andersen (1995) explains that predisposing characteristics consist of, for example family composition, social structure and health beliefs, enabling resources such as income and then need (as ill health, which brings about the need for health care). All of these factors ought to act together to bring about utilisation of health care.

The authors also acknowledge that in addition to the factors they listed above, the structure and organization of the health system might also limit utilisation of health services. Using this analytical framework of access therefore, income, supply of health professionals, distance to health care and insurance coverage were used to explain and predict the use of health care (Andersen, 1995). Although the Andersen and Newman (1973) model has been widely accepted and used, it has offered little overall explanation of variation in access to health care (James, 1994). The model has therefore been refined over time to include genetic characteristics of individuals in need of health care, client satisfaction in respect of the services provided, as well as the outcomes of health care as added explanatory factors of access to health care (Millman, 1993; Aday et al., 1998).

Recently, the model has been used to study the rate of hospitalisations for ambulatory care sensitive conditions as an indicator of primary care access in the US (Ricketts et al.,

2001). A critical analysis of the model proposed by Andersen and Newman shows that the model, although it describes access factors, incorporates more of the supply side factors of access discussed more extensively in the next section, with income being the only demand side factor. It is also worth noting that all these studies used facility utilisation as a proxy for access to health care, and thus can be considered as models predicting utilisation rather than access to health care.

Nonetheless, some forms of research have been carried out specifically to examine access as the opportunity to use health care rather than utilisation. These are reviewed below along the lines of the access dimensions and factors that were examined, and how comprehensive an explanation is offered by these factors in measuring access to health care.

2.3.5 Scope of Access

The objective of measuring access, in terms of the opportunity to use health care has not been without difficulty. The opportunity to use health care is indeed often associated with certain aspects of access, such as physical accessibility of health care, financing mechanisms, provision of health care, waiting times and opening hours, income and other socio-economic related factors. Thus, much of the work on access has been focused on dimensions such as availability, accessibility, accommodation, affordability and acceptability of health care (Guagliardo, 2004; Puentes-Markides, 1992). Gulliford et al. (2002), however, consider only four dimensions or aspects of access, viz. availability, affordability, physical accessibility and acceptability as relevant for evaluating access.

Accessibility, as used in these studies, often refers to physical accessibility to health care whereas availability refers to the number of health service points that clients can choose from, or the range of health services, the waiting times and opening hours of health service points. Affordability, in contrast, is associated with financing mechanisms, and acceptability is related to cultural factors that might act as barriers to use of health care. Accommodation is used to describe the relationship of health providers to different subgroups of a population. The affordability and accessibility dimensions as observed in these studies are simply measuring what is later in the conceptual framework referred to as the single access factor of a dimension, whereas the acceptability and the accommodation dimensions are broadly defined to constitute several access factors. Thus, although these authors acknowledge the different dimensions of access, it is less clear what these dimensions mean. This is because, whereas the authors consider acceptability as comprising a number of socio-cultural factors, affordability and accessibility simply represent one access factor, such as user cost and physical distance respectively.

Other authors also equate access to either physical or financial accessibility and thus the access literature is dominated by these two assumptions (Rosenberg and Hanlon, 1996; Rosero-Bixby, 2004). Fielder and Suazo (2002) argue that access to health care in the US is often equated to having medical insurance to cover health care, but the magnitude of the contribution and the co-payments, which reflect differential access to health care, are considered secondary.

In most developing countries and especially in sub-Saharan Africa, where health sector reforms are taking place, the focus on addressing access to health care has followed the same tradition of looking at both the physical and financial accessibility of health care. In Ghana, even though the policy document considers access as improving quality of care and removing barriers such as financial, geographical and socio-cultural factors (MOH, 2001c), much emphasis has been placed on physical and financial accessibility. It is clear, though, that in health care systems where user charges are not existent, there are still considerable variations in personal costs of using health services across socio-economic groups (Falkingham, 2004; Pannarunothai and Mills, 1997), indicating that these two access factors are limited in explaining variations in access to health care.

The term access has also been used in other studies to include referral mechanisms, waiting lists and the quality and variety of health services on offer, although studies about these factors are not common (Martin et al., 2002; Goddard and Smith, 2001). It may be argued that the physical and financial accessibility factors are directly observable and hence are easier to measure than other factors, but simply equating access to these two factors does not allow the health system to have a broader view of the dimensions and factors that require consideration. Consequently, it is a gap that this study seeks to fill.

One other objective of the thesis is to examine access as both a demand and supply side phenomenon to highlight the importance of these two sides in evaluating access to health care. The access factors that are supply oriented are those related to service provision and organization of the health services, such as the distribution of health facilities and

personnel, geographical location of health facilities or service providers, provision of primary and secondary health care and whether the health system operates a user fee system or other mechanisms for financing health care. Demand side factors, which are associated more with the characteristics of the household in terms of its socio-economic status, socio-cultural makeup and belief systems, as well as how informed the household is, have received insignificant attention in policy intervention.

Very few studies have attempted to examine and clearly define the factors that fall under the demand or supply side of health care as described above. In the two studies that have attempted to address access, one has focused only on the supply side of health care. Goddard and Smith (2001), for instance, listed availability, quality, costs and information as reasons for variations in access to health care on the supply side. The authors did not state clearly whether these terms constitute dimensions, however, and were also less clear about the factors that constitute quality and information. Availability and costs were associated with the type of health services and financial or other costs related to the use of health care in their study.

Similarly, Gulliford et al. (2002) considered four aspects of access viz. availability, affordability, physical accessibility and acceptability, as mentioned earlier, and defined availability as the supply of health services, but exactly what access factors constitute this supply of health services is not explicit. The other three aspects of access, which Gulliford et al. (2002) listed as acceptability, affordability and physical accessibility, are implicitly taken as factors that determine the demand for health care. Yet again, the

authors did not specify which access factors constitute the three aspects of demand for health care. Following the description of supply side factors as those related to the provision of health care, one can conclude that most of the factors such as quality of health services, physical and financial accessibility, waiting time and opening hours (all of which have been examined in the review so far) are in fact more supply side factors than demand side factors. This is despite the fact that there are acknowledged difficulties in identifying exactly which access factors fall under the supply side and which access factors constitute the demand side of health care. The overemphasis on the supply side stems from the argument that it is the most relevant consideration in ensuring equal access for health care for equal need (Olivier and Mossialos, 2004; Mooney, 1994). The impact that the demand side factors have on access, as discussed below, is however as relevant as the supply side in measuring access to health care.

It is clear that variations in clients' and patients' awareness of the availability of services and the information available on the effectiveness of treatment methods do have an impact on access to health care (Goddard and Smith, 2001). For example, the role of cultural beliefs, perceptions of disease causation and pattern of health seeking behaviour are all factors that may lead to use or non-use of existing formal health services (Mwenesi et al., 1995; Heggenhougen et al., 2003). A case in point is the notion of what causes convulsions in children as reported in studies from Ghana and Kenya. Whereas convulsions are usually a complication of cerebral malaria, the perceived causes of convulsion are often associated with spirituality, and thus mothers will seek care from traditional medicine men, who they believe to have the correct treatment for convulsions

(Agyepong and Manderson, 1999; Mwenesi et al., 1995). Consequently, it is necessary to have an equally and well informed population to ensure that individuals are not ignorant about their health or how to improve their health through health care (Sorell, 2003). Mooney (1994) suggests that the definition of access should be refined to include informed access to health care. The role of information in access to health care is thus critical but it has not formed the basis for addressing access to health care in most of the literature reviewed so far.

In a study that included information as an access factor, it was described more as a supply factor than facilitating both the demand and supply sides of health care (Goddard and Smith 2001). Information thus fall into both categories, as on the one hand, the health system is responsible for making information available, and on the other hand, it is the responsibility of an individual to make use of the information to improve health (Sorell, 2003). Thus, evaluating information in terms of how equally available it is to subgroups of the population, is as important as knowing how individuals use this information.

Differences in access to health care often also result because of the socio-economic status of the population seeking health care. Moreover, where user fees are non-existent or there are exemptions to cover vulnerable groups, as is the case in Ghana, health service access is still problematic, due firstly to the system's inability to identify the poor and, secondly due to the indirect costs of using health care. It can however, be pointed out that health systems often focus more on examining the direct impact of user fees as a supply issue of

access with less emphasis on how the socio-economic position of the population potentially affects demand for health care.

Despite the fact that access has not been addressed in its entirety with regard to which dimensions and factors constitute the supply and demand side respectively, there are also issues of the right methods of measuring the individual factors that have been identified. As a result, different methods have been used to measure physical accessibility and socio-economic status, partly because the dimensions are narrowly defined and have not been conceptualised very well. In other words, instead of considering, for example, the access factors (such as the number of health providers, the number of facilities and the distance to a health provider and so on) as falling under the availability dimension of access to health care, these access factors are viewed as independent measures of physical accessibility. Even in the paper by Gulliford et al. (2002), physical accessibility is placed under the demand side of access. Thus, some measure physical accessibility as the number of health providers in a given area, whereas others use the distance between service providers and the populations they serve.

2.3.6 Measures of Physical Accessibility

Most published measures in respect of the physical accessibility of health care fall into the following categories: provider-to-population ratio, average distance to a set of providers, gravitational models of provider influence, and distance to the nearest provider (Guagliardo, 2004; Rosero-Bixby, 2004; Wang and Luo, 2004; Gesler, 1986). The first of

these, viz. the provider-to-population ratio, is the most common measure, as data is often available on the population and number of health professionals available per population, and as it does not require competence in the use of geographic information systems (GIS). This method is also appealing for broad comparisons between regions or districts. It is however, less useful for this study as the interest is to measure internal variations in physical access to health care within the same district and also because the number of health personnel is considered as a part of the availability dimension.

The second measure, that is, the average distance to provider method, measures the distance from a population point to the nearest health provider, and thereafter sums up these distances to provide an average. Though appealing, this method has the disadvantage of putting too much weight on providers at the periphery and masking great differences in access to health care because of an inflated average distance to health care (Guagliardo, 2004).

In contrast to the above, the third method being the gravity measures provides potential distances of a population matched to all service facilities within reasonable reach. Gravity models are able to produce reliable distances for both rural and urban areas. Low values indicate areas with poor physical access, and high values identify areas with good physical access to health services. Although this method is very intuitive and thus valuable, it is of less value to policy makers who are interested in easily interpretable measures, such as a simple method based on the distance to the nearest provider (Guagliardo, 2004).

The fourth method of measuring spatial accessibility is the distance to the nearest provider. The present study uses this measure, as it allows one to calculate the distance from the patient's residence to the nearest provider. It is a good measure to use in rural areas, such as the Kassena-Nankana, where choice of providers is limited and the nearest facility is more likely to be used. It also allows the use of GIS techniques, which have been employed in this study to calculate distances, and it provides a simple measure of distance, which is of importance to policy makers.

The GIS technique has been applied in the study of disease and determinants in epidemiology, as well as in the planning of health services especially in the location of health services from populations of interest (Rosero-Bixby, 2004; Parker and Campbell, 1998; Dowie et al., 1995).

The problems discussed with respect to what is an appropriate measure of physical accessibility to health care also arises with the use of a socio-economic status measure for evaluating equity in access to health care.

2.4. Measures of Socio-economic Status

2.4.1 Introduction

The attempt to measure access is to enable us to focus on how to improve access for the most vulnerable members of society. Measuring inequity in access to health care therefore relies on a solid measure of a SES indicator and thus, in this section, various

methods of measuring SES are discussed, along with methodological issues affecting the choice of a particular socio-economic indicator.

2.4.2 Consumption as a Measure of Economic Welfare

The common approaches of measuring living standards include household income, household expenditures, consumption, and household wealth (World Bank, 2003; Rustein et al., 2000). In theory, the best indicator of welfare is actual consumption by individuals or households, as this ideally includes both the consumption of food, services such as education and health, and other goods, but in practice expenditure and income are usually used as proxies for consumption (Falkingham and Namazie, 2002).

Income measures are frequently used because there is a strong theoretical link between income and the demand for goods and services. The use of income as a measure is, however, more appropriate in situations where data on cash incomes are available such as in developed countries. In developing countries, though, where subsistence farming forms the bulk of home food production and data on cash incomes are uncommon, using income is problematic. Also, income data is often unreliable, as it is subject to recall bias. Different sources of income are often not disclosed, and where they are disclosed, there are often inconsistencies. Income surveys often also exclude household production, and in the case of a developing country, this leads to substantial biases, as home production forms the bulk of income for households (World Bank, 2003; Falkingham and Namazie, 2002).

In addition to household income, household expenditure is the other frequently used proxy for consumption, even though the two concepts (expenditure and consumption) are considerably different. Expenditure refers to the purchase of goods or services, but these may not be immediately consumed, which will lead to an overestimation of household expenditure where the price of the good is used. In contrast, when using consumption, only the benefits of using the item would be captured. Many items of household expenditure are used in estimating consumption, but consumption has one added dimension, home-produced food, which is not valued when using only expenditure data. Consumption is therefore seen as a preferable measure for developing countries where subsistence farming is common. It is, however, only in very few studies that consumption is used, primarily because of inherent difficulties in valuing home produced food (World Bank, 2003; Rustein et al., 2000; Waters, 2000; Falkingham and Namazie, 2002).

Consumption refers to resources actually consumed by the household, whether home produced or purchased from the market. In considering the use of consumption as a measure of welfare, four important areas are relevant in arriving at an appropriate aggregate. The World Bank classifies these as food items, non-food items, housing and durable goods (World Bank, 2003). Under the food items, one needs to take into account food produced at home, food purchased from the market, food received in kind from other households and food received in kind for payment for services. Conducting interviews and collecting data on these four aspects can create practical difficulties though. It is often problematic to value home produced food, as it requires not only appropriate quantities of all farm produce, but also an indication as to whether farm gate

prices or market prices should be used. A common approach is to ask households to value the produce, but where this is not possible, using farm gate prices or market prices may be considered. Deaton and Zaidi (1999) suggest that what is important is to ensure that, whatever prices are used, they reflect labour and transport costs.

Similarly, getting rental equivalents for housing, especially in rural areas where people live in their own houses, can be daunting as is obtaining rental equivalents for durable goods (such as television sets or refrigerators) that have a long-term use. It is argued that using rental equivalents is more appropriate than using the one time off cash values of these items (World Bank, 2003; Falkingham and Namazie, 2002). In most rural communities, though, where rental equivalents are almost non-existent, it poses a significant practical problem in trying to value these items (Houweling, Kunst and Mackenbach, 2003), as will be discussed later with regard to the Kasena-Nankana district.

Similar problems are encountered with non-food items such as water and electricity provided publicly. Imputing prices may be difficult, and it is proposed that for comparisons inside a single country, these items could be left out, whereas for inter-country comparisons, values should be inputted to reduce possible biases (Falkingham and Namazie, 2002).

The discussions highlight the inherent difficulties in measuring some of the components of consumption and, more especially in obtaining rental equivalents for durable and

housing items and values for home produced food. The use of consumption rather than expenditure as a measure of living standards in this survey stems from the fact that expenditure usually excludes home consumption, which is not based on market transactions (World Bank, 2003), and thus will produce an inaccurate measure of wealth. As observed above, there are several debates about which measures of SES are appropriate, but for a developing country such as Ghana, consumption is an appropriate measure for the reasons already highlighted. Consumption is also smoother than expenditure over time, and is perhaps more directly related to living standards than income, which is received intermittently (World Bank, 2003).

A more recent approach to ascertaining socio-economic status is the use of a wealth index based on household assets and housing characteristics. The method is assumed to be less subjective to the discussed biases regarding income, expenditure and consumption. Asking people about the assets that they own is not as sensitive and invasive as asking them how much income they earn or on what they spend their incomes. This method has also been found to be better at discriminating among socio-economic groups than using other measures, such as expenditure or income. Very few studies have however attempted to compare consumption and the wealth index as indicators of welfare in developing countries. In the studies that have done so, the wealth index appears to compare well with consumption (Filmer and Pritchett, 2001; Falkingham and Namazie, 2002).

2.4.3 The Wealth Index as a Measure of Economic Welfare

The wealth index, like consumption or income, has the ability to define disparities in terms that are primarily economic. It is created by using factor scores derived through principal component analysis (PCA) or factor analysis (FA). These two techniques have an intuitive appeal, because they generate factor scores that represent weights of asset items in the wealth index, as well as producing coefficients and common factors in a regression. The factor scores are a measure of the strength of association of an asset item or variable with the first principal component, and this first factor is often assumed to represent economic status, as it explains a greater percentage of variation in the asset index relative to subsequent components (Wang and Luo, 2004; Field, 2000;World Bank 2003; Houweling, Kunst and Mackenbach, 2003; Gwatkin et al., 2000). The wealth index is calculated using this formula[1]. Using the factor scores, households can be divided into equal quintile groups to compare access to health services or outcomes of wealth groups. The PCA technique has been applied in studies that employed the wealth index as a measure of wealth, as well as in studies measuring the determinants of health outcomes or health services. Filmer and Pritchett (2001) for example, used the technique to assess household wealth in India with regard to school enrolment. Similarly, Gwatkin et al. (2000b) applied the method in creating a wealth index to study socio-economic differences in health, population and nutrition in Indonesia. The factor scores approach has also been used to develop the deprivation index to measure socio-economic

[1] $A_i = \sum_k \left[\frac{f_k(a_{ik} - \bar{a}_k)}{s_k} \right]$ Where A_i= the wealth ranking of household a_{ik}= the value of variable k for household i, a_k= the sample mean and s_k is the standard deviation of variable k

disparities in health care (McIntyre et al., 2001). This deprivation index is used to measure deprivation in terms of material and social conditions relative to what is normally available.

In a general regression analysis, May and Kline (1987) also used FA to study a type A behaviour pattern and its association with heart disease.

Factor analysis has also been used by Pickering (1986) to study the characteristics of long-term users of tranquilizers, with non-users as controls. Pickering's study included variables that measured the health status of patients, vital demographic statistics related to deaths, divorces and the medical histories of patients, and then using factor analysis, it examined the variables that were significant in explaining anxiety factors and patient related factors.

A major criticism, however, in the use of the wealth index in assigning households into economic groups is that the method lacks a theoretical basis on which to judge disparities compared to the more traditional methods such as income, expenditure or consumption. Other problems of using the wealth index that also need to be resolved are the inclusion of certain assets in ascertaining wealth of a household. These include sanitation items (toilets), publicly provided items (public standing pipes, toilets, electricity), housing characteristics and durable goods. Arguments in favour of this are, firstly, that public services such as potable water, toilet and health facilities are often located where the well-to-do reside, and secondly that clean water and toilet facilities prevent diarrhoeal

diseases and thus should form part of determining wealth of households. Arguments against this notion are related to the fact that including public assets will yield an indicator that may indicate a greater degree of inequality and place groups in economic classes to which they do not belong. Apart from that, it is also difficult to distinguish the direct effects of clean water or toilet facilities as a determinant of health and as a determinant of wealth, although these arguments remain inconclusive (World Bank, 2003; Rustein et al., 2000; Houweling, Kunst and Mackenbach, 2003; Gwatkin et al., 2000). Thus, some analyses of household wealth often take into account public assets, while others do not.

The inclusion and exclusion of some of the asset items in deriving the wealth index are also reported to be sensitive in determining socio-economic groups. The World Bank wealth index often includes public and private asset items, but a study that compared the sensitivity of including all items as in the World Bank case as well as excluding, first of all, only sanitation items, then sanitation items together with housing characteristics and finally using only durable items have found that the overall explanation of variances in the difference indices varied. The World Bank item list produces the lowest overall explanation of variance in the wealth index of between 12-20%, but as they excluded the other items sequentially, the average overall explanation of the variance increased to 35% (Houweling, Kunst and Mackenbach, 2003). Their study also highlighted the fact that using shorter lists of items made it impossible to distinguish between socio-economic groups. The extreme situation that yields the highest variance, occurs when only durable goods are included in compiling the index and with that, the poorer quintiles are virtually

excluded because they do no possess these assets (Houweling, Kunst and Mackenbach, 2003; Gwatkin et al., 2000). These findings highlight the importance of having a balance of items, as well as using items that describe wealth and are specific to a particular context. However, assets often used in creating the wealth index in many of these studies are frequently the assets in the Demographic and Health Surveys, which may not be appropriate for certain local situations.

Factor analysis and principal component analysis both of which are used in regression analysis, have also been criticized for producing results of what one expects to see and that they are unable to test the significance of the results and cannot be replicated (Kline, 1994). In addition, there is no external criterion, as there is in logistic regression, multivariate analysis of variance and discriminant function analysis, to judge how the solution best predicts group membership. One other problem is related to the number of rotations that are made to make common factors interpretable. Most often, rotations produce the same amount of variance although slightly different from the original, and the choice of which solution is best rests with the researcher's judgement of the solution's interpretability and scientific relevance (Tabachnick and Fidell, 1996; Kline, 1994). Notwithstanding these limitations, the PCA and FA do offer considerable understanding and interpretability of multi-dimension data, and their advantages far outweigh any disadvantages.

There are also other techniques available in the literature for weighting assets as an indicator of wealth but these rely on the researcher's experience in using weights for

assets in the particular study area or applying market values to weight certain assets higher if the values are higher and vice versa. However, these latter methods are more subjective and less formal than using the PCA method (Rustein et al., 2000).

2.5 Gaps in Equity in Access Research

The above review of past research in the area of equity in access to health care has highlighted the fact that the way access is defined is critical to how it is measured. Information plays a crucial role in conceptualizing equity. Equal information is an element of equitable access to health care. Unequal utilisation does not necessarily reflect a situation with unequal access to health care, as informed individuals may well choose not to use services even if they are available, accessible and affordable. The concept of equal access to health care for equal groups of the population offers a policy relevant measure of equity in health care, and using utilisation as a proxy for access is insufficient.

Studies on the different access factors are also often undertaken independently, as if they were different and independent of each other. This has been problematic for shaping what exactly constitutes access to health care and establishing the most relevant access factors for policy intervention.

Whereas extensive work has been done on individual access factors, these are mostly factors associated with the supply side of health care. The gap that remains is that it is less clear which factors constitute the demand and supply side of health care, which is

very important if policy efforts are to be geared towards the demand for health care. Within the concept of access, the supply side is not necessarily the most important aspect. In order to achieve equal access to health care, health systems should direct their attention towards the whole set of factors that affect access to health care. This set includes demand side factors.

Some dimensions of access have already been identified in the literature, but the definitions of the various dimensions are unclear, and where they are provided, they are not comprehensive. Most of the dimensions also, as observed earlier, simply describe a single access factor and few attempts have been made to combine these factors into dimensions that reflect a broader range of access factors. Focusing on broader dimensions consisting of several access factors, will allow wider measures of access. Issues of what constitutes an appropriate measure of physical accessibility are therefore eliminated, when for example, all factors associated with the provision of health care are considered under a broader dimension, such as availability of health care.

Information has never been considered a dimension of access as such and has therefore not been examined in this context. Thus very little is known about possible access factors that constitute this dimension.

Measuring equity in access to malaria control interventions also requires a rigorous choice of a socio-economic indicator to identify the poor. The literature shows that income and expenditure are most often used as proxy measures for consumption. This poses a problem especially in the context of a developing country where the bulk of food

consumption comes from home food production, which is not usually captured in income and expenditure surveys. Apart from the use of the conventional methods, such as income and consumption in measuring socio-economic status, the wealth index has also recently been used as a measure of SES and has been found to be comparable with consumption, although, it has only been tested by a few studies. Assets that are most often used in compiling the wealth index are usually from the Demographic Health Surveys, which may be less appropriate for local situations.

In order to address the gaps identified in the literature review above, the task of this thesis is to develop a conceptual framework that examines the myriad factors affecting access to health and to design an appropriate methodology to measure access. This study attempts to do this first by deconstructing access into its dimensions, and identifying the factors that apply respectively to the supply and demand side of access. It tests the relevance of these factors as determinants of access by using statistical techniques with primary data from the Kassena-Nankana district.

Furthermore, this study will contribute to the knowledge base of measuring SES. As opposed to simply using proxy based measures such as income and expenditure, it operationalises consumption data and a wealth index and also analyses the sensitivity in use of the wealth index to measure SES. It will further highlight the comparability of consumption and the wealth index. The assets used in this survey included assets and housing characteristics specific to the Kassena-Nankana district, as well as most of the assets used in the Demographic Health Surveys, where these are appropriate.

Chapter 3: Conceptual Framework

3.1. Introduction

The aim of this present chapter is to provide a conceptual framework of access by deconstructing access into its relevant dimensions and common factors that are useful for policy makers seeking to address access to health care as part of their equity objectives. The chapter starts with the definitions of dimensions of access as developed for the purposes of this study, and based on this, introduces a conceptual framework in section 3.3. The conceptual framework moreover, lays out the access factors that constitute each dimension, and the interdependence of these factors. Factor analysis (FA) and principal component analysis (PCA) are used in running regressions to estimate the coefficients of the access factors and to create a disadvantage index for access to health care by using the factor scores. Equations for estimating the models are discussed along with a priori expectations of the access factors in each model.

3.2 Definition of Dimensions of Access

Definitions of access dimensions and their constituent access factors are developed to explain the meaning of each dimension as used in this study.

- Availability refers to the supply of health services and the opportunity to use these services when they are needed. It therefore includes a range of specific health services, relevant personnel and the physical location of health services.

- Acceptability also refers to the nature of service provision; moreover, the health service environment as well as the services being offered should be sensitive to the cultural needs and understanding of the people seeking health care. Acceptability may vary in response to cultural beliefs and the nature of the illness, as was observed in Chapter 2.

- Affordability refers to the cost of health care services in relation to the socio-economic characteristics of the population seeking care. Paying for health care beyond a certain threshold could have detrimental effects on the provision of other essentials in the production of health, such as food, clothing and education, leading to a further deterioration in the health of the individual. Moreover, poor socio-economic status may invariably make services unaffordable, even if health services were available free of charge, due to inherent indirect costs not related to user fees. Affordability therefore comprises factors that are peculiar to both the household and the health system.

- The information dimension requires individuals in need of health care to possess knowledge about the availability and effectiveness of the services provided to make an informed decision on whether or not to access these services. Information on disease and disease prevention, the availability of both curative and preventive health care, as well as information with regard to exemption mechanisms to ease financial constraints for the poor should be made known

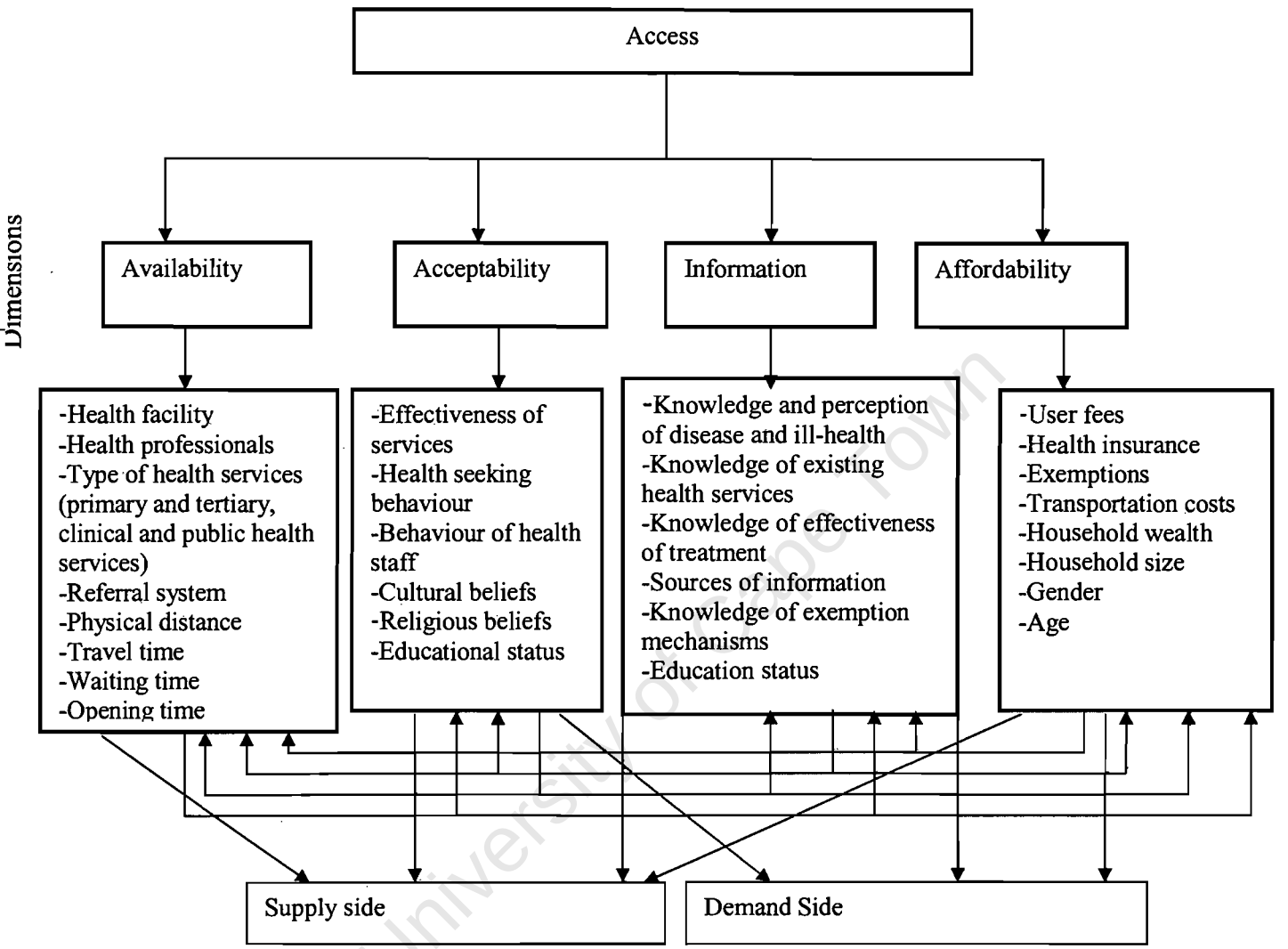
equally to all those in need of these services. These dimensions defined above can be integrated into the conceptual framework of access that is examined below.

3.3 Framework of Access

Figure 2 below shows the various dimensions of access and the access factors constituting each dimension. The availability dimension comprises service related access factors, such as health facilities, health professionals (number and cadre of staff), physical distance and travelling time to service points, waiting time to receive health care, opening hours of the health facility and the referral mechanisms in place. It also includes the nature of health service, viz. whether the facility provides outpatient or inpatient care, primary or secondary care, and so on. It is expected that these factors should provide a measure of availability of health care.

The acceptability dimension, in contrast, includes factors that are associated with whether the services or treatment provided is effective for the illnesses presented and in this case, we look at malaria management as a case study. The acceptability dimension also includes factors that relate to behavioural aspects of the population, such as whether the population seeks care from traditional or modern health care sources, the cultural and religious belief systems in place, and the attitudes of health staff, with the latter representing a health service provision factor.

Figure 2: Dimensions of Access to Health Care



The information dimension comprises access factors that are associated with the knowledge of disease causation and perception of ill health. Where people ascribe a different cause to a disease or illness, they are likely to adopt a different method of seeking health care than what is conventional, and thus it is necessary to provide the required health information to change perceptions and attitudes. Information regarding the services offered by a health care system, the effectiveness of the services, measured

by the quality of health care, the sources of information people have on health services and the type of exemption from fee payment schemes would determine if they have access to health care and not necessarily the availability of services.

Factors that constitute the affordability dimension, lastly, relate to composition of the household, its age structure, gender, the economic status of the household as well as financing mechanisms of the health system. The implications of these factors are explained in section 3.5.

Figure 2 also reflects the interrelations between the dimensions and the factors of access. For instance, physical accessibility depends on the existence of a health facility and services provided by such facility. Even if a service facility might be in the proximity of a community, their belief in respect of the causes of an illness and the ability of the health facility to treat such illness will determine whether they seek care at the existing facility or health provider or not. Complications of malaria, especially convulsions in children, are usually taken to the home of a traditional herbalist who is believed to be more capable at handling these conditions (Mwenesi et al., 1995). The acceptability of the effectiveness of the health service for treating certain illnesses may thus directly influence the use of the service.

The existence of a service and the type of financing mechanisms in operation also has a bearing on whether the service is affordable. The Ghanaian health system operates on a fee for service system, while offering exemptions to children under five, pregnant women

and the aged, and theoretically the poor. A community might therefore have a facility within reach, which provides quality service, but the community might not use its services because of their inability to pay for them. Alternatively, households may have the ability to pay for the health services but, due to poor perception of ill health, prevailing cultural beliefs they adhere to and the perception of the quality of services offered by the particular health facility, may not make use of it.

The information that people have on available health care services also influences access to health care. Medical anthropologists' views regarding illnesses are that the health state of an individual depends on how individuals view their own health and may not necessarily be a case of establishing a disease condition from a biomedical point of view. Furthermore, an individual might consider her state of health as good because she does not have information on what could be a possible cause of ill health and no knowledge of preventive or curative measures available within her environment (Sen, 1992). Similarly, an illiterate population may have very little or poor perception of ill health, and although this is no indication that there is little illness to perceive, they often do not attempt to treat it when it does exist (Sen, 1992).

In health care systems where there are exemptions for vulnerable groups and the poor, as is the case of Ghana, people may not have financial access because they have no information regarding the availability of exemptions, and where they do, may not have information of what services they are entitled to, and thus access to health services will

be unequal. These arguments emphasize the important role of information in access even where services are available, affordable and acceptable to the population.

Information means that patients are aware of a range of choices that allow them to have access to available care to improve their health. For example, knowledge of the symptoms of minor ailments or early signs of a disease might assist patients to seek prompt care or to use the information to prevent the occurrence of a disease. Malaria is a disease that is currently advocated as being managed effectively at home, and thus pre-packed drugs have been tested for their effectiveness in managing malaria at home (WHO, 2002). However, knowledge of the signs and symptoms of malaria, the cause of the disease and the danger signs is critical if home management of malaria is to become an effective control strategy. An effective information exchange has the potential of reducing the number of people seeking health care at health facilities for minor ailments, and the relationship between the health provider and the client plays an important role in this.

The doctor-patient relationship for instance, is built on the exchange of information, allowing the patient to be informed about his state of health and channels to adopt to improve health. As Sorell (2003) puts it, patients have the moral right to take decisions to improve their health and those who are well informed have the moral duty to take actions to preserve their health. Patients are also to be encouraged by the health system to ask questions about the medical advice they receive and to receive an explanation about the treatment. The point of view expressed here is that, patients have a responsibility towards

themselves and a social responsibility to support the efficient use of the country's scarce resources. It is for these reasons that information is examined as a separate dimension in this thesis.

The framework clearly shows which access factors constitute which dimension and also provides insights into which dimensions relate to the supply or demand side of health care. It is difficult to draw clear lines on which dimensions are solely supply or demand oriented though. The diagram illustrates that the availability dimension describes solely supply side factors, but with the other three dimensions, there is an overlap between the factors, with some access factors constituting the supply and demand side as well, but with these dimensions overall representing more of the demand side issues.

The various dimensions and the access factors discussed above are all linked together in defining access to health care. Attempts to measure access based on a single factor or dimension therefore do not adequately establish a concrete measure of access that will be useful in assessing the performance of health systems and in monitoring inequities in access to health care over time.

The four dimensions hence adopted in this study to describe access are based on an approach that looks at several variables or a group of variables that fully explain the access dimensions affordability, availability, acceptability and information. The literature review highlights that the shortcoming of earlier approaches to defining these dimensions was each dimension has been associated with a single measurable variable (Penchansky

and Thomas 1981; Puente-Markides, 1992, Guagliardo, 2004; Gulliford, 2004). In defining access, the focus has been on accessibility, affordability, acceptability, and accommodation factors in much of the literature and these factors are used as single variables. In this study, the process for defining each dimension has been to describe a comprehensive set of factors that may explain the dimension. The availability of health care is characterized by variables such as physical distance (in the literature accessibility is used to represent this variable), waiting and opening times, type of care services, travel time, referral procedures an so on, under one umbrella in order to vividly describe the dimension at length. Acceptability relates to people's behaviour, the cultural norms of the society and their perception of the etiology of ill health and its management. Thus all attitudinal variables that affect health seeking from cultural and professional perspectives are placed under this dimension. The accommodation variable, which refers to the ability of health staff to relate and accept patients who seek health care is thus placed under the acceptability dimension instead of treating it as a separate dimension as in previous studies. Similarly, the access dimension information is derived from the fact that being informed about health and health services facilitates access. The interchange of information between health providers and individuals builds a positive attitude towards improving health. In this study, it has been acknowledged that education increases one's knowledge around health care. Using drugs (e.g. anti-malarials) relies on having information about its effectiveness and efficacy. In addition, the type of provider and also the sources from which individuals receive information constituted variables for the information dimension."

3.4 Access Models by Factor and Principal Component Analysis

The models used to estimate access to health care in previous studies were discussed in Chapter 2 as placing more emphasis on the utilisation of health care, and thus were not adequately addressing and measuring access to health care. In this study therefore, the model of access extends beyond what had previously been studied and incorporates all four dimensions of access in the framework (Figure 2). Separate models for each dimension are developed and used to predict access to health care. Modelling each dimension separately stems firstly from the fact that, although access to health care is multi-dimensional and the factors interrelate, each dimension significantly influences access in its own way. Secondly, although these dimensions and factors have already been described as influencing access to health care, there has not been sufficient testing of all the potential access factors that correlate highly on each dimension. Thirdly, different access factors may determine the common factors associated with the different dimensions. Thus sub analysis of the access factors peculiar to each dimension is appropriate within the factor analysis technique (Tabachnick and Fidell, 1996; Kline, 1994). In effect, analysing each dimension as a separate model is appropriate and important, as one can include all the potential access factors for each dimension and provide a wider knowledge of the factors that will be useful for policy intervention and monitoring of policy outcomes.

Supply and demand factors, such as distance to a health care facility, travelling cost and time, means of transport, type of health services, user fees, source of information for health services, knowledge of treatment and prevention methods of malaria,

consumption, household size, education and background variables such as age, sex, marital status, ethnicity and religious affiliation, were explicitly introduced in the models below. The principal component and factor analysis (FA) statistical technique is then used to extract a common factor(s) that explains primary and secondary indicators of access.

Generally, the PCA is used as a first step of FA to determine which factors to include in the analysis. Although the two methods are sometimes used interchangeably, FA is conceptually and mathematically different from the PCA (Joliffe, 1986; Bailey and Gatrell, 1995). With the PCA, the same number of uncorrelated variables captures the same variance in the original data, implying that no information has been lost in using PCA. The PCA technique is therefore used to indicate the relative importance of the components, based on how large or small the eigenvalues are. The FA, on the other hand uses a few of the components in PCA to capture a greater proportion of the total variation. In order to determine which of the components to retain for FA analysis and which variables to include in the interpretation of each component, the general rule is to use components with eigenvalues greater than one, and a cut off point of 0.5 at least factor loading is required for each variable (Joliffe, 1986; Bailey and Gatrell, 1995). There is, however, a trade off between using all the components in PCA and using fewer components in FA. In using fewer components as in FA, it is easier to interpret the common factors that determine access to health care, and little information is lost, whereas in retaining all the components as in PCA, one gets a higher total variance, but the factors become less interpretable (Joliffe, 1986; Bailey and Gatrell, 1995; Wang and

Luo, 2004). Using few common factors in FA also allows critical access factors and less critical access factors to be extracted. FA then is more suited for this study, as the aim is to establish which factors are of primary importance in access to health care.

The basic idea behind FA is that there are p observed random variables x, which can be expressed as linear function of m (<p) hypothetical variables except for the error term (Tabachnick and Fidell, 1996; Kline, 1994; Jolliffe, 1986). That is with p variables, there are fewer than p, (m) random variables or common factors that explain the variance in each model that is estimated. This is represented by the equation

$x_1 = \lambda_{11} f_1 + \lambda_{12} f_2 + \ldots\ldots\ldots\ldots\ldots\ldots + \lambda_{1m} f_m + e_1$

$x2 = \lambda_{21} f_1 + \lambda_{22} f_2 + \ldots\ldots\ldots\ldots\ldots\ldots + \lambda_{2m} f_m + e_2$

.

.

.

$x_j = \lambda_{p1} f_1 + \lambda_{p2} f_2 + \lambda_{p3} f_3 + \ldots\ldots\ldots\ldots + \lambda_{pm} f_m + e_j \qquad (1.1)$

Where

x_p= random variables of p

λ_{jk}, j= 1, 2,……., p; k=1, 2,……..m, are constants known as factor loadings

e_j, j=1, 2, ……., p= error terms

The reduced form of equation (1.1) is written as a matrix of the form

$$X=\lambda f + e \qquad (1.2)$$

Where

X= Vector of variables

λ =Vector of factor loadings

f= Vector of factors

e= vector of error term

Variables are the access factors used in the regression. For example, in determining the variables that affect access to health care, access factors such as user costs, consumption, distance to health care, gender and so on, are considered. Factor loadings represent correlations between the access factors and the common factors produced in factor analysis. A high access factor loading implies a strong relationship between that access factor and the common factor on which it loads, and likewise a low loading implies a low or unimportant association between that access factor and the common factor, irrespective of the sign assumed by the loading of the access factor (Tabachnick and Fidell, 1996).

The reduced form of equation 1.2 was used to derive equations for estimating the models below.

Affordability Model

The access factors in the affordability model (1.2.1 below) included the sex and the marital status of the household head, size of the household, consumption, cost of health care and transport cost. Males potentially have more access to economic resources than

females in the Kassena-Nankana district, so sex is likely to indicate in this context if health care is affordable or not. Similarly, the size of the household may determine whether a household has the resources to seek health care. Furthermore, being married implies one has access to economic resources such as land and animals and has the ability to take decisions to seek health care. Consumption measures the standard of living of the household and will thus influence how much is spent on health care and other goods necessary for the production of health. These access factors are descriptive of the household and hence may predict the demand factors in this model.

The supply side factors in this dimension, on the other hand, include cost of transport to seek health care and the cost of treating malaria. The equation for the affordability model is given as

$$X=\lambda f + e$$

```
factor logcomag dumysex1 dumyage, loghousize
logtreatmentcost transportfare dumymar eduleveld1
eduleveld2 pcf (1.2.1)
```

and estimated using the STATA function pcf. This command allows the extraction of principal components as well as common factors and factor loadings.

Definitions of the access factors in each model are provided in Table 1 below and a priori expectations of the access factors are discussed afterwards.

Acceptability Model

The acceptability model comprises access factors related to treatment and management of malaria in children and adults, and religious beliefs and educational levels of the household head. Specific access factors on the type of treatment and management of the different severity conditions of malaria such as severe, moderate and mild malaria, are included in the model estimation.

$X=\lambda f + e$

```
factor medicinesevch1 medcinemodch1 medicinemildch1
adultsevmedicine1 adultmildmedic1 managingfch1 managingfch3
managingsech1 managingsech3 managing3rdch1 managing3rdch3
adultmanagingf1 adultmanagingf3 adultmanagingsec1
adultmanagingsec3 adultmanaging3rd1 adultmanaging3rd3
religd1 religd2 eduleveld1 eduleveld2, pcf
(1.2.2)
```

Information Model

Similarly, the information model comprises access factors measuring the source of information for treating malaria, knowledge of the signs of malaria, management and treatment of malaria, education and religion. There was, however, no variability for the knowledge of the signs and symptoms access factor, and for factor analysis there must be a comparison for each variable that is measured. Hence, knowledge of the signs and symptoms variable was excluded in the estimation of the model.

$X=\lambda f + e$

```
=factor medicinesevch1 medicinemildch1 adultsevmedicine1
adultmildmedic1 firstinfosouc2 secondinfosouc2
thirdinfosouc2 eduleveld1 eduleveld2, pcf
```
(1.2.3)

Availability Model

Factors pertaining to the availability dimension included physical distance to a professional health provider or health care facility, inpatient and outpatient care, travelling time to the facility, possession of a bicycle or a car as means of transport and area of residence (Table 1).

$X=\lambda f + e$

```
factor chpsfacdist5km residence outinpat traveltime1
transportbikecar, pcf
```
(1.2.4)

Common factors in each dimension of access were interpreted based on whether they relate to the supply or demand side of health care and the importance of the access factors that correlate highly on the common factor. Varimax rotation was used to improve the interpretability of the factors extracted for each dimension.

Table 1: Description of Access Factors

Variable description	
Availability dimension	
chpsfacdist5km	1=Distance of 5km 0= Otherwise
residence	1=Urban 0= Otherwise
traveltime1	1=Travel time if less than hour 0= Otherwise
outinpat	Inpatient care in facility=1 0= Otherwise
transportbikecar	1= Household has car/bicycle 0= Otherwise
Affordability dimension	
logcomag	Log of consumption
dumysex1	1= Male 0=Otherwise
loghousize	Log of household size
logtreatmentcost	Log of cost of treatment
tranportfare	1=Transport <=10,000.00 Cedis 0=Otherwise
dumymar	1= Married 0=Otherwise
dumy age	1= <=49 years 0=>49 years
eduleveld1	1=primary 0=Otherwise
eduleveld2	1=secondary and higher 0=Otherwise
Information dimension	
medicinesevch1	1= Anti-malarial for treating child severe malaria 0=Otherwise
medicinemildch1	1= Anti-malarial for treating child mild malaria 0=Otherwise
adultsevmedicine1	1= Anti-malarial for treating adult severe malaria 0=Otherwise
adultmildmedic1	1= Anti-malarial for treating adult mild malaria 0=Otherwise
firstinfosou	1= government information source for treating mild malaria 0=Otherwise
secondinfosouc2	1= Government information source for treating moderate malaria 0=Otherwise
thirdinfosouc2	= Government information source treating severe malaria 0=Otherwise
eduleveld1	1=primary 0=Otherwise

Access Factors description Continued	
eduleveld2	1=secondary or higher 0=Otherwise
Acceptability Dimension	
medicinesevch1	1= Anti-malarial for child severe malaria 0=Otherwise
medcinemodch1	1= Anti-malarial for child moderate malaria 0=Otherwise
medicinemildch1	1= Anti-malarial for child mild malaria 0=Otherwise
adultsevmedicine1	1= Anti-malarial for adult severe malaria 0=Otherwise
adultmodmedicine1	1= Anti-malarial for adult moderate malaria 0=Otherwise
adultmildmedic1	1= Anti-malarial for adult mild malaria 0=Otherwise
managingfch1	1= Anti-malarial -Managing mild malaria symptoms in child 0=Otherwise
managingfch3	1= Qualified provider-Managing mild malaria symptoms in child 0=Otherwise
managingsech1	1= Anti-malarial -Managing moderate symptoms in a child 0=Otherwise
managingsech3	1 Qualified provider-Managing moderate symptoms in a child 0=Otherwise
managing3rdch1	1= Anti-malarial -Managing severe symptoms in a child 0=Otherwise
managing3rdch3	1= Qualified provider -Managing severe symptoms in an adult 0=Otherwise
adultmanagingf1	1= Anti-malarial -Managing mild malaria symptoms in adult 0=Otherwise
adultmanagingf3	1= Qualified provider-Managing mild malaria symptoms in adult 0=Otherwise
adultmanagingsec1	1= Anti-malarial -Managing moderate symptoms in a adult 0=Otherwise
adultmanagingsec3	1= Qualified provider-Managing moderate symptoms in a adult 0=Otherwise
adultmanaging3rd1	1= Anti-malarial -Managing severe symptoms in a adult 0=Otherwise
adultmanaging3rd3	1= Qualified provider -Managing severe symptoms in a adult 0=Otherwise
religd1	1=Traditional religion 0=Otherwise
religd2	1=Christianity =Otherwise
eduleveld1	1=primary 0=Otherwise
eduleveld2	1=secondary and higher 0=Otherwise

3.5 A Priori Expectations of Access Factors

The explanatory variables for each model are categorized as to whether they are expected to directly affect the provision of health services or the demand function of households seeking health care. Income or wealth in the affordability model is postulated to have a positive impact on the production of good health. Wealthy households have access to more nutritious food, they have ability to pay for health care and to utilise health information better for the production of good health. Thus, a wealthy household or a household with high income would have greater access to health care relative to those with no income or low income and wealth. Wealthy households also use more specialist care and less primary health care services than those from lower income backgrounds (Van Doorslaer et al., 2000).

Alternatively, a health system, which operates a user fee at the point of service, is likely to have a negative impact on access to health care. The introduction of user fees in most developing countries has seen a reduction in access to health care but where quality is assured, user fees may not serve as a deterrent to health care access (Kipp et al., 2001; Reddy and Vandemoortel, 1996).

Household size and the composition of the household may determine the level of access to health care. A larger household may be more prone to ill health thus leading to more use of health care, particularly if household resources are too limited to meet good nutritional requirements of the family. Similarly, larger households may not have access to health care because of limited resources to meet the needs of a large family. The

affordability model therefore incorporates characteristics specific to health provision and the household.

Acceptability of the available health care, on the other hand, is affected by the religious and cultural beliefs of people and the types of alternative treatment methods available for various illnesses. It is expected that those who profess traditional religion are more likely to adhere to traditional methods of treating malaria relative to households with less affiliation with traditional religion. Furthermore, the level of severity of illnesses and the age of the patient have both been noted to inform the source of treatment for malaria in households (McCombie, 1996; Heggenhougen et al., 2003; Russell, 1996). Acceptance of treatment for a disease is regarded as the use of effective formal or western medicine available in health care facilities to treat illnesses and is expected to have a positive relationship with access. For malaria, effective treatment involves the use of anti-malarials in the recommended dosage or the use of a qualified provider for diagnosis and treatment and complying with the treatment regimen. The variables in this model are treatment and management of severe, moderate and mild malaria in children and adults respectively as well as religious beliefs of the household.

Level of education operates as a proxy for a well-informed household (models 1.2.2.and 1.2.3). Households with higher educational levels are therefore more likely to be informed about treatment methods of malaria and hence will use effective treatment methods compared to households that have lower educational levels. As such, an effective measure of health information is the knowledge of causation of ill health, the

methods of treating the illness and the source of information for treating that ill health as well as the level of education.

The need for health care also varies by age and sex. In the case of malaria, the vulnerable groups are children under-five and pregnant women and these groups are more likely to seek health care than other groups (model 1.2.1).

Education is not only related to access to information and the use of better treatment and prevention methods but as an indication of economic wealth. Households with higher levels of education are more likely to have higher incomes that would enable them to afford the cost of health care thus leading to a positive relationship between education and access (models 1.2.2 and 1.2.3).

Empirical research has shown that waiting times and calibre of health staff at health facilities are associated with access to health care. Information was not available for waiting times and opening hours of the health facility; and therefore these variables are not included in the model. However, data on the number and cadre of staff was collected but did not vary much for each of the primary health facilities.

In the availability model, the variable outpatient and inpatient care reflects the organization of health services and its ability to treat less severe and severe illnesses.

Generally, primary health care facilities provide basic outpatient care for less severe illnesses whereas hospitals provide both outpatient and inpatient care for both less severe and acute illnesses. Inpatient and outpatient services are supply variables and consequently indicate service availability.

Likewise, travel time is envisioned as relating to distance, but it is in fact more associated with households' demand for health care. Thus the time that households expect to spend travelling to seek health care will impact on access to health service as it directly affects use of time for other productive activities to produce wealth. However, households that have their own means of transport for travelling to health care facilities may perceive health services as being more available relative to households without any means of transport.

Distance serves as a measure of geographical accessibility and those who live close to a health facility are expected to have greater physical access to health care. Distance also has a direct link with the provision of health care (Guagliardo, 2004; Rosero-Bixby, 2004).

Analysis of the importance of these access factors as determinants or indicators of access is assessed through the factor loadings. Access factors with high loadings irrespective of the sign indicate the priority of that factor in determining access to health care.

3.6. The Disadvantage Index

As much as the interest of this research is to examine equal access to health care, there is also utmost importance to examine inequities among the poorest of the poor in order to prioritise health services for them. The Kassena-Nankana district is considered as one of the poorest districts in Ghana, thus examining inequities among the poorest of the poor will help direct health policy towards providing health care to benefit them. Estimating the values of the access factors as outlined above by using the FA and PCA techniques, is therefore important not only in highlighting which access factors are the most relevant but also because it allows the evaluation of how equitable access to health care is for various geographical areas and socio-economic groups using a disadvantage index developed for this study.

Standardized factor scores obtained from factor analysis as already mentioned could be used to create indices that provide rankings for households from the worst-case scenario to the best-case scenario. The index using these factor scores ensures that access factors are additive in that a household that receives poor or low scores on two or more access factors will be considered worse-off than a household that receives a low score on only one access factor. The index also assigns different weights to each access factor to ensure that the importance of each access factor in contributing to improved access is reflected in the weights received by the access factors.

Field (2000) developed a relative advantage index by compiling a list of factors that affect health care access, using factor scores in order to explain areas that have relative advantage or suffer from poor access to health care. More recently, Wang and Luo (2004)

also used factor scores to examine areas with high or low access to spatial and non-spatial factors, which affect access to health care. In terms of their study, spatial factors referred to physical accessibility, whereas non-spatial factors included socio-economic status, socio-cultural barriers and health care needs. The spatial factor was described as a supply factor of health care, whereas the non-spatial referred to the demand factors of health care (Wang and Luo, 2004). In these two studies, however, access factors were assigned equal weights. Assigning equal weights to the access factors usually implies that each access factor contributes to relatively the same level of disadvantage to overall access as any other access factor in the index. However, assigning different weights to the access factors shows the relative importance of the different factors of access in compiling the disadvantage index (McIntyre et al., 2001).

Factor scores for the affordability, availability, acceptability and information dimensions were thus used to create a disadvantage index for each dimension. The household that receives the lowest score on the index is considered the most disadvantaged in access to health care for that dimension, in contrast to a household that receives the highest score on the index for that dimension. For the purpose of this study, households were grouped into quintiles with lowest 20% representing lowest access and the highest 20% representing the highest access score.

The disadvantage index was calculated in STATA using the formula below.

$$A_i = \sum_k \left[\frac{f_k(a_{ik} - \bar{a}_k)}{s_k} \right]$$

Where

A_i= the access ranking of household *i*

a_{ik}= the value of variable *k* for household *i*,

a_k= the sample mean and s_k is the standard deviation of variable *k*

The variables used for compiling the disadvantage index for each dimension are the access factors for each model in section 3.4.

It should be clear from the discussion of the conceptual framework that the importance of having a clear definition of each dimension of access is paramount in trying to provide a measure of access to health care. It eliminates the problem of attempting to measure the same access factor in different ways. Many methods have been devised to measure, for example physical accessibility (distance or number of health care providers etc), because the relevant dimensions have not been properly conceptualised. This conceptual framework demonstrates the relevance of having well constructed dimensions that capture all the features of service provision under availability, and the financing mechanisms and economic characteristics of the household under affordability, and so on.

The conceptual framework set up above was tested against empirical data, using primary data from the Kassena-Nankana district. The research design for data collection and statistical methods used in analysing the data to test the conceptual models is discussed next.

Chapter 4: Research Design and Methods

4.1 Background to the Kassena-Nankana District

The Kassena-Nankana district (KND) is situated in the northern corner of Ghana, adjacent to the border with Burkina-Faso (Figure 3). The district is predominantly rural and has a population of 141,000 people (Nyarko et al., 2001). It lies within the guinea savannah woodland area of Ghana. The district has two main ethnic groups, being the Kassenas and the Nankanis, who live in dispersed settlements. This makes health service provision quite challenging. Although the languages of the two ethnic groups are different, their culture and traditions are homogenous. Traditional beliefs also form a major lifestyle of the people, although there are other religions such as Christianity and Islam. Literacy rates are also generally low.

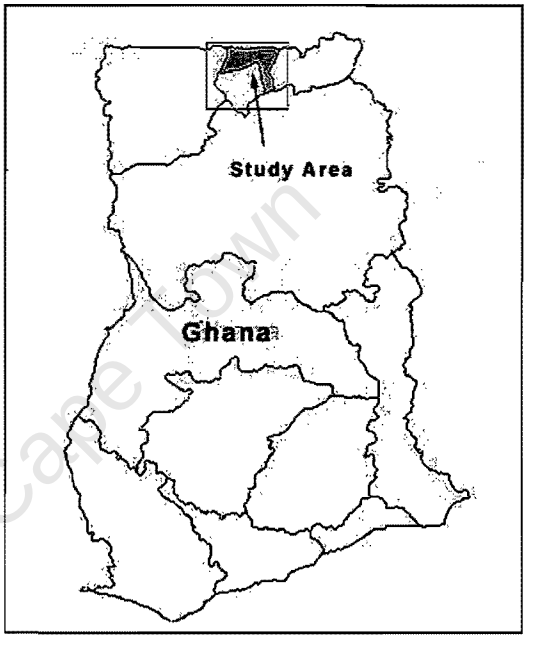


Figure 3: KND Map

The district has only two main seasons: a long dry season from October to May and a short rainy season from June to September. The people are subsistence farmers with farming constituting major activities in the district. Erratic rainfall patterns are common and, coupled with the short rainy season food yields are poor, making food shortages and poverty a common phenomenon. The district is also the site of a large irrigation dam with 42 canals, which covers an area of approximately 4,000 hectares. The dam provides water

for dry season farming, but there are also many dugouts dispersed through out the district. Malaria is therefore common throughout the year and has peak periods between September and November (Armah et al., 1997).

Infrastructure and social amenities in the KND are very limited. Movement within the district is facilitated by an underdeveloped transport system with many people resorting to the use of bicycles. Seasonal rains, erosion, inaccessible and poor roads have made bicycles a very popular means of transport. Roads are often muddy, waterlogged or flooded during the rainy season (which coincides with the peak malaria season), rendering the roads impassable and making access to health care facilities very difficult.

Health services are provided by three health centres, three clinics, a district hospital, community health officers and village health volunteers; the latter two are located in specific areas of the district. The term community health officers (CHO) is used to refer to community health nurses who have received training in basic curative care in addition to the conventional training in public health. The district has been the site of a study testing various strategies of delivering door-to-door health care in rural communities, popularly referred to as the Navrongo Community Health and Family Planning project (CHFP). Key findings of this study have now been adopted in the national strategy (CHPS) for delivering primary health care in rural communities. The CHPS strategy is a replication of some aspects of the CHFP project, involving mainly the retraining of community health nurses in curative care and placing them in rural communities to provide door-to-door primary health care services (Nyanator, 2004).

The design of the CHFP involved four cells each representing a different health delivery strategy. The first cell tested a strategy of mobilizing village health volunteers to deliver health care. The second cell comprised retraining community health officers in basic curative health care and placing these nurses in communities of about 1500 compounds to provide door-to-door health services. A third cell strategy involved a combination of community health officers and community heath volunteers. The fourth cell, the comparison cell, maintained the routine activities of the Ministry of Health at the sub-district level (CHFP-NHRC, 1998).

The insecticide treated bed net trial in the district was carried out between 1992 and 1995, and over 62,000 bed nets were distributed during the trial (Binka et al., 1997). UNICEF and WHO continue to support the sales and distribution of insecticide treated nets in the district. The nets provided by UNICEF are highly subsidized for pregnant women and children of less than five years of age, using the immunization and antenatal cards as an identifier for the subsidy. There is also a rectal artesunate drug trial (2000-2004) ongoing in the district. The Rectal Artesunate Project works closely with traditional healers who treat cases of convulsions in the district to evaluate the effectiveness of the drug.

The KND is the field site of the Navrongo Health Research Centre, and a number of population and health research activities such as the insecticide treated net and the CHFP trials have been undertaken in the district. To facilitate research activities, the NHRC maintains a demographic surveillance system, the Navrongo Demographic Surveillance System (NDSS) in the district. The NDSS routinely collects information on demographic

events (births, deaths, marriages, migration) occurring within the district. It provides an up-to-date profile of the population of the district on a regular basis, thus offering an accurate sampling frame for research studies.

The NDSS divides the district into 5 zones (North, South East, West and Central) and 244 clusters. Every compound in the district has an identification number, as do the individuals living in the compounds. The CHFP project was designed using this database to map out clusters and communities where each service strategy would be implemented. The background to the district has a significant impact on the design of the study discussed below.

4.2 Study Design

4.2.1 Cross-Sectional Survey

Quantitative and qualitative research techniques were used to design and collect data for this thesis. The quantitative study was a cross-sectional household-based survey conducted between June and September 2003 in a representative sample of 2000 households. A multi-stage sampling technique was used to select households for participation in the study. First, a hundred clusters were randomly selected from the 244 clusters using the NDSS database. Clusters were selected based on the CHFP cell design to capture the impact of the service delivery design on access to health care, as well as the population coverage of each cell. In each selected cluster, 10 compounds (residential units) were systematically selected. On average, there are 2 households in a compound, and for each cluster, twenty households were systematically selected. Thereafter, all

households heads identified within the compounds were interviewed until the required number of households within a cluster had been interviewed. Because of the farming activities during this period, the number of compounds was increased to 15 (30 households) to cater for households that might have moved away to farm in distant places.

By the end of the survey, 1880 household interviews had been completed, constituting a 94% response rate. The 6% non-response rate came about because after a household that had been visited three times, was still empty, it was concluded that the family had moved to cultivate their fields in far distant villages and did not return within the period of the survey. There were only 2 refusals and the reasons were mainly that they did not feel comfortable revealing some of the information that we required regarding assets and consumption.

4.2.2 Identification of Households

The concept of a household is quite alien in the KND as people tend to live in extended houses called compounds (a compound could have one or several households). In order to distinguish households from compounds, a household was defined as a group of people living together and sharing the same budget on food. The main source of information on the number of households was obtained from the compound head. The compound head is the most senior male in the compound who oversees the general welfare of the compound. He was identified first and asked about the number of separate catering

arrangements in the compound, and his response established the number of households in that particular compound. Thereafter, each household head was identified and an individual questionnaire was administered to him or her till all the households in the compound had been covered

4.2.3 Data Collection Techniques

Structured interviews were carried out using questionnaires (Appendix I) covering issues such as on the kinds of reported illnesses and their severity, health care utilisation and health care expenditure during the four weeks prior to the survey; type of health care providers used, reasons for choosing a particular health care provider, amount of out-of-pocket money paid for consultation, laboratory examination and medication. Data on morbidity was assessed retrospectively.

Severity of illness was classified as mild, average and severe based on the respondents' own assessment of the condition of the household member. In respect of malaria, households classified signs and symptoms based on whether they considered these as mild, moderate or severe.

Self-treatment was defined as buying and using modern drugs or traditional drugs without professional medical consultation, using drugs available at home or any kind of medication at home without consulting with a professional health provider. Respondents

who reported illness but who did not use of any of such medications or drugs were considered as no treatment cases.

4.2.4 Health Expenditure and Economic Data

Expenditure for health care included payment for consultation, laboratory tests, drugs, travel cost to health facility or provider and any in-kind payments made during the period of ill health.

The economic status of households is assessed based on consumption and the wealth index, and data was collected for both measures.

Socio-economic variables in the consumption survey included monthly expenditure of food and non-food items, and occasional expenditures on durable goods.

Information on farm produce was obtained from household heads in respect of the crops that had been cultivated in the last farming season, including the number of bags, bowls or basins of yields from each crop that was cultivated. The main farm crops include millet, groundnuts, rice, bambara beans, soya beans, kidney beans and maize. Farm yields over the last five years have been poor and thus gathering information on bags of farm crops was not generally possible. Bowls or basins were used as the standard measure instead of bags. The prices of the above farm produce were solicited from the local market, since they do tend to vary from location to location due to transport cost.

Household heads were also asked to provide information on any farm produce they received in kind from any of the crops listed. The prices for bowls or basins of each crop were then multiplied by the quantities obtained for each crop and added up. Similar prices were used in valuing food crops obtained in kind. The total of both farm crops produced and farm crops received in kind constitute the aggregate for farm produce.

Food items purchased from the market were collected on market days and on a monthly basis. Most markets in the district occur every three days, thus the prices of items were collected based on market days for frequently used items, and on a monthly basis for items that were purchased monthly. The wife of the household head assisted in providing this information on expenditure on ingredients and other food items purchased frequently. Household heads only invited their wives for this portion of the interview when the woman was the person responsible for purchasing those items.

Food items included cereals, such as rice, maize and millet as well as non-cereals like tomatoes, salt, fish, meat, oil, pepper, maggi cubes and others. All of these items were added up and multiplied by twelve months to calculate the total expenditure on these items for the year. The survey also collected information on any of the food items that had been received in kind in the month preceding the survey. The total for food items is the sum of the yearly expenditure and the value of the items received in kind.

Items that were classified as non-food items included, soap, kerosene, gas, petrol, water and electricity bills, fuel wood and charcoal. Many people in the district have access to

borehole water, and thus every compound pays a certain amount towards the maintenance of the borehole. These maintenance fees are collected on a yearly basis per compound. The yearly figure was divided by the number of households per compound to obtain the water bill per household per year. The other non-food items were converted to yearly amounts by multiplying by twelve. The value of non-food items received in kind was added to the sum of the yearly amount for non-food items to obtain an aggregate value for non-food items.

Some items and bills in the district are usually purchased or paid seasonally. These include clothing, shoes, funerals (common in the district), school fees and so on. Households were asked if they had spent money on any of these items over the last six months before the survey, and how much they spent on these items. These items were added up to give a total of items purchased occasionally.

The final component of items collected in respect of consumption was the purchase of durable items. Information was obtained for the following: housing, car, tractor, motorcycle, a bicycle, radio, television set and sewing machine. Although over 90% of the households live in their own houses, they were asked to value the rental equivalent of the rooms in which they were living to obtain a monthly rental equivalent per room. The monthly rent was converted to yearly amounts on rent. It was highlighted in the literature that durable assets such as television sets, gas cookers, electric cookers, sewing machines, refrigerators and so on have a long lifespan and are more appropriate to value using their rental equivalents rather than the total amount paid originally for the item. On this basis,

two durable assets, television sets as well as gas or electric cookers were excluded from the aggregation of consumption, as rental equivalents could not be obtained for them. The percentage of the population that own these assets is 3% and thus excluding them are not likely to greatly affect the value of the consumption variable.

The consumption aggregate is therefore composed of the sub-aggregate of home-produced food, food and non-food items purchased from the market, occasional items and durable goods.

In order to create the wealth index, data was collected on the assets, possessions and housing characteristics of households. Data was collected in respect of animals, housing and housing characteristics (roofing and wall material), cooking ware, bicycles, radio, television set, sewing machine, gas cooker, coal pot, car, use of wood or millet stalks, wooden or iron bed, water source, availability of a health post or a health service provider and toilet facilities. Some of these items are more specific to the district, such as the use of coal pots, animals and millet stalks as fuel for power. Respondents were also asked to indicate if items mentioned were in fact functioning (non-functioning items were not recorded).

Publicly owned or shared assets in the household such as type of toilet, drinking water source, possession and use of insecticide treated nets, availability of electricity and nearby health facilities were also ascertained.

4.2.5 GIS Data for Calculating Distance to Care

The distances to health providers or facilities were digitised and geo-referenced by using the GIS (Geographic Information System) software and methods. The design of the community health and family planning project (CHFP) used clusters to map health facilities and health providers to nearby compounds. As a result, the CHFP clusters were used as the reference points for calculating distances to all households who participated in the survey. As mentioned above, the compounds in the district all have unique identification numbers and thus a list of compound identity numbers was generated, using the NDSS database. Field assistants collected an inventory of public and private health providers (including chemists, village health volunteers, and traditional healers) in the district. Two hand-held geographical positioning systems (GPS) were also used to record the geo-referenced positions of the 2000 households in relation to the 3 health centers, 83 healers, 40 chemists and peddlers, 46 village volunteers and 16 community health nursing compounds.

With the GIS technique, straight-line distances were calculated for households in the study to the nearest providers to these households. Distances were calculated from each compound to the health centres, clinics, village volunteers, chemists, community health officers (nurses) and traditional healers nearest to them. In addition, the distances from each compound to the main district hospital, which serves the whole population, were calculated too. It must be noted that the GIS calculates straight lines distance between two points, and though some households may live close to a particular health facility, actual travel distances may be longer due to the nature of the terrain.

4.2.6 Qualitative Interviews

The qualitative interviews were conducted between March and June of 2003; they included focus group discussions, in-depth and key informant interviews. Focus group discussion is a method used to explore issues about which little is known, or as a complementary method to other research methods (Greenbaum, 1998; Macun and Posel, 1998). The focus group discussions and in-depth interviews were conducted before the quantitative survey to explore issues regarding malaria treatment among children under five and adults, the perception of the use of different providers and the relationship of use of a particular provider with the level of severity of the illness. In addition, the FGDs and IDIs were used to explore perceptions about poverty; possible markers of poverty and to carry out a wealth ranking exercise of household assets and possessions that are associated with wealth within the community. Information on the assets associated with wealth in the FGDs and IDIs were used to refine the survey questionnaire. In this study therefore, the qualitative method was used as a complementary method to the cross-sectional survey.

Focus group discussions (FGDs) are often held with homogenous groups of people who share common characteristics, such as age, gender, occupation, level of education, child bearing experiences and so on. This is done in order to encourage open and frank discussions among peers participating in the group discussion. The discussions were held separately with men and women in the following age categories 18-25, 26-35, 36-45, and 46+. In order to ascertain whether men and women from the same community or village in fact had the same views on the issues raised FGDs were conducted in pairs. FGDs

were held with male and female groups in the same village between two hours interval. Participants of both groups however came from different compounds and different sections of the same village; in other words, if we held a focus group discussion in a particular section of a village in Kayoro with women 18-25 years, we held another discussion with much older men in the same village but in a different section of the village and at a different venue and different time. Each FGD lasted about an hour and thirty minutes and on average, 12 participants took part.

The discussions pursued specific issues around the causes of malaria, signs and symptoms of malaria, levels of severity and management of malaria at different levels of severity, methods of treatment for the various levels of severity of malaria, perceptions of the causes of malaria, and beliefs regarding preventive and control measures. Discussions were also held on the perception of poverty and in addition, participants carried out a wealth ranking exercise with the help of pictures containing items such as different type of animals, different building and roofing types, cooking utensils, electrical appliances and others. The wealth ranking exercise is a participatory approach that allows people to place themselves in different socio-economic groups based on the assets and possessions they identify with wealth. In this study, possessions and assets identified by participants and used for the wealth ranking exercise during the FGDs and IDI were similar assets used for the asset index. The consistency of the wealth ranking of assets and assets used in compiling the wealth index are discussed in the results chapter.

Participants for the FGD sessions were identified and selected from the NDSS database. The CHFP stratification was used as a basis for selecting clusters for participation in the study. Discussion groups were further stratified by age and sex, to enable one to gain an in-depth view of the issues discussed. Clusters selected for the qualitative interviews were different to the clusters selected for the quantitative survey. This was done in order to obtain varied opinions from different sections of the district, and to avoid interviewing the same households during both types of interview and thus eliminating any biases. A list of 50 individuals in each age category was generated from the NDSS database and since one needs between 8 and 12 participants for each discussion, 15 participants were randomly selected from each list using a simple random number table. We over sampled for each group discussion to cater for people who might not turn up due to the farming activities at the time. On average, 12 people participated in each focus group discussion.

There are varied arguments on the right number of people to participate in FGDs. Some writers suggest between 6-8 and between 6-10 individuals, while others suggest that the right size is between 8-12 individuals. The tenets of the arguments are that the group should be small in order to ensure that all participants participate actively, as well as to enable in-depth discussions of the issues. Groups that are larger than 12 individuals obviously become unmanageable (Greenbaum, 1998; Macun and Posel, 1998; Stewart and Shamdasanin, 1998). In the end, thirty-six (36) focus group discussions were held among the various age groups, with nine FGDs held in each of the CHFP cells.

After the FGDs, the in-depth interviews (IDIs) were conducted with elderly men who oversee the general welfare of their lineages. In-depth interviews are often held to pursue issues that had been raised during the FGDs. These interviews were held to gain an in-depth knowledge of the extent of poverty experienced by the communities, the categorisation of poor households, their disease burdens and wealth in the selected communities. A total of 16 IDIs were conducted with lineage heads in four different villages in each CHFP cell.

The key informant interviews were held with health care providers in the public and private health sectors in charge of the facilities visited. Key informant interviews (KII) are usually conducted with people who are experts in the field of enquiry. The key informant interviews were semi-structured interviews. Specifically, interviews were conducted with the medical doctor in charge of the district hospital, medical assistants, community health nurses, village health volunteers, chemists and traditional healers who treated malaria related cases. Interviews covered the diseases they treat and other services they provide, the population covered by their services, the prices for malaria related drugs, the cost of in-patient care for malaria at the hospital, the number and cadre of staff, exemptions from fee payment and health education messages.

Interviewees included one medical doctor, three medical assistants, four community health nurses, four village health volunteers, eight chemical drug shops and eight traditional healers. Selection of the doctor and three medical assistants was purposely done, as they are in-charges of their respective facilities. The other providers were however randomly selected by using a simple random number table. For instance, 4-

community health officers out of 14 were randomly selected: two each from CHFP cells 2 and 3 respectively. This group of providers offered similar services so four was a reasonable number to capture the issues that were discussed. Most of the chemists were located in the urban part of the district and about an average of one kilometre away from the district hospital. Other chemists aside from those operating in the centre of town were spread out in the outskirts of the district. These chemists sell drugs most often without a prescription and based on how much the client can pay for.

Three interviews were also conducted with district and regional health administrators and a retired national director of health services who was a key figure in developing the decentralized and primary health care policy for Ghana. They were interviewed in respect of the operation of primary health care policy, issues of equity in the delivering of health care and implementation of these at the district, regional and national levels. The resulting data from the KII provided information on variables to measure cost of treatment and quality of health care factors with regard to the availability dimension of access.

An unstructured and open-ended question guide was developed to aid the discussions during the FGDs and IDIs, while a semi-structured interview guide was used in the sessions with health providers (see Appendix II).

The interviews were conducted by a moderator and assisted by a note taker and an observer. The moderator is the lead person who facilitates the discussions. Moderators

were recruited from a list of university graduates on holidays who speak the native language fluently and who have previously worked with the Navrongo Health Research Centre conducting qualitative interviews. A training manual was developed on qualitative methods of data collection. This manual included the different qualitative methods (FGDs, IDIs and KII), the purpose of using these methods and the processes involved in conducting these interviews. It also included a step by step approach to establishing a rapport with participants, selecting neutral grounds for the discussion, assuming a neutral position throughout the discussion, conducting the discussions and providing feedback to participants to agree or disagree on the important issues raised in the discussion. This step by step approach is often necessary in qualitative data collection to make participants feel comfortable and uninhibited about sharing their views. Participants were also visited two days before each discussion session to seek permission from the compound head or household head and to seek permission from the participant as well.

4.3 Validity and Reliability of Data

The quality of the quantitative interviews was controlled by daily supervision of interviewers by the researcher and supervisors. At the end of each day, completed interviews were checked and verified for consistency before submitting them for data entry. Questionnaires that were incomplete and contained some inconsistencies were returned to fieldworkers for verification. As part of the quality control, supervisors repeated 5% of the completed interviews. Two data entry clerks inputted the data, and lastly a verification check was run to reconcile differences where they arose.

To ensure the reliability of the qualitative interviews, the note taker captured important issues discussed as well as non-verbal actions from participants, which were often important in interpreting their responses. The observer alerted the moderator to follow up on issues that needed clarification. A tape recorder was used to capture the whole discussion to ensure an accurate record of information. At the end of each discussion, the moderator recapitulated some of the key issues raised during the discussion, creating a space for participants to agree or disagree about the issues. The tapes were transcribed from the local language to English verbatim, and these transcripts were compared with the notes taken. As much as possible, local terms describing diseases and concepts were written out in the local language, with an explanation in English added thereto. These processes were undertaken to ensure that the interviews reflected the views of participants and that the data was consistent for all groups participating in the study.

Qualitative interviews offer researchers an opportunity to collect rich, in-depth data based on the opinions and own words of the respondent. Researchers can therefore determine deeper levels of meaning from the issues and points raised and draw important conclusions. The flexibility of the question guides also allows probing for clarification on unclear issues. In focus group discussions, for instance, one can discuss a variety of topics as had been done in this study with different groups of individuals with varying experience; this is often not possible with interviews done using structured questionnaires. Despite their advantages though, qualitative interviews have been criticised for not being representative, and that the findings thus cannot be generalised. In other words, views gathered from a few groups of individuals cannot be taken to

represent the views of a larger population. However, as already observed, the principal objective of qualitative studies is to understand how individuals perceive, organise, give meaning to and express their understanding of themselves, their experiences and their own worlds within a particular context which quantitative techniques cannot offer (Macun and Posel, 1998; Mishler, 1986). Thus, while the validity of qualitative data cannot be subjected to quantitative verification, they do offer insights into issues such as what people perceive as poverty, and allow more appropriate interpretations of issues that are pursued by using quantitative techniques. They can also be used in their own right to report on issues that are necessary in understanding topics on which very little is known. The use of qualitative methods in this thesis allowed the questionnaire used for the cross-sectional survey to be refined, as well as offering an understanding on poverty issues and interpretation of the quantitative results.

4.4 Data Analysis

4.4.1 Cross-Sectional Data Analysis

The structured questionnaires were computerised using the visual Foxpro software for data entry. Data was double entered to eliminate errors that would have arisen because of data entry mistakes. Data was thereafter cleaned to eliminate any outliers and recategorised to enable the use of statistical techniques used for analysis.

The quantitative survey data was analysed using STATA 8. Frequencies and means were calculated in relation to socio-economic factors, demographic background and health

variables. Bivariate and multivariate analysis was done to establish the correlation and statistical significance of the variables.

Yearly consumption totals as low as 50,000 Ghanaian Cedis (US$5.81)[2] and as high as 100,000,000 Ghanaian Cedis (US$11,627.91) were excluded from the calculation, as possible outliers and extremes. Rental equivalents for some household durables (specifically television sets, refrigerator, cars, motorbikes, etc. that had been purchased in the last six months before the survey) could not be obtained as these items are privately owned and are not available for commercial renting. These items have therefore been excluded from aggregation of consumption.

Access factors and asset items used in the factor analysis were reproduced as dichotomies (0, 1) for categorical access factors such as type of toilet facility, ownership of a bicycle, methods of treating and managing malaria and all the variables were included in the regression. As much as possible the analysis included access factors that could be measured objectively. For instance, distance to health facility was geo-coded and referenced to produce distance measures to health facilities and households covered in the survey. Inpatient and outpatient services were obtained from the facilities and matched with households' reports of the services provided by these facilities.

The distance to health facility used in the analysis was calculated based on public health providers exclusively. Access to these providers was dichotomized based on 5km distance to either a health center or community health compound (1) and 5km to a

[2] ¢8600.00 = US$1.00 (2003)

hospital. The underlying rationale was to look at those who live 5km to either a health center or hospital and to also measure if people were using more hospital services even though they may live close to a health center or community health compound.

Similarly, the sources of information were categorized into three dichotomous variables: professional health providers, such as nurses or doctors made up one category, information from chemists and the media was another category, and information from relatives or traditional healers comprised the third category. Management of malaria at the severe, mild and moderate stages included the type of treatment used for each level of severity; these were categorized as using chloroquine and paracetamol, using herbs, and using a qualified health provider. Using of professional health providers as the first source of information for managing malaria was the standard measure of whether households had access to professional information in treating malaria. Variables, such as sex, religion, distance, outpatient and inpatient services, private use of car and bicycles were coded as dummies.

The continuous variables such as consumption, age, cost of health care, household size, etc. were transformed into logarithms to reduce any possible biases.

Knowledge of signs and symptoms of malaria was excluded from the factor analysis because all signs and symptoms reported by respondents were related to malaria and a comparison group could not be created for the analysis.

All variables were then assigned weights or factor scores and each household was assigned a standardized score for each variable. The score for each household differed, depending on, for example, whether a household's source of information was a professional health care provider or not, whether the distance was less than five kilometres or not and so on. These scores were then used to create indices and households grouped in quintiles with equal numbers in each group, which were then used to explain low and high access to health care for each dimension. The scores or weights used to construct the disadvantage index resulting from the PCA for each dimension are used to highlight areas with low or high scores in terms of affordability, acceptability, availability and information.

There are debates about the appropriateness of using public services in the creation of household asset index as was discussed in Chapter 2, but in examining the private wealth of a household, public assets may not reflect the wealth of a household even though they may be indicators of health. In order to compare the appropriateness of using a combination of private and public assets rather than only private assets to determine the wealth of households, the wealth index was first of all compiled by using all the asset items and housing characteristics including the public asset, borehole water. The subsequent compiled indices excluded the public assets and results are presented in Chapter 5.

4.4.2 Qualitative Data Analysis

The qualitative data was analysed by looking at emerging themes and sub-themes from the data, and developing codes around these themes. Codes are conceptual labels and may refer to a theme, such as symptoms of malaria or to a sub-theme, such as the symptoms experienced by adults and the symptoms experienced by children (Fielding and Lee, 1998). Segments of texts in the respondent's own words and expressions relating to each theme or code were extracted and labelled. Subsequent texts that were coded under the same themes were constantly compared to previous segments of text coded under the same codes and contrasted with other codes. Similarities and differences in each theme and sub-themes (codes) were looked for, as these trends informed the pattern of health seeking behaviour and access to health care. Relationships between themes and sub-themes were established and used for writing the report.

The data were transcribed from the audiotapes; thereafter the transcripts were typed and edited. QSR Nvivo software was used to categorise the data into themes and to discern patterns emerging from the themes. This software allows one to code unstructured data in respondents' own words, using both free and tree nodes. Free nodes refer to broad themes and sub-themes that one can generate from the data. Tree nodes then refer to a broad theme under which the sub themes generated by using free nodes relate to and this allows one classify the data into the same and different themes (Fielding and Lee, 1998). The analysis centred on specific themes, such as causes of malaria, symptoms of malaria, treatment of malaria and poverty. These broad themes were further analysed for biomedical and social causes of malaria, modern and traditional treatment of malaria,

symptoms for mild, moderate and severe malaria, sources of information for treatment, social and economic poverty. There was further analysis by age and sex of respondents, as well as by age for treatment of malaria as these might differ and possibly have an effect on the interpretation of the data.

Findings and quotable texts from the qualitative research were combined with the quantitative results to produce a comprehensive report for the study.

4.5 Limitations

Households were asked to provide information on basic items they purchase monthly and to indicate the quantities and prices at which the items were bought. Asking questions of items bought often produces biases in reporting due to problems of recall. In order to overcome this problem, respondents were asked to provide information on a market day basis. Market days are mostly held three days in the major towns of the district, and people make purchases of basic items such as vegetables, ingredients and cereals such as rice, and maize on market days. However, a random sample of some of the completed questionnaires for re-interviewing did indicate that some respondents gave different amounts for items they had purchased after a one-week interval. Using expenditure data also sometimes yielded some biases, as respondents are unable to value their goods realistically and responses are likely to contain some amount of error. This may happen with home produced food in particular, and thus in this study, respondents were asked to provide quantities of home produced food, and local market prices were used to value the

Chapter 5: Evaluation of Socio-economic Indicators of Welfare and Markers for Identifying the Poor

5.1 Introduction

The results of this study are presented in three chapters. The results are based on information collected in the cross-sectional survey, in-depth interviews, the focus group discussions, the key informant interviews and the GIS. This first chapter describes the demographic and socio-economic characteristics of the study population. It also provides a detailed description of the social and cultural structure and how these influence their perception of health and welfare. It presents the results of the wealth index and consumption and compares and contrasts these concepts as measures of socio-economic status. The chapter further discusses people's perception of poverty and the potential markers for identifying poor people for exemptions for health care services. It also examines the poverty distribution in geographic areas using a poverty map.

5.2. Socio-demographic Characteristics of Households

A total of 1880 household heads were interviewed; these included 78% males and 22% females between the ages of 17 and 70 years.

About 17% of the respondents were widows, and in households where younger males were heads of households, their mothers were widows (see Appendix IV). This is so because traditionally, on the death of the father, male children assume the responsibilities of the head of the household at a younger age.

On average, 13.8% (260) household head interviews were each completed in the village health volunteers, the community health nurses and the usual Ministry of Health service cells respectively. In the cell comprising community health nurses and village health volunteers only, which has larger population coverage, 35.6% (670) household heads interviews were completed.

Literacy rates are generally low in the district. Of the total number of households interviewed, only 33.8% of household heads had ever been to formal school. Most household heads with formal education had primary or middle school education (73.7%) in contrast to only 26.3% who had secondary education or higher. Similarly, 49.4% of other household members had primary or middle school education compared to only 7.4% with higher levels of education.

The composition of the household reflected a very young age structure, with 50% of household members aged 0-15 (see Appendix IV). Household sizes ranged between 1 and 18 members with an average of five members per household. Male household heads had larger families compared to female household heads. Following national trends, there are more female household members (56.5%) than males (43.5%). Traditional religion (63%) was more predominant compared to Christianity (32.2%) and Islam (4.8%). Traditional religion is apparently more common among the rural populace (69%) than among the small urban populace (20%).

Subsistence farming is the mainstay of the Kassena-Nankana society, and thus over 80% of the households reported farming as a main occupation, compared to only 6% of formal government employees and 11% of petty traders. With very few commercial activities in the district, avenues for earning incomes apart from farming activities is so limited. Hence the indicators of economic status presented in the following sections were generally poor for households in the district.

5.3 Comparison of Wealth Index and Consumption as Indicators of Economic Status

Consumption and wealth were used as indicators of economic status. Results of the correlation coefficient of the score index of assets and aggregate consumption indicated an association of 0.37. Although the association between the two welfare indicators is positive, it is not strong. Similar observations have been made in other studies. Sahn and Stifel (2001) report a correlation coefficient ranging between 31-71 percent for ten developing countries. Despite the poor association, the proxy-based coefficient (wealth) compares well with the consumption coefficient in the distribution of health care and wealth (Tables 2a and 2b). There is generally consistency in the description of the poor as having poor access to health services or living further away from health facilities than the rich with both consumption and wealth methods. Relatively equal percentages of socio-economic groups make use of bed nets, health center services, drug stores and attendance at formal school for both SES methods.

Table 2a: Comparison of Consumption and Wealth (Asset) Index for Health Services by Quintile

HEALTH SERVICES	CONSUMPTION (%)					WEALTH INDEX (%)					
	Q1	Q2	Q3	Q4	Q5	Q1	Q2	Q3	Q4	Q5	N
Bed net use*	11.1	16.8	20.4	23.7	28.0	11.3	16.1	19.0	27.9	25.8	839
Facility used for* Health care											
Health centre	16.5	24.3	14.6	25.7	18.9	16.3	21.7	28.6	23.2	10.3	203
Hospital	10.5	17.7	19.6	22.3	30.0	6.9	10.6	18.0	24.0	40.6	217
CHO	6.1	7.6	31.8	28.8	25.8	21.5	23.1	23.1	21.5	10.8	65
Village volunteer	3.7	0.0	29.6	37.0	29.6	11.1	14.8	33.3	25.9	14.8	27
Traditional Healer	18.5	15.4	20.0	27.7	18.5	23.1	24.6	32.3	18.5	1.5	65
Drug store	22.3	16.9	20.5	17.9	22.3	20.6	18.2	20.3	17.7	23.4	374
Severe Malaria Treatment*											
Paracetamol/Chloroquine	19.1	16.7	23.8	16.7	23.8	13.7	10.0	11.3	18.6	46.0	124
Paracetamol & chloroquine	20.1	22.7	20.8	20.1	19.1	16.6	19.3	18.7	23.2	22.2	555
Herbs	21.6	19.0	20.2	20.1	19.1	23.3	21.9	22.3	19.4	13.2	988
ORS-pain killers	13.3	17.7	15.5	24.9	28.7	19.7	17.4	18.0	15.7	29.2	178
Live within 5km of public health Facility*	9.8	14.4	20.4	23.3	32.2	6.2	7.6	10.9	19.7	55.7	1880

*P<0.000

Table 2b. Comparison of Consumption and Wealth (Asset) Index for Socio-economic Factors

SOCIO-ECONOMIC FACTORS	CONSUMPTION (%)					WEALTH INDEX (%)					
	Q1	Q2	Q3	Q4	Q5	Q1	Q2	Q3	Q4	Q5	N
Ever Attended school*											
Yes	10.1	16.5	20.1	25.0	28.3	9.7	11.6	18.8	29.0	37.0	662
Owns a bicycle*	11.0	17.4	21.2	23.5	26.9	3.0	17.1	25.0	28.4	26.6	1111
Owns bed*	9.1	16.7	21.5	24.2	28.5	0.7	8.8	22.5	32.5	35.5	978
Radio*	11.6	16.8	21.9	22.1	27.6	3.8	16.5	22.8	28.1	28.8	1129
Television set*	3.4	4.6	16.6	21.1	54.3	0.0	0.0	0.0	3.0	97.0	175
Sewing machine*	6.3	14.0	19.9	22.3	37.5	1.2	3.4	9.5	29.1	56.8	366
Coal pot*	11.3	16.9	21.9	22.9	27.1	3.9	12.9	21.9	28.6	32.6	1067
Electric/gas cooker*	4.6	7.6	10.6	18.2	59.1	0.0	0.0	1.6	0.0	98.4	66
Owns vehicle*	5.8	9.3	11.6	7.0	66.3	0.0	0.0	2.4	10.8	86.8	86
Toilet Facility*											
No toilet facility	20.9	20.7	20.3	19.8	18.3	21.5	21.5	21.3	21.0	15.0	1759
Pit-latrine/KVIP	9.8	7.8	19.6	21.6	27.8	0.0	0.0	0.0	8.3	91.7	102
Flush	0.0	5.6	5.6	27.8	61.1	0.0	0.0	0.0	0.0	100.0	18
Wall Material*											
Bricks	18.7	22.1	20.5	19.9	18.8	12.5	18.3	23.3	27.4	18.5	905
Mud	24.0	19.9	19.9	20.0	16.2	32.8	25.4	20.1	15.3	6.4	798
Cement	9.1	9.7	18.2	20.1	42.9	0.0	0.0	0.0	2.7	97.3	151
Roofing Material*											
Zinc	15.1	14.8	18.3	22.0	29.8	0.0	6.4	12.2	29.7	51.7	629
Thatch	26.7	21.5	18.0	19.8	14.0	39.1	26.9	20.5	12.3	1.2	171
Mud	22.1	22.7	21.5	18.8	14.9	29.2	26.8	24.6	15.8	3.6	1054
Source of Drinking water*											
Well water	21.4	19.3	22.7	19.6	17.0	27.1	19.6	20.4	15.9	17.0	383
Bore-hole	21.2	20.8	18.5	19.9	18.6	20.2	22.1	21.5	23.0	13.2	1289
Pipe	8.8	11.3	18.8	21.9	39.3	0.0	1.3	2.7	9.3	86.7	150
Stream	18.8	34.4	18.7	15.6	12.5	34.4	21.9	37.5	6.2	0.0	132

*P<0.0000

The patterns that emerged from using consumption and the wealth index show that wealth is primarily distributed between the two extremes, poorest and richest, while the patterns in the middle groups are less distinct. One could further observe that there are relatively less disparities in access to health services and possession of assets between the poor and the rich, when the consumption method is used than when using the wealth index. In using consumption, slightly more poor households tend to have access to bednets, primary health care, to have formal education and to possess assets like television sets, gas cookers and vehicles; in contrast, slightly fewer households of the richest quintile have access to these same factors and asset items. The converse is true when the wealth index is used instead. The wealth index also discriminates better in respect of the distribution of the wealth and health service variables than consumption.

The distinction between households that live within 5 km to a public health facility, own assets such as television sets, flush toilets, piped water, sewing machines, zinc roofing and cement wall material is clearer when the wealth index is used than consumption. Similar findings, where the wealth index was better at discriminating among variables, were also reported in studies in Nepal, India, Pakistan and others where the wealth index and consumption were used (Montgomery et al., 2000; Sahn and Stifel, 2001; Filmer and Pritchett, 2001). It is clear from the results that the wealth index and consumption work similarly in distinguishing between socio-economic groups, but it is important to examine how well the assets and housing characteristics used to compile the index actually explain wealth in the Kassena-Nankana district.

5.4 Is the Wealth Index consistent with Community's Perception of Wealth?

Ownership of the following assets was weighted positively as an indicator of wealth in the Kassena-Nakana district in the survey (see Appendix V): radio, bed, television set, sewing machine, wooden or iron bed, battery lamp, bicycle, vehicle, zinc roofing, concrete and brick wall, aluminium pans, KVIP-pit-latrine and flush toilet, gas or electric cooker, coal pot, standing pipe, well water and renting a house. However, higher weights were assigned to renting a house (0.57), having a KVIP-pit latrine toilet (0.50), a concrete wall (0.43), pipe water (44), a television set (0.33), flush toilet (0.27), electric or gas cooker (0.25) and zinc roofing (0.27) than the other assets that also received positive weights.

Possession of animals and living in one's own house, use of a kerosene lamp, having a borehole as a source of drinking water, lacking a toilet facility and using mud material for the wall of the house were all weighted poorly and not associated with wealth. These assets thus received very low and negative weights as indicators of wealth in the district. Many houses in the district are built with mud, and the low weights assigned to this variable may explain why having a mud building and living in one's own house is not associated with wealth. Similarly, the use of borehole as the main source of drinking water was not associated with wealth because these were publicly provided and did not constitute household private wealth (see Appendix V). The survey also only asked households if they owned animals without capturing the quantities or types of animals. This might explain why owning animals had a low and negative weight as indicator of

wealth. The qualitative discussions did however indicate that the type of animal was important in establishing wealth. For instance, participants explained as follows

Respondent: *If you have fowls and guinea fowls and you don't have a goat or sheep or a cow, it means the one who has these things is better than you. On the other hand, if you have a goat and you don't have a cow, the one who has a cow is better* (IDI: Elder interview, Kurugu-Kandiga Village)

Respondent 4*: If you want to look at household possession you will see that the one with cattle is the most rich followed by the one with sheep. The one with goats is same as the one with sheep* (FGD: Women 18-25 years, Kayoro-Kadania Village).

Respondent 2: *If someone has cattle and another has sheep, the one with the cattle is richer than the one with sheep, who is in turn richer than the one with the goats that is how is goes* (FGD: Women 46+ years, Nogsenia Village)

Assets such as the use of aluminium cooking ware and battery lamps were weighted low with regard to their ability to predict wealth in the district. This is not surprising as the participants in the FGDs and IDI also gave both items a low rank. These items were perceived as either used solely by the poor or by both the poor and the rich, and hence did not constitute a sign of wealth. However, asking about the type of aluminium cooking ware was associated with wealth as some types are more expensive to acquire. Generally, the survey only asked for aluminium cooking ware irrespective of the value.

As expected, the distribution of assets and housing characteristics indicating wealth in the district is skewed in favour of the rich (Table 3). Assets and possessions such as cars, television sets, electric and gas cookers, flush toilets, KVIP-pit latrines, and concrete block buildings were highly skewed to the advantage of the rich. However, they are only owned on average by 4.8% of the sample population.

Table 3: Percent of Households that Own Assets (%)

Assets	Poorest quintile (%)	2nd quintile (%)	Middle quintile (%)	4th Quintile (%)	Richest quintile (%)	Yes (All) %	N
*Bicycle	8.8	51.5	74.9	84.2	80.8	60.0	1132
*Vehicle/car	0.0	0.0	0.54	2.4	19.7	4.6	86
*Wooden/iron bed	1.9	22.8	58	83.2	92.9	52.0	978
*Radio	11.2	49.6	68.2	83.4	87.4	60.0	1129
*Television set	0.0	0.0	0.0	1.3	44.7	9.3	175
*Sewing machine	1.1	3.0	9.5	25.4	50.7	18.0	338
*Electrical/battery lamps	23.7	32.5	44.5	42.8	56.2	40.0	753
*Kerosene lamps	88.3	93.2	96.2	98.1	88.8	93.0	1747
*Charcoal pot	11.2	37.4	63.1	81.6	95.3	58.0	1089
*Gas/electric cooker	0.0	0.0	0.3	0.0	17.3	3.5	66
Animals	72.8	78.1	85.2	86.9	57.0	75.9	1410
Cooking utensils:							
Earthen ware	58.2	14.9	11.2	8.2	7.5	7.3	137
Aluminium ware	16.1	20.0	20.4	22.2	21.3	87.6	1648
Plastic ware	32.3	28.1	26.1	5.2	8.3	5.1	96
Accommodation							
Lives in own house	100.0	99.7	100.0	99.7	75.8	94.8%	1783
Renting	0.0	0.0	0.0	0.3	22.2	4.6%	86
Occupying rent free	0.0	0.3	0.0	0.0	0.0	0.6	11

Table 3: Percent of Households that Own Assets continued

Housing Characteristics	Poorest quintile (%)	2nd quintile (%)	Middle quintile (%)	4th Quintile (%)	Richest quintile (%)	All %	N
***Main wall material:**							
Brick	30.2	45.0	56.9	66.3	45.8	48.8	909
Mud	69.8	55.0	43.1	32.6	14.0	42.9	798
Cement block	0.0	0.0	0.0	1.1	40.2	8.3	154
***Roofing material:**							
Zinc	0.0	10.8	20.8	50.0	89.0	34.6	650
Thatch	17.9	12.5	9.4	5.6	1.2	9.2	172
Mud	82.1	76.7	69.8	44.4	3.6	56.2	1056
***Toilet facility:**							
No toilet	100.0	100.0	100.0	97.9	71.5	93.6	1759
KVIP-Pit latrine	0.0	0.0	0.0	2.1	24.4	5.4	102
Flush toilet	0.0	0.0	0.0	0.0	4.1	1.0	18
****Source of drinking: water**							
Well water	27.7	20.3	21	16.3	17.8	20.4	384
Borehole	69.3	77.2	74.7	79.4	46.6	69.4	1305
Standing pipe	0.0	0.6	1.1	3.8	35.6	8.5	160
Stream	2.9	1.9	3.2	0.5	0.0	1.7	32

*Significant at P<0.000 for both Wealth index and consumption
** Significant at P<0.000 for wealth index but not significant for consumption

Generally, the rankings of wealth based on assets from the qualitative interviews were consistent with the weights produced using factor analysis. The ownership of a concrete block or brick building with zinc roofing, a television set, electric and gas cookers, wooden bed and vehicles were described as signs of wealth. Participants also weighted the benefits of having a television set and electrical cookers in rural areas where there are

no lights differently, although factor analysis usually does not take these differences into consideration. Thus the use of coal pots, radio and tapes, which do not require electricity, were more useful in rural areas and thus weighted more heavily in the qualitative interviews.

The first principal component used to compile this wealth index explained only 21% of the total wealth in the district, which suggests that there may in fact be other factors that indicate wealth in the district, other than those considered in this study. This is because the wealth index usually does not capture other indicators of socio-economic status such as education, occupation, gender and other factors that may indicate disparities in wealth (Gwatkin et al., 2000). Nevertheless, the low overall explanation of wealth using the broad range of durable assets and housing characteristics is related to the number of variables included in the wealth index as discussed previously. When considering only durable assets such as, television sets, cars, gas cookers and housing characteristics such as a concrete wall, a zinc roof, flush and pit-latrine toilets, and pipe water, the asset index explained 33% of wealth compared to 21% when all the items were included. The sensitivity of the wealth index to the number of items included has definite implications for measuring inequities, as the choice of fewer variables will improve the overall explanation of wealth although it tends to exclude many poor people who may not have these durable goods due to their socio-economic position (Houweling, Kunst and Mackenbach, 2003). Thus the use of the large number of assets in compiling the wealth index for the district has the advantage of capturing the socio-economic position of households in a way that is useful for the comparisons made here, as well as because of the fact that very few households in the district have durable assets of this nature.

Interpreting these assets as signs of wealth may also need a certain amount of caution in some instances. Many other underlying factors may account for wealth, not merely the physical existence or ownership of these items. Participants did for example; make an interesting observation about the ownership of concrete block and brick houses with zinc roofs that were owned by retired people. Some of these retirees were in fact classified as poor because their entire earnings had been used to build the house and they had nothing left to live on. In such situations, ownership of a concrete or brick building with a zinc roof did not signify wealth. The type and number of animals were thus preferred indicators of wealth within the household in these rural communities.

Moreover, as will be discussed below, the observed disparities in wealth distribution among households in the district resemble disparities in respect of the consumption patterns of households.

5.5 Consumption Patterns and Rising Cost of Health Care

The consumption aggregate suggests very high consumption levels for basic necessities in the district and, as with the asset rankings, there are significant differences in consumption across the economic groups. The total consumption among the poorest households is just about ¢1,923,700.00 (US$223.69 in 2003 prices) per annum, as compared to about ¢9,788,400.00 (US$1,138.19 in 2003 prices) of the richest households (Table 4). Food comprises the bulk of household consumption with wealthier economic groups spending more on food than the poor. These differences can be also attributed to

household sizes. The wealthy have bigger families (more than 5 members per family) than the poor. However, whereas the poor spend as much as 13% of aggregate consumption on health care, the wealthiest spend much less on health care (5.1%).

Expenditure on social events and non-food items follow the same pattern, with both the poorest and the wealthiest paying similar amounts albeit at relatively varying consumption levels. Wealthiest however spend more on the education of their children than do the poor further highlighting the plight of the poor in having access to good education. Households generally spend more than their incomes for basic consumption needs in the district (Table 4).

Table 4: Annual Consumption and Basic Expenditures by Quintile

Socio-economic group	Annual Consumption aggregate (Cedis)	% Spend on Food	% Spend on Health	% Spend on education	% Spend on social events**	% Non-food items*
Poorest Quintile	¢1,923,700.00 (US$223.69)*	65.0	13.0	2.7	6.6	14.4
2nd Quintile	¢3,225,200.00 (US$375.02)	96.0	12.0	2.4	5.5	16.4
Middle	¢4,606,000.00 (US$535.58)	95.0	6.5	2.0	5.2	17.2
4th Quintile	¢6,231,000.00 (US$724.54)	70.0	5.8	2.8	4.7	15.8
Wealthiest Quintile	¢9,788,400.00 (US$1,138.19)	68.0	5.1	4.8	7.0	15.2
Total	4602000.00 (US$535.12)					

* ¢8600.00 to US$1.00 (2003) **Social events include funerals and marriages; non-food is basically toiletries, kerosene, water and electricity bills.

These spending patterns imply that households have negative savings and may continue to live in perpetual poverty, as highlighted in Table 5.

Table 5: Consumption Levels below Poverty Line

Socio-economic group	Annual consumption per household	Consumption per day per household	Annual Consumption per person	Consumption per day per person
Poorest Quintile	¢1,923,700.00 (US$223.69)	US$0.61	488,966.7 (US$56.86)	US$0.16
2nd Quintile	¢3,225, 200.00 (US$375.02)	US$1.02	725750.00 (US$84.39)	US$0.23
Middle Quintile	¢4,606,000.00 (US$535.58)	US$1.48	907,680.00 (US$105.54)	US$0.29
4th Quintile	¢6,231,000.00 (US$724.54)	US$1.99	1,139,000.00 (US$132.44)	US$0.36
Wealthiest Quintile	¢9,788,400.00 (US$1,138.19)	US$3.12	1,595,625.00 (US$185.34)	US$0.51
Total annual consumption	¢4602000.00 (US$535.12)*	US$1.47	1,212,795.00 (US$141,02)	US$0.39
N=1879				

*¢8600.00 to US$1.00 (2003)

The absolute poverty line, as defined by the World Bank, includes those who live on less than US$1.00 per day per person for basic physiological needs (Falkingham and Namazie, 2002). The data shows that about 40% of the households in the district do indeed live on less than US$1 per day. When this is adjusted for the size of the household, 59.6% of the population lives on US$0.39 per day, which is an extremely high percentage. There were significant differences across income groups, with the poorest spending just US$0.16 of consumption per day, compared to as much as US$0.51 for the wealthiest households. Overall, however, the entire district appeared to live below the poverty line. The latest round of the GLSS (Ghana Living Standards Survey) showed

similar findings, with more than 50% of the population in the district apparently living below the poverty line (GSS, 2003).

In general, the use of the wealth index and consumption demonstrates that the classification of socio-economic groups using both methods is consistent; thus, the methods are used concurrently in this report to, firstly demonstrate their comparability and, secondly, to allow consistency in the flow of the discussion. The wealth index is maintained for most of the results presented afterwards. In the remaining chapters, therefore, the wealth index is used to examine differences among households in the management of malaria, and socio-economic inequities in access factors and dimensions. Consumption is however used to examine differences in self-reported morbidity and to develop a poverty map for small geographic areas in the district so as to enable a comparison with poverty maps developed at an earlier time by the GLSS for districts in Ghana. Consumption is also used to examine differences in out of pocket payments for health care, as it relates more of spending than use of wealth in this case.

The significant levels of poverty in the district nonetheless necessitates an understanding of what communities actually see as poverty and what possible identifiers could be used in ear-marking health services for those most in need of health care.

5.6 The Community's Perception of Poverty

In the qualitative interviews, participants described poverty in terms of meeting the basic necessities of life, such as food, health, education and clothing, with an added dimension of poverty being associated with social exclusion. Some of the discussions below provide greater insight into perceptions of poverty among members of the community. Food, notably, was the first priority of participants, and ensuring a good harvest in this farming community was regarded as critical.

Respondent 4:. *Poverty is not having good yield in both dry season and raining season, just as we have done and unable to send yourself or children to the hospital* (FGD:Women 36-45 years old, Badunu Village).

Respondent: *Poverty is lack of food for feeding, inability to support/show concern towards your in-law in times of crisis simply because you have no fowl, no guinea fowl and you cannot also sell your millet you produced to get money to support you. Lack of money is poverty* (IDI: Elder interview, Amuntanga Village).

Respondent 6: *The inability to get your needs show that you are poor. If you don't have the means to get money to buy your daily bread and other necessities these are all manifestations of poverty* (FGD: Women 18-25 years old, Kayoro-Kadania Village).

Respondent 2: *Poverty is our inability to get food to feed ourselves and clothes to wear* (FGD: Women 18-25 years old, Kayoro-Kadania Village).

After food as the first priority, good health and access to health care were regarded as the second most important attribute of poverty among participants. Ill health resulted in people's inability to farm adequately and, in addition, not being able to seek health care when ill because of inadequate economic resources.

Respondent 5: *Sickness also makes people poor. When you fall sick for instance the presence of malaria does not enable one to work effectively and thus can cause poverty* (FGD: Men 36-45 years; Nogsenia Village).

Respondent 11: *Some people also die due to poverty. Because if his/her relative has not got money, taking a sick person to the hospital and unable to pay for treatment would be an embarrassment and therefore they will allow the relative to die* (FGD: Women 18-26 years; Nogsenia Village).

Respondent 3: *Poverty can be expressed in a different way. You may see me here thinking that I'm a strong person when in reality I have some sickness in me, which makes it impossible for me to work and feed myself. That is an expression of poverty* (FGD: Men 36-45 years; Punyoro Village).

Respondent 7: *The poverty is making it difficult for most of us to seek treatment at the hospital. As I am sitting here and I don't have anything, what can I do to treat myself, one who doesn't have a good sleeping place, one who doesn't have a fowl or an animal, that is poverty* (FGD: Men 46 years plus; Natugnia Village).

The links between ill health and poverty were quite pronounced, and these findings have been reported in several other studies. Poverty makes people ill, just as ill health makes people less productive economically, which in turn has a substantial impact on household incomes. Thus poor households and poor individuals are caught in a vicious cycle of ill health and poverty (Wagstaff, 2002).

Interestingly, poverty was not only viewed in absolute terms but in relation to others living within a similar community or environment. The generalization of poverty reduction strategies may be unlikely to be effective, as what is perceived as poverty in one community may not necessarily apply to other communities or individuals.

Although food and health were prominent in the discussions, one dimension of poverty that was frequently encountered and voiced by participants was associated with the inability to participate in normal social obligations.

5.7 Poverty and Social Exclusion: Are the Voices of the Poor Heard?

The social support system is a network, and one can be excluded from existing social support networks because of poverty. Poverty is thus not only an inability to meet one's basic needs but also one's inability to become involved in issues that ultimately affects one's social existence.

Respondent 6: *The poor men are not usually invited to public places because, they know that all they bring is always problems, he comes to complain of hunger* (FGD: Men 36-45 years; Nogsenia Village).

Respondent*: ....if a poor person sits with us under this hut won't you recognize him? if you are chatting he will not contribute because of the poverty. The poverty (neni) prevents him from chatting. Yes. That is how we are able to know a poor person* (IDI: Elder Interview; Kayoro Village).

Respondent 8: *The reason why we know that a particular family is poor is that, if there is a problem and the family is just sitting, they can't solve the problem because they don't have the means, there is a contribution in the community or some other support and the family is isolated because they can't contribute, that is where you will know that the family is poor. Even food they have to struggle to get the food to eat* (FGD: Men 46 years plus; Natugnia Village).

Respondent 9: *There is also another type of poverty that prevents you from associating yourself with colleagues. Because you will not have food to eat and something to put in your pocket therefore it limits your rate of associating with friends* (FGD: Women 18-25 years; Nogsenia Village).

Respondent 2: *If you don't live with anybody, you don't have a child and when day breaks you feel lonely, that is poverty* (FGD: Women 18-25 years; Vunania Village)

Respondent: *Poverty is when one has no child or you give birth to children and they die before you, so you suffer. That is poverty (IDI: Elder Interview; Kayoro Village).*

These findings highlight a critical issue viz. that the voices of the poor are not being heard, as they do not form part of the decision-making process nor do they participate in discussions of issues that have to do with livelihood or health. The impact of ill health, death and childlessness, as echoed by some of the participants also take their toll on the poor, thus completely isolating them from the rest of society. The process of identifying the poor and their needs may therefore be impeded, because they do not form part of the decision-making processes of the community and might ultimately be forgotten. The crucial question then is: how do we include the poor in decision making and ensure that policies aimed at alleviating poverty and ill health actually reach the poor?

5.8. Identifying the Poor

Several considerations and issues were raised in the bid to identify the poor households or individuals in the communities. The poor were described by three criteria: The first criterion is whether they have food to eat. Secondly, certain demographic characteristics were clear markers of poor households or individuals: the aged, those who are ill, the death of one or both parents or of the main breadwinner of the household, childlessness or the existence of orphans. Thirdly, poor households tend to have no animals in their homes, and participants were of the view that, a household without any animal was

definitely a poor household. The varied issues in the following discussions emphasize the criteria for identifying the poor.

Respondent 2: *Poor households are those that are old and sick. People who cannot work to earn a meal a day, when they are sick they cannot bear their own cost of treatment. But those that are strong enough but refuse to work cannot be called poor. They are only lazy* (FGD: Women 18-25 years; Kayoro-Kadania Village).

Respondent: *When you have information that this is a poor household, it would have come from the wife or the household head because if she tells you that they did not cook the previous night then it means they are poor. Otherwise how will you know by just merely entering into the household*? (IDI: Elder interview; Amuntanga Village).

Respondent 3: *When you wake up and a particular family do not pound anything in the mortar or set fire you surely know that they are not going to eat and this shows poverty* (FGD: Women 36-45 years; Nagao-Baloo Kajelo Village).

Respondent 4: *As at now, I have no husband and I live with my children. When I wake up and I don't get food for my children or when they fall sick I'll have to manage and get them treated without going to the hospital, this shows poverty and suffering in me* (FGD: Women 36-45 years; Nagao-Baloo Kajelo Village).

Respondent 6: *If you have animals, you can catch a sheep and go and sell and get people to weed your farm. If you don't have millet, you can catch an animal and sell and buy millet for your family to eat and use part of the money to get people to weed your farm for you. So the animals that you have in your yard make you a rich person. But if your yard has nothing, not even a fowl, not a goat, a sheep or a cow then your family is poor* (FGD: Men 46 years plus; Natugnia Village).

Respondent 2: *A poor person's compound has not got fowls, goats or sheep, therefore when you get to his compound, you can't get the faeces of any of these animals mentioned* (FGD: Women 18-26 years; Nogsenia Village).

Respondent 5: *Maybe the compound that is better to do has both parents alive while the poor compound has both parents' dead. In this case you can understand that the parents will at least offer some assistance to their children, but those who have no parents and therefore are orphans will live in poverty* (FGD: Women 18-26 years; Nogsenia Village).

These findings strongly suggest that communities have a clear understanding of whom they consider as poor. They could therefore give very clear guidelines as to those who should be exempted from health service fees or who might benefit from poverty reduction strategies. In addition, communities are aware that poverty is very dynamic, and poor households today could be wealthier tomorrow and vice versa. A number of factors were listed as promoters of wealth. The excerpts below explain how households that had once been poor extricate themselves from poverty.

Q: Are there some households in your community who were once poor and are today better off?

Respondent: *Yes, they are there. For instance, if I have children to feed, I will be poor. But if the children grow and become independent and can even support me, my condition will improve. So if people were suffering and now they are enjoying, it is because there are people in the family now who can support the family purse* (IDI: Elder Interview; Kurugu-village).

Respondent 5: *Yes, an example is Mr. X in this community, whose parents were just poor, couldn't support him but today he is better off.*

Q: What made him better off today?

Respondent 5: *It was because he attended school and the guidance of God in the form of wisdom to study and the support his father gave him through paying his school fees that has made him better off today* (FGD: Men 36-45 years; Nogsenia Village).

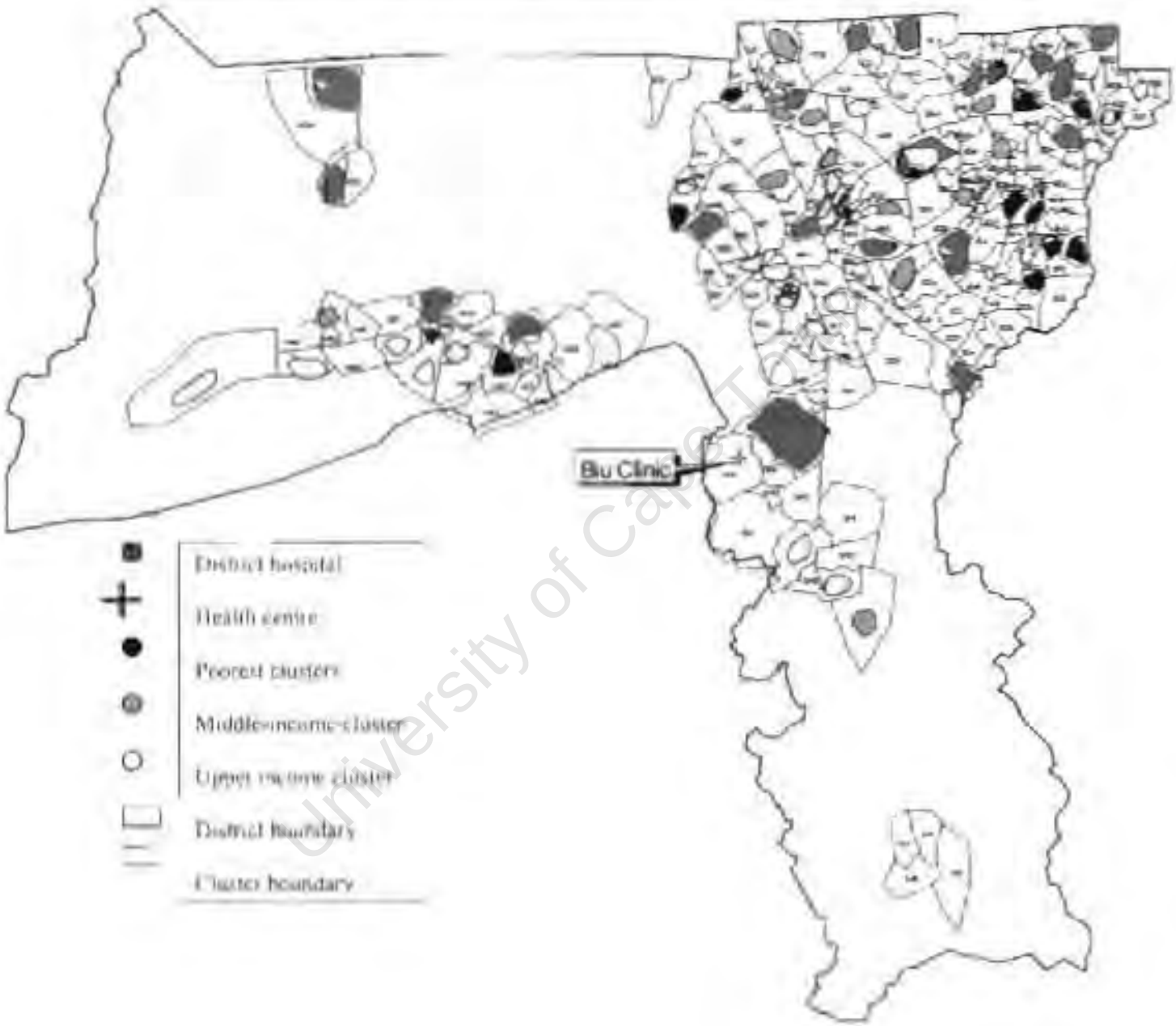
Respondent 4: *Some people did not also have good knowledge of farming practices as compared to what they know now, that is why their poverty level has declined now* (FGD: Women 18-25 years; Punyoro Village).

In summary, then, the following can promote wealth: education, good farming practices and small family sizes. These wealth-promoting factors that indicate poverty would thus serve as a guide in revising the guidelines used to identify the poor over a period of time. How long it takes for an individual or a household to improve upon his or its socio-

economic status is unknown, however, as it requires more information than this study could gather. Nevertheless, these criteria provided by the communities will certainly make it easier to identify the poor for more effective coverage of health interventions aimed at reaching them. A district level poverty map such as shown below is also essential for resource allocation as well as for targeting the health services to meet the health needs of poorer communities, and this will further facilitate the identification of poor individuals and households.

Although close to 60% of the population of KND is described as living below the poverty line, poverty is concentrated in various geographical clusters, and at the district level an understanding of which areas are more disadvantaged, especially for delivery of health care, will be particularly useful in implementing policies to meet the needs of the poorest of the poor. The poverty map below provides a general picture of the pattern of poverty within the district by clusters. Clusters are sections of communities and are categorized into the following: the poor, representing the first and second poorest quintiles, the middle-income group, representing the middle quintile, and the rich, which are classified as falling in the fourth and fifth quintiles, using consumption in Figure 4 below. Clusters are described as poor, if over 50% of households fall in the poorest two quintiles and, similarly clusters described as rich are those with more than 50% of the households falling into the wealthiest two quintiles.

Figure 4: Poverty Map for Survey Clusters in Kassena-Nankana District



Using the location of the hospital as the centre of the town, one can see that most of the poorest clusters are farther away from the centre of town. In general, there are relatively few clusters that are rich. Most clusters fall in the poorest quintiles. The west zone is however distinct with most households falling either into the poor or rich clusters indicating significant disparities in consumption in these areas. In contrast, 87% of the clusters or communities in the east fall in the poorest quintile. There were also significant differences in consumption levels within clusters.

Evidence from these results shows that the use of the wealth index is comparable to consumption and outlines the perception of community members as to what assets and possessions constitute wealth in their communities as a measure of socio-economic status. The community's perception of poverty was associated with lack of food, with lack of animals, and with being ill, old, orphaned or socially excluded. These broad social aspects of poverty imply that approaches to eradicating poverty and improving health should include non-monetary strategies. More striking is the fact that community members are able to identify individuals and households that are poor in their communities with vivid descriptions of the lack of food, the lack of animals and the inability to interact socially. These classifications have turned out to be the critical poverty identifiers in such a rural district. The difficulty of identifying poor people for exemptions, which is currently the major problem with the exemption policy, could benefit from this knowledge by allowing community level identification of the poor. Poverty maps help to identify where the poor are located and together with the community knowledge should offer considerable help in identifying the poor for exemptions, especially for the health insurance schemes that are sub-district based. The

socio-economic status of households in the district as described is considerably low and tends to have consequences for seeking health care and having access to health service as discussed in the next chapter.

Chapter 6: Equity in Malaria Control Interventions

6.1 Introduction

This chapter describes the burden of malaria and explores household knowledge of signs and symptoms of malaria, the degree of severity associated with the various signs and symptoms described. It then describes the health seeking behaviour of households with respect to the management of malaria and the factors that influence the choice of a provider. In addition, the chapter examines factors that shed light on inequities in access to prompt effective malaria treatment and to the use of insecticide treated nets in the district. A concentration index is used to measure the degree of inequality in the use of insecticide treated nets across socio-economic groups.

6.2 Burden of Ill Health

Approximately 53% of household heads reported that a household member had been ill in the month preceding the survey, with 72% of them reporting malaria related symptoms, while other symptoms such as a cough and diarrhoea alone were reported by 28% of household heads. It must be noted, however, that the study took place during the peak malaria season in the district. Fifty-six percent of the perceived malaria cases were described as severe, 36% as moderate and only 8% reported the malaria as mild.

The results on Table 6 below, report on episodes of malaria illness in the last month per household. About 12% (103) of all cases were admitted to inpatient care at the hospital. There were relatively more children (52%) reportedly suffering from malaria than adults. In addition, more females (52%) than males reported suffering from malaria and these

differences were statistically significant. Further analysis indicates that more male children 0-14 years old reported more illnesses than did females in the same age group; and conversely, more females in the 15-49 years age group reported ill-health than did males in the same age bracket. A plausible explanation for these differences in malaria ill health between men and women is that women in the reproductive age are more vulnerable to malaria because of pregnancy.

Table 6: Self-reported Morbidity by Total Consumption (%)

N=703	Poorest 20%	2nd Quintile	3rd Quintile	4th Quintile	Richest 20%	All
*Malaria in the last month	17.0	18.6	19.4	21.9	23.2	72%
Sought Health care	16.2	18.2	19.7	22.4	23.6	86%
Hospitalized	16.5	16.5	16.5	25.2	25.3	12%

*P<0.000

The burden of malaria was also related to socio-economic position of the household (Table 6). In other words, the wealthiest households reported more episodes of malaria in the last month (23%) than the poorest households. Although the poorest reported less ill health, though, it may not imply they have less health problems but rather that their perceptions of ill health might be completely different. It is recognized that a subjective measure of self-reported ill health often produces perverse gradients in developing countries with the wealthiest reporting worse ill health (Wagstaff, 2002). When the levels of ill-health reported by the various socio-economic groups was compared to the

symptoms that accompanied the illnesses, the poor reported more malaria related symptoms (such as diarrhoea, vomiting and chills), but described their symptoms as less severe than did the rich. Perception of disease and one's ill health, as Sen (1992) puts it, could lead to people not seeking health care due to ignorance and their own perceptions of what actually constitutes ill health.

The level of severity of malaria also had an impact on where households sought health care and this also varied greatly by socio-economic status.

6.3 Knowledge of Severity Levels of Malaria

Recognizing malaria signs and symptoms influences whether and how households choose to seek health care, and Table 7 provides a list of signs and symptoms sorted by level of severity from both the quantitative and qualitative surveys. Frequently occurring symptoms are listed according to how spontaneously they were mentioned in the FGDs and IDIs and the quantitative interviews. The first five general symptoms were commonly associated with children less than five years old whose mothers have to touch and observe, whereas with adults, the symptoms were expressed verbally and were associated with pains and body aches, loss of appetite, chills and others. Results indicate that 92% of the respondents in the cross-sectional survey reported these signs and symptoms and in all the FGDs and IDIs, most respondents reported these signs and symptoms as well.

Table 7: Signs and Symptoms of Different Malaria Severity

General Signs and Symptoms	Signs of Severe Malaria	Signs of Moderate Malaria	Signs of Mild Malaria
Fever or hot body	Loss of appetite and weakness	Loss of appetite and weakness	Hot body
Diarrhoea	Diarrhoea	Chills	Chills
Vomiting	Chills	Vomiting	Headache
Chills	Dark urine	Headaches	Yellow urine
Loss of appetite	Vomiting	Hot body	
Weakness			
Headache			
Body aches			
Dizziness			
Paleness			
Yellow eyes			
Yellow urine			
Pains in the joints			

Respondents in both the qualitative and structured-questionnaire interviews were further asked to list and classify the general signs and symptoms according to whether they perceived those signs to be associated with severe, moderate or mild malaria in children and adults respectively (Table 7). The signs and symptoms of malaria did not vary much for children and adults. Signs such as loss of appetite and weakness, diarrhoea, chills, vomiting, dark urine, hot body and headaches were perceived as signs for severe to moderate malaria. Mild malaria was associated with the onset of hot body and chills. A distinguishing feature of severe malaria, however, was diarrhoea (Appendix VI). Kaona and Tuba (2003) similarly reported that simple malaria was associated with fever or hotness of the body whereas severe malaria was recognized by fever, hot body, diarrhoea and loss of appetite; Kaona and Tuba's study focused on the Nakonde district of Zambia,

whose findings are similar to the ones in this study. As previously discussed, the poor tend to underestimate the perception of the severity of malaria.

Less than 1% of household heads also reported convulsions as a sign of malaria, and in the qualitative interviews convulsion was mentioned as an entirely different disease, when participants listed diseases that could not be effectively treated by the health facilities or by the 'white man's medicine'. However, the perception that convulsions cannot be treated by modern medicine is gradually dissipating with the rectal artesunate study underway in the district. Nonetheless, this misconception is echoed in the discussions below.

Respondent: *The convulsion and the 'sagesage'[3] are the same. It is the convulsion that develops into 'sagesage'. It is treated at home and it can also be treated in the hospital. If it attacks a child too, the child becomes stiff and you have to rush to the hospital* (IDI: Elder interview; Kurugu-Kandiga Village).

Respondent 8: *They usually have the belief that when they send the child with convulsion to hospital, the child will be injected, and when that is done, the illness will only disappear and come again but the herbs have a final cure* (FGD: Women 18-25 years old; Punyoro Village).

Respondent 4: *The truth of the matter is that convulsion is not best treated traditionally than at the hospital. Convulsion is as a result of severe malaria so the traditionalist only*

[3] 'Sagesage' (local name for convulsion in the particular location)

try to alleviate the illness and then they take it to the hospital where the treatment is completed (FGD: Women 18-26 years; Nogsenia Village).

Respondent 5: *There is a special injection for convulsion that can now be found at the hospitals* (FGD: Women 18-26 years; Nogsenia Village).

The perception that modern medicine is indeed able to treat convulsions is more widespread among younger women than older groups. A possible explanation can be attributed to the fact that the rectal artesunate trial works closely with traditional healers and focuses on treating children less than three years of age who have convulsions. This means that younger mothers are more involved in education about such treatments, and are involved with referrals for further treatment processes at the health facilities than older mothers. Although knowledge of malaria symptoms and severity levels are high in the communities, a number of factors impede prompt access to health care.

6.4 Factors Affecting Demand for Malaria Control Interventions

Households take several actions to treat malaria. These actions are informed by their beliefs of the causation of ill health, the sources of care immediately available and the socio-economic status of the household.

Treatment of malaria is shaped by the perceived severity of the symptoms of malaria in a child or an adult. In endemic areas where knowledge of malaria symptoms is high,

households first try to self-diagnose and self-treat. The focus group discussions below highlight a typical trend in seeking health care for malaria.

Respondent 2: *When I realize it is malaria, I boil the leaves of the 'eucalyptus' tree for the child to bath and drink: when it does not get better I dissolve chloroquine for the child and then take the child to the hospital when it does not get better* (FGD: Women 26-35 years old; Nagao-Baloo Kajelo Village).

Respondent 1: *If the child is well and playful and all of a sudden he is hot bodied shivering and vomiting or having a running stomach, definitely I will have to classify his condition as very severe. Then I will have to go about looking for herbs to boil and give him the water to drink and then I bath him with that hot water* (FGD: Women 18-25 years; Kayoro-Kadania Village).

Respondent 5: *It is the herbs we will make for the child to inhale, if it doesn't improve the situation, we go to see the health worker. Most at times it ends there but should it still persist, we call on the hospital* (FGD: Women 46 years and over; Badunu Village).

Respondent 1: *It means after 2 days, if the local treatment is not worth its salt, we will go to the hospital* (FGD: Women 46 years and over; Badunu Village).

The level of severity of malaria and the age of the person are primary factors in the choice of treatment. In addition, households' perceived knowledge of the symptoms of

severe and less severe malaria compounds the treatment behaviour and may have fatal consequences. Falciparum malaria, which occurs often quickly, is more complicated and involves longer delays in seeking treatment than does uncomplicated malaria. Participants indicate that if a child comes down suddenly with severe malaria, then the gods have to be consulted before any further treatment can be sought. Thus the child will start treatment with some herbal preparations until the consultation proves that the gods are not angry. Two young women describe their experiences in managing severe malaria.

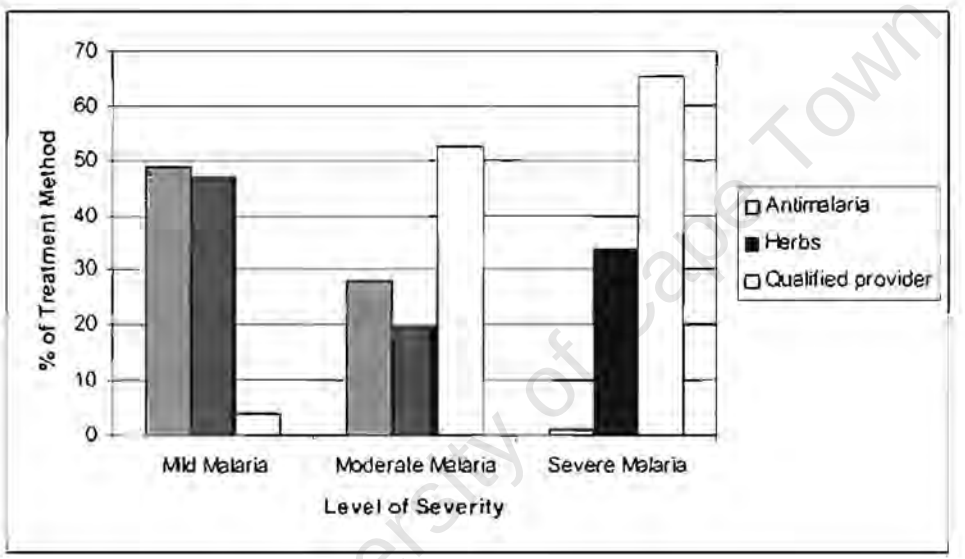
Respondent 2: When my child is sick I run helter-skelter to see what I can do to reduce the sickness before I send him to the hospital, if you take the sick child to the hospital at once, there are certain illnesses that are not to be taken to the hospital and if that happens the sickness might kill the child. That is why we often try the herbal treatment first before sending the child to hospital [FGD: Women 18-25 years, Kayoro-Kadania Village].

Respondent 4: That is the reason (Consultation with the gods) why some will wait too long at home until their condition is worse before they rush to the hospital, and sometimes they die [FGD-Women 25-36 years; Natugnia Village)

In order to further understand the decision-making process in treating malaria, households were asked to describe in detail the actions they take to treat malaria when they first realize a child or an adult has malaria, and subsequently, if symptoms persist the next steps that are taken. Households typically begin with self-medication, which

includes use of anti-malarials (48.8%) and herbal medicines (47%) for treating malaria (Figure 5). However, there was a definite preference for the use of a qualified provider or formal health facility (52.4%) for moderate to severe malaria, but over a third of households still use only herbal treatment for the third stage, which is perceived by respondents as a critical stage when the symptoms are severe.

Figure 5: Choices of Management of Malaria by Severity



A greater proportion of households also revert to the use of herbal treatment between the moderate and severe stages of malaria (Figure 5). The use of antimalarials as self-medication is almost non-existent at the severe stage, which underscores their understanding of the level of severity, as well as the information that is passed on to those who choose to use formal health care for treating moderate malaria.

Households vary greatly in their use of self-medication and of a qualified health provider in managing malaria. The poorest households use more of herbal medicines to self-treat for all severity levels of malaria than do the wealthiest households (Table 8).

Table 8: Management of Malaria Severity Levels by Wealth Quintile

	Mild Malaria			Moderate Malaria			Severe Malaria		
Wealth Quintile	Anti-Malaria %	Herbs %	Qualified Provider %	Anti-Malaria %	Herbs %	Qualified Provider %	Anti-Malaria %	Herbs %	Qualified Provider %
Poorest	39.6	57.5	2.9	23.7	20.3	56.0	0.3	34.0	65.8
2nd Quintile	40.3	56.4	3.3	28.2	19.0	52.8	0.5	35.2	64.3
Middle Quintile	44.7	50.7	4.7	24.8	24.3	50.9	0.5	36.4	64.8
4th Quintile	54.2	41.7	4.1	27.0	17.4	55.6	0.5	36.4	63.1
Wealthiest	66.0	28.1	5.9	35.9	17.3	46.8	2.3	29.3	68.2

P<0.000

The pattern is however different in the use of a qualified provider in managing malaria of different severity levels (Table 8). When a child's or an adult's malaria is mild, the use of a qualified provider for that instance is significantly greater among the wealthiest households than among the poorest households. The latter only begin to use a qualified provider when symptoms become severe, but they still do so to a lesser extent than the wealthiest of households for the same level of severity.

The type of treatment sought for malaria was also significantly associated with religion. Households who believe in traditional religion (33%) were less likely to use anti-malarials to treat malaria than other religions (44%). Interestingly, 80% of the poorest

households profess traditional religion compared to only 20% of the wealthiest households.

The demand for malaria control interventions was also associated with perceptions regarding the effectiveness of the treatment provided by both modern and traditional medicine. The following issues raised in the discussions shed light on these factors.

Respondent 5: *Because you do not know, you send the child to the hospital to find out the reason why the child is vomiting and lacks appetite. They (hospital) also give the appropriate medication for the disease* (FGD: Women 46 and over; Navrongo Central).

Respondent 2: *Even at present some people prefer going for the herbal treatment to going for treatment at the hospital. Supposing they went to hospital to treat a child and the illness doesn't go, instead of going to the hospital again, they prefer attending to the local/herbal treatment* (FGD Nogsenia women 18-26 years).

Respondent 6: *You know some of the herbal treatments are as good as modern hospital treatment. Sickness and death are different. I know that the malaria that day was bringing an end to my life. That's why that herb saved me. But if it had been the sickness that can only be treated at the hospital I would go to the hospital* (FGD: Women 18-25 years; Kayoro-Kadania).

Respondent 7: *The doctor is the best but there are certain people no matter how near their houses are to the hospital, they prefer the spiritual or local treatment to that of the western medication methods. I don't know why they still do that but I know people who actually believe in those things* (FGD: Men 36-45 years; Nogsenia).

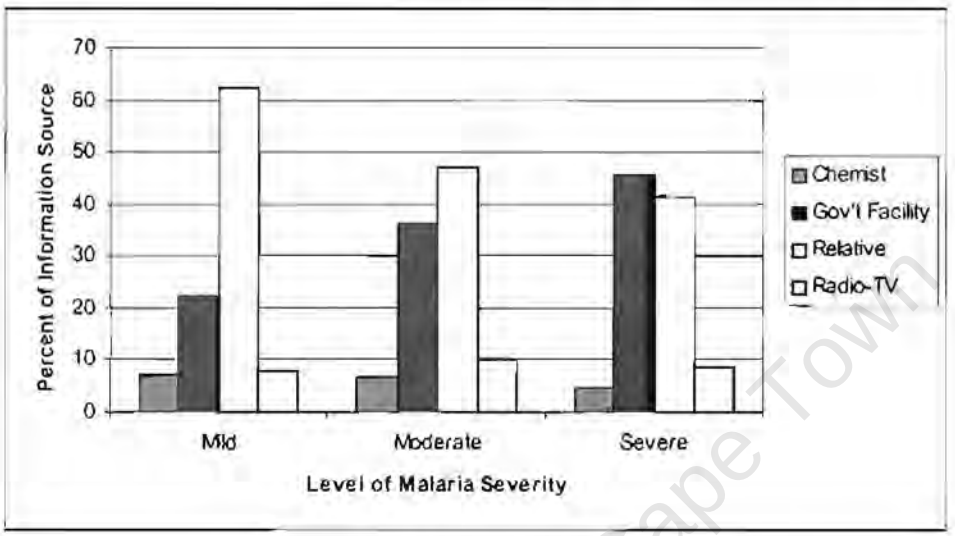
This interplay of western and traditional medicine in treating illnesses stems from the perception of how effectively; both western and traditional medicine can treat diseases. Prior experience of using western treatment and outcomes will influence subsequent use of treatment methods. Furthermore, availability of information on appropriate treatment methods also affects the confidence people have in the use of western medicine in treating malaria.

6.5 Information and Management of Malaria by Households

The first source of information for managing simple malaria appears to be the most critical as subsequent treatment of malaria similarly relies on this. In terms of Figure 6, it appears that households first rely on information from relatives to treat mild malaria in a child or an adult. As symptoms persist, less emphasis is placed on information obtained from relatives, while information from qualified providers and health facilities increases but less than that obtained from relatives. The use of chemists and the media is less widespread, and chemists as sources of information become even less important in subsequent moderate and severe stages. An overwhelming number of households do,

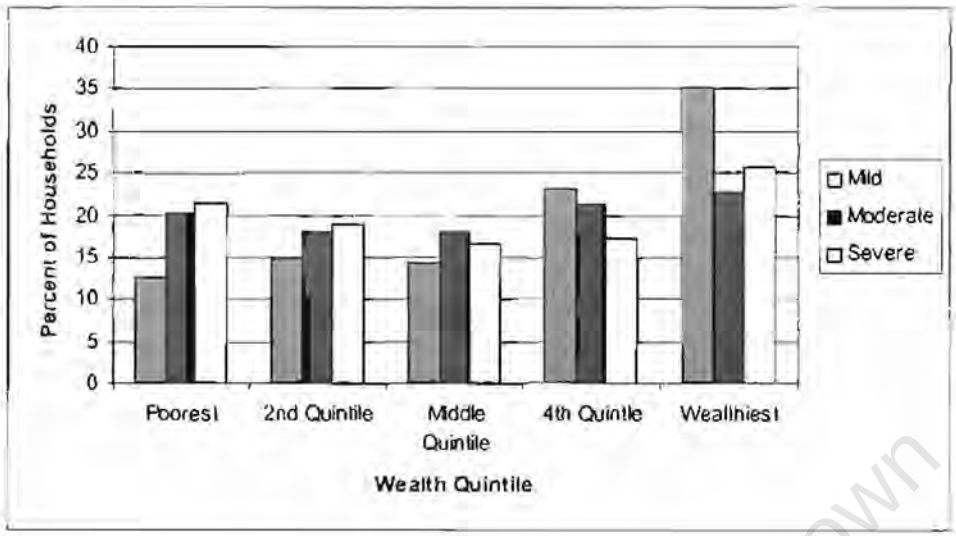
however, continue to use relatives as their main sources of advice on treatment when symptoms worsen.

Figure 6: Source of Information for Managing Malaria Severity Levels



The source and role of information seems to be very important in the mild and moderate stages of malaria if the gap between using relatives and formal health services as sources of information is to be bridged. For instance, households whose first source of information is public health providers, treat mild malaria with anti-malarials (87%), in contrast to those whose first source is relatives (28%). There is however an unequal distribution of professional health information to the disadvantage of the poorest in managing different levels of severity of malaria (Figure 7).

Figure 7: Government Information Source for Managing Levels of Malaria Severity



Those who are not poor seem to have more access to professional information for managing simple and mild malaria (35.3%) than do the poor (12.6%). As observed above, the poorest households do have access to professional health information for managing malaria when levels of severity of malaria are high, although to a lesser extent than the wealthiest households. The implication is that the rich can effectively manage malaria at a lower cost as they have know how to treat mild malaria that costs less than do the poor who only have access to similar information when they come down with severe malaria, thus ironically further impoverishing them.

The qualitative interviews brought to light the key players in passing on information in the homes. Older adults and women with childbearing experience are the first source of information for treating malaria in children and adults. Participants in the discussions

strongly believe that the source of information from these relatives is reliable because the methods have been passed on from one generation to the next.

Respondent 1: *If malaria attacks you and you have a mother-in-law, if she cannot determine what it is she will consult other people who will direct as to where to get the treatment. The herbalist very often will give you something to mix with hot water and drink and some to use in preparing food for you to eat* [FGD: Women 18-25 years; Kayoro-Kadania].

Respondent 7: *Our grandmothers often advise us to go and do this or that. Since they are elderly people, they know better* [FGD Women 18-25 Vunania Village].

Respondent 2: *Some of the treatment we give the children is learnt from the radio, they tell us how to give the children chroloquine before they are sent to hospital* [FGD: Women 18-26 years; Nogsenia Village].

Respondent 3: *They told us at weighing (antenatal clinics) when we were pregnant that after giving birth, if a child has this illness, this is how to treat it and that is what we do.* [FGD: Women 18-25 years; Punyoro Village].

Respondent 1: *You know that times have changed and the nurses go round to inform us on these things* [FGD: Women 36-45 years; Badunu Village].

Although relatives play a significant role in providing information for treating malaria, there is a high tendency for people to use anti-malarials or qualified health professionals, if the first source of information is from a health provider. Of course, elderly people will continue to act as the initial source of contact on information for treatment at the household level. Thus, it is important to widen the health education programme to include them, in addition to providing health education to pregnant women and mothers at antenatal and child welfare clinics. The disparities observed in access to curative health care among different demographic and socio-economic groups, also exists with the use of insecticide treated nets.

6.6 Inequity in the Use of Insecticide Treated Nets

The ownership and use of insecticide treated nets (ITNs) is widespread among households (67.5%), compared to the use of other preventive methods such as repellents (9.7%), strong scented leaves (12.8%) and environmental sanitation (12%). This may be due to the Insecticide Treated Bed Net Trial and the continuous sale and promotion of nets in the district.

The results show that more children less than five years of age and women sleep under these nets relative to men. A similar observation was made by Agyepong and Manderson (1999) in relation to Ghana; they found that 64% children or 24% children and their mothers use ITNs.

This finding contrasts however, with studies in Tanzania and other countries where less priority is given to getting children to sleep under nets, because it is believed that they need less privacy and because of the cost of buying ITNs for the whole family. The high use of ITNs among children and women in more recent years may be attributed to the UNICEF programme in the district, which provides ITNs to pregnant women and children under five for a token fee of US$0.56, compared to the prevailing price of US$4.00 in the district and US$9.04 in major towns countrywide.

The use of ITNs may be linked to the financial position of the households. Households whose yearly consumption amounts to less than US$240.00 own only 4% of ITNs, in contrast to 96% of nets being owned by households that earn over US$240.00 per annum. Fifty-two percent of the poorest households earn below USD240.00 per annum. Some participants raised the cost of buying ITNs as a key reason for not using them.

Respondent 3: *This net here is to prevent us from getting malaria but when you don't have money to buy this mosquito net, you'll have to be bitten by mosquitoes to get malaria. If you have the money, you'll buy a mosquito net and hang it over a foam mattress to sleep in comfort because the mosquito net is not only meant for those who are better off because every one health is at stake* (FGD: Men 36-45 years; Nogsenia Village)

A study in the Gambia however found no significant difference between income and usage of ITNS (Aikins et al., 1993), but Ziba et al. (1994) did find that in Malawi use of malaria prevention measures such as bednets, mosquito coils and other repellents was

dependent on the income of the household. The findings of this present study are similar to the findings in Malawi: households with higher incomes make more use of ITNs than do households with lower incomes.

The distribution of net use is thus skewed in favour of those who are not poor. The degree of inequality in the use of ITNs was analyzed by using the concentration index and curve. The concentration index is similar to the gini-coefficient often used in measuring income inequality. The index is able to measure the outcome or health variable of interest such as insecticide treated nets relative to the economic status variable thus giving it an intuitive appeal in equity analysis compared to the standardized gini-coefficient which measures and compares the values of a distribution against other values in the same distribution. The concentration index takes on a negative value when the concentration curve lies above the line of equality, meaning that the inequality is greatest among the poor. Alternatively, a positive concentration index indicates that the concentration curve is below the line of equality and it implies that the health variable is concentrated among the rich (Waters, 2000; World Bank 2003). The index was calculated using this formula[4]. The concentration index ranked by wealth (0.0632) and consumption (0.1023) as measures of socio-economic status respectively highlights the use of ITNs to be

[4] The concentration index is calculated in a spreadsheet programme using the formula below

$C=(p_1L_2-p_2L_1) + (p_2L_3-p_3L_2) +.....+ (p_{T-1}L_T-p_TL_{T-1})$,

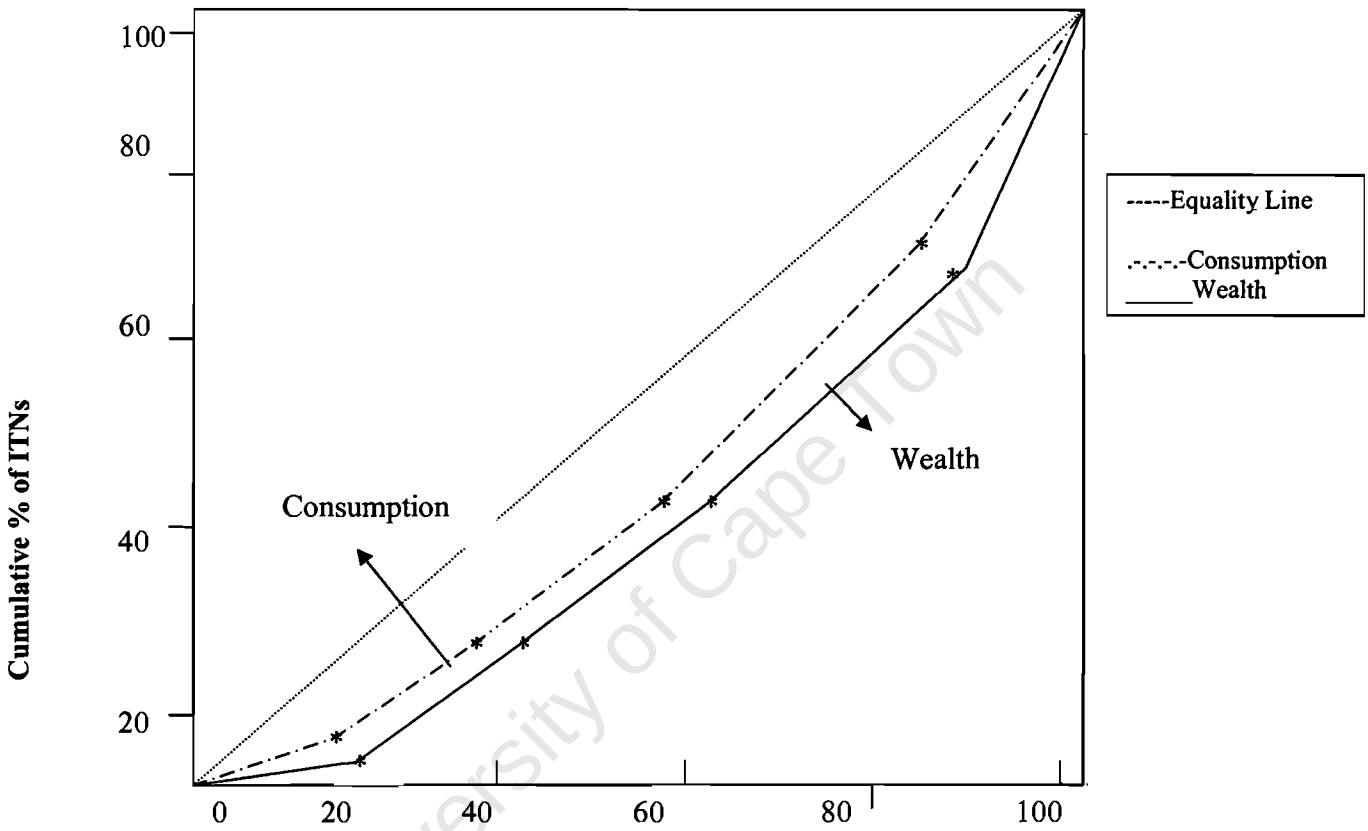
Where p= cumulative percent of the sample ranked by economic status ,

L(p)=concentration curve ordinate

T= number of socio-economic groups.

concentrated among the rich. In Figure 8, the concentration curves for both wealth and consumption are below the line of equality.

Figure 8: Concentration Curve for Insecticide Treated Nets



The degree of inequality is slightly greater using assets as an economic measure, but the two measures of socio-economic status are in close approximation in explaining inequality in the use of ITNs in the district. The significance of these findings suggests that the poor benefit the least from the use of ITNs, even where they are highly subsidized as in the UNICEF programme in the district.

As the results indicate, the approach to intervening in malaria endemic areas where there is a high knowledge of the symptoms and people tend to self diagnose and treat has to be different. Traditionally, older women and mothers-in-laws are the custodians of culture and groom newly married and young women according to what custom demands. However, women who attend antenatal and child welfare clinics in Africa and other developing countries, where health education on malaria and other diseases is passed on, tend to be younger women who cannot by themselves take decisions and treat malaria because of the limited authority they have. In effect, less of this professional information is utilized at the appropriate time as these findings indicate. Health education programmes, which are built around the cultural norms of the people, are certainly a way forward in treating malaria with appropriate anti-malarials. Thus, a more effective approach would be to target older women who will in turn relay this information to younger women.

Subsidization of insecticide treated nets currently benefits the rich, and a more proactive approach that makes use of community poverty identification criteria as well as area poverty maps should be the key priority in identifying poor households for effective implementation of malaria control interventions.

In conclusion, results in this chapter show the burden of malaria to be relatively higher within the wealthier groups than within the poor groups. The poor have however been observed to report less poor health as also shown in other studies, not because there is less ill-health to report but due to a low perception of ill-health and a high value placed

on time especially during farming seasons. Health care seeking for malaria treatment is significantly correlated with the level of severity and age of the person. Children under the age of five tend to receive more attention when they have malaria. The implication of this finding is that interventions aimed at reducing morbidity and mortality due to malaria in children are more likely to be effective, given the priority with which households place on the health of children under the age five of years. More children under the age of five sleep under ITN though there is a disparity in use across socio-economic groups. The wealthiest have more access to these nets even where they are highly subsidized (Schellenberg et al., 2004).

Chapter 7: Determinants of Equity in Access to Health Care

7.1 Introduction

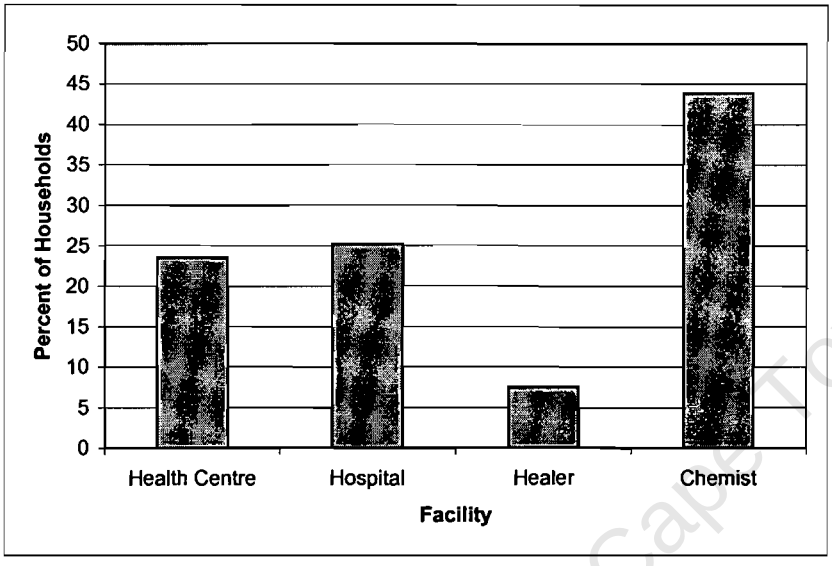
The objective of this chapter is to outline the factors that determine access to health care and the common factors that describe each dimension of access. The chapter begins with a description of the utilization of health care by health provider type and distance to health care and disparities in health care utilization by socio-economic groups. It further examines the cost of treating malaria by household and highlights the disparities in out-of-pocket payments between households of different socio-economic status. The results of the common factors of access that emerged from analyzing each dimension of access using the PCA technique are then presented. The results of the factors scores used in the derivation of disadvantage index show areas with low and high indices in terms of the dimensions availability, acceptability, affordability and information. The chapter also discusses inequities in access to health care for each dimension.

7.2 Utilization of Health Care for Malaria

The utilization of health services for malaria varied by gender, the consumption levels of households as well as by the marital status of the household head and by CHFP cell. About 92% of the households whose members were ill sought health care outside the home. Generally, households sought health care from both public and private sources (Figure 9a), with a greater number of households using the chemists (43.5%) as opposed to the hospital (25%) and the health centres (23.5%). Thirty-nine percent and 31% of

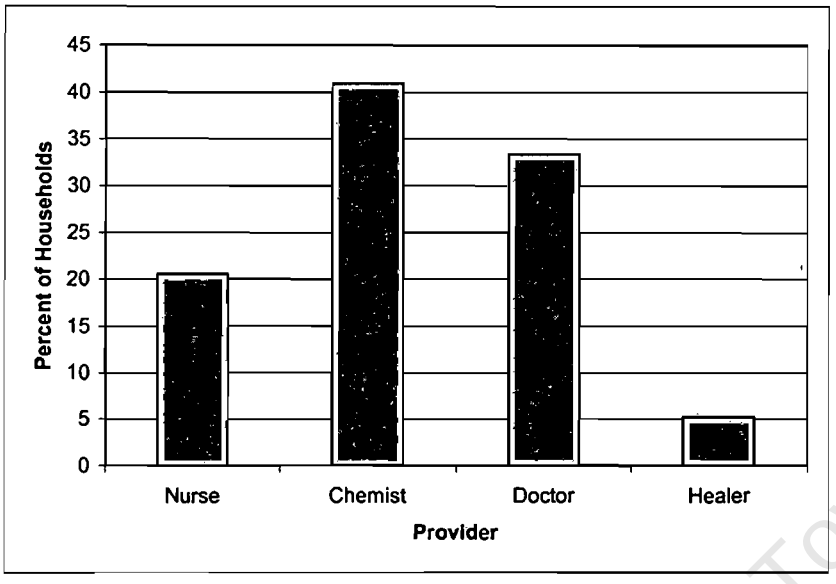
perceived severe malaria cases (460) were treated at the hospital and the chemists respectively.

Figure 9a: Facility Used for Health Care



A similar pattern was observed when respondents were asked about which health personnel they actually consulted during the last episode of malaria (Figure 9b). Over 40% used chemists, whereas less than 35% used the doctor.

Figure 9b: Health Provider used for Consultation



The use of the services of nurses in CHO areas and at the health centres is quite low, as reported earlier, because nurses are mainly located on the periphery of these areas and cannot handle severe cases of malaria. This is interesting, as one would think that residents would prefer to consult with nurses as professionals rather than going to the chemists. However, the preference for the chemist in this study was due mainly to the availability of drugs and moderate fees charged by them, even though the quality of both diagnosis and treatment might be less effective. Further analysis by CHFP cell, however, revealed that households in the village volunteer cell (21.5%), the community health officers' cell (27%) and the cell that combined community health officers and village volunteer (29.5%) were less likely to use chemists than were households in the cell with the static MOH services (54%). Similarly, 23% of the poorest used the CHO compared to 15% who used the chemists. These results were statistically significant. These findings imply that the CHFP and CHPS strategy may offer a solution to the home management of

malaria using pre-packaged drugs, as households are more likely to use them than the chemists. An effective use of such community-based service delivery points is also likely to promote monitoring of compliance of use of anti-malarials as these community-based providers are mobile and move from house to house during their daily routine activities.

There is a significant relationship between marital status and the type of health provider used. Single women and widows tend to use drug stores more for treating malaria (48%) than those who are married (32%). Similarly, whereas 72% of households with male heads sought health care outside the home, only 27% of female households did so and over 45% of women household heads used the chemist compared to 30% of male household heads. Male household heads generally used more professional health services for malaria management than did female household heads. This is not perhaps surprising as women have lower incomes relative to male household heads. Using consumption as a proxy for income, male household heads also earn 1.5 times more than female heads. In the cultural context of the Kassena-Nankana district, males are custodians of family wealth and hence own more farmlands than females. Even in the event of the death of a husband, the next male kin inherits the family wealth and lands and supposedly takes care of the deceased offspring.

7.3 Physical Accessibility of Health Care

Among the households that sought health care, about 70% used the facility closest to them whereas only 30% used a facility further away. The choice of the latter was also

significantly related to the availability of drugs (45.6%), the absence of a service provider in the area at the time of ill health (21%), and severity of the illness (15%). Forty-seven percent of those who used the chemists described the shops as being located within walking distance, as opposed to the hospital (21%) and the health centres (22%). This was however dependent on the mode of transport.

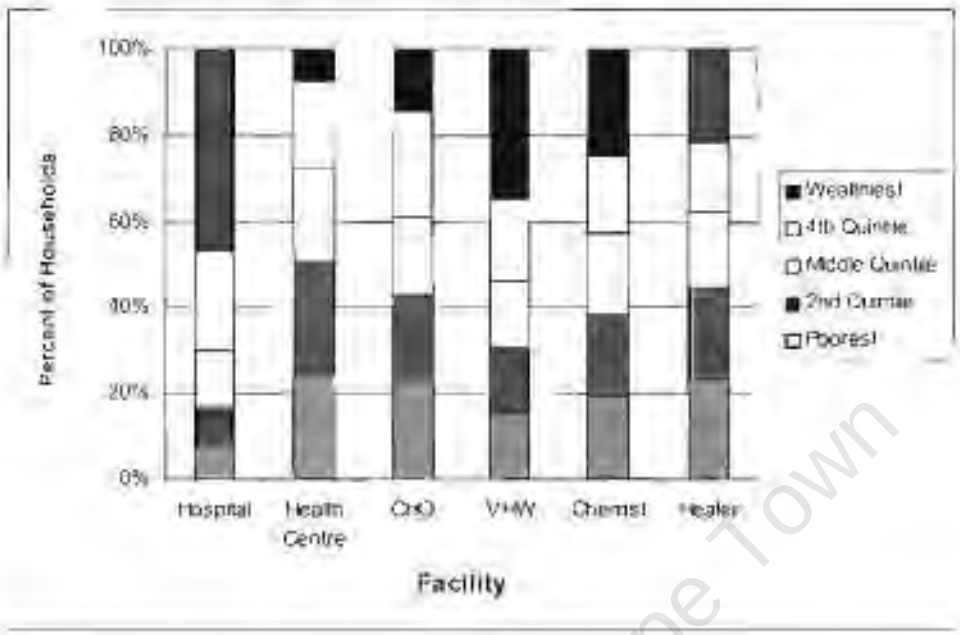
Over 35% and 25% of those who used the hospital went on bicycle and with public transport respectively. Similarly, 35% and 10% used bicycles and public transport respectively to go to the health centres. This utilization data does not provide precise distance to these facilities, as with the use of the geographic information systems for measuring physical distance to health care.

The average straight-line distance to a public health facility in the district using the GIS is 6 km for a health centre and 12 km for a hospital. There are great disparities in physical access, with the cells in which there are only CHOs (23 km) and MOH services (17 km) having the least physical access to hospital services. The geo-referenced data showed that over 70% of households live 6 km away from a health centre and 56% live more than 10 km away from the hospital, both of which are the primary sources of public health services in the district. In contrast, chemists are on average 4 km away from the households covered in the survey. In communities that have the village volunteers and the community health officers the average distance to these providers is 5 km and 4.6 km respectively.

A comparison was made between perceived distance as reported by respondents in the questionnaire and actual straight-line distances obtained from the GIS. Although household perceptions are a subjective measure and might be influenced by many factors (such as the mode of transport, severity of the illness), the patterns of the perceived distances may provide insight into the households' general impressions of ease of access to a health provider. Households who reside more than 10 km away from the health centre reported that the same was within a shorter distance. Interestingly, households who went on foot also reported a travel time of less than an hour and even shorter distances compared to the straight-line distance of 10 km. These households perceive themselves to live closer to the health centres, than they actually do whereas those living within 5 km tend to overestimate travel time and distance to the facility.

Figure 10 shows a 5 km distance to health facilities and providers within the district by socio-economic status. More poor households live close to health centres, the CHO and the traditional healer than the richest households. Of those who live within a 5 km distance to the hospital, about 47% of them fall within the richest quintile, compared to only 7.6% of the poorest quintile who live within 5 km from the hospital.

Figure 10: Physical Accessibility to Health Facilities by Wealth Quintile



The physical distance to chemists is relatively even across socio-economic groups. Health centres and CHOs in Ghana are located at the periphery to provide basic curative care for malaria and other diseases, and are accordingly more physically accessible to the poor. Health centres and the recently introduced CHPS programme are more pro-poor and thus will serve to bridge inequities in physical accessibility. However, the primary care facilities, as discussed earlier, are unable to manage severe malaria cases and thus will only be effective if less severe cases get there on time. Delays in seeking health services, compounded by both cultural and socio-economic factors, often result in more severe malaria cases that are beyond the competence of the primary care facilities. The number of perceived severe malaria cases (56%) that were treated at the hospital testifies to this. The high number of perceived severe malaria cases treated at the hospital and the inability of the primary health care facilities to handle these cases raise concerns about

prompt access to effective malaria treatment. Prompt access at the first signs of malaria is the only way in which service providers at the periphery can effectively manage malaria, and providing adequate information on early management of malaria will greatly ease the burden of the poor in using hospitals with their associated costs.

7.4 The Cost of Health Care: Where do the Poor seek Health Care?

The relationship between socio-economic status and the type of health care used also sheds light on the affordability of health care. The two welfare indicators (consumption and wealth) in Figures 11a and 11b, show that the poor more often tend to use primary care facilities and providers at the periphery, as well as chemists than do those who are better off and able to afford the higher costs associated with the use of the hospital and doctors. Poorest households were also more likely to treat at home using traditional healers. Current government spending on health however sharply favours hospital and tertiary care, with district and regional hospitals accounting for almost 75% of total government health capital investment compared to only 7% capital investment allocation for sub-district clinics and health centers (Canagarajah and Ye, 1998). Nonetheless, given the differential use of hospital services by socio-economic groups below, it appears that such government funding is not effective in targeting the poor and the most vulnerable.

Figure 11a: Use of Facility by Wealth Index

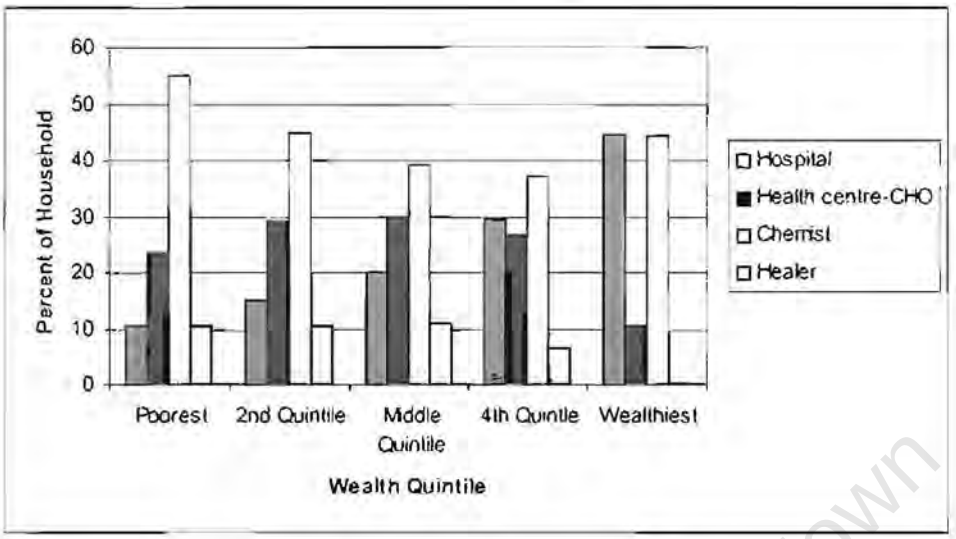
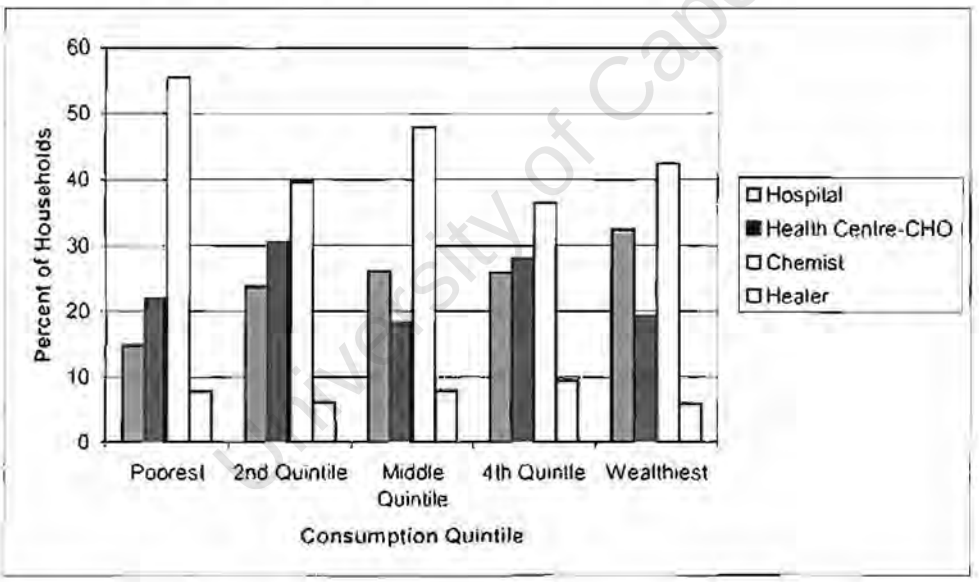


Figure 11b: Use of Health Facility by Consumption Quintile



The expansion of rural facilities through the CHPS program may be a way forward in reducing both physical and financial cost in the use of health care as direct costs of health care are essentially lower and one may not incur transport costs because they are located in the communities themselves.

The total out-of-pocket payments for health care in the month preceding the survey were significantly associated with socio-economic status. These percentages (Table 9) reflect the total cash payments for single episodes of malaria. The poorest quintile spent three times more on health care relative to the wealthiest quintile as a percentage of total consumption. These differences are more pronounced for each severity level of malaria. The cost of treating severe malaria was 3.5 times more for the poorest households relative to their income compared to the wealthiest.

Table 9: Out-of-Pocket Payments for Health Care as a Percentage of Consumption

	Out-pocket payments as Percentage of Consumption expenditure		
Socio-economic group	Total	Severe malaria	Moderate malaria
Poorest Quintile	1.2	2.12	0.33
2nd Quintile	0.98	0.99	0.38
Middle Quintile	0.55	0.76	0.23
4th Quintile	0.48	0.60	0.22
Wealthiest Quintile	0.37	0.52	0.26

P<0.000

Out-of-pocket payments (OOP) were also significantly higher for those without any formal education (0.61% of consumption in contrast to 0.49% for those with formal education) indicating that out-of-pocket payment for health care may be regressive. In general, the less advantaged tend to pay more out of total consumption for health care. Cost of health care significantly affected the type of health provider that households choose to treat malaria. On average, the out-of-pocket payment (OOP) for an episode of

malaria was 42,601 Ghanaian cedis (US$ 4.95) in public health facilities as compared to 12,411.2 cedis (US$1.44) at the chemist's.

There were great variations in OOP by socio-economic group and severity of malaria in public health facilities. As in Table 10, payments for severe and less severe malaria for the poorest households in public health care facilities were 55,013.91 cedis (US$6.40) and 8,352.94 cedis (US$0.97) respectively. The cost of treating severe malaria is 6.6 times more in public health facilities for the poorest than by means of chemists.

Table 10: Out-of-Pocket Payments for Malaria Treatment by Facility and by Total Consumption Quintile

Socio-economic status	Public Facility OOP Severe Malaria	Chemical shop OOP severe Malaria	Public Facility OOP Less severe	Chemists OOP Less severe
Poorest Quintile	¢55013.91 (US$6.40)*	¢8352.94 (US$0.97)	¢13000.00 (US$1.51)	¢4000.00 (US$0.47)
2nd Quintile	¢31,508.32 (US$3.66)	¢28,355.00 (US$3.30)	¢19,411.81 (US$2.26)	¢6,822.73 (US$0.79)
Middle Quintile	¢38,740.93 (US$4.51)	¢23,250.00 (US$2.70)	¢15,625.00 (US$1.82)	¢6,974.00 (US$0.81)
4th Quintile	¢46703.08 (US$5.43)	¢12176.47 (US$1.42)	¢19411.8 (US$2.26)	¢6822.73 (US$0.79)
Wealthiest Quintile	¢64,808.96 (US$7.54)	¢19,092.3 (US$2.22)	¢54,966.70 (US$6.39)	¢11,214.30 (US$1.3)
N	380		236	

* ¢8600.00 to US$1.00

It is therefore not surprising that most poor people resort to the chemist and herbal medicines as the main sources for malaria treatment. Issues of the costs of payment for health services featured frequently in all the qualitative interviews with community members and health providers as well, and cost of treatment is one of the main reasons why people do not use effective health services. For instance, community respondents and health providers reported as follows:

Respondent 5: *The reason why some people do not go to the hospital is not that they don't actually like the hospital but that they may not be able to purchase the drugs that the doctor might prescribe for them at the hospital because they do not have money. So some have to rely on the local treatment that may only require a fowl or tobacco* (FGD: Men 36-45 years; Nogsenia Village).

Respondent 1: *It is not free because any time you go to see the herbalist; they have payment, like that of the hospital. They may tell you to bring a fowl and tobacco. But what they do is that they give you the treatment first, if you become better, then you can do the payments later, but it is not just free. That is why it attracts more people even in this contemporary time* (FGD: Men 36-45 years; Nogsenia Village).

Respondent: *Some are not able to pay for the drugs we give them at the health centres especially when we add antibiotics but because we know most of the community members some do ask for time to pay. In fact some will take about a day to pay, and some will take*

about a week. We don't chase (go after) those who don't come back to pay (Medical Assistant-KND).

Respondent: *You know, we have all sorts of drugs. Usually when they come with prescription from the hospital, some ask for credit. They will ask of the cost of the drugs on the prescription and tell you that they are going to bring money and they don't come back because of affordability, they can't afford to pay for the prescription.* (Chemist; Navrongo).

Households therefore devise several strategies to cope with the cost of formal medical care. In the periphery where health providers serve smaller communities, health providers may provide time for payments but, as the excerpts point out, some households are never able to pay back. In bigger health facilities, this type of credit facility is not available and households will have to sell their possessions to pay off medical bills.

Respondent: *If you have an animal, you will have to sell it and go and pay. If you don't have an animal and you have groundnuts, you can take it and go and sell and pay the bills. If you have fowls and guinea fowls, you have to catch them and sell and go and pay* (IDI: Elder Interview; Kurugu-Kandiga Village).

Respondent 1: *Some people don't usually have money to either go to the hospital or drug store, so they rather will prefer to try the local treatment and if it works successful it*

spares us the task of going to borrow money from somebody to go to hospital (FGD: Women 18-26 years; Nogsenia Village).

Respondent 9: *Some do not even have money to buy food and feed the family, not to talk about going to hospital, so that is why we treat at home, while we borrow somebody's money to enable us go to hospital* (FGD: Women 36-45 years; Badunu Village).

The repercussions of borrowing and selling off possessions are grave as they leave households poorer in meeting other necessities of life such as providing food and education for their children (Russell, 1996). A review of the implementation of user fees, especially in sub-Saharan Africa, has noted its effects on financial access to health services for the poor (Newbrander et al., 2000; Wagstaff, 2002). Strategies such as targeting and exemptions have been adopted by governments to mitigate the effects of user fees in Ghana and in many other countries, but these have not been very successful. A review of the implementation of user fees in Ghana points out that the poor benefit least from targeting, as there has not been an explicit exemption for them and as health administrators use their own discretion to exempt them or not (BHI-MOH, 2001; Garshong et al., 2001). Furthermore, those who qualify for exemptions often do not have access to medical care because of a lack of information or an outright refusal by health personnel to make policies and information available (Garshong et al., 2001; BHI-MOH, 2001). There have also been many disparities in the implementation of the exemption by regions and districts. The Upper East region where the KND is located has been one of the regions where implementation of exemptions have been applauded, and in the KND

this has mainly been in preventive services such as immunizations and general child-welfare clinics and antenatal services. Clinical care has not seen very much uptake in the perspective of users, although health managers do think there have been substantial increases in clinical attendance. The discussions below highlight the perceptions regarding the exemption policy:

Respondent: *Not at all, we pay for everything, no free service. The only exception is the medicine (Immunizations) that health personnel go round compounds and give to children* (IDI: Elder Interview; Amuntanga Village).

Respondent 11: *My brother's wife paid nothing for her delivery at the hospital apart from the caesarian operation charge and that of the drips they put on her. And that of the children you asked is also free of charge* (FGD: Men 36-45 years; Nogsenia Village).

Respondent 9: *At first we heard that government gave a directive that if you are seventy-five (75) and above and you go to hospital, they have to treat you free of charge. But I have never seen an old man or woman receiving treatment at the hospital free of charge. If you are sending an old person there, you have to pocket some money so that when you get there and they receive you, you will go for a card.* ..... (FGD: Men 46 years plus; Natugnia Village)

Respondent 5: *To me too I paid every bit when I went to the hospital; it is only the weighing of the child that was free but the rest, involved payment; from pills to injections.*

May be I am yet to experience these free services (FGD: Women 35-46 years; Nagao-Baloo Kajelo Village).

Respondent 2: *If the drugs are in the dispensary, you do not pay. However, if the drugs are not in the dispensary, and you have to go to the drug store, you pay for them. If the prescribed drug is in the dispensary, you will not pay* (FGD: Women 18-25; Vunania Village)

Respondent 3: *I have been staying in this community for the past years and I used to have a lot of deaths and serious condition in the community but for the past 2 years I don't get serious conditions. I feel it is because of the exemptions that they come to the clinic early, because they know I am not going to pay why should I sit back in the house and die, they come. I am sure that has reduced the number of severe conditions that we get* (Community Health Nurse- CHO, Gaani Village).

Respondent: *The exemption policy as far as I am concerned has been a very good policy that wants to achieve equity. With the exemption scheme we have seen increase in service uptake for about 3 years to 4 years now* (District Health Manager- KND).

In terms of the exemption policy, all children less than 5 years are supposed to receive health care free of charge but the survey results also indicate that about 34% (474) of household members who were ill were children less than 5 years and 80% of these children received treatment at the public health care facility. However, 46.9% did not pay

for receiving health care, as compared to 53.1% that paid cash. The participants in the focus group discussions echoed that the services are not free, as drugs are often not available and hence one is referred to the chemist to purchase drugs; moreover, refunds are not made to patients who are exempted and have to buy drugs from private chemists.

In theory, the exemption policy is supposed to relieve the financial constraints that impede access to health services among the exempted groups, but as some participants pointed out, it is not uniformly implemented, and thus people still pay for services that are supposed to be exempted. Moreover, many Ghanaians who do not have financial access to health services are also not covered by the exemptions; it is estimated that 4-5 million Ghanaians miss outpatient visits in the public health sector every year as a result of financial constraints, and these are considered to be the poor (BHI-MOH, 2001). The current social and mutual health insurance scheme underway in the country is intended to offer financial relief for users of health services and especially for the poor. The identification of the poor however has been a very difficult task and has resulted in many poor people not being exempted under the current exemption policy. This is likely to impede the implementation of the mutual insurance schemes for them. However, this study's findings suggest that communities do have considerable knowledge of households and individuals that are poor, and that such communities themselves should be given the task of designing clear guidelines as to who should qualify for the exemptions. The sub-districts that manage small coverage areas could also be given the responsibility of coordinating the identification and registration of the poor for each sub-district, and poor people who require hospital care should receive a referral note from the sub-district.

7.5. Testing the Conceptual Framework against Predictions of Access Dimensions

7.5.1 Primary and Secondary Indicators of Access to Health Care

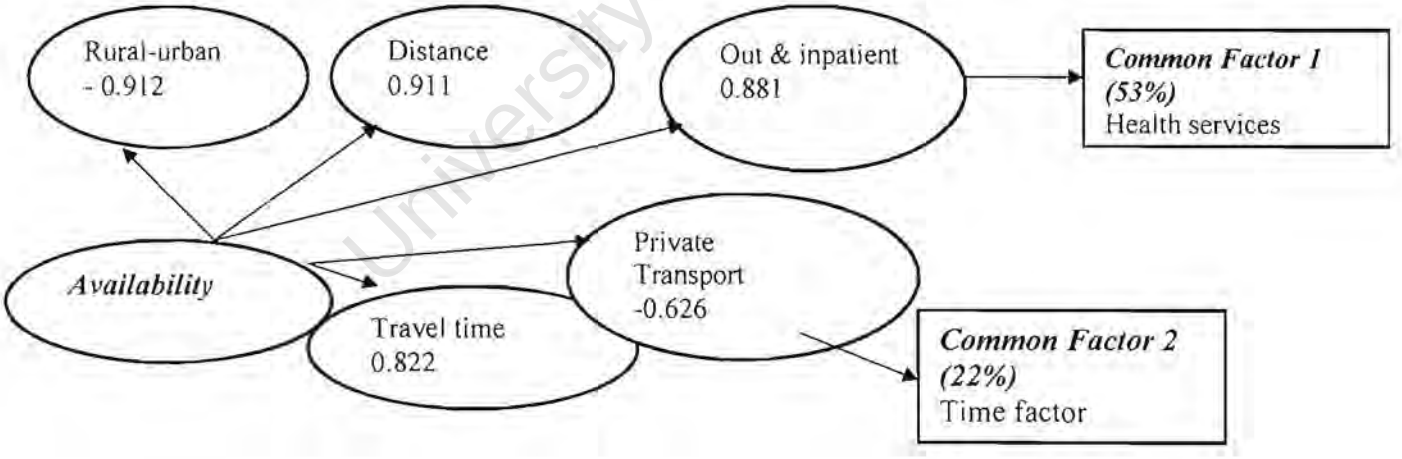
Issues around cultural beliefs, physical distance, direct cost of health care, socio-economic status, quality and effectiveness of health services have all been raised in the previous sections of this chapter as factors that potentially affect access to malaria control interventions. This section presents the effect and impact of these factors as either primary or secondary indicators of access, drawing from the conceptual framework and the access factors postulated to predict health care access. The results of each access dimension are examined for their relevance to measuring access and how well the common factors relate to the supply or demand side of health care. The results further highlight areas and households in the Kassena-Nankana district that have poor access to health care by using the disadvantage index.

There were 695, 119, 1678 and 1274 observations respectively for the factor analysis of each dimension of access (availability, affordability, acceptability and information). Following the rule of thumb that only principal components with eigenvalues greater than one are important, the common factors retained for each dimension reported in the ensuing sections had eigenvalues greater than one. Varimax rotation was used to improve the interpretability of the factors. The access factors (according to the access models set out in Chapter 3) included in the interpretation of a common factor for each dimension are access factors with factor loadings of 0.5 (see Appendix VII). The religion, occupation and education factors that did not load on any common factor because of their low loadings, are excluded from the results presented.

7.5.2 Availability of Health Care as a Dimension of Access

Applying factor analysis, two common factors were extracted to explain the availability dimension. These explained 75% of total variance of health care availability. The first common factor is primarily a health service provision factor and accounted for 53% of the variance in availability of health care (Figure 12). Thus it constitutes the most important indicator of access for this dimension. It captured access factors such as distance, outpatient and inpatient services and area of residence. The second common factor (time) is associated with the characteristics of the household and includes travel time and private means of transport. The second common factor explained 22% of total variance in health care availability and thus constitutes a secondary indicator of access to health care.

Figure 12. Factor Loadings and Common Factors of Availability Dimension



These findings also highlight the importance of individual access factors through the values of the factor loadings in determining the availability of health care. Households with high factor loadings on the service provision factor (common factor 1) place a high value on distance (0.911) and availability of inpatient (0.881) services compared to area

of residence. The rural-urban access factor reflects the nature of health service organization as outpatient services are mainly provided in rural areas rather than in urban areas, and thus a low value is assigned to this access factor. Nonetheless, a health facility that provides in-patient health care certainly is a priority for households. Health care facilities that provide in-patient services have more qualified health personnel and treat more acute illnesses than do facilities that provide only outpatient care in the district. The number of severe malaria cases that have been treated at the hospital also indicates that households prefer to use facilities with inpatient care for treating acute illnesses.

Households also value the time that is spent on accessing health care, and thus travel time (0.822) is of more concern in the second common factor (time factor). The means of transport available to a household is not significant in determining availability of health care and households consider it less a priority with its negative factor loading relative to travel time. During the rainy season, the opportunity cost of time in seeking treatment for malaria as noted earlier, is particularly high and the poor may simply ignore their ill health (McIntyre et al., 2001; Sauerborn et al., 1996).

The health service factor is by far the most relevant factor in determining the availability of health care. Thus, in measuring the availability of health services, policy makers need to pay priority attention to these key availability access factors. Data on waiting times and opening hours of the public health facilities are not available for this study and may account for the 25% variation in availability that could not be captured herein.

Factor scores (weights) generated by using the first principal component of the availability dimension were used to create an availability disadvantage index of access. This index highlights areas with the lowest and the highest availability of health services in the district, as well as showing socio-economic groups that are highly disadvantaged in terms of the availability of health services. Figures 13a and 13b below shows the spatial distribution of availability scores for major villages in the district.

Figure 13a: Spatial Distribution of Available Health Care

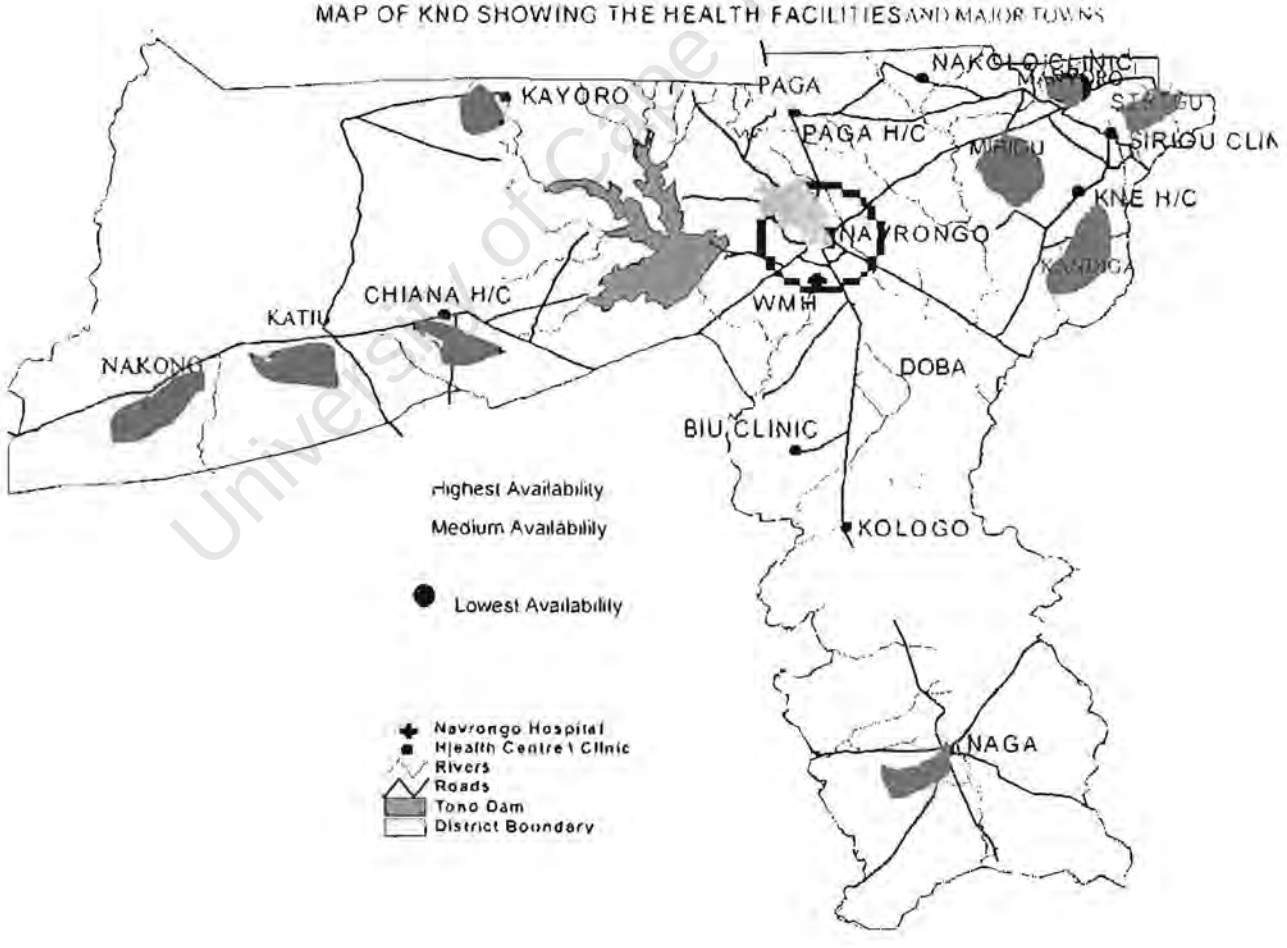
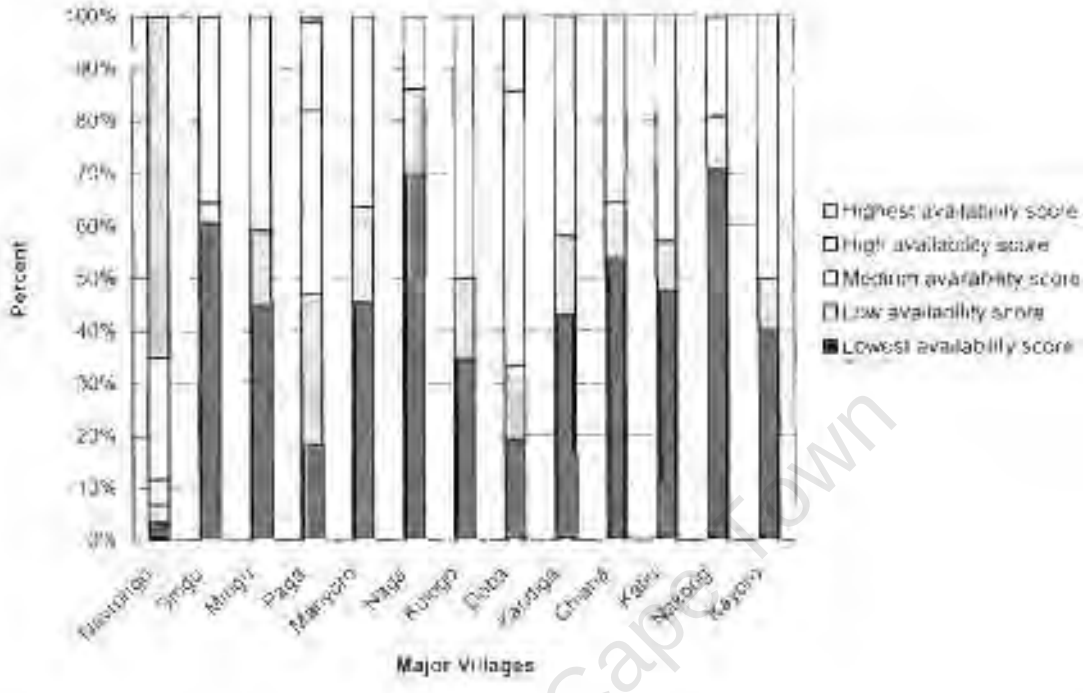


Figure 13b: Availability of Health Care-Disadvantaged Areas

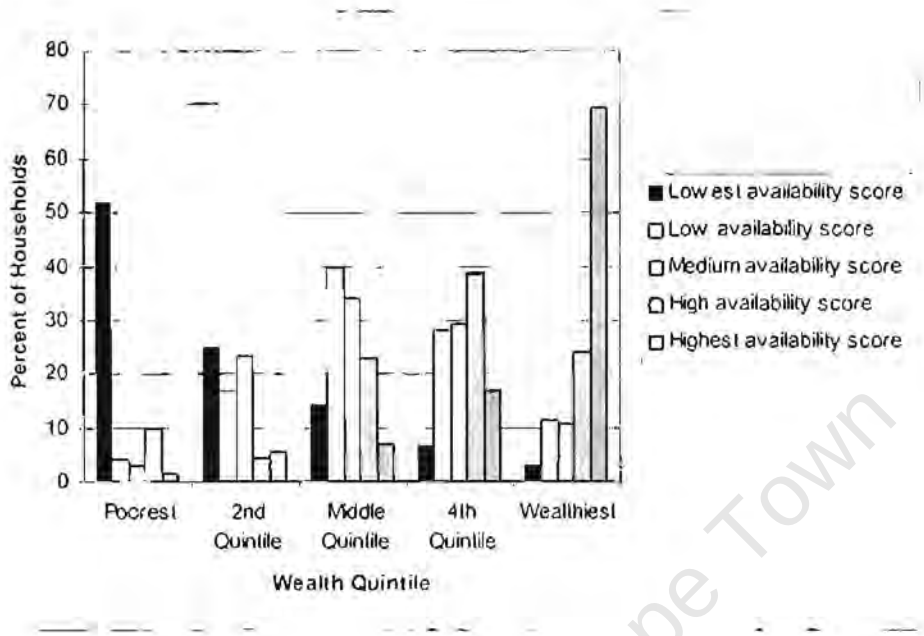


As the diagrams illustrate, service availability here is very poor, with the lowest accessibility areas being concentrated in the interior of the district (Figure 13a). As expected, the urban area (Navrongo) has a relative advantage in access to health services over all the other areas in the district. In areas such as Doba, Kologo, Kayoro, Katiu and Chiana where the CHOs are located (Figure 13b), service availability appears relatively better than in areas like Nakong, Sirigu, Mirigu and Manyoro, where the CHOs do not operate. The village of Naga where CHOs also operate is peculiar though, as it still has worse access to health services relative to the areas in which the CHOs do not reside. As earlier discussions have shown, most of these areas are on average 6 km and 5 km away from the health centres and CHO areas, and more than 10 km away from the hospital. Coupled with the fact that the opportunity cost of seeking health care during the peak

malaria season (rainy season) is high, the availability of health services is therefore significantly low. This has definite implications on the households such as causing delays in seeking health care for malaria. Notwithstanding the low availability of health care in general, the presence of the CHOs in some communities is improving this availability to some extent. Nonetheless, far more efforts are needed to increase the number of CHOs in these areas, as well as to expand their use to areas that currently do not have them.

The availability index also highlights great inequities in service availability across socio-economic groups. Whereas close to 70% of the wealthiest households have the highest availability index of health care, only 1.5% of the poorest households have the same (Figure 14). Likewise, only 2.1% of the wealthiest have the lowest availability in contrast to over 50% of the poorest quintile. The disparities between the rich and the poor are thus very pronounced for the availability dimension of access, which implies that greater policy efforts are needed within districts to bridge the existing inequities in health care availability.

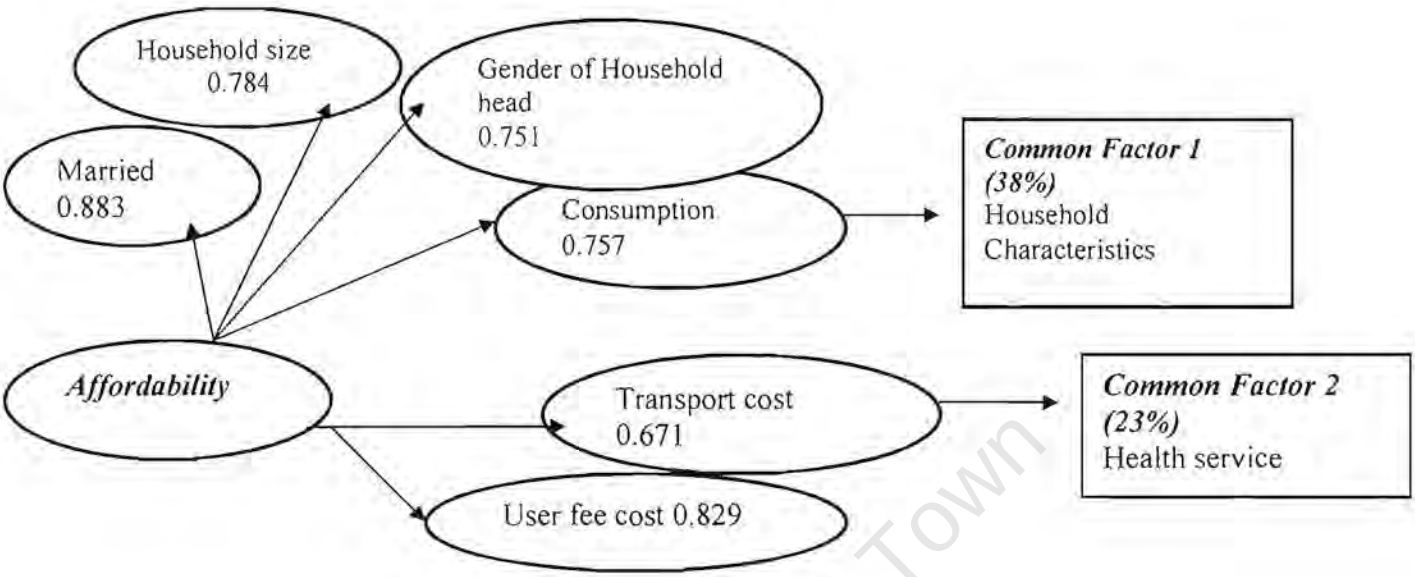
Figure 14: Availability Score by Asset Quintile



7.5.3 Affordability as a Dimension of Access to Health Care

The affordability dimension of access is also influenced by two common factors. The primary factor is associated with the characteristics of the household whereas the second factor is a user fee cost factor (Figure 15). Factor loadings for consumption, household size, the head of the household being male, and marital status were significantly higher in respect of the primary factor (common factor 1). This indicates that, the characteristics of the household are the critical factor in determining the affordability of health care.

Figure 15: Factor loadings and Common Factors of Affordability Dimension



The average household size was five, and larger households with more than five members had significantly more economic resources compared to households of smaller sizes. Smaller households also tend to use health care less frequently than do larger households. There were no significant differences in the level of education between smaller and larger households. It may therefore not be surprising that bigger households have more economic wealth, as they are more likely to have a broader social support system than smaller households. Furthermore, having many children in this cultural set-up provides the household with free labour force and thus with economic wealth (Ngom et al., 2003; Bawah et al., 1999; Adongo et al., 1998). Some of the qualitative interviews provide an explanation for this difference.

Respondent:..... *if I have many children to feed, I will be poor. But if the children grow and become independent and can even support me, my condition will improve. So if people were suffering and now they are enjoying, it is because there are people in the family now who can support the family purse* (IDI: Elder Interview; Kurugu Village)

Respondent: *Normally, one will think that the one with the eight children is supposed to suffer compared to the one with only two children. But since the eight children are more than half of the labour force of the one with only two children and working to support their parents, they could even be far better off them the one with the two children* (FGD. Men 36-45 years; Nogsenia Village).

The annual average consumption levels were 1.6 times higher for larger households than for smaller households. Smaller households had females as household heads and over 50% of them were widows. This probably explains why smaller households are the least likely to be able to afford health services although under normal circumstances the size of the household should put constraints on the consumption budget of larger households as had been assumed in the conceptual framework.

The gender and marital status differences can be attributed to the fact that men have more education and economic resources. As explained earlier, the Kassena-Nankana district is a patriarchal society where males have more economic sources, which naturally produces inequalities in the use of resources (such as to seek health care for instance). As a result,

female-headed households are more disadvantaged in terms of the economic resources available to them for this.

With regard to the second common factor, user fees are of greater importance to households than transport costs, further affirming the implication of user fees for access to health care (Figure 15). User costs in a previous study in Ghana also showed that respondents preferred to pay between 4000-7000 Cedis (US$0.47-US$0.81)[5] in a mission hospital compared to over 10,000.00 Cedis (US$1.16) for basic health services in a public hospital (Garshong et al., 2001).

The overall affordability dimension of access explained about 62% variation of health care affordability. The household's socio-economic characteristics factor (38%) is a primary explanation for affordability of health care and user fees (24%) being a second factor. As observed, this model was only able to explain 62% of the affordability of health care, which implies that there are other access factors that this study did not include in analysing the affordability dimension, and which might further explain the observed differences. Education and occupation factors did not load on any common factor of this dimension due to the very low factor loadings and hence were not included in the presentation of the results.

The high factor loadings of consumption, household size, gender and marital status of the household factors observed in Figure 15 imply that the socio-economic position of the household and its make up are probably a large cause of lack of access to health services

[5] 8600.00 Cedis =(US$1.00) in 2003

rather than direct user fee costs. Impoverished households may not have access to health services not because direct out-of-pockets payments of health services may be high, but rather because of these other indirect inhibiting factors. For example, out of 474 (34%) children less than five years who reported ill in the last month, 80% had sought public health care, whereas 19% and 1% sought health care from chemists and traditional healers respectively. Despite the fact that health services are free at the point of service for these children, the poorest households (27%) still sought health care from the chemists in a greater proportion of cases compared to the wealthiest households (14%). This suggests that the socio-economic characteristics of the household may be more important than direct costs of health services in facilitating access to health care.

The primary factor of affordability may be essentially regarded as an indicator of socio-economic disadvantage for geographic areas and among households in the district (Figure 16a and 16b). In contrast to the availability disadvantage index reported in the previous section, the diagrams show that areas with high affordability scores are in the interior of the district especially areas such as Naga, Nakong and Kayoro that had the lowest availability scores. This is not surprising, as these areas have large forests and farmlands and thus have more farm yields than other areas in the district. It was indicated earlier that farming makes up about 80% of the livelihood of the Kassena-Nankana people and thus provides the bulk of income for the people. However, some areas are disadvantaged in both dimensions by having the lowest availability and affordability scores as well (Mirigu and Kandiga areas).

Figure 16a: Affordability of Health care: Disadvantaged Areas

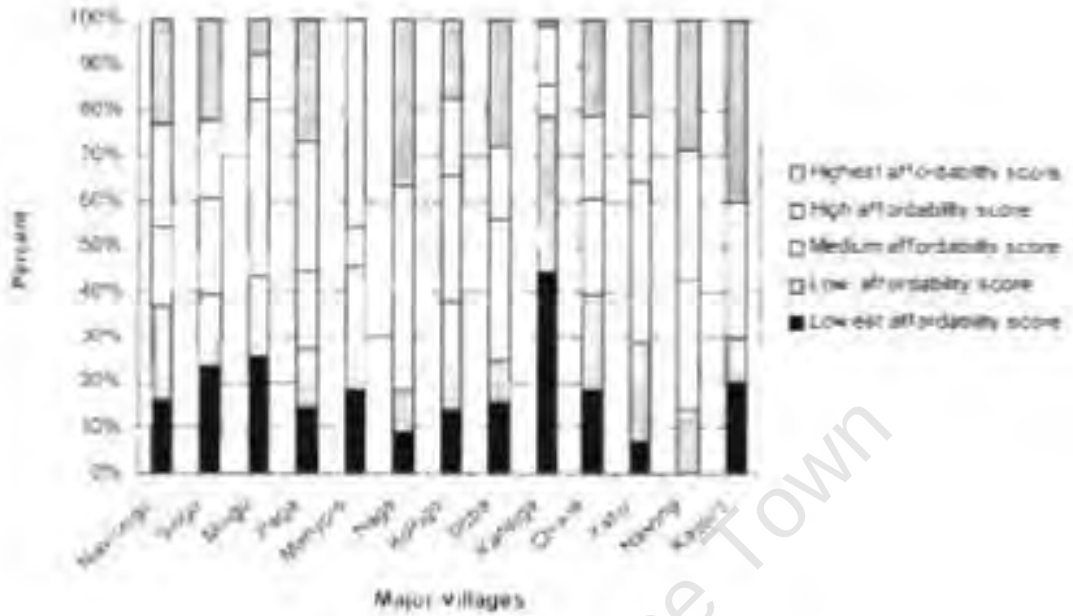
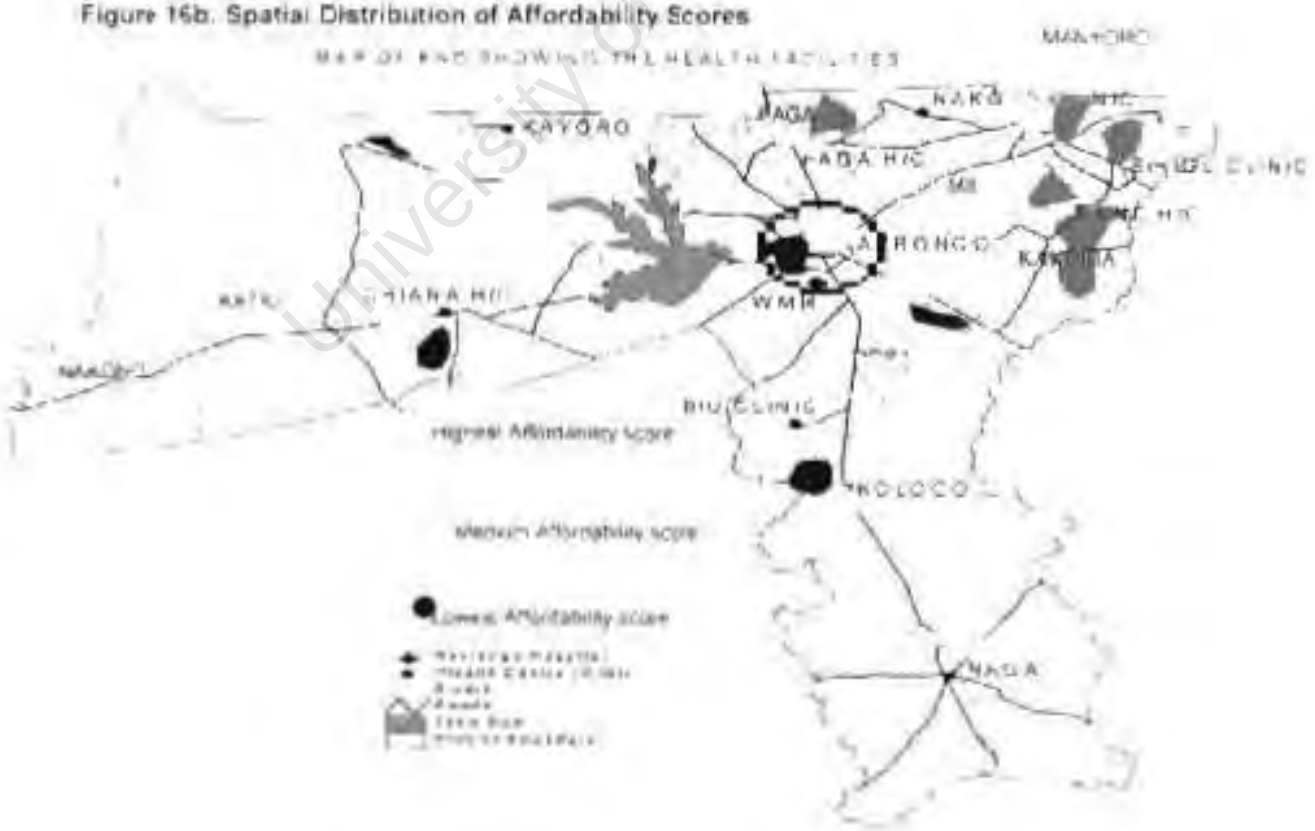


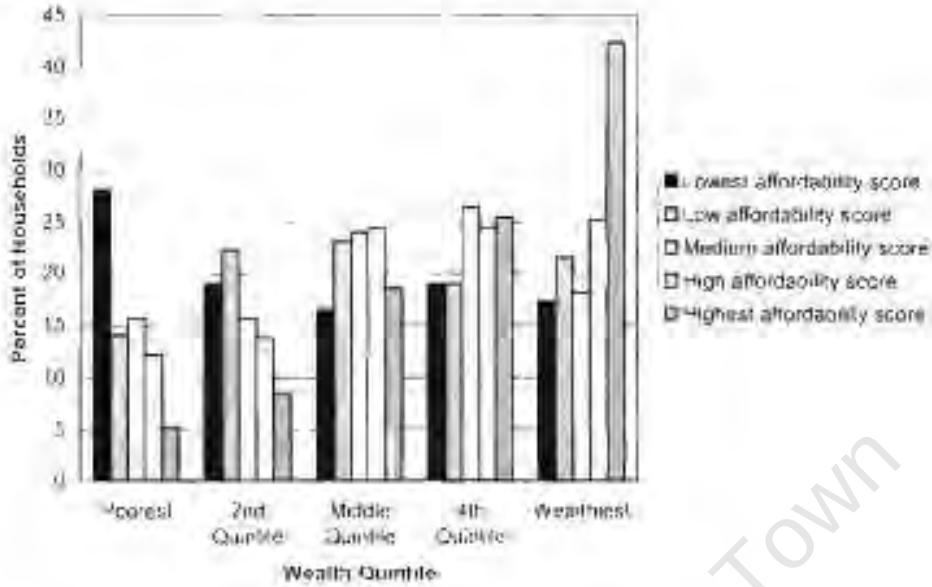
Figure 16b. Spatial Distribution of Affordability Scores



These findings demonstrate that areas that may be disadvantaged in terms of the availability of health services may not necessarily be disadvantaged economically. However, there are areas that are disadvantaged in all dimensions of access, and thus health officials need to take into consideration the differences in needs of the different areas and thus prioritise service provision accordingly.

In addition, there are significant disparities among households in affording health services. Generally, the affordability of health care is of primary concern to all households with a reasonable percentage across all the socio-economic groups having the lowest affordability score. The inequities are however very striking between the poorest 20% and the wealthiest 20%, with less than 5% of the poorest having the highest affordability score compared to over 40% of the wealthiest households (Figure 17). The critical factor determining affordability is the household socio-economic position and this is reflected in the poverty levels in the district.

Figure 17: Affordability Score by Wealth Quintile

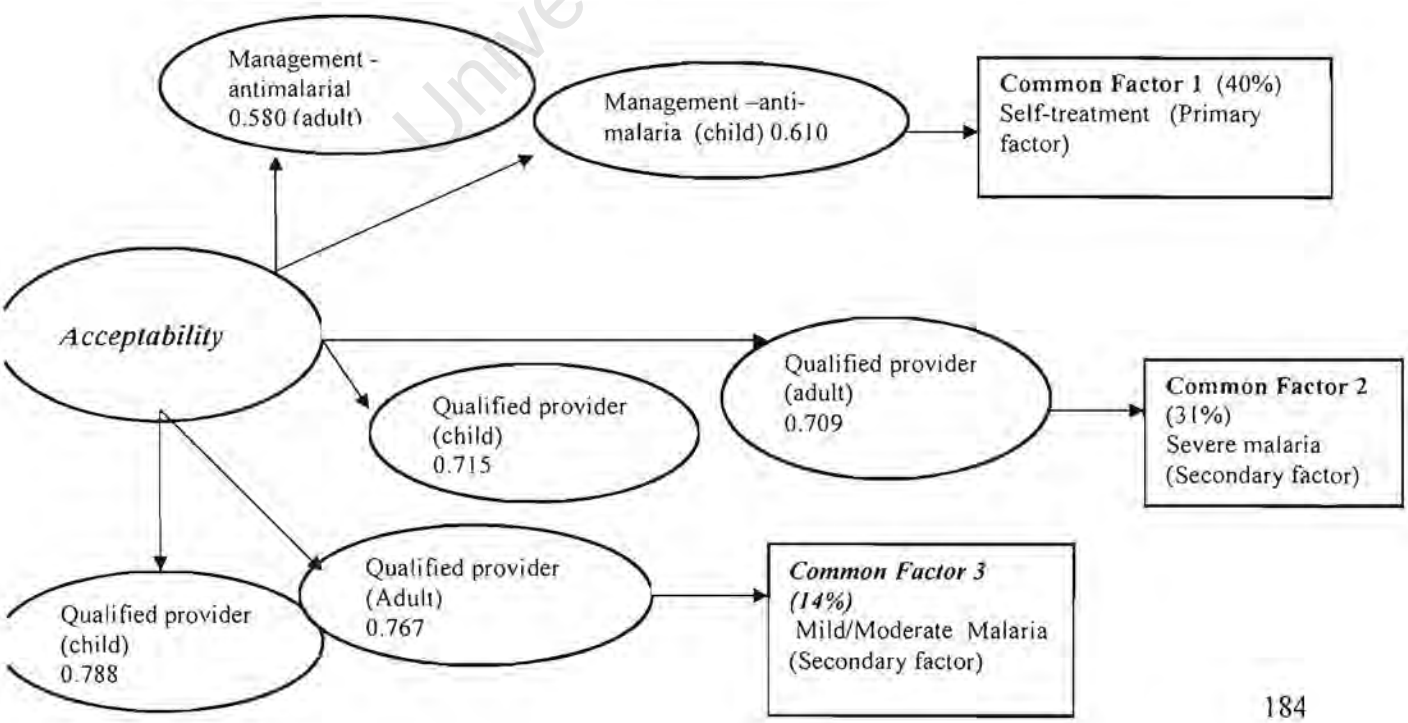


The poverty analysis conducted in Chapter 5 showed that about 60% of households live below US$1.00 per day. Extending this analysis to consumption per person indicates that all residents of the Kassena-Nankana district could be described as living on less than US$1.00 per day. The implications of this is that removing user fees alone are not enough to ensure access to health services, and thus it is critical to draft policies directed at improving the economic position of households. Much of the emphasis is on health service delivery on the supply side of health care but the results of this study indicate that the demand side is even more critical if access levels among the poor are to improve.

7.5.4 Acceptability as a Dimension of Access

The acceptability dimension is described by the treatment method that households use to treat and manage malaria, and the religious and cultural beliefs of households. An appropriate treatment for malaria is specified as the use of effective antimalarials and professional health services rather than herbal medicines. Unexpectedly, education, the cultural and religious beliefs access factors had very low factor loadings and did not constitute a factor in interpreting the acceptability of health services. This may imply that the use of western medicine is generally accepted as an effective treatment for malaria. The three common factors then extracted to explain acceptability were related to general self-treatment of malaria and the management of different severity levels of malaria (Figure 18). The first common factor is primarily how households' self-treat malaria with anti-malarials at home, which explains a 40% total variance in the acceptability of health care.

Figure 18: Acceptability Dimension



The secondary factors are more related to management of different severity levels of malaria. The second factor, for instance, loads high on households' management of severe malaria in both adults and children by using qualified health providers. The second factor explains 31% of the acceptability of health care for malaria. In contrast, the third factor explains 14% of total variance in acceptability and the access factors that load high are those that explain how households manage mild to moderate malaria in children and adults by using professional medical personnel. Thus the management of different levels of severity of malaria is a secondary indicator of the acceptability of the use of antimalarials and services of health professionals in managing malaria whereas how households generally manage malaria at home is the primary indicator of the acceptability of effective malaria treatment.

High factor loadings of self-treatment with anti-malarial, implies that households tend to assign higher values to the treatment of children with anti-malarials for malaria than to the treatment of adults. Likewise, for those scoring highly on acceptability, high values are placed on the use of a qualified health provider for severe malaria in children and adults, as well as the management of mild to moderate malaria. The low values accorded to the use of herbal medicines, which are culturally related, indicate that traditional practices do not significantly impede the use of effective anti-malarials in treating malaria, which can also be seen in the reports of the low use of healers in this study. Previous misconceptions in respect of the inability of western medicine to treat convulsions effectively are being dispelled as indicated earlier because of the close collaboration between the Rectal Artesunate Trial and traditional healers in the district. Fostering this collaboration should in effect provide adequate information on the

effective treatment of acute malaria at formal health care facilities. Despite the fact that the acceptability of modern medicine in treating malaria is not significantly affected by cultural beliefs in this setting, there are still inequities in acceptability of the use of anti-malarials and qualified providers by area and socio-economic groups.

The disparities in the acceptability of health care are similar to the patterns observed with regard to the availability of health services (Figure 19a and 19b). Areas with lowest acceptability scores (low access to antimalarials and use of health professionals) are areas with the lowest availability of health services. This indicates that the less available effective treatment and service provision are accessible in areas, the lower the use of effective anti-malarial or health providers. Thus, socio-cultural factors may not be the most important factors impeding access to effective treatment but the primary factor may be the availability of health services. Interestingly, areas with lowest acceptability (Naga, Chiana, Nakong, Katiu and Kayoro) are economically better off than other areas as they had the highest affordability scores, and yet households in these areas tend to use more herbal medicines for treating malaria. This reaffirms the earlier argument that the lack of use of effective anti-malarial treatment in these areas may not be due to cultural beliefs but could be significantly tied to service availability.

Figure 19a Acceptability of Health Care: Disadvantaged Areas

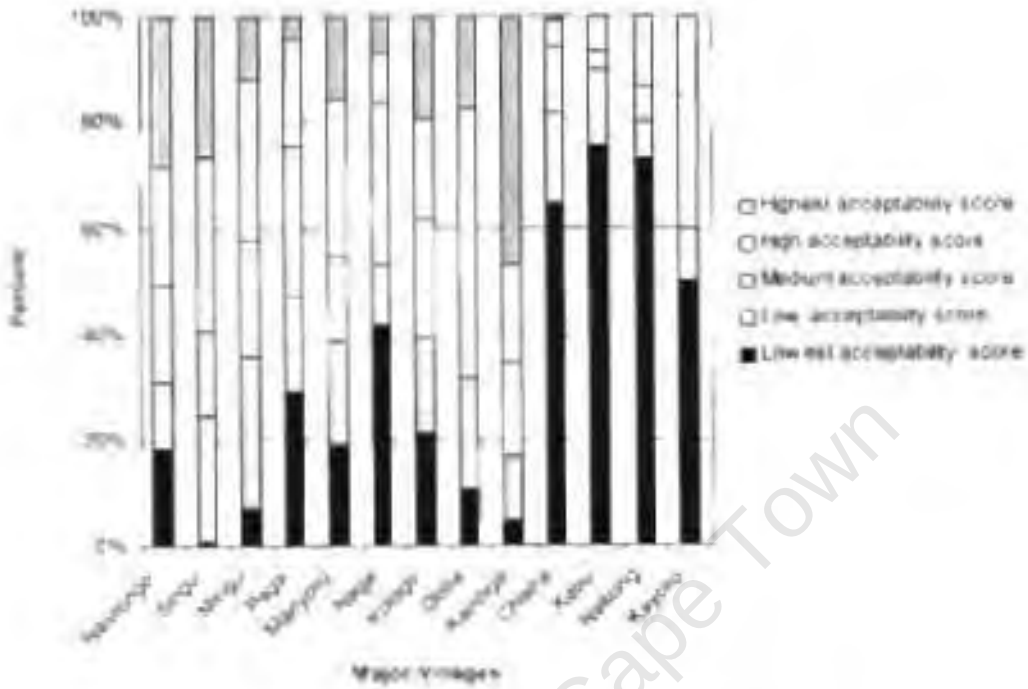
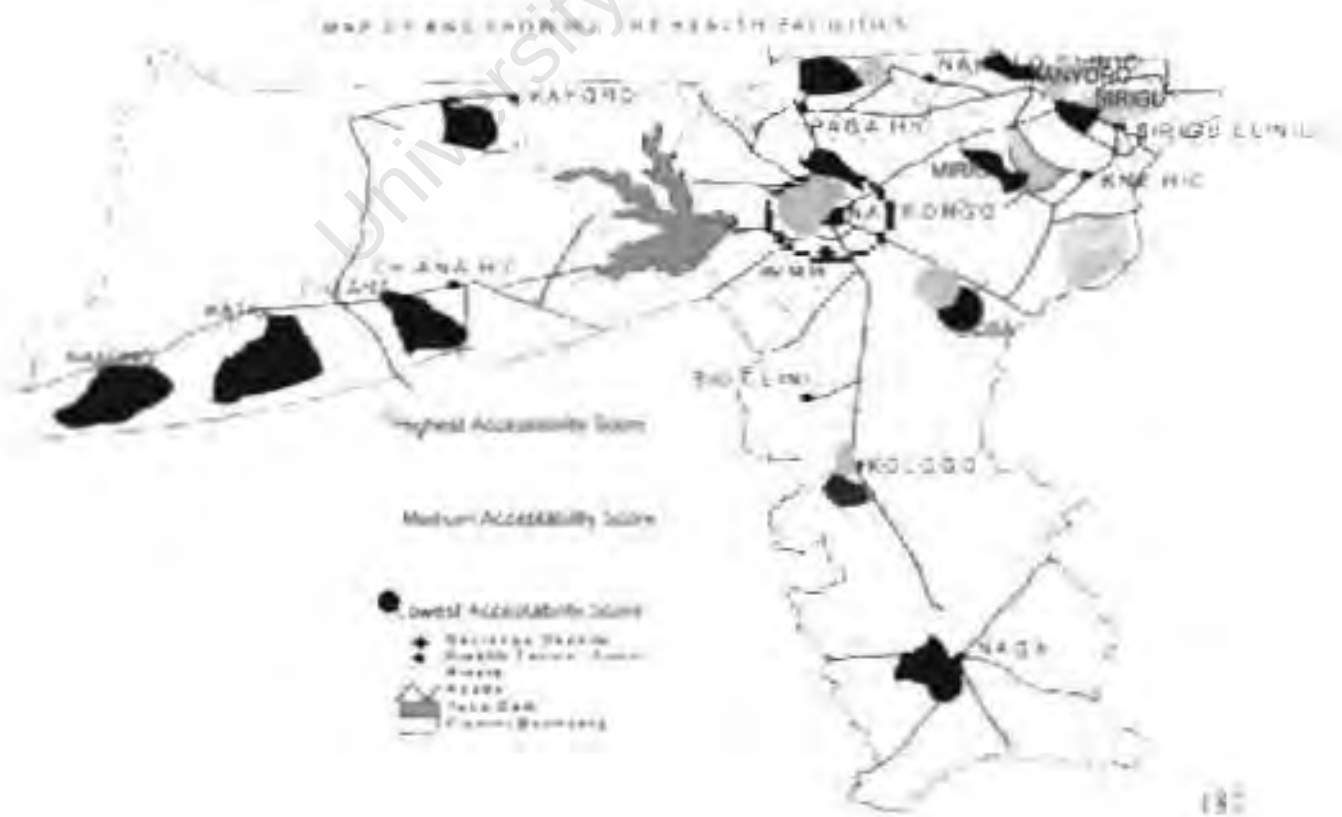
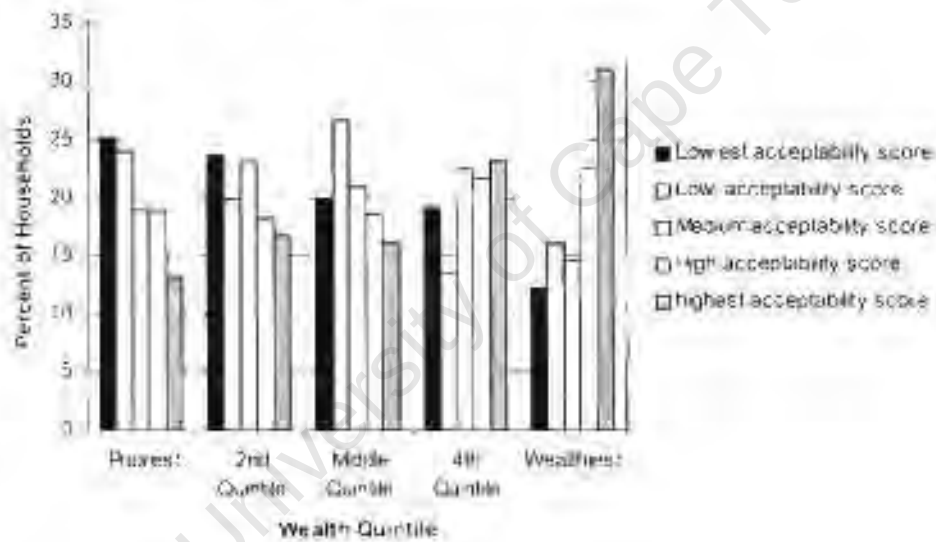


Figure 19b: Spatial Distribution of Acceptability of Health Care



A further indication that socio-economic status may not necessarily result in low acceptability of effective anti-malarial treatment is depicted in Figure 20. Low acceptability scores or areas that have poor access to effective anti-malarials are less reflected in the socio-economic status of the households. Poor access is widespread among all socio-economic groups with both the wealthiest (12.3%) and the poorest (25.1%) having the lowest acceptability scores although the wealthiest still have an advantage over the poorest.

Figure 20: Acceptability Access Score by Wealth Quintile

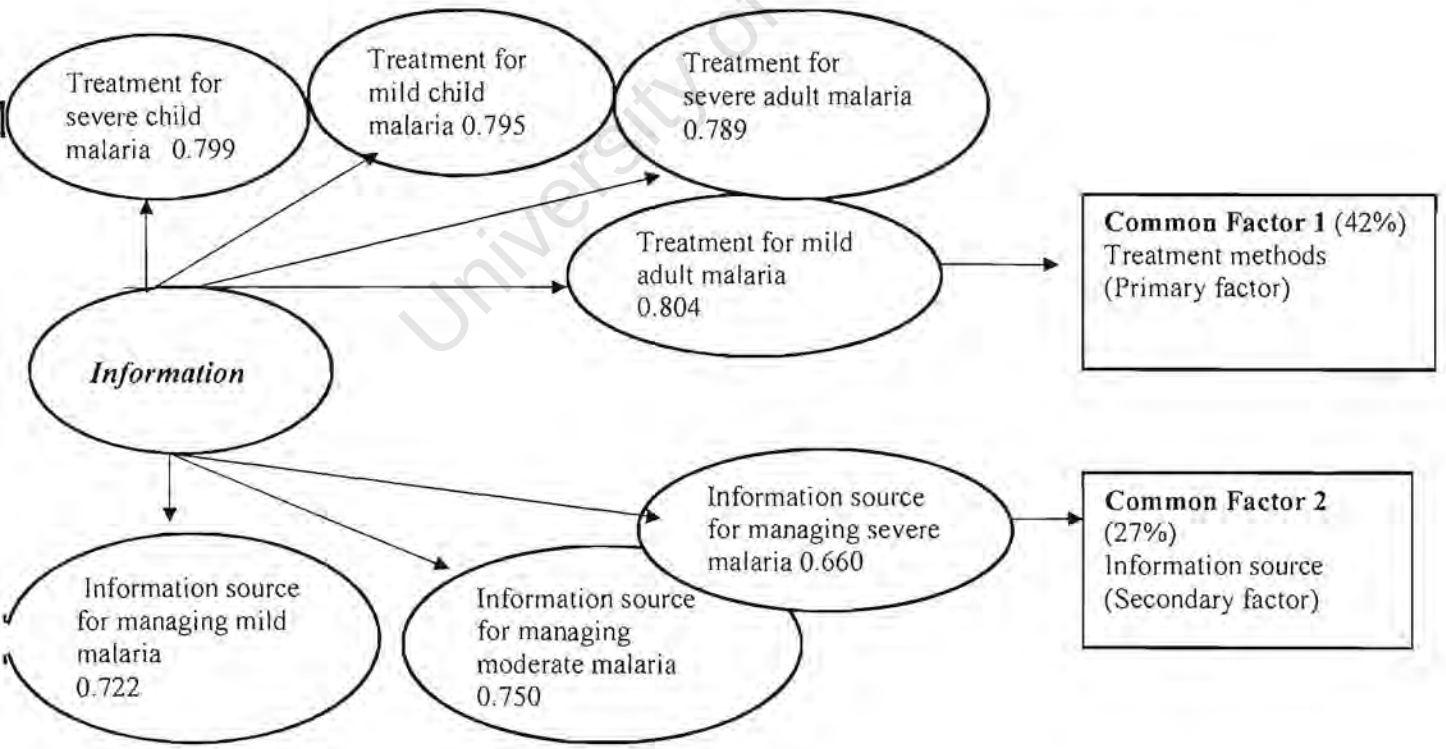


These differences in access across socio-economic groups (acceptability scores) may thus be more associated with availability, affordability and information dimensions of access than with acceptability. The efforts of government policies in bridging the gaps between the poor and the rich with regard to effective health services for malaria should place emphasis on the other three dimensions of access.

7.5.5 Information as a Dimension of Access

The factor analysis on the information dimension contained in Figure 21 revealed two factors to explain access to health information: the use of a qualified provider to treat malaria (primary factor) and the source of information (secondary factor). The first factor relates to the sources of care that households use for treating mild and severe malaria. The second factor, on the other hand, relates to the source of information for treatment, and the two factors together explain 69% of the total variation in access to information. The level of education and religious beliefs did not make a significant difference regarding the source of information and the methods of treating malaria (see Appendix VII).

Figure 21: Factor Loadings and common access Factors of Information Dimension



The high loadings for the treatment of mild and severe malaria in adults and children using qualified health providers indicates the level of knowledge of the household with regard to appropriate malaria treatment methods. In addition, in households where adults are treated with anti-malarials for both mild and severe malaria, the tendency is to treat children with similar symptoms with anti-malarials from qualified providers. This contrasts with households that use herbal medicines to treat severe adult malaria. Households also have a high probability of relying on information from professional health providers, if the first source of information on managing malaria was obtained from health professionals as the high loadings indicate, compared to where the first source of information was a relative.

Inequity in access to appropriate treatment and information using the information disadvantage score indicates that access to appropriate information is low in the district but pronounced for areas that are farther away from the centre of the district (Figures 21a and 21b). The trend that is observed here for areas farther in the interior of the district is that these areas are more disadvantaged (poor access) with regards to availability of health care, and acceptability of health services and that they have the lowest access to information from qualified providers. As noted earlier, these areas are however economically better off than most areas that have good access to available care and information.

Figure 21a: Information Score: Disadvantaged Areas

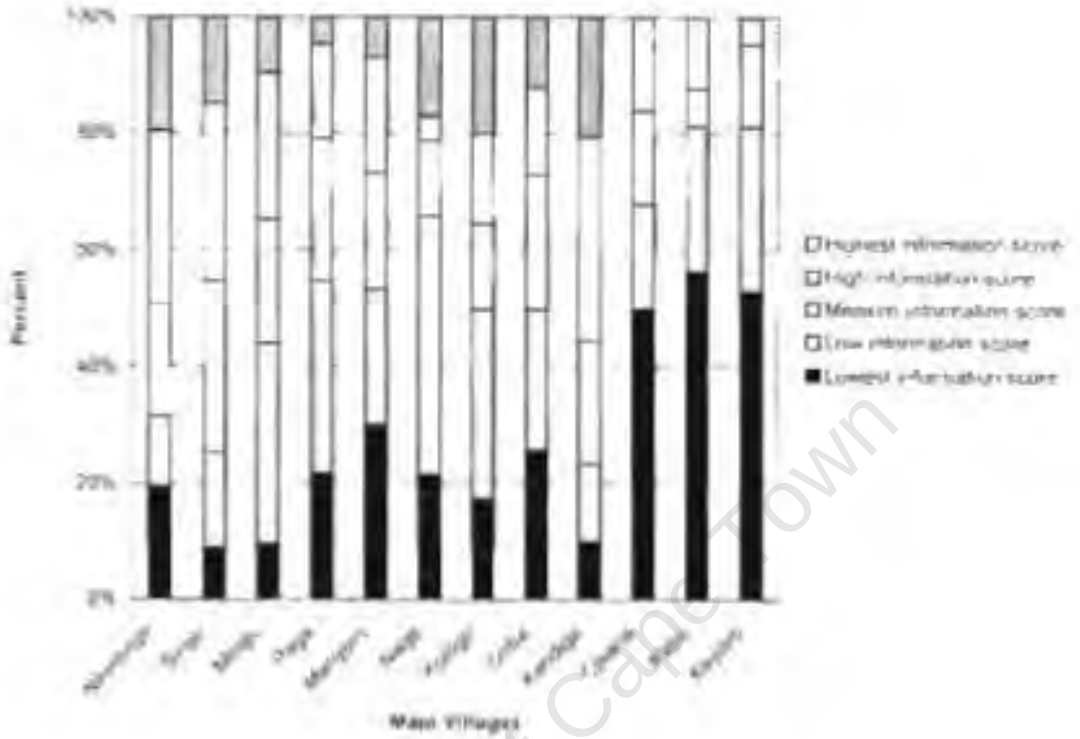
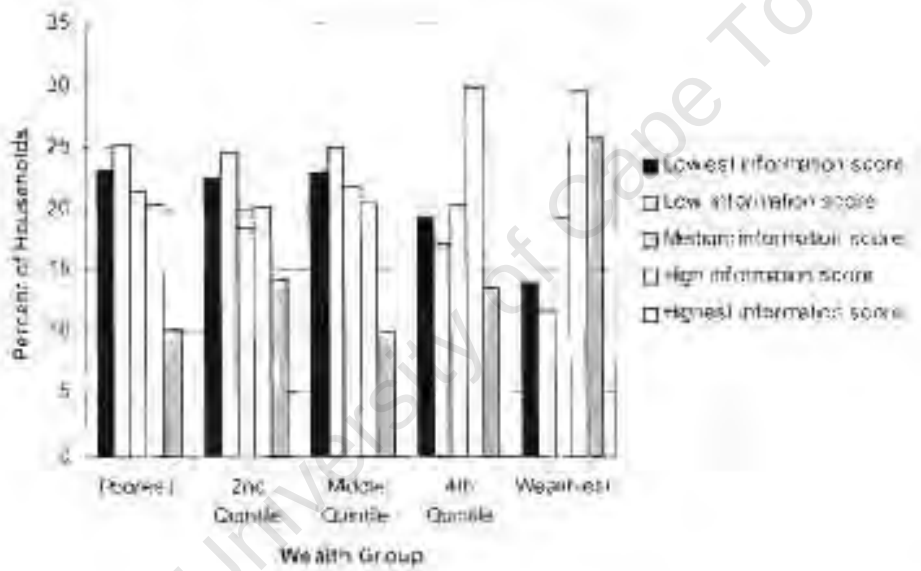


Figure 21b: Spatial Distribution of Health Information

As already discussed, villages that were highly disadvantaged in access to health information (lowest information score) were not located in the most socio-economically disadvantaged areas. Thus, in Figure 22, poorest households may be socio-economically disadvantaged but have more access to health information; likewise, the households that are economically better off may represent households that have less access to health information.

Figure 22: Information Score by Wealth Quintile



One can however still see disparities in access to health information within each socio-economic group. For example, over 25% of the wealthiest households have the highest advantage in terms of health information; this compared to 13.9 % of wealthy households who have the lowest access to health information. Similarly, among the poorest households, 23.1% have lowest access to health information relative to only 10% with the

highest access to health information within the same quintile. These inequities in access to health information within the same socio-economic group indicates that care must be taken not to assume that areas that are wealthy, automatically have the highest access to health information relative to poorer groups, rather efforts must be made to reach both poorer and richer areas that are in the remotest parts of the district with health information, but also to specifically identify the poorest households within each area.

In general, the results from the dimensions of access – availability, affordability, acceptability and information – show that many areas of the district are disadvantaged in more than one dimension of access to health care. The primary factors determining access to available health care are physical distance to health care, travel time and the range of inpatient and outpatient services. In respect of affordability, the socio-economic position of the household with regard to economic wealth, gender and marital status of the household head and household size are the outstanding factors. The primary determinant of the access dimension information is the use of appropriate professional health information for treating mild and severe malaria. Acceptability of health services as we have seen is low but this is linked more to the non-availability of health services in the more distant areas of the district than to cultural factors or financial barriers in these areas. These primary factors are therefore the most important determinants of access to health care for malaria in the district. One critical issue to note, as illustrated in the conceptual framework, is that it is the availability dimension that best measures the supply side of access to health care and that the other dimensions reflect the demand side components of access to health care, especially with respect to malaria. These are

centered around the characteristics of the household. The socio-demographic and economic characteristics of the household coupled with knowledge and the sources of health information are priority factors that determine the demand for malaria control interventions. Generally, as the scores on the dimensions show, access to health care is low within the district. However in order to tackle access problems in the most deprived areas, their relative needs must be taken into account. Some areas have greater need for service provision whereas other areas have more need for financial access or appropriate information for accessing health services.

Chapter 8: Discussion of Key Findings

8.1 Introduction

This chapter discusses the results presented in chapters 5,6 and 7, highlighting the critical findings of the study with regard to the management of malaria by households and their implications for current malaria control interventions. The discussion also examines the economic status of households and the implication of this for access to health services and poverty in the district. The primary focus of this research was to find an objective measure of access to health care and to highlight the critical role of the individual access factors on overall access to health care, as well as propose strategies to improve such access. The chapter begins by discussing the use of self-reported morbidity as a measure of health status and presents the methodological issues regarding the use of the wealth index in measuring socio-economic status and disparities in health services access.

8.2 Methodological Issues

8.2.1 Strengths and weaknesses of PCA in the study context

The rationale for the use of principal component analysis (PCA) in this study lies in the need to quantify and identify a phenomenon that cannot be measured directly. PCA allows the identification of groups of variables that are interrelated via a phenomenon that cannot be directly observed. This is in contrast with other multivariate regression techniques available that require the use of a directly observable and quantifiable variable as the dependent variable in order to establish a relationship between the dependent and

independent variables. Access as described is multidimensional and cannot be measured with one observed and quantifiable variable. Various variables that are interrelated explain each dimension of access and it is postulated that each dimension is explained by a set of interrelated variables. Thus, by using PCA it is possible to identify the variables that characterize each dimension and discriminate among the dimensions of access.

PCA also allows the use of a screen plot to select the factors that manifest strongly as characterizing each dimension of access. These different techniques of selecting, which common factors and variables should be included in a model make this technique more suitable for measuring a non-observed factor such as access (Rushton, 2004; Burstyn, 2004). The principal factor scores generated via PCA are used as a measure of factors that act as explanatory variables in the model. In compiling a disadvantage index of access to health care, the factor scores were used to generate an index with the lowest score representing the most disadvantaged area and the highest score representing the least disadvantaged area. The use of other multivariate technique would not have offered the opportunity to compile a disadvantage index to examine disparities in access to health care in small geographic areas.

The technique also yields factor loadings, which are a correlation between the principal component scores and the variables and these are examined qualitatively to interpret the principal components. This was important in this analysis as it explained which common factors were associated with each dimension of access.

A frequent point of criticism of PCA in contrast to other methods as highlighted earlier is that it produces results of what one expects to see and that the technique is unable to test the significance of the results. It is also criticized for problems in replicating the analysis (Kline, 1994). Other limitations of the technique relate to the fact there is no external criterion, as there is in logistic regression, multivariate analysis of variance and discriminant function analysis, to establish how the solution best predicts group membership. Rotations are applied to make the common factors interpretable and frequently, rotations will produce the same amount variance but slightly different from the original and the choice of the best solution is now based on the researcher's judgment of which solution produces scientific relevance (Tabachnick and Fidell, 1996; Kline, 1994). Notwithstanding these limitations, the PCA technique offers considerable understanding and interpretability of the access dimensions as illustrated earlier, and its advantages in the analysis outweigh the disadvantages by far.

8.2.2 Self-reported Morbidity as a Measure of Health Status

Self-reported morbidity was used as a proxy for the need for health care. It is thus regarded as a subjective measure as it is based on the respondent's perception of ill health. As a result, it is possible that poor people report less ill health than the rich although this may not in fact imply that they are really healthier (Wagstaff, 2002; McIntyre et al., 2001; Sauerborn et al., 1996). This study found indeed that the poor reported less of malaria burden than the rich, although the symptoms they associated with malaria indicated more severe malaria than that which they perceived. This reaffirms the

subjective nature of using self-reported morbidity. However, using health facility data, as a measure of access to health care may also be limiting as it excludes people who are ill but nonetheless use informal sources of care and who might in fact be the poor. Using utilisation data also cannot fully capture a measure of physical accessibility of health care. Hence self-reported morbidity turned out to be a better measure.

8.2.3 Concerns about the Use of Consumption and Wealth Index as Socio-economic Status Indicators

Major concerns with respect to using the wealth index are related to whether the inclusion of public assets in the index is appropriate for measuring household private wealth, as well as to whether this proxy-based welfare measure accurately reflects welfare differences, as does consumption or income.

The inclusion of public services such as toilet facilities and borehole water in calculating the wealth index often stems from the argument that most of the well-to-do live in areas where these facilities are publicly provided. Thus including them in the analysis is appropriate for creating a wealth indicator (Rustein et al., 2000). In this analysis, the use of a public water source (boreholes) was included but this asset item received a very low weight as an indicator of household wealth, thus implying that public assets could be excluded in measuring private wealth.

This study collected data in respect of consumption as well as household assets and possessions as indicators of socio-economic status (SES), and thus was able to make a comparison between consumption and the wealth index as a proxy measure of socio-economic status. There was a weak correlation (0.37) between the wealth index and consumption. The correlation coefficient is often low for assets and consumption in studies that have attempted to compare the two methods (Montgomery et al., 2000; World Bank, 2003; Sahn and Stifel, 2001). In analysing the use of health facilities, treatment methods for malaria, attendance at school of household heads, and use of insecticide treated nets, the proxy-based coefficient compared favourably with those obtained using consumption. Some studies have also confirmed that the wealth index compares well with coefficients obtained using consumption. For example, in rural Guatemala, Montgomery et al. (2000), analysing in respect of fertility, child schooling and mortality outcomes, obtained coefficient estimates from the wealth index that compared favourably with consumption. Similarly, in a study to predict school enrolment status by using data from Pakistani, Indonesian and Nepalese Living Standard Measurement Surveys, Filmer and Pritchett (2001) concluded that the wealth index compared well with current consumption and both were better indicators than the expenditure based measures in predicting educational enrolment. In addition, they noted that the wealth index was thought to act as a better measure of long-run household wealth than current per capita consumption (Filmer and Pritchett, 2001; Falkingham and Namazie, 2002). The results and findings of this current study are thus consistent with previous studies, which used both the wealth index and consumption. The methodology adopted for this research is therefore appropriate and the findings are indeed reliable.

8.3 Does the Choice of Socio-economic Indicator Matter in Measuring Equity in Health Care?

The comparison of the wealth index and consumption showed that both welfare indicators clearly classified socio-economic groups in the extremes (poorest and richest) whereas less distinction was found in the middle quintiles. In addition, the bottom 20% in terms of the wealth index had more households and villages in the poorest quintile than did the bottom 20% in terms of consumption. This pertained particularly to the use of health public health facilities and insecticide treated nets.

Similarly, the consumption index classified more poor households as owning durable assets that indicate wealth than did the wealth index. In using the wealth index, 60% of the villages were also placed in the poorest quintile compared to only 30% of villages when using consumption. Most of these differences were not statistically significant, as the proxy-based indicator compared well with the consumption index. However, the choice of the wealth index is more likely to show that the poor are more disadvantaged than the rich and, similarly, the choice of consumption as a welfare measure will highlight less disparities than there actually are. These differences that arise with respect of using wealth and consumption as indicators of welfare were also observed by Filmer and Pritchett (2001): they concluded that the two welfare measures should not be taken as proxies for each other.

The wealth index is also very sensitive to the number of asset items included in compiling the index. The selection of a broad number of asset items including durables,

housing characteristics and ownership of sanitary and water facilities, as items that reflect the socio-economic situation in a district such as the Kassena-Nankana, yields a low total variance of 21% as an explanation of wealth in the district. On the other hand, a selection of only durable asset items (television sets, cars, electric cookers, piped water and flush toilet), which do particularly indicate wealth, yields a higher total variance (33%) but has the potential of classifying many more households as poor, as these assets are highly skewed in favour of the rich. Inequities are therefore likely to be greater where few asset items selected for the index exclusively belong to the rich. Likewise, where most assets included are actually owned by the poor, fewer inequities will be observed. The use of the World Bank list of assets as described by Houwling and colleagues (2003), usually yields a low total variance, as it includes the highest number of variables in compiling the index. Their choice of a few items to test the sensitivity of the wealth index yielded similar findings as those found in this study: including fewer and mainly durable assets and excluding most housing characteristics and sanitation items, resulted in a considerable increase in the total variance of wealth explained by using these assets. The comparability of the wealth index with consumption shows that the adoption of the wealth index may be more appealing as a measure of welfare, because it is easy and quick to collect data on housing characteristics and durable goods relative to consumption. However, care must be taken when determining the type of assets to include in compiling the index. A better approach to the selection of items as had been used in this study, which is to hold brief discussions with community members using focus groups interviews and thereby to ascertain the assets and housing characteristics that they associate with wealth. Focus group discussions are usually easy and inexpensive

to carry out. The impact of these welfare indicators on the health seeking behaviour of households and access to health services is certainly critical, as they do highlight inequities in health care access.

8.4 Determinants of Access to Malaria Health Services

Households do have considerable knowledge of the perceived signs and symptoms that constitute both severe and mild malaria, but the perception of severity varies by education and by socio-economic status. There were no significant differences in the signs and symptoms of mild malaria reported by both the poorest and the wealthiest households, but there were significant differences in reporting the signs and symptoms of severe malaria.

Interestingly, the poor when reporting signs and symptoms they considered as signs of severe malaria, described their conditions as being less severe than did the wealthiest households, as well as with those with higher than secondary education, when reporting similar signs and symptoms. McIntyre et al. (2001), in a study of illness/injury perception in South Africa reported that the poor reported less illness/injury but when they did report an illness, it was more severe as they had to take more days off work. They concluded that there is lower recognition of illness/injury among lower income groups than among higher income groups. Similarly, as Sauerborn et al. (1996) observed in a seasonal malaria study in Burkina Faso, in the rainy season people do not have the time to be sick due to the opportunity cost of seeking health care. Thus they may simply live with the

disease and act as if there is no ill health. The poor in this study might thus be ignoring the signs and symptoms of malaria with possible progression into severe malaria stages, with its attendant consequences, such as more days lost to productivity and high costs of health care.

Delays in seeking professional health care often lead to worsening health conditions. This was reflected in the number of severe malaria cases (56%) that had been treated at the hospital in this survey. The situation becomes even more critical as community health officers (CHOs) cannot manage severe malaria conditions effectively, and nor can health centres at the periphery. Delays in using professional health services is more pronounced among the poorest, further pushing them into poverty as they may have to seek hospital services for severe cases of malaria and thus pay more.

The choice of a treatment method or health provider for treating malaria was primarily determined by age of the person who was sick, marital status of the household head, sex and religious affiliation of the household head, socio-economic status and availability of health services. An overwhelming majority seek professional health care for severe malaria when it afflicts children, but far less so for adults. Similarly, male household heads who have more economic resources and are gate-keepers in the Kassena-Nankana context (Ngom et al., 2003), sought more professional health care than did females who are not only economically disadvantaged but moreover require permission from male compound heads to seek professional health care. A greater proportion of women thus

seek health care from chemists, which do not require permission from the compound heads as drugs from the shops can be purchased when women go to the market.

Those who adhere to traditional religion use more herbal medicines to treat both mild and complicated malaria, and 80% of the poorest households profess a belief in traditional religion. Thus, traditional religion may lead to the poorest households using less effective methods of treating malaria even in situations where formal health care services are available free of charge for the poor.

Whereas the wealthiest households also received health care from professional health care facilities for mild and severe malaria cases, the poor only sought professional health care in cases of severe and potentially fatal malaria. Mild and moderate malaria conditions are self-treated by the poor.

The placement of community health officers (CHOs) in rural communities is however having a positive impact on the use of anti-malarials by households. In the areas of the Kassena-Nankana district where these CHOs are located, less than a third of households used the chemists compared to over 50% of households in the control area, where the CHOs do not operate. This implies that the quality of services provided by these professional nurses is preferable to the use of chemists. Thus, the expansion of the CHPS programme would enhance and facilitate the more effective treatment of malaria.

Inequities also exist in the use of insecticide treated nets. Insecticide treated nets in this study were used mainly by the wealthiest households than among the poorest households.

This also indicates that the highly subsidized UNICEF nets for pregnant women and children under five are benefiting the wealthiest households in the district. The current strategy of using immunization and antenatal cards for distributing ITNs, which are subsidized by UNICEF, is however hardly reaching the poor, as the poor may be the least likely to have immunization cards which is a prerequisite for being provided with the net. This seems to suggest that stricter targeting needs to be in place to actually get the poor to benefit from these nets. In a district such as KND, where households have well-defined identification numbers, developing a poverty map should allow programmes aimed at benefiting the poor to be more effective. The use of poverty maps or disadvantaged area maps as developed in this study are useful in highlighting disparities, as well as pinpointing the areas that have poor access and need to be targeted for interventions.

Differences in access to appropriate health information also lead to the use of different methods and sources of information for treating malaria. It is quite clear that the perception of the severity of malaria differs between the poor and the rich; thus although free services may be available for the poor, access might be low, because of a poor perception of disease. A gap that is acknowledged in treating malaria is also the lack of association between high knowledge of malaria signs and symptoms and the treatment of malaria (Heggenhougen et al., 2003; McCombie, 1996; Agyepong and Manderson, 1999).

Information can however bridge this gap by changing the behaviour of households in treating malaria. Efforts on the part of health providers to understand the diffusion of

information in treating common illnesses such as malaria, and integrating this within the primary health service delivery strategy, should improve the effectiveness of treating malaria early enough at the primary health care facilities in order to avoid the complications that require hospital treatment. A particular focus is needed on targeting elderly women and providing them directly with information on how to assist younger women in managing malaria in children. Results indicate that such elderly women are often the first source of information in treating malaria, especially in children, and their misperception of the severity of the condition could lead to delays and fatal consequences for the child. With the expansion of the CHPS programme, districts therefore need to emphasize the integration of malaria management information to cover not only the younger women attending child welfare and antenatal clinics but also reaching out to the decision makers at home. It is probably the most effective way of avoiding delays in treating minor malaria, which these health providers can manage at the primary health care level. These facilities mostly serve the poor on the periphery but their purpose is defeated when severe cases of malaria are taken to them, as they often lack the skills to deal with these cases.

8.5 The Impact of Poverty on Access to Malaria Control Interventions

The Kassena-Nankana district is generally very poor in terms of the economic resources of households, and has very low consumption levels. According to this study, over 59% of households live below the poverty line; similar findings were reported in the last GLSS (2003) report. While the GLSS figures were a general representation of the overall

region, this study examines inequities within the district and how these affect the distribution of health care and the health of the poor. The poverty map shows that there are significant differences in the level of poverty in the district; in some clusters or sections of villages, the disparities between socio-economic groups are even greater. Sections of villages in the east show relatively higher poverty levels than the rest of the district. The sections of villages in the west seem to have the worst distribution of consumption levels between the wealthiest and the poorest. Disaggregating the results of poverty levels within the district by using maps such as these is of particular importance for targeting health care programmes to those who need it most in the face of scarce health resources and in trying to identify the poorest of the poor. Poverty mapping is used frequently in Ghana, Malawi, and Ethiopia and in many other countries. In the last GLSS survey, a poverty map was produced for all districts in Ghana. Based on that, some districts and regions have been earmarked as poorest areas and the national health budget actually uses this to allocate more resources to the poorest regions (GSS, 2003, Benson 2002, Ghana Poverty Reduction Strategy, 2003).

Poverty generally is not a perception of the lack of income alone, but it was defined as not being able to meet the basic necessities of life and ones social obligations, such as contributing levies for family occasions and for community development programmes. The description of poverty indicates the multi-faceted nature of poverty and the range of strategies that need to be employed to address different facets of poverty. The non-income characteristics of poverty such as consumption of food, health and social exclusion were of more concern to households than cash incomes.

In relation to health, the poorest households generally pay as much as 13% of their total consumption on health care, relative to only about 5.1% for the wealthiest. Demery et al. (1995) reported very similar findings in respect of health care spending by the poor, with the latter spending as much as 11.8% of their incomes for health care, in contrast with 4.2% spent by the wealthiest households, nationally. This suggests that the percentage of spending on health care has increased with the growing burden on the poor. Disparities may be even greater for the Kassena-Nankana district, which is considered one of the poorest districts in Ghana.

In the current study, the poorest spent about US$2.1 of their total consumption for the last episode of severe malaria in public health facilities, compared to the less than US$1.00 spent at chemists. Poor health is acknowledged as a cause of poverty and vice versa. Poor households may thus pay more of their annual total consumption for health care that deprives them of other basic necessities. Paying for health care beyond certain levels would have significant adverse effects on the households as the findings highlight. It does not only deprive them of other basic necessities but also equally worsens their ill-health, as they resort to the use of less effective methods to treat malaria.

The wide range of aspects that are considered to contribute to poverty may seem to fall outside the domain of the health sector. However, strengthening current health strategies, such as implementing exemptions for the poor and allocating resources to highly disadvantaged regions and districts, could have a significant impact on improving health for the poor and making households more economically productive. Paradoxically,

though the poor are currently exempted from payment in terms of the policy, over half of one of the groups clearly targeted for exemptions (children under the age of five) who attended a government health facility still paid for health care for the last episode of malaria as a result of the policy's improper implementation. Of those children under five who did not benefit from the exemptions, 19% came from the poorest households.

The current strategy used by the Ministry of Health (MOH) to identify the poor and exempt them from fee payment, is certainly limited and inadequate given the issues raised in the qualitative interviews. The poor also include very poor households and poor individuals who do not fall in any of the categories covered by the policy. As the interviews highlighted, communities do have considerable knowledge of the poor in their communities, and sub-districts, which serve small populations at the primary health care level, and it is possible to start the process of identifying the poor based on the criteria proposed by community members. In a rural community of this nature, where formal employment and literacy rates are low, poverty is associated with lack of food, lack of animals that will assist one in times of need, and inability to contribute levies towards social activities. Possession of animals was associated with wealth, with owners of cattle being ranked as the wealthiest followed by those who have sheep and goats and other smaller animals. Dzikunu and Wujangi (2004) conducted a participatory poverty study to identify the poor for exemption and subsidies under the current health insurance scheme in the Chereponi district of Ghana. They arrived at the following criteria for identifying the poor, that is, availability of food, shelter, contribution towards development levies, ability to pay school fees and health care bills as well as single parents, orphans and the

mentally retarded. This further suggests that it is possible for communities to draw up criteria to identify the poor, which should ease the current problem of not extending exemptions to cover the poor due to a lack of appropriate criteria.

Using the community criteria, then, the poor could be issued with reference numbers that allow them to receive free health services under the current exemption scheme. When the mutual social health insurance schemes come into full effect, the same reference numbers could be used to provide free or subsidized services for the poor when they present themselves at any public health facility. The district mutual health insurance schemes are enrolling people of different poverty levels who are labeled as core poor, very poor and poor. These include people with no jobs, the aged and children under the age of 17 years and thus do not fully meet the community criteria for identifying the poor. These poor groups are provided with registration numbers representing the category under which one is registered. The insurance cards have different colours to indicate if the card belongs to a core poor, poor or a paying contributor. With the current registration, the protection of the poor from discrimination is not evident In this study it is proposed that a universal reference number system that includes both the poor and the non-poor but which offers a unique way of identifying the poor at the point of payment, would also protect them from being discriminated against or provided with poor quality services during consultation, laboratory tests and drug services. This is because a targeting system that does not conceal who is poor and who is not, seems to result in poor quality health services for the poor, as well as in health providers being hostile towards the poor (Gilson et al., 1995). In addition, there is also no mechanism with the current mutual insurance system of finding

out when socio-economic status of the poor or core poor improves especially with those who have no jobs. However, if the community identification criteria are implemented at the district and community level, the health insurance committees can use the community poverty identification criteria to make changes to the reference numbering system for those who move out of poverty and to enrol those who sink into poverty.

The CHPS program with nurses living in the community could further facilitate the implementation of exemption schemes at the community level, and it would do so much more effectively as the nurses could easily verify if households receiving free health services are actually poor households.

8.6 Measures of Access to Health Care

An appropriate measure of access was arrived at by evaluating the dimensions of access to health care in the Kassena-Nankana district, with particular focus on access to malaria treatment using the conceptual framework (Chapter 3). The overall total variance explained by the models presented herein shows the relevance of the dimensions and the individual access factors as measures of access to health care. The framework therefore offers a substantial improvement on how health systems can measure and evaluate policies that are aimed at improving access to health care. The modelling of each dimension also highlights the critical roles of each access dimension and factors as determinants of access to health care.

Physical accessibility significantly determines what type of health care people seek for malaria. Generally, those who live farther away were more likely to resort to self-treatment with anti-malarials or herbal medicines, further delaying prompt access to effective treatment.

Physical accessibility is also related to the cost of public transport coupled with treatment costs at the health facilities, which make services expensive. This does not take into consideration the inconvenience and loss of income, as one spends time at the health facility. The average distance to a primary health care facility; i.e. to a health centre or a community health officer's compound was 6 km and 4.6 km respectively. However, 50% of the poorest live more than 5 km away from a primary health care facility, and over 73% live more than 10 km away from the hospital. This contrasts with 37% and 41% of the wealthiest households respectively, indicating great inequities in physical accessibility, which continues to serve as a physical barrier to seeking health care for less severe malaria cases. The high value assigned to households on the distance factor in the factor analysis clearly indicates that physical accessibility is extremely important in determining the availability of health care Thus, although primary health care facilities are only 6 km away, residents make less use of them, only doing so in acute malaria cases that require hospital treatment; ironically, these primary health facilities cannot manage severe cases. Not only is physical accessibility impeding access to primary health care facilities, but households also tend to place higher value on health care facilities that are equipped to provide both outpatient and inpatient care, which could be said to be related to their perception of quality and the availability of doctors. Over 40% of households

members that visited the hospital went there because of the probability of seeing a doctor, however less severe illnesses such as mild to moderate malaria can be effectively treated at primary health care facilities, if communities are well informed and seek health care much earlier. The implications are that health services are still not available to the great majority of the population at the perceived required level and hence households are more likely to self-treat at home and only seek higher levels of care for complications.

Service availability in the district as based on the availability disadvantage index is very low, with over 40% of areas having the lowest access to service availability. Villages that are farther away in the interior of the district benefit least from available services. Service availability is therefore certainly concentrated in the urban parts of the district.

The CHPS programme may bring health services much closer to the people but a critical intervention that is required is to have an effective health education programme that would enhance communities' abilities to recognize early warning signs especially of malaria, so as to make the presence of the primary health providers much more effective.

Delays in accessing prompt effective treatment were also more frequently associated with poverty in households, and as a primary factor of affordability instead of user fees. Poverty levels in the district as well as the size of the household and the gender of the household head tended to be assigned high values as determinants of affordability. The emphasis of health services in Ghana has however been more on eliminating financial barriers to access than on understanding the role played by these demand factors. The

consumption of other goods and services such as food that are equally important for health may be more of a pre-occupation to households than user fees; and poorer households may even tend to perceive ill health and health care as less important. Gender is certainly related to economic power as well as to decision-making in the households regarding ill health, sources of care and other social activities (Ngom et al., 2003; Bawah et al., 1999). Men therefore have a clear advantage in access to economic resources to seek health care. Seventeen percent (17%) of the household heads were widows, and as some of the qualitative interviews indicate, single women with children have particular difficulties in providing food and health care to their families. Whereas issues of improving the economic status of households and influencing the gender and household dynamics may seem to be outside the control of the health sector, they are actually not. An effective health system could integrate the socio-economic background of the area it serves as well as recognizing the role of gender in providing effective interventions to meet the needs of the disadvantaged. In their recent review of the behavioural and social aspects of malaria by Heggenhougen et al. (2003), this social component was acknowledged as significantly affecting the use of effective malaria control interventions. In addition, the major challenge facing the implementation of effective drug and preventive activities lies in the difficulty of incorporating and providing effective information at the household level, emphasizing the fact that the health system needs to critically study the socio-economic characteristics of the population they serve and to harness this knowledge in providing effective services. Until an attempt is made to provide services in line with the perceived needs and circumstances of the population,

based on the knowledge we have of them, providing effective health services (especially for malaria) could remain a potential problem.

The use of the disadvantage index, as proposed in this study, can moreover assist in ascertaining the needs of deprived communities. Villages closer to the centre of town had the lowest affordability scores relative to villages farther in the outskirts, thereby implying that these areas closer to the town centre have more socio-economic barriers to access to health care than the others. Using this information should help the health system to design effective health services that address the demand side of access to health care.

The cost of health services was the second factor in determining the affordability of health services. Out-of-pocket payments for single malaria episodes in public health care facilities ranged from US $0.37 for less severe malaria to US $4.95 for severe malaria leading to over 37% of perceived severe malaria cases being treated at the chemists. Over 50% of the poorest households still rely on the chemists as the main source for treating both minor and severe cases of malaria. Many households also continue to resort to the use of ineffective treatment because of the cost of health care with its attendant consequences, such as fatal malaria cases. There is also inequity in the payment for health services with the poorest paying a higher proportion of their earnings for health services than the rich. As the findings show, the impact of ill health can be unpredictable and as such, the burden of health care cost can be adverse, especially for the poorer members of the community. Thus protection against financial hardship for health care use owing to catastrophic illnesses is desirable, especially for the poor. Current exemptions in Ghana,

as acknowledged herein do not in really benefit the poor, which means that effective malaria control interventions are unaffordable to about 60% of the population in the district who live below the poverty line. There is an urgent need for specific targeting of the poor for exemptions from fee payment, if more severe malaria cases are to be treated effectively at public health facilities.

In addition, efforts to identify chemists in the communities and to provide them with the right training and skills for diagnosing malaria and prescribing the right dosage for treating malaria are very important. This is because effective public services are not adequately available or affordable to a majority of the population in rural communities. Hence, recognizing the fact that many more households will resort to the use of chemists in the years to come means that integrating these private providers effectively is critical.

An intervention at the sub-district level to identify chemists within the communities they serve and provide training periodically should thus be particularly important in improving treatment for malaria. Findings from an intervention study in Zambia, which compared trained and untrained drug distributors found that the trained drug sellers improved the prescription of anti-malarials by about 32%, compared to only 3% in the control area, thus implying that efforts at training chemists can be an effective strategy (Tavrow, Shabahang and Makama, 2003).

Exploring a possible public-private mix of managing malaria may be an appropriate strategy as this could also enhance the implementation of the exemption from fee

payment scheme. These registered chemists could provide free drugs to the poor who have a prescription from a public health facility, and could be used in areas where these chemists are the main sources of treatment for mild to moderate malaria.

The acceptability of modern medicine for treating malaria was very high, and households placed a high priority on using anti-malarials and qualified providers to treat children and adults alike. However, the use of anti-malarials was significantly related to the severity of malaria, with the use of qualified health providers for severe malaria and the use of anti-malarials for self-treating malaria receiving high weights. This study has found that traditional healers were approached for cases of convulsions but in less than 1% of the severe malaria. The perception of convulsions as being only amenable to traditional treatment and not to conventional medicine is fortunately being dispelled by collaboration between traditional healers and the Rectal Artesunate Drug Trial Project. This certainly implies that with better collaboration between traditional healers, traditional methods of treating severe malaria will become less of a priority for households. Many households and areas that used herbal medicines did so because of the lack of availability and partly because of affordability of health care. However, areas that had the lowest availability scores were the villages that had highest affordability scores; yet, these were also the villages that used more herbal medicines. This confirms that, affordability and acceptability may actually not be impediments to the use of effective malaria control interventions in these villages, but rather services are just not available. The implications are that strategies for treating malaria will only be effective if treatment costs are affordable, services are close to households and there is appropriate information

for recognising dangerous malaria signs, and managing and treating effectively at home, as self-treatment at home for malaria continues to gain prominence in households.

Making appropriate information available to households is certainly a key factor in bridging the gap in access to available and affordable health care. The primary factor for the information dimension was information for treatment of malaria. Households who receive treatment information from a qualified provider, assigned high values to the use of a qualified provider; this contrasted with households that relied on relatives and the use of herbal medicines. The former households were also more likely to consistently use a qualified provider for both severe and less severe malaria cases. The results indicated that, paradoxically, most households who used formal health care for treating mild and moderate malaria reverted to herbal medicines and information from relatives in severe stages; this indicates that there is an information gap in respect of the appropriate method and source of information for managing malaria in mild and moderate malaria cases.

Access to accurate health information therefore plays a major role in improving access to health care and eliminating inequities in health care. Of concern, however, is the role played by informal sources of information in the process of treating and managing malaria, especially in poor households. It is clear that the main source of informal information for treating malaria is older women and women with childbearing experience. The fight to control malaria through recognition of the danger signs of malaria and through prompt access to effective antimalarial and appropriate care is far from being realized if information available to households is still based on what is passed

on from relatives, and more importantly, if people still rely on treatment from herbal preparations. The low access to health information generally implies that appropriate information does not reach the least advantaged members of the community, and where it does, may not be provided adequately during initial contacts with the health system, hence resulting in many households using relatives as sources of information after initial contacts with the health system.

As we have seen, there are great disparities in access to health care within poor districts, such as the Kassena-Nankana district. Some villages have a greater need for available health services, whereas others have a greater need for financial accessibility, and there are also areas such as Mirigu, which is disadvantaged in all dimensions of access addressed here. This sounds a note of caution to the effect that it is critical for health policy to tailor interventions to specific needs of areas. This would not only improve the services needed in those areas but also more importantly contribute to efficient use of existing health care resources. Areas that may not need financial support in terms of exemptions might in fact need better services to be provided, and thus resources should be channelled appropriately. With dwindling economic resources and the need to improve equity in access to health services, it is important that local needs are taken into account in health planning to enable the right access factors to be addressed, even in districts that are considered completely poor in relation to other districts nationally.

Chapter 9: Conclusion and Policy Implication

9.1 Introduction

This study set out to achieve a number of objectives. One of the primary objectives of the study was to deconstruct access into dimensions and to model the access dimensions in order to highlight which common factors manifested most in each dimension. Four main dimensions (availability, acceptability, affordability and information) of access were established based on their interactions with the demand and supply side of health care and interrelation between the variables of each dimension. The common factors describing each dimension were generated using the factor analysis, in particular PCA.

Another objective of this study was to develop a disadvantage index for measuring geographic disparities in access to health care. Using the factor scores of each access dimension, a disadvantage index was constructed. Areas with the lowest index were analyzed as areas of poor access and conversely, areas with the highest index indicated areas of high access.

Focus group and in-depth interviews were used to pursue the objective to explore community perceptions of poverty as well as markers of poverty. Community members participated in a discussion about their perception of poverty and undertook a wealth ranking exercise of assets and possessions they identified with wealth in their communities. Community members' perceived poverty as a relative phenomenon and

included social exclusion, ill health, orphaned and income related poverty in their assessment.

In order to explore the use of poverty maps for identifying the poor, the GIS tool was used to map households and the distances to health facilities. This technique allowed the development of a poverty map to show which areas and households in the district were economically disadvantaged. The identification of poor households through the poverty map mechanism established areas that can be targeted for health care interventions to improve the health of the poor.

Equity in access to ITN as a secondary objective was measured using data on ITN use and the concentration curve and index. The analysis highlights that the wealthiest households have better access to ITNs as compared to poorest households.

The comparison of the wealth index and consumption relied on cross sectional data collected on household produce and expenditure for consumption as well as assets and possessions for the wealth index. The wealth index was constructed using principal component analysis. Households were divided into five quintiles both in terms of consumption and in terms of the wealth index. The two measures of socio-economic status were comparable. The ranking of wealth by community members was also similar to the weights (scores) assigned to assets and possessions on the wealth index. However, in contrast to the wealth index, house ownership by retired persons did not signify wealth according to the community perspective. These people are assumed to have spent their

earnings in putting up the houses they live in and therefore have less resources to fend for themselves once they retired. This implies that any interpretation of weights assigned to assets in the context of a wealth index needs to consider the local context and how it affects the index as a measure of welfare.

The main conclusions of the study draw on the findings of both primary and secondary objectives of the research.

9.2 Conclusions

From the preceding chapters, it is clear that, overall, access to health care in the Kassena-Nankana district is very poor. This is not surprising, given that this district is part of the Upper East region of Ghana, which is among the most disadvantaged regions of the country in terms of the distribution of health care resources as well as having one of the lowest life expectancy rates in the entire country. The current distribution of health infrastructure, and the organization of the health system have negatively affected access to health services for malaria control interventions with poorer households and outlying areas having the lowest affordability, availability and information scores in respect of health services.

Access is a broad concept and as was proposed in Chapter 3, is associated with the dimensions of availability, acceptability, information and affordability. The use of facility utilisation data as a measure of access therefore provides a very narrow definition and

measure of access, and does not enable policy makers to assess the overall performance of the health system.

Factor analysis thus proved to be an important method for identifying the access factors that are critical in determining each dimension of access and highlighting which access dimensions have not been adequately addressed by existing health care policies.

The primary access factors of the availability dimension, are physical accessibility, inpatient clinical care and travel time. Over 50% of households live more than 5 km away from a primary health facility. Nonetheless, demand for hospital services continues to be high, as primary health care facilities are unable to manage severe cases of malaria.

The primary factor that determines the affordability of health care is socio-economic status, which in turn is related to consumption levels, household size, sex and gender differences in the communities. User fees were also significantly important for households in assessing the affordability of health services, although it was a secondary factor. This draws attention to the need to understand the socio-economic characteristics of households in service areas; consequently, efforts to use the disadvantage index to assess which communities and households really need socio-economic support or health care availability cannot be overemphasized.

The current exemption policy is relieving some of the financial burden among the targeted groups, although about 50% of the targeted children still pay for health services.

In addition, the poor have the least access to services with regards to service availability and affordability and they are not covered by the exemption policy; this inevitably results in inequities in access to health care among socio-economic groups in the district.

The acceptability of modern health care in treating malaria is very high among households, and the current use of herbal medicines is mainly due to the unavailability and affordability of health services. Where services are available and affordable, information plays a key role in allowing households to have access to these health services, and a well-informed population will use the most appropriate channel of health care in treating illnesses. It is vitally important to strengthen the relationship between the health system, health providers and users of health care services, particularly with regard to initial contact that patients have with the health system, as this determines future access to health services. On such first time contact with the health system, all essential information should be provided to the client in a culturally appropriate manner. These clients should then be given the opportunity to ask questions and to receive appropriate explanations regarding the future management of their illnesses.

Inequities in access to health care and the challenges of reducing these disparities are especially critical within poorer districts. The disparities in each access dimension are most striking in the availability, affordability and information dimensions of access. This is where the most important concerns of households come to light. Inequities in access to health care are manifested in all the dimensions of access, and are in particular determined by the spatial distribution of health services, the types of health services, the

socio-economic characteristics of the household, the user fees, the acceptability of effective malaria treatment for levels of severity and the sources of information for treating these. The targeting of the poor by means of offering them exemptions with regard to health care has not significantly improved their plight largely due to inadequate implementation of the exemptions policy in terms of identifying the poor. What is important to note, however, is that in the poorest districts great inequities persist thus exacerbating the situation of the poorest of the poor. Consequently, policy objectives should not only focus on reducing inequities in access between regions and districts (i.e. on a macro scale) but also on reducing inequities between the poorest of the poor within districts (i.e. on a micro scale).

Access is certainly both a supply and demand side phenomenon, and policy makers can influence the demand side by playing an active role with respect to information flow through existing structures in the communities. Characteristics of affordability are more demand oriented and primarily determine access to health services, even if these are made available free of charge. Theoretically, utilisation is seen as a concept of demand and supply, but demand cannot be divorced from access, which has often led to a confusion of using utilisation as a proxy for access. It is clear, however, that access has both demand and supply characteristics, and it is impossible to separate the two when addressing access to health care. Conceiving access as comprising both supply and demand issues will thus allow policy interventions to play a more active role and would allow access to be measured by the factors of each dimension rather than being based on actual utilisation of health services.

9.3. Policy Implications

As services continue to be unavailable and unaffordable to households, more households are relying on ineffective methods of treating malaria with the implication that complicated malaria cases continue to be treated at hospitals rather than at primary health care centres. Consequently, the objective of primary health care, which promotes universal access to affordable and effective health care, becomes less achievable. Currently, much effort in respect of service delivery in Ghana is based on providing more health facilities and providers at the periphery, but in fact much more needs to be done to ensure the broader availability of health services. The expansion of the CHFPs programme should accompany the ability of health centres to provide advanced clinical care, to treat more severe illnesses and to serve as an effective referral mechanism for the community health officers.

Health policies currently overemphasize the role played by the supply of health care in determining access to health care, and fail to understand the socio-economic context of the population and the need to promote health education. A policy objective that focuses more on the supply of health care is less likely to have a great impact on overall access to health care in pursuing equal access for all, unless special policy efforts are made to influence the demand factors for health care outlined.

In order to monitor and assess the levels of accessibility to health care over time and by socio-economic group it is necessary to consider the four access dimensions on their own merits. On the availability dimension, ensuring that households have information on the

availability of community health officers in their communities and ensuring that poorer households have access to them would enhance physical access. Health care facilities that provide both inpatient and outpatient care were of a priority to households but if households with ill members visit the community health officers early enough, there should be less malaria complications that require inpatient care. This would hence contribute to low cost of treatment for especially members of the poorer households. Thus providing adequate information about malaria and the capability of these primary care providers to handle early symptoms of the disease is a prerequisite to ensuring availability of health care.

In addition, time is of essence to households during the rainy season, which is the most productive period for them and yet is the major malaria season. Hence devising ways such as providing information more frequently about malaria as well as the need for community health officers to increase their routine visits to households during this period would assist in treating malaria cases promptly. On the information dimension specifically, packaging health information to meet cultural demands of the people is very important. It is clear that older women and adults are often the first to be contacted for health care information, so repackaging the current health information to include older women and adults in the communities would greatly enhance the treatment of illnesses at home. This is necessary as often well-informed younger women, who the health education programme currently targets at child welfare and antenatal clinics, cannot by themselves take decisions to treat illnesses given their limited authority in this cultural context.

Knowledge of appropriate treatment especially for severe malaria is also very relevant as it turned out to be a key primary factor of information access. The need to provide adequate information of the signs and symptoms that constitute potential severe malaria and especially emphasizing that health care should be sought at the appropriate health facilities without any delays is critical. This is also because there are more delays in treating severe malaria and complications of malaria as households turn to consult the gods in such cases before they seek appropriate health care. In line with this also, although modern methods of treatment were generally accepted in this study, many households as observed reverted to use of herbal medicines after initial contacts with the formal health service, indicating that the interaction between health staff and patients may be poor as well as the information exchange between health personnel and patients. Fostering a more culturally acceptable atmosphere as well as encouraging clients and patients to ask questions regarding their ill health and other issues that may relieve anxieties and fears, is strongly required for improving access to health care.

With regard to the affordability dimension, broad social and poverty programmes are required to improve the socio-economic positions of households in the district as reducing user fees alone is not sufficient to ensure financial accessibility. However, the current exemptions for the poor could be improved by using the knowledge communities have about the poor as well as using the poverty maps to ensure that exemptions actually benefit the poorest of the poor.

The introduction of the health insurance system if well designed, will also offer some financial relief for the poor, and will enable government to put resources into providing services for this group. Nonetheless, universal mutual and social health insurance coverage will not necessarily create equal financial access to health care, unless special efforts are made to include the poorest of the poor, and, even more importantly, unless efforts to identify the poor precede the implementation of this policy. From this study, it is clear that the communities themselves are well able to identify the poor among them. Thus, in conjunction with the community officers at the sub-district level, they should be given the opportunity to identify the poor to enable them to have free or at least subsidized health services under the health insurance programme. A tracking system could be designed to register the poor; very importantly, though, both the poor as well as paying households should have similar health insurance identification numbers or cards for health services to avoid any stigmatisation associated with being label poor and to ensure that the former are not discriminated against or given poor quality health care.

Addressing each dimension as highlighted above can potentially inform policy makers about the efficacy of their policies and where to concentrate their efforts. Monitoring and evaluating the factors that determine each dimension of access should also provide an adequate measure of the overall performance of the health system. Furthermore, the disadvantage index if adopted for health planning at the local and national level, should enable health care provision to be tailored to the demands of different communities and then specifically to meet the needs of disadvantaged groups.

9.4 Contributions to Knowledge

Attempts to measure the dimensions of access have been hampered by a lack of appropriate models and a method that potentially allow researchers to measure the diversity of factors determining each dimension. The conceptual framework introduced in this study and the presentation of comprehensive definition of each dimension reduce the problem of narrowing and measuring access based on individual access factors, and instead allows policy makers to focus their perspective on concrete and operational access factors.

Deconstructing the concept of access into factors that determine the supply and demand side of access, as has been done herein, is particularly insightful, as it has clearly demonstrated that a supply- focused understanding of health services is necessary but not sufficient to establish equitable access to health care. Health policy makers have to actively promote the demand side of access by closely examining the factors that affect demand for access and integrating this in service delivery.

The use of factor analysis to extract the factors for each model of access is an extremely valuable approach that provides very useful information as to which factors policy efforts should concentrate.

The use of factor scores to create a disadvantage access score, thereby measuring inequities in access to health care, would allow policy makers acting under the premise of equal access for equal need, to monitor and evaluate how effective service distribution is

in reaching the poor and the poorest of the poor. Most often, facility utilisation data is used to measure inequities in access to health care but as these findings show, it is possible to create a relative disadvantage index that provides weights for each dimension and allows one to measure inequity in access more directly and accurately.

The development of a poverty map using GIS technology at such a disaggregated level highlights how policies aimed at bridging inequities can be focused specifically on the poorest of households who need these services. Consequently, maps such as these are important for policy makers for resource allocation and monitoring of the effectiveness of their interventions. Malaria control interventions are currently not reaching the poor. Subsidies allocated via immunization cards, as it is currently done in the Kassena-Nankana district for insecticide treated nets, are not reaching the poor. An appropriate method of getting subsidies to reach the poor is to adopt the use of a poverty map to first target the poorer communities and then, within those communities, to give residents the opportunity to decide on criteria to identify the poorest individuals and households. This study demonstrates the critical role that poverty maps can play by combining these with the knowledge communities themselves have with regard to the poor in their midst.

There is much need for studies designed specifically to examine inequities in malaria burden and to examine the impact of malaria control interventions on the poor. This study has demonstrated that the poor reported less malaria burden, even though they reported more signs and symptoms related to severity of malaria (diarrhea, vomiting and fever). Treatment for severe malaria is more expensive compared to treating less severe malaria.

Thus, the poor paid as much as 13% of their total consumption expenditure for the recent malaria episode compared to the rich who paid only 5%.

This research has also provided insights into the use of the wealth index and consumption as measures of welfare and the implications of choosing either method. The choice of consumption will tend to show slightly less socio-economic disparities for any particular health variable relative to the wealth index, whereas the wealth index will highlight many socio-economic inequities in access to health care. Also, in choosing the wealth index, it is imperative to examine the items that are included in the index, as a highly skewed distribution of durable asset items is likely to favour high socio-economic groups, which will affect the outcome measure of any health variable.

9.5 Generalisability of Research Findings

This research was undertaken to investigate the equity policy objectives of the Ghanaian health system as these relates to the concept of equal access to health care for equal need. A related aim was to provide insights into how this objective has been interpreted and implemented, as well as propose guidelines for improving the policy objectives with data specific to the Kassena-Nankana district of northern Ghana. This district is one of the 110 districts in Ghana, and it has served as a model site for the implementation of effective health care delivery interventions such as the current national CHPS and insecticide treated nets programme. The first experiment of the CHPS initiative was done in this rural setting between 1994 and 1998, and it has now been adopted as a national policy for the delivery of primary health care. Furthermore, the concept of access to

health care and how to measure this is a concern to most health systems in the world. The indicators of access as measured by the dimensions of availability, acceptability, and affordability have been examined in other settings, as well as in this study and have been found to have a significant impact on access to health care in general. This study has included an information access dimension, which is likely to be of relevance and importance in other contexts as well.

The sampling methodology, as well as the statistical methods applied in the analysis, are representative and provide rigorous tests of statistical significance of the variables measured. The sample size of 1880 is large enough to eliminate errors due to chance. Lastly, the extensive literature review on the concepts of equity and access to health care, which gave a sound background to this research, means that the results are applicable in other settings as well.

9.6. Recommendations for Further Research

The research presented herein has greatly enhanced our knowledge of the factors that are primary indicators of access to health care. Further research is however required to understand other underlying access factors that may contribute to explaining the dimensions of access to health care, as it transpired from the study that the access factors included in each model did not provide a complete explanation for each dimension. Particular attention should be paid to understanding the dynamics of the household and the cultural setting of the population and what strategies are necessary to influence demand for health care.

The diverse factors that impact on access to health care coupled with the role of each dimension in this, implies that for a total measure of access each dimension has to be addressed. However, communities across the district are not in fact homogenous: some communities have more advantages in respect of particular dimensions of access and may not require intervention in all areas, whereas others may need assistance in all access dimensions. In view of the limited resources available for health care, it is important to determine exactly which of these access dimensions most importantly require intervention in a particular community or district. Wholesale access intervention strategies for the entire country will lead to duplication of efforts and a waste of scarce resources in communities and districts. Moreover, this might happen at the expense of intervening in an access dimension that is of priority to a particular community or district.

The use of community-based identification criteria may be appropriate for the identification of the poor eligible for free or subsidized services under the social and mutual health insurance schemes, but when it is adapted the criteria will have to be revised from time to time to take into account changes and perceptions of wealth in communities. Communities do to some degree have knowledge of the factors that promote wealth. It is however necessary to conduct research to understand how long it takes households to move out of poverty and to plan the appropriate periodical revision of poverty identification criteria.

Implementing effective drug and preventive methods for malaria is particularly challenging as there is not much understanding of how to provide effective health information at the household level and the potential role and effectiveness of relatives in

providing health information. Further research in this area is necessary to ascertain adequate treatment information and to design appropriate guidelines for effective management of malaria at the household level.

The continuous use of chemists to treat even severe malaria cases and the role played by these outlets calls for substantial efforts to be made to integrate their activities into the formal health system, which will allow the monitoring of the effectiveness of malaria treatment provided by these outlets. A public-private mix of health care provision could moreover, be actively fostered to promote the home management of malaria and to implement the exemption schemes. There is clearly the need for further research into the viability of such public-private mix initiatives.

9.7 Concluding Comment

Equitable access is a key policy objective of the Ghanaian Ministry of Health and major efforts have been made to improve access to health care but more on the supply side. This study has shown that both supply and demand side issues of health care are critical and hence all the four dimensions of access- availability, affordability, information and acceptability- need priority attention if health service access is to improve substantially. It is only when this is done that equitable access to health services can be fully achieved which will greatly reduce the burden of ill health, prevent premature deaths in Ghana and in particularly improve access for those who are most disadvantaged.

References:

Aday L. A., Begley C. E., Lairson D. R. and Slater C. H. (1998) *Evaluating the health care system: Effectiveness, efficiency and equity*. AHSR Health Administration Press. Chicago.

Adongo P. B., Binka F.N. and Phillips J. F., (1998). The influence of traditional religion on fertility regulation among the Kassena–Nankana of Northern Ghana. *Studies in Family Planning*, Vol. 29: 23-40.

Agyepong I.A. and Manderson L (1999) Mosquito avoidance and bed net use in the Greater Accra Region, Ghana. *Journal of Biosocial Science,* Vol. 31: 79-92.

Aikins M.K., Pickering H., Alonso P. L., D'Alessandro U., Lindsay S. W., TODD J and Greenwood B. M. (1993) A malaria control trial using insecticide treated bed nets and targeted chemoprophylaxis in a rural area of The Gambia, West Africa: Perceptions of the causes of malaria and of its treatment and prevention in the study area. *Transactions of the Royal Society of Tropical Medicine and Hygiene, Vol.* 87 (Suppl-30).

Alberts J.F., Sanderman R., Eimers J. M. and Van Den Heuve W.J.A. (1997) Socioeconomic inequity in health care: A study of services utilisation in Curracco. *Social Science and Medicine,* Vol.45 (2): 213-220.

Andersen R.M (1995) Revisiting the behavioural model and access to medical care: does it matter? *Journal of Health and Social Behaviour*, Vol. 36(1): 1-10.

Andersen R. and New J. (1973) Societal and individual determinants of medical care utilisation in the United States. *Milbank Memorial Quarterly*. Soc. Vol. 51: 95-123.

Armah G.E., Adiamah J.H., Binka F.N., and Adjuik M. (1997) The effect of permethrin-impregnated nets on the activity of malaria vectors in Kassena-Nankana district of the Upper East Region of Ghana. *Medical and Veterinary Entomology.*

Bailey T. C. and Gatrell A. C. (1995) *Interactive spatial data analysis.* England Longman Harlow.

Barat L. M., Palmer N., Basu S., Worral E., Hanson K. and Mills A. (2004) Do malaria control interventions reach the poor? A view through the equity lens. *American Journal of Tropical and Hygiene;* Vol.7 (Suppl. 20): 174-178.

Bawah A.A., Akweongo P., Simmons R. and Phillips J.F. (1999) Women's fears and men's anxieties: Impact of family planning on gender relations in northern Ghana. *Studies in Family Planning,* Vol. 30(1): 54-66.

Benson T.; Kanyanda S. and Chinula R. (2002) *Poverty Mapping-Malawi-Results of the fourth iteration of the analysis.* Mimeo. International Food Policy Research Institute, Washington, DC, USA and the National Statistical Office, Government of Malawi, Zomba, Malawi.

BHI-MOH (2001) *Bulletin of health information: Information for action.* Ministry of Health, Vol. 1 (2 &3).

Bin Juni M. H. (1996) Public health care provisions: Access and Equity. *Social Science and Medicine,* Vol. 43(5): 759-768.

Binka F.N. and Adongo P. (1997) Acceptability and use of insecticide impregnated bed-nets in Northern Ghana. *Tropical Medicine and International Health,* Vol. 2: 499-507.

Birch S. and Abelson J. (1993). Is reasonable access what we want? Implications of, and challenges to, current Canadian Policy on equity in health care. *International Journal of Health Services,* Vol. 23: 626-653.

Blundell R. and Windmeijer F. (2000) Identifying demand for health resources usining waiting times information. *Health Economics* ; 9 (6): 465-474.

Bolduc D., Lacroix G. and Muller C. (1996) The choice of medical providers in rural Benin. A comparison o discrete choice models. *Journal of Health Economics; 15: 477-498.*

Bradley A.K., Greenwood B. M., Greenwood A. M., Marsh K., Byass P., Tulloch S. and Hayes R. (1986) Bed-nets and morbidity from malaria. *Lancet,* Vol. 2: 204-207.

Burstrom B. (2002). Increasing inequalities in health care utilization across income groups in Sweden during the 1990s? *Journal of Health Policy,* Vol. 62: 117-129.

Burstyn G. (2004) Principal component analysis is a powerful instrument in occupational hygiene inquiries. *Annals of Occupational Hygiene*; 48(8): 655-661.

Canagarajah S. and Ye X. (1998) *Public health and education spending in Ghana in 1992-1998: Issues of Equity and Efficiency.* The World Bank. ***http://rrru.worldbank.org/PapersLinks***

CHFP-NHRC (1998) *The Navrongo community health and family planning project: Lessons learned 1994-1998.* Navrongo Health Research Centre, MOH- Ghana.

Creese J. and Long J. S.(2000). *Regression models for categorical dependent variables.* A Stata Press Publication. STATA Corporation. College Station Texas.

Culyer A.J. (1998). The primary goal of the health care system should be to maximize health. In: New B (edit). *Rationing: Talk and Action in Health care.* London: King's Fund.

Culyer A.J. and Wagstaff A. (October 1991) Need, Equality and Social Justice. *Discussion Paper 90.* Centre for Health Economics, Health Economics Consortium, University of York.

Culyer A.J. and Wagstaff A. (1992). Need, equity and equality in health and health Care: *Discussion Paper 95*, Centre for Health Economics, Health Economics Consortium, University of York.

Culyer A.J. and Wagstaff A. (1993) Equity and Equality in Health and Health Care. *Journal of Health Economics,* Vol. 12:431-457.

Daniels N., Bryant J., Castano R.A., Dantes O. G., Khan K.S., and Pannarunothai S. (2000). Benchmarks for fairness for health care reform: A policy tool for developing countries. Bulletin of the World Health Organization, Vol. 78(6): 740-750.

Deaton A. and Zaidi S. (1999) *Guidelines for constructing consumption aggregates for welfare analysis.* Washington DC: World Bank.

Demery L., Chao S., Bernier R., and Mehra K. (1995) The incidence of social spending in Ghana. Washington DC: Poverty and Social Policy Department, World Bank.
London.

Deolaikikar A. B. (1998) The demand for health services in a developing country. The role of prices, service quality and reporting of illness. In A.G. Ullah and E. A. David (Eds) Handbook of applied economic statistics; 93-117. Ne Yprk, Basel, Hong Kong: UWN.

Donabedian A. (1976) *Benefits in medical care programmes*. Cambridge, MA: Harvard University Press.

Donaldson C. and Gerard K. (1993) *Economics of health care financing*. Macmillan,

Dor A., Gertler P. and van der Gaag D. J. (1987) Non-price rationing and the choice of medical care providers in rural Cote D'Ivoire. *Journal of Health Economics*; 6: 291-304.

Dowie P.J., Roland M.O, Burnhill P.M. and Healy R.G. (1995) *GIS and community health care: A study of geriatric services provision.*

Dzator J. and Asafu-Adjaye J. (2004) A study of malaria care provider choice in Ghana. *Health Policy,* Vol. 69: 389-401.

Dzikunu H. K. and Wujangi K. (2004) *Meeting the health needs of the poor through health insurance in the Saboba Chereponi district, Northern Region of Ghana. A pilot project on testing mechanisms for identifying the poor at the community level.* DANIDA Health Sector Support Office, Accra-Ghana.

Falkingham J. (2004) Poverty, out-of-pocket payments and access to health care: Evidence from Tajikistan. *Social Science and Medicine,* Vol. 58: 247-258.

Falkingham J. and Namazie C. (2002) *Measuring Health and Poverty: Review of approaches to identifying the poor.* DFID Health Systems Resource Centre; 27 Old Street London EC1V9HL.

Field K. (2000) Measuring the need for primary health care: an index of relative advantage. *Applied Geography,* Vol. 20: 305-332.

Fielder J.L. and Suazo J. (2002) Ministry of Health user fees, equity and decentralization: Lessons from Honduras. *Health Policy and Planning*,Vol. 17 (4): 362-377.

Fielding N. and Lee R. (1998) *Computer analysis and qualitative research.* London: Sage. Oxford University Press.

Filmer D. and Pritchett L. (2001) Estimating wealth effects without expenditure data –or tears: With an application to educational enrolments in states of India. *Demography* Vol. 38 (1): 115-132.

Gallup J.L. and Sachs J.D. (2000) The economic burden of malaria. Centre for International Development at Harvard University. *CID Working Paper* No. 52 July: 1-22.

Garshong B., Ansah E., Dakpallah G., Huijts I. and Adjei S. (2001) *We are still paying...."A study on factors affecting the implementation of the exemptions policy in Ghana.* Health Research Unit, *MOH*-Accra.

Ghana Poverty Reduction Strategy (2003) An Agenda for growth and Prosperity. Available on http://siteresources.worldbank.org/GhanaEXTN/resources/Ghana_prsp.pdf

Gertler P. . (1985) A decomposition of the elasticity of mediaid nursing home expenditures into price, quality and quantity effect. *National Bureau of Economic Research. Working Paper 1751.* In Shengelia B., Tandon A., Adams O. B. and Murray C. J. L. (2005) Access, utilization, quality and effective coverage: An integrated conceptual framework and measurement strategy. *Social Science and Medicine*; 61: 97-109.

Gertler P., Locay L. and Sanderson W. (1989) Are user fees regressive? The welfare implications of charging for medical care in Peru. *Health Economics: Latin American Perspectives.* New York: World Health Organization, Pan American Health Organization, Scientific Publication No. 517.

Gertler P. and van der Gaag J. (1990) The willingness to pay for medical care: Evidenec from two developing countries. Baltimore, London: Johns Hopkins University Pres for the World Bank, P. ix, 139.

Gesler W (1986) The issue of spatial analysis in medical geography: a review. *Social Science and Medicine,* Vol. 23(10): 963-73.

Ghana Health Service (2003) *Evidence for policy and planning.* Ministry of Health Ghana. GHS/PPME/PBU.

Ghana Statistical Services (2004) *Core Welfare Indicators Questionnaire 2003. Preliminary results. Accra- Ghana.*

Gilson L., Russell S. and Buse K. (1995) The political economy of user fees with targeting: developing equitable health financing policy. *Journal of International Development,* Vol. 7: 369-401.

Goddard M. and Smith P. (2001) Equity of access to health care services: Theory and evidence from the UK. *Social Science and Medicine,* Vol. 53: 1149-1162.

Greenbaum T. L. (1998) *The handbook for focus group research.* Second edition. Sage Publications.

Greenwood BM. (1991) Malaria chemoprophylaxis in endemic regions. In: Malaria: waiting for the vaccine. Tragett G.A.T.(ed.) New York: John Wiley and Sons.

Grossman M. (1972) On the concept of health capital and the demand for health. *Journal of Political Economy,* Vol. 80: 223-255.

Guagliardo M.F. (2004) Spatial accessibility of primary care: concepts, methods and challenges. *International Journal of Health Geographics,* Vol. 3 (3).

Gulliford M., Fugueroa-Munoz J., Morgan M. Hughes D., Gibson B. and Hudson M. (2002) What does access to health care mean? *Journal of Health Services Research and Policy,* Vol. 7 (3): 186-188.

Gwatkin D. R. and Guillot M. (2000) *The burden of disease among the global poor: Current situations, future, trends and implications for strategies*. Geneva: Global Forum for Health Research Publications.

Gwatkin D. R., Rutstein S., Jonhson K., Pande R. P. and Wagstaff A. (2000) *Socio-economic differences in health, nutrition and population.* Washington: The World Bank.

Heggenhougen H. K., Hackethal V. and Vivek P. (2003) *The behavioural and social aspects of malaria and its control. An introduction and annotated bibliography.* UNDP/World Bank/WHO Special Programme for Research & Training in Tropical Diseases (TDR). World Health Organization.

Houweling T. A. J., Kunst A. E. and Mackenbach J. P. (2003) Measuring health inequality among children in developing countries: Does the choice of the indicator of economic status matter. *International Journal of Equity in Health*, Vol. 2 (8).

James A. M. (1994) Aging in urban and rural areas: Where are the differences? A study of health care utilization by the elderly population of eastern Ontario, unpublished PhD. Dissertation. Queens University, Kingston, Ontario. In: Access and utilisation: A continuum of health service environments. Rosenberg M. W. and Hanlon N. T. (1996) *Social Science and Medicine*, Vol. 43(6): 975-98.

Jolliffe I. T. (1986) *Principal component analysis*. Springer Verlag Series in Statistics. New York.

Kaona F.A.D. and Tuba M. (2003) Improving ability to identify malaria and correctly use chloroquine in children at household level in Nakonde District, Northern Province of Zambia. *Malaria Journal,* Vol.2(43).

Kidane G. and Morrow R.H. (2000) Teaching mothers to provide home treatment of malaria in Tigray, Ethiopia: a randomised trial. *The Lancet* Vol. 356.

Kipp W., Kamugisha J., Jacobs P., Gilbert B. and Rubaale T. (2001) User fees, health staff incentives and service utilization in Kabarole District, Uganda. *Bulletin of World Health Organization;* 79 (11).

Kline P. (1994) *An easy guide to factor analysis*. Routledge.

Leibowitz A. A. (2004) Demand for health and health concerns after 30 years. *Journal of Health Economics; 23: 663-671.*

Leighton C. and Foster R. (1993) *Economic impacts of malaria in Kenya and Nigeria. Health financing and sustainability project*. Bethesda ML: Abt Associates:6.

Macinko J. A. and Starfield B. (2002). Annotated bibliography on equity in health. *International Journal for Equity in Health, Vol.*1 (1).

Macun I. and Posel D. (1998) Focus groups: A South African experience and a methodological reflection. *African Sociological Review,* Vol. 2(1): 114-135.

Makemba A.M. (1995) Community-based sale, distribution and insecticide impregnation of mosquito nets in Bagamoyo District, Tanzania. *Health Policy and Planning,* Vol. 10: 50-59.

Martin D., Wrigley H., Barnett S. and Roderick P. (2002). Increasing the sophistication of access measurement in a rural health care study. *Health and Place,* Vol. 8: 3-13.

May J. and Kline P. (1987) Extraversion, neurotism, obsessionality and the Type A behaviour pattern. *British Journal of Medicala Psychology*, Vol.60: 253-259.

McCombie S. C. (1996) Treatment seeking for Malaria: A review of recent research. *Social Science and Medicine,* Vol. 43 (6): 933-945.

McIntyre D., Muirheas D., Gilson L., Govender V., Mbatsha S. Goudge J., Wadee H. and Ntutela P. (2001) *Geographic patterns of deprivation and health inequities in South Africa*: *Informing public health allocation*. Health Economics Unit, University of Cape Town. South Africa.

McIntyre D., Gilson L., Valentine N. and Soderlund N. (2001) *Equity of health sector revenue generation and allocation: A South African case study*. Partnerships for Health Reform (PHR).

Millman, M. (Ed.), 1993. *Access to health care in America*. Institute of Medicine. National Academy Press, Washington, DC.

MIM/TDR (2001) http://www.nih.gov/news/pr/aug2001/fic-02.htm

Ministry of Health (1996) *Documentation from the MIS of the District Health Management Team on the War Memorial Hospital*. Kassena-Nankana District, Navrongo.

Ministry of Health (August 1999). *Medium Term Health Strategy towards Vision 2020.* Accra, Ghana.

Ministry of Health (2001a) *Report of the Health and Disease Task Team: Five-Year Programme of work (1997-2001)*. Ghana Health Service.

Ministry of Health (May 2001b) *The Health of the Nation: Analysis of the Ghana Health Sector Programme of Work 1997-2001*. Accra, Ghana.

Ministry of Health (2001c) *Partnerships for Health: Bridging the Inequalities Gap: The Second Health Sector Five-year Programme of Work: 2002-2006 SWAP II.* Accra, Ghana.

Mishler E. G. (1986) *Research interviewing, context and narrative.* Cambridge Massachusetts: Harvard University Press.

Montgomery M. R., Gragnolati M., Burke K. A. and Parades E. (2000) Measuring living standards with proxy variables. *Demography*, Vol. 31: 155-174.

Mooney G. (1994). *Key issues in health economics.* London: Harvester Wheatsheaf.

Mooney G. (1983). Equity in health care: Confronting the confusion. *Effective Health Care,* Vol.1: 178-185.

Mwenesi H., Harpham T. and Snow R. W. (1995). Child malaria treatment practices among mothers in Kenya. *Social Science and Medicine,* Vol. 40:1271-1277.

Newbrander W., Collins D. and Gilson L. (2000) *Ensuring equal access to health services: User fee systems and the poor.* Management Sciences for Health: Boston

Ngom P., Debpuur C., Akweongo P., Adongo P. and Binka F. (2003) Gate-keeping and women's health seeking behaviour in Navrongo, northern Ghana. *African Journal of Reproductive Health,* Vol. 7(1): 17-26.

Nyamongo I.K. (2002) Health care switching behaviour of malaria patients in a Kenyan rural community. *Social Science and Medicine*, Vol. 54: 377-386.

Nyanator FK. (2004) Strategic Plan for Rolling Out CHPS in Ghana. Accra: *PPMED Ghana Health Service.*

Nyarko P. Wontuo P., Wak G., Chirawurah D., Welaga P., Nchor S., Hodgson A. and Binka F. (2001) The Navrongo Demographic Surveillance System: Report to the Rockefeller Foundation. *Community Health and Family Planning Project. Documentation Note.* Number 45. NHRC. Navrongo.

Olivier A. and Mossialos E. (2004) Equity of access to health care: Outlining the foundations for action. *Journal of Epidemiology and Community Health*; Vol. 58: 655-658.

Pannarunothai S. and Mills A. (1997) The poor pay more: Health-related inequality in Thailand. *Social Science and Medicine*, Vol. 44(12): 1781-1990.

Parker E.B. and Campbell J.L. (1998) Measuring access to primary medical care: some examples of the use of geographical information systems. *Health and Place*, Vol. 4(2): 183-193.

Penchansky R. and Thomas J. W. (1981) The concept of Access. *Medical Care,* Vol. 19(2): 127-140.

Pereira J. (1989) What does equity in health mean? *Discussion Paper 61*. Centre for Health Economics, University of York.

Perry B. and Gesler W. (2000). Physical access to primary health care in Andean Bolivia. *Social Science and Medicine*, Vol.50 pp. 1177-1188.

Pickering P. M. (1986) *Psychological characteristics of long-term tranquiliser users. PhD thesis*. Department of Psychology, University of Exeter. In: Kline P. (1994) An easy guide to factor analysis. Routledge.

Puentes-Markides C. (1992) Women and access to health care. *Social Science and Medicine,* Vol. 35: 619-626.

Reddy S. and Vandemoortel J. (1996) *User financing of basic social services: A review of theoretical arguments and empirical evidence*. UNICEFStaffWorking Papers, Evaluation, Policy and Planning Series. New York: UNICEF.

Ricketts T.C., Randolph R., Howard H. A., Pathman D. and Carey T. (2001). Hospitalization rates as indicators of access to primary care. *Health and Place,* Vol. 7: 27-38.

Rosero-Bixby L. (2004) Spatial access to health care in Costa Rica and its equity: A GIS-based study. *Social Science and Medicine,* Vol. 58: 1271-1284.

Rosenberg M. W. and Hanlon N. L. (1996). Access and utilization: A continuum of health service environments. *Social Science and Medicine,* Vol. 43(6): 975-983.

Rushton J. P. (2005) Placing intelligence into an evolutionary framework or how g fits into the r-k matrix of life-history traits including longetivity. *Psychology Public Policy and Law;* 11(2), 302-310.

Russell S. (1996) Ability to pay for health care: Concepts and evidence. *Health Policy and Planning,* Vol.11 (3): 219-237.

Rustein S., Gwatkin D. and Johnson K. (2000) *Poverty, wealth, inequality and its health and demographic effects.* Paper presented at the Population Association of America Annual Meeting, March 23-25, 2000 Los Angeles, California.

Sahn D. and Stifel D. (2001) '*Exploring alternative measures of welfare in the absence of expenditure data'*. Mimeo paper, Cornell University.

Sahn D. E. and Stifel D. C. (2001) " Exploring alternative measures of welfare in the absence of Data. Processed. In Lindelow M. (2002) Sometines more equal than others: How the choice of socio-economic indicator can affect the measurement of health

inequalities and the incidence of public spending. *Centre for study of African Economics* Oxford University, CASE WPS/2002-15.

Sauerborn R., Nougtara A., Hien M. and Diesfeld J. (1996) Seasonal variations of household costs of illness in Burkina Faso. *Social Science and Medicine*, Vol. 43 (3):281-290.

Schellenberg Joanna Armstrong, Victora CG, Mushi Adiel, de Savigny Don, Schellenberg David, Mshinda Hassan, Bryce Jennifer: Inequities among the very poor: health care for children in rural southern Tanzania. *Lancet* 2003, 361:561-566.

Sen A. (1992). *Health equity: Perspectives, measurability and criteria.* In: Evans T., Whitehead M., Diderichsen F. Bhuiya A. and Wirth M. (2001). Challenging inequities in health: From Ethics to Action. Oxford: Oxford University Press: 69-75.

Shengelia B., Tandon A., Adams O. B. and Murray C. J. L. (2005) Access, utilization, quality and effective coverage: An integrated conceptual framework and measurement strategy. *Social Science and Medicine*; 61: 97-109.

Simoes E. J., Byers T., Coates R.J., Sendual M.K. Mokdah A. H., and Health G. W. (1995) The association between leisure time physical activity and dietary fat in American adults. *Journal of the American Medical Association*; 85(2): 240-244.

Sorell T. (2003) *Health care provision and public morality: An ethics perspective*: In Equity in Health and Health Care. The Nuffield Trust.

Stewart D. and Shamdasani P. (1998) *Focus group research: Exploration and discovery.* In Handbook of applied Social Research Methods, Bickman L. and Rog D. (Eds.): 505-526. Thousand Oaks.

Tabachnick B.G. and Fidell LS (1996) *Using Multivariate Statistics,* 3rd Edition. Chapter 13-Principal Components and Factor Analysis:635-707.

Tavrow P., Shabahang J. and Makama S. (20030 Vendor-to-Vendor education to improve malaria treatment by private drug outlets in Bungoma District, Kenya. *Malaria Journal* Vol. 2 (10).

Thiede M. (2004) Information and access to health care: Is there a role for trust. *Social Science and Medicine*, Forthcoming

Van Doorslaer E., Wagstaff A., Van der Burg H., Christiansen T., De Graeve D., Duchesne I., Gerdtham U.G., Gerfin M., Geurts J., Gross L., Hakkinen U., John J., Klavus K., Leu R.E., Nolan B., O'Donell O., Propper C., Puffer F., Schellhorn M., Sundberg G. and Winkelhake O. (2000). Equity in the delivery of health care in Europe and the US. *Journal of Health Economics,* Vol. 19: 553-583.

Waddington, C and Enyimayew K. A, (1989). A price to pay: Part 1: The impact of User Charges in Ashanti-Akim District, Ghana. *international Journal of Health Planning and Management;* Vol. 4:17-47.

Wagstaff A. (2002) Poverty and health sector inequalities: Policy and Practice. *Bulletin of the World Health Organization 80(2).*

Wang F. and Luo W. (2004) Assessing spatial and nonspatial factors for healthcare access: Towards an integrated approach to defining professional shortage areas. *Health and Place*, Forthcoming.

Waters H. R. (2000) Measuring Equity in access to health care. *Social Science & Medicine,* Vol.51: 599-612.

Whitehead M. (1992) The concepts and principles of equity and health: *International Journal of Health Services,* Vol.22: 426-445

Whitehead M. (1990). The concepts and principles of equity and health. World Health Organization Regional Office for Europe. Copenhagen. EUR/ICP/RPD414/7734r: Original: English.

Williams A. and Cookson R.(2000) Equity in Health, Handbook of Health Economics, Vol. 1. Elsevier Science B. V.

WHO (1998) Roll Back Malaria; a global partnership. WHO, Geneva.

WHO/TDR Progress report 1999-2000 (2000), accessed from *http://www.who.int/tdr/diseases/malaria/diseaseinfo.htm*

WHO (2002) Scaling up home management of malaria: *TDR News, No.67: 1-2.*

Winch P.J. (1997) Social and cultural factors affecting rates of regular recruitment of mosquito nets with insecticides in Bagamoyo District, Tanzania. *Tropical Medicine and International Health,* Vol. 2:760-770.

World Bank (1997) World Development Indicators. World Development Report, pp.78.

World Bank (2003) Measuring Living Standards: Household Consumption and Wealth Indices. *Quantitative Techniques for Health Equity Analysis-Technical Note #4. Http://www.worldbank.org/poverty/health/wbact/health.eq.htm*

Ziba C., Slustker L., Chitsulo L. and Steketee R. W. (1994) Use of malaria prevention measures in Malawian households. *Tropical Medicine and Parasitology,* Vol. 45: 70-73.

APPENDIX I: STRUCTURED QUESTIONNAIRE

EQUITY IN ACCESS TO HEALTH CARE SURVEY
HOUSEHOLD HEAD QUESTIONNAIRE

SECTION 1: IDENTIFICATION

CLUSTER NAME:_____CLUSNAME

COMPOUND NAME:_____COMPNAM

NAME OF HOUSEHOLD HEAD_____COMPNAM

CLUSTER CODE		CLUSCOD
COMPOUND ID		COMPID
PERMID OF HOUSEHOLD HEAD		PERMPID
NUMBER OF HOUSEHOLDS IN COMPOUND		HHCOMP
HOUSEHOLD NUMBER IN COMPOUND		NUMHH
DATE OF INTERVIEW		DINT
FIELDWORKER'S CODE		FW
FIELD SUPERVISOR'S CODE		FS
RESULT OF INTERVIEW: COMPLETED	1	RESULT
REFUSED	2	
COMPOUND DESERTED	3	
COMPOUND UNOCCUPIED	4	
WRONG ADDRESS	5	
COMPOUND NOT FOUND	6	
OTHER-SPECIFY:	7	

SECTION 2: Socio-economic and demographic characteristics of respondents

1.	How old are you now? (Age in completed years)	☐☐ DK……9	AGE
2.	Sex of household head	Male……1 Female……2	SEX
3.	What is your ethnic origin?	Kasssena……1 Nankana……2 Boils……3 Other(specify)……4	ETHNIC
4.	What is your religion?	Traditional……1 Christian……2 Muslim……3 Other(specify)……4	RELIG
5.	What is your present marital status?	Married……1 Never married……2 Divorced/separated……3 Widower/widow……4 Other (specify)……5	CURMAR
6.	Have you ever attended school?	Yes……1 No……2	ATTSCH → 9
7.	What level of education do you have?	Primary……1 JSS/Middle……2 Secondary……3 Tertiary……4 Other (specify)……5 Na……88	EDUCLEV
8.	How many years of education did you get at that level?	☐☐ Na……88	EDUYEAR
9.	What is your main occupation?	Farmer……1 Trader/artisan……2 Civil servant……3 Other (specify)……4	OCCUP

10.	What other work do you do in addition to your main occupation?	Farmer……1 Trader/artisan……2 Civil servant……3 Other (specify)……4 None……5	OTHOCCUP
11.	How many people live in this household?		HHSIZE
12.	How many sleeping rooms do you have in this household? **(Excludes kitchen, bathroom and animal sheds)**		SLPROOMS

13. Write down name, sex, age and education of each household member other than head of household

[IF HOUSEHOLD MEMBER IS LESS THAN ONE YEAR OLD PUT ZERO (0) FOR AGE] RECORD AGE IN COMPLETED YEARS

Household Member Name	**Age**	**Sex** Male……1 Female….2	**Educational level** Primary……1 JSS/M……2 Secondary……3 Tertiary……4 None……5 Na……88	
P1……				PERS1ASE
P2……				PERS2ASE
P3……				PERS3ASE
P4……				PERS4ASE
P5……				PERS5ASE
P6……				PERS6ASE
P7……				PERS7ASE
P8……				PERS8ASE

SECTION 3: CLASSIFICATION AND MANAGEMENT OF MALARIA

14.	How can you tell when a child has paa/ pua? **(CIRCLE ALL MENTIONED)**	Hot body……..…………..1 Vomiting…..…………….2 Chills……..……………..3 Yellow eyes……………4 Yellow urine…………….5 Diarrhoea…………..….6 Convulsions..……………7 Other (specify)…..………..8	MALSIGNC
15.	How can you tell when an adult has paa/ pua? **(CIRCLE ALL MENTIONED)**	Hot body……..…………..1 Headache………………..2 Vomiting…..…………….3 Chills……..……………..4 Yellow eyes..……………5 Pain in joints/rips…..…….6 Yellow urine…………….7 Diarrhoea…………..….8 Other (specify)…..………..9	MALSIGNA
16.	How can you tell if a child's paa/pua is severe? **(CIRCLE ALL MENTIONED)**	Very Hot body…..……..1 Hot body……..……...2 Vomiting……..………..3 Chills……………..……..4 Yellow eyes……..……5 Diarrhoea………………… 6 Yellow urine……………7 Convulsion………………8 Other (specify)…..……....9	SEVESIGNC
17.	How can you tell if a child's paa/pua is moderate? **(CIRCLE ALL MENTIONED)**	Very Hot body…………..1 Hot body…..…………..….2 Vomiting…………..…….3 Chills…………...……..4 Yellow eyes……………..5 Diarrhoea………………… 6 Yellow urine……………7 Convulsion………………8 Other(specify)……….….9	MODSIGNC
18.	How can you tell if a child's paa/pua is mild? **(CIRCLE ALL MENTIONED)**	Very Hot body…………..1 Warm body..……………...2 Hot body……………..…..3 Vomiting…..…………….4 Chills………..………..5 Yellow eyes…..…..……...6 Diarrhoea……….…...…… 7 Yellow urine…………….8 Convulsion…………..…9 Other (specify)……..…..10	MILDSIGNS

19.	Sometimes children have severe diseases. What type of symptoms would cause you to take your child to a modern health facility right away? **DO NOT PROMPT** **(CIRCLE ALL MENTIONED)**	Child cannot breastfeed ……..1 Child has hot body……...2 Child is vomiting……3 Child has diarrhoea……...4 Child has fast breathing……...5 Child has difficult breathing……6 Child convulses……...7 Other (specify)……8	SYMHFC
20.	How can you tell if an adult's paa/pua is severe? **(CIRCLE ALL MENTIONED)**	Hot body……...1 Headache……2 Vomiting……..3 Chills……..4 Yellow eyes……..5 Diarrhoea……6 Yellow urine……...7 Other (specify)……...8	SEVESIGNA
21.	How can you tell if an adult's paa/pua is moderate? **(CIRCLE ALL MENTIONED)**	Hot body……...1 Headache……2 Vomiting……..3 Chills……..4 Yellow eyes……..5 Diarrhoea……6 Yellow urine……...7 Other (specify)……...8	MODSIGNA
22.	How can you tell if an adult's paa/pua is mild? **(CIRCLE ALL MENTIONED)**	Hot body……...1 Headache……2 Vomiting……..3 Chills……..4 Yellow eyes……..5 Diarrhoea……6 Yellow urine……...7 Other (specify)……...8	MILDSIGNS
23.	What medicine do you use to treat children with severe malaria? **(CIRCLE ALL MENTIONED)**	Chloroquine only……...1 Paracetamol only……...2 Chloroquine&paracetamol……3 Herbs……...4 Concoction……...5 Do not Treat……6 Other (specify)……...7	SEVRTREC
24.	What medicine do you use to treat children with moderate malaria? **(CIRCLE ALL MENTIONED)**	Chloroquine only……...1 Paracetamol only……2 Chloroquine&paracetamol……3 Herbs……4 Concoction……...5 Do not Treat……6 Other (specify)……...7	MODETREC

25.	What medicine do you use to treat children with mild malaria? **(CIRCLE ALL MENTIONED)**	Chloroquine only.....1 Paracetamol only.....2 Chloroquine&paracetamol.....3 Herbs.....4 Concoction.....5 Do not Treat.....6 Other (specify).....7	SEVRTREC
26.	What medicine do you use to treat adults with severe malaria? **(CIRCLE ALL MENTIONED)**	Chloroquine only.....1 Paracetamol only.....2 Chloroquine&paracetamol.....3 Herbs.....4 Concoction.....5 Do not Treat.....6 Other (specify).....7	MODETREA
27.	What medicine do you use to treat adults with moderate malaria at home? **(CIRCLE ALL MENTIONED)**	Chloroquine only.....1 Paracetamol only.....2 Chloroquine&paracetamol.....3 Herbs.....4 Concoction.....5 Do not Treat.....6 Other (specify).....7	MODETREA
28.	What medicine do you use to treat adults with mild malaria at home? **(CIRCLE ALL MENTIONED)**	Chloroquine only.....1 Paracetamol only.....2 Chloroquine&paracetamol.....3 Herbs.....4 Concoction.....5 Do not Treat.....6 Other (specify).....7	MODETREA
29.	What medicine do you currently have at home that cane used to treat paa/pua?	Choloroquine syrup.....1 Chloroquine tablets.....2 Paracetamol syrup.....3 Paracetamol tablets.....4 Has no medicine.....5 Other specify.....6	HAVEMED

ASK WHAT THEY DO FIRST AND SUBSEQUENT MEASURES IF MALARIA SYMPTOMS PERSIST

	Question	First	Second	Third	
30.	When a child first has malaria what do you ? **(CIRCLE ALL MENTIONED)**	Sponge child only....1 Give paracetamol....2 Give chloroquine.....3 Herbs.....4 Use qualified provider.....5 Nothing.....6 Other (specify).....7	Sponge child only.....1 Give paracetamol.....2 Give chloroquine.....3 Herbs.....4 Use qualified provider.....5 Nothing.....6 Other (specify).....8	Sponge child only.....1 Give paracetamol.....2 Give chloroquine.....3 Herbs.....4 Use qualified provider.....5 Nothing.....6 Other (specify).....8	CHMFIR
31.	When an adult has malaria what do you first? **(CIRCLE ALL MENTIONED)**	Sponge child.....1 Give paracetamol.....2 Give chloroquine.....3 Herbs.....4 Use qualified provider.....5 Nothing.....6 Other (specify).....8	Sponge child.....1 Give paracetamol....2 Give chloroquine....3 Herbs.....4 Use qualified provider.....5 Nothing.....6 Other (specify).....8	Sponge child.....1 Give paracetamol.....2 Give chloroquine.....3 Herbs.....4 Use qualified provider.....5 Nothing.....6 Other (specify).....8	ADMFIR
32.	From what source did you get this information on how to manage and treat malaria?	Nurse at HC.....1 Nurse in community...2 Drug store.....3 Hospital.....4 Traditional healer.....5 YZ.....6 Relative.....7 Radio.....8 TV.....9 Other(specify).....10 Na.....88	Nurse at HC.....1 Nurse in community...2 Drug store.....3 Hospital.....4 Traditional healer.....5 YZ.....6 Relative.....7 Radio.....8 TV.....9 Other(specify).....10 Na.....88	Nurse at HC.....1 Nurse in community....2 Drug store.....3 Hospital.....4 Traditional healer.....5 YZ.....6 Relative.....7 Radio.....8 TV.....9 Other(specify).....10 Na.....88	INFOSU
33.	How useful is this information in treating malaria?	Effective.....1 Moderate.....2 Not effective.....3 Na.....88	Effective.....1 Moderate.....2 Not effective.....3 Na.....88	Effective.....1 Moderate.....2 Not effective.....3 Na.....88	INFOUSF
34.	What do you use to prevent malaria? **(CIRCLE ALL MENTIONED)**			Coils.....1 Mosquito net.....2 Spray.....3 Scented leaves.....4 Clean environment.....5 Other(specify).....6	PREVMAL
35.	Do you use more the curative information, or preventive or both?			Curative.....1 Prentive.....2 Both.....3	PRVCURA

36.	Does this household own a mosquito net?	Yes.....1 No.....2	OWNET → 43
37.	How many nets does this household have?	 Na.....88	NUMNET
38.	Who sleeps in the net/nets that you have? **(CIRCLE ALL MENTIONED)**	Child <5.....1 Mother&child.....2 Children.....3 Father.....4 Mother.....5 Other (specify).....6 Na.....88	SLEEPNET → 40
39.	If **response to 38 is 1or 2,** Ask did child sleep under a bednet last night?	Yes.....1 No.....2 Na.....88	CSLPNIGHT
40.	Was this bednet ever treated with insecticide?	Yes.....1 No.....2 Na.....88	NETREAT → 42
41.	When was the bednet treated for the last time?	A month ago.....1 3 months ago.....2 6 months ago.....3 More than six months .....4 Never treated.....5 Don't know.....6 Na.....88	LASTREAT
42.	How useful is the bednet? **(CIRCLE ALL MENTIONED)**	Prevents mosquito bites....1 Prevents malaria.....2 Child not fall sick often....3 Don't know.....99 Na.....88	NETUSEFU
43	How many times on average do children under five-get malaria during the malaria season in this household?	Once.....1 Twice.....2 Thrice.....3 Four.....4 Five.....5 Six times.....6 Other.....7	AVEMALC
44.	How many times on average do adults get malaria during the malaria season in this household?	Once.....1 Twice.....2 Thrice.....3 Four.....4 Five.....5 Six times.....6 Other (specify).....7	AVEMALA

45.	How many times did you seek health care from a provider in the past one-month?	None.....1 → **47** Once.....2 Twice.....3 Three .....4 More than thrice.....5 Other (specify).....6	CARETIME
46.	What kind of provider did you use? **(CIRCLE ALL MENTIONED)**	Nurse at health centre.....1 Nurse in the community...2 Drug store.....3 Doctor.....4 Traditional healer.....5 YZ.....6 Drug peddler.....7 Other (specify).....8 Na.....88	PROVTYPE

SECTION 4: HEALTH FACILITY /SERVICES AND INFORMATION

47.	In the past one month, has any member of your household used any of these facilities /providers? **(CIRCLE ALL MENTIONED)**	Health Centre……..……1 Hospital……...……..2 Clinic……....3 CHO……...4 YZ……...5 Traditionalist home ……..……6 Drug store/chemist……..……7 Drug peddler……8 Private clinic……..……9 Other Specify……..10 No……...11 → **50**	MEMUSEF
48.	Is the facility members used the closest to your household?	Yes……..……1 → **50** No……....2 Na……...88	MFACLOS
49.	If NO, why did you go to a farther health facility? **(CIRCLE ALL MENTIONED)**	Illness was severe……1 Doctor available……..……..2 Drugs available……3 Lab services available……..4 For privacy……..……5 Nurses are kind……6 Free services……7 Other specify……..…..8 Na……88	WHYHC
50.	Which facilities do you usually use first when a member of your household is sick?	Health Centre……..……..1 Hospital……...……..2 → **57** YZ……...3 → **63** Nurse……...4 → **69** Traditionalist home ……..……6 → **75** Drug store/chemist……..……..7 → **81** Private clinic……...8 → **87** Drug peddler……..9 → **93** Other Specify……..10	FACUSE
51.	When do you use the health Centre/?	Illness is severe……...1 Illness is less severe……...2 Illness is mild……3 All the above……..……4 Na……..88	USEHC
52.	Why do you use the health centre? **(CIRCLE ALL MENTIONED)**	Proximity……..……1 Drugs……..……..2 Moderate fees……..3 Lab services……..……4 Credit facility……..……5 Doctors……..……..6 Nurses……..……8 Other (specify)……..……9 Na……..88	WHYHC

53.	What services are offered at the Health Centre? **(CIRCLE ALL MENTIONED)**	Lab services……..……..1 Drugs……..……..2 Antenatal……..……..3 Child welfare……..……..4 Reproductive health……..……..5 Consultation……..……..6 Environmental……..……..7 Personal hygiene……..……..8 Other(specify)……..……..9 Na……..……..88	SERVHC
54.	What kinds of services are offered free at the health centre? **PROMPT** **(CIRCLE ALL MENTIONED)**	Drugs……..……..1 Antenatal……..……..2 Child welfare……..……..3 Reproductive health……..……..4 Consultation……..……..5 Environmental……..……..6 Personal hygiene……..……..7 Herbs……..……..8 Dk……..……..9 → **100** None……..……..10 Other……..……..11 Na……..……..88	FREEHC
55.	Which of these free services have you benefited from the health centre? **(CIRCLE ALL MENTIONED)**	Drugs……..……..1 Antenatal……..……..2 Child welfare……..……..3 Reproductive health……..……..4 Diagnostic care……..……..5 Environmental……..……..6 Personal hygiene……..……..7 Herbs……..……..8 Dk……..……..9 None……..……..10 Other……..……..11 Na……..……..88	BENEFHC
56.	Which groups of people benefit from the free services at the health centre? **(CIRCLE ALL MENTIONED)**	Children under five……..……..1 Pregnant women……..……..2 70+……..……..3 Don't know……..……..4 Other Specify……..……..5 Na……..……..88	AGEGRPHC
57.	When do you use the hospital?	Illness is severe……..……..1 Illness is less severe……..……..2 Illness is mild……..……..3 When referred……..……..4 Na……..……..88	WHENHOSP

58.	Why do you use the hospital? **(CIRCLE ALL MENTIONED)**	Proximity……1 Drugs……2 Moderate fees……3 Lab services……4 Credit facility……5 Doctors……6 Nurses……7 Other (specify)……8 Na……88	WHYHOSP
59.	What services are offered at the hospital? **(CIRCLE ALL MENTIONED)**	Lab services……1 Drugs……2 Antenatal……3 Child welfare……4 Reproductive health……5 Consultation……6 Environmental……7 Personal hygiene……8 General surgery……9 Other……10 Na……88	SERVHOSP
60.	What kinds of services are offered free at the hospital? **(CIRCLE ALL MENTIONED)**	Drugs……1 Antenatal……2 Child welfare……3 Reproductive health……4 Consultation……5 Environmental……6 Personal hygiene……7 Herbs……8 Dk……9 → **100** None……10 Other……11 Na……88	FREEHOSP
61.	Which of these free services have you benefited from the hospital? **PROMPT** **(CIRCLE ALL MENTIONED)**	Drugs……1 Antenatal……2 Child welfare……3 Reproductive health……4 Consultation……5 Environmental……6 Personal hygiene……7 Herbs……8 Dk……9 None……10 Other……11 Na……88	BENEFHP

62.	Which groups of people benefit from the free services at the hospital? **(CIRCLE ALL MENTIONED)**	Children under five…………1 Pregnant women…………..…..2 70+..……………………….3 Don't know…………….……4 Other Specify………………..5 Na…………………………88	AGEGRPHC
63.	When do you use the YZ?	Illness is severe………………1 Illness is less severe…………2 Illness is mild………………..3 Na…………………………..88	USEYZ
64.	Why do you use the YZ? **(CIRCLE ALL MENTIONED)**	Proximity……………………1 Drugs………………………..2 Moderate fees………………..3 Lab services……….…..……4 Credit facility……...………..5 Other (specify)……………....6 Na………………….……….88	WHYYZ
65.	What services are offered at the YZ compound? **(CIRCLE ALL MENTIONED)**	Drugs……………..……………1 Antenatal……………………2 Child welfare……...…...…..3 Reproductive health………....4 Consultation…..………….…5 Environmental……...………6 Personal hygiene……..……..7 Other (specify)…….………..8 Na…………..……………...88	SERVYZ
66.	What kinds of services are offered free by the YZ? **PROMPT** **(CIRCLE ALL MENTIONED)**	Drugs……………………….…1 Antenatal…………………..…2 Child welfare…………….…..3 Reproductive health………....4 Consultation………….……..5 Environmental……….....……6 Personal hygiene……..….…..7 Herbs………………………...8 Dk……………………………9 → **100** None………………………10 Other…....…..…………….…11 Na…………………………..88	FREEYZ
67.	Which of these services have you benefited free from the YZ? **(CIRCLE ALL MENTIONED)**	Drugs………………………..1 Antenatal………………...….2 Child welfare…………….…..3 Reproductive health………....4 Consultation…………..…....5 Environmental……………...6 Personal hygiene…………….7 Herbs………………………...8 Dk……………………………9 None..………………………10 Other…...………………..….11 Na…………………......…..88	BENEYZ

68.	Which groups of people benefit from the free services at the YZ compound? **(CIRCLE ALL MENTIONED)**	Children under five……1 Pregnant women……..2 70+……..3 Don't know……4 Other Specify……..5 Na……..88	AGEGRPYZ
69.	When do you use the nurse/CHO compound?	Illness is severe……..1 Illness is less severe……...2 Illness is mild……3 Na……..88	WHENNURS
70.	Why do you use the nurse/CHO compound? **(CIRCLE ALL MENTIONED)**	Proximity……1 Drugs……..2 Moderate fees……..3 Lab services……..4 Credit facility……..5 Nurses……..6 Other (specify)……..7 Na……..88	WHYNURS
71.	What services are offered at the Nurse's compound? **(CIRCLE ALL MENTIONED)**	Drugs……..1 Antenatal……..2 Child welfare……..3 Reproductive health……...4 Consultation……..5 Environmental……..6 Personal hygiene……..7 Other (specify)……8 Na……..88	SERVNURS
72.	What kinds of services are offered free at Nurse's compound? **PROMPT** **(CIRCLE ALL MENTIONED)**	Drugs……..1 Antenatal……..2 Child welfare……..3 Reproductive health……..4 Consultation……..5 Environmental……6 Personal hygiene……7 Herbs……..8 Dk……9 → **100** None……10 Other……..11 Na……..88	FREENURS

73.	Which of these services have you benefited free from the nurse? **(CIRCLE ALL MENTIONED)**	Drugs……..1 Antenatal……..2 Child welfare……..3 Reproductive health……..4 Consultation……5 Environmental……6 Personal hygiene……..7 Herbs……..8 Dk……9 None……..10 Other……..11 Na……..88	BENENURS
74.	Which groups of people benefit from the free services at the nurse? **(CIRCLE ALL MENTIONED)**	Children under five……1 Pregnant women……2 70+……3 Don't know……4 Other Specify……5 Na……88	AGEGRPNU
75.	When do you use the traditionalist home?	Illness is severe……..1 Illness is less severe……..2 Illness is mild……..3 Na……..88	WHENTRAD
76.	Why do you use the traditional healer? **(CIRCLE ALL MENTIONED)**	Proximity……1 Drugs……..2 Moderate fees……3 Lab services……4 Credit facility……5 Treatment effective……6 Spiritual cause……7 Herbs……..8 Other (specify)……9 Na……88	WHYTRAD
77.	What services are offered at traditional healer's facility? **(CIRCLE ALL MENTIONED)**	Herbs……1 Incisions……..2 Incantations……..3 Drugs……4 Environmental care……5 Personal hygiene……..6 Antenatal……..7 Child care……..8 Other……..9 Na……..88	SERVTRAD

78.	What kinds of services are offered free at traditional healer's home? **PROMPT** **(CIRCLE ALL MENTIONED)**	Drugs.....1 Antenatal.....2 Child welfare.....3 Reproductive health.....4 Consultation.....5 Environmental.....6 Personal hygiene.....7 Herbs.....8 Dk.....9 → **100** None.....10 → **100** Other.....11 Na.....88	FREETRAD
79.	Which of these services have you benefited free from the traditional healer? **(CIRCLE ALL MENTIONED)**	Drugs.....1 Antenatal.....2 Child welfare.....3 Reproductive health.....4 Incisions.....5 Incantations.....6 Environmental.....7 Personal hygiene.....8 Dk.....9 Herbs.....10 None.....11 Other.....12 Na.....88	BENETRAD
80.	Which age groups benefit from the free treatment and services provided at the traditional healers home?	Children under five.....1 Pregnant women.....2 70+.....3 Don't know.....4 Other Specify.....5 Na.....88	AGEGRPST
81.	When do you use the drug store?	Illness is severe.....1 Illness is less severe.....2 Illness is mild.....3 Na.....88	WHENSTOR
82.	Why do you use the drug store? **(CIRCLE ALL MENTIONED)**	Proximity.....1 Drugs.....2 Moderate fees.....3 Lab services.....4 Credit facility.....5 Doctors.....6 Nurses.....8 Spiritual cause.....9 Herbs.....10 Other (specify).....11 Na.....88	WHYSTOR

83.	What services are offered at the drug store? **(CIRCLE ALL MENTIONED)**	Herbs……1 Incisions……2 Incantations……3 Drugs……4 Consultation……5 Environmental care……5 Personal hygiene……6 Antenatal……7 Child care……8 Other……9 DK……10 Na……88	SERDRGST
84.	What kinds of services are offered free at the drug store? **(CIRCLE ALL MENTIONED)** **PROMPT**	Drugs……1 Antenatal……2 Child welfare……3 Reproductive health……4 Consultation……5 Environmental……6 Personal hygiene……7 Herbs……8 Dk……9 → **100** None……10 → **100** Other……11 Na……88	FREESDRUG
85.	Which of these services have you benefited free from the drug store? **(CIRCLE ALL MENTIONED)**	Drugs……1 Antenatal……2 Child welfare……3 Reproductive health……4 Incisions……5 Incantations……6 Environmental……7 Personal hygiene……8 Dk……9 Herbs……10 None……11 Other……12 Na……88	BENETRAD
86.	Which age groups benefit from the free treatment and services drug store? **(CIRCLE ALL MENTIONED)**	Children under five……1 Pregnant women……2 70+……3 Don't know……4 Other Specify……5 Na……88	AGEGRPST
87.	When do you use the private clinic/provider?	Illness is severe……1 Illness is less severe……2 Illness is mild……3 Na……88	WHENPRV

88.	Why do you use the private clinic/provider? **(CIRCLE ALL MENTIONED)**	Proximity……1 Drugs……2 Moderate fees……3 Lab services……4 Credit facility……5 Doctors……6 Nurses……8 Spiritual cause……9 Herbs……10 Other (specify)……11 Na……88	WHYPRV
89.	What services are offered at the private clinic/provider facility? **(CIRCLE ALL MENTIONED)**	Drugs……1 Antenatal……2 Child welfare……3 Reproductive health……4 Consultation……5 Environmental……6 Personal hygiene……7 Other(specify)……8 DK……9 Na……88	SERPPROV
90.	What kinds of services are offered free at the private clinic/provider's home? **(CIRCLE ALL MENTIONED)** **PROMPT**	Drugs……1 Antenatal……2 Child welfare……3 Reproductive health……4 Consultation……5 Environmental……6 Personal hygiene……7 Dk……9 → **100** None……10 → **100** Other……11 Na……88	FREEPRIV
91.	Which of these services have you benefited free from the private clinic/ provider? **(CIRCLE ALL MENTIONED)**	Drugs……1 Antenatal……2 Child welfare……3 Reproductive health……4 Diagnostic care……5 Environmental……6 Personal hygiene……7 Herbs……8 Dk……9 None……10 Other……11 Na……88	BENEPRIV
92.	Which age groups benefit from the free treatment and services of the private clinic? **(CIRCLE ALL MENTIONED)**	Children under five……1 Pregnant women……2 70+……3 Don't know……4 Other Specify……5 Na……88	AGEGRPRV

93.	When do you use the drug peddler?	Illness is severe……..1 Illness is less severe…….2 Illness is mild……..3 Na……..88	WHENPED
94.	Why do you use the drug peddler? **(CIRCLE ALL MENTIONED)**	Proximity……..1 Drugs……..2 Moderate fees……..3 Lab services……..4 Credit facility……..5 Doctors……..6 Nurses……..8 Spiritual cause……9 Herbs……10 Other (specify)……..11 Na……..88	WHYPED
95.	What services are offered at the drug peddler facility? **(Circle all mentioned)**	Drugs……..1 Antenatal……2 Child welfare……..3 Reproductive health……4 Consultation……..5 Environmental……..6 Personal hygiene……7 Other(specify)……..8 DK……99 Na……..88	SERPED
96.	What kinds of services are offered free at the drug peddler's home? **(CIRCLE ALL MENTIONED)** **PROMPT**	Drugs……..1 Antenatal……..2 Child welfare……..3 Reproductive health……4 Consultation……5 Environmental……6 Personal hygiene……..7 → Dk……9 **100** None……10 → **100** Other……..11 Na……..88	FREEPED
97.	Which of these services have you benefited free from the drug peddler? **(CIRCLE ALL MENTIONED)**	Drugs……..1 Antenatal……..2 Child welfare……..3 Reproductive health……..4 Diagnostic care……..5 Environmental……..6 Personal hygiene……..7 Herbs……8 Dk……9 None……10 Other……..11 Na……..88	BENEPED

98.	Which age groups benefit from the free treatment and services from the drug peddler? **(CIRCLE ALL MENTIONED)**	Children under five……1 Pregnant women……2 70+……3 Don't know……4 Other Specify……5 Na……88	AGEGRPED
99.	How did you get information about the free services? **(CIRCLE ALL MENTIONED)**	Health Centre……1 YZ compound……2 Nurse compound……3 Hospital……4 Traditional healer……5 Drug store……6 Private provider……7 Radio……8 Other……8 Na……88	FREEINFO
100.	Do you have a service provider/facility in this community?	Yes……1 No……2	SERVPROV →**102**
101.	What kind of provider/facility do you have in this community?	Clinic……1 Health Centre……2 Nurse……3 Hospital……4 YZ……5 Drug store……6 Drug peddler……7 Other……8 NA……88	PROVTYPE

SECTION 5: FARM PRODUCE

In the last farming season how much of the following farm produce did you get?

Item	How many bowls did you get?	How much did that cost in the market?	Did you receive any in Kind? Yes.....1 No.....2	How much will what you received in kind cost?	TOTAL	
102. Millet						FMILLET
103.Rice						FRICE
104. Maize						FMAIZE
105. Ground nuts						FGRNUTS
106. Beans						FBEANS
107. Bambara beans						FBAMBAR
108. Others (specify)						FOTHER
109.Grand total						FTOTAL

SECTION 6: CONSUMPTION EXPENDITURE
MONTHLY CONSUMPTION ITEMS
HOUSEHOLD CONSUMPTION / EXPENDITURE

What items did you spend your money on last month?	How much did you pay?	Are there things you got in-kind last month? Yes.....1 No.....2	How much did you get in kind?	Total	
110. Rent					RENT
111. Fish (Amani or other fish)					FOOD
112. Meat					MEAT
113.Millet					MILLET
114. Rice					RICE
115. Maize					MAIZE
116. Beans					BEANS
117. Maggi cube					MAGGIC
118. Tomatoes/pepper					TOMATO
119. Cooking Oil					OIL
120. Salt					SALT
121. Soap					SOAP
122. Kerosene/cooking gas					KEROGAS
123. Wood/charcoal					WOODCH
124. Water					WATER
125. Electricity					ELECTRIC
126. Transport except health					TRANPORT
127. Drinks (alcohol, minerals)					DRINK
128. Grand Total					GRANDTM

SECTION 7: HOUSEHOLD DURABLES AND OCCAISONAL EXPENDITURE

In the last six months to one year, have you bought any of the following items?

Item	How many did you buy?	How much did you pay?	Did you receive any in Kind? Yes.....1 No.....2	How much will what you received in kind cost?	
129.Clothing					CLOTHS
130.Shoes/sandals					SHOES
131. House wares					HWARES
132. Gifts					GIFTS
133. School fees					SCHFEES
134. Bicycle					BICYCLE
135. Motorbike					MBIKE
136. Vehicle					VEHICLE
137. Radio					RADIO
138. Petrol					PETROL
139. Taxes					TAXES
140. Family celebrations (Funerals or marriage)					FAMCELEB
141. Others (specify)					OTHER
142. Grand total					GRANDTD

SECTION 8: MALARIA EPISODE IN HOUSEHOLD

143.	Has any member of your household been ill in the last month?	Yes....................................1 No....................................2 → 171	MEMILL
144.	How many people in your household were ill in the last month?	[ ][ ] Na..............................88	NUMILL

Q 145. WRITE names of members ill in the spaces provided and REFER to Q13 for ages and sex of MEMBERS ill.

	Name of member ill?	Age	Sex Male......1 Female....2	
P1.				HHMEM1
P2.				HHMEM2
P3.				HHMEM3
P4.				HHMEM4
P5.				HHMEM5
P6.				HHMEM6

	Question	First person sick Name	Second person Name	Third person Name	
146.	What signs and symptoms did **(NAME) have?** **(CIRCLE ALL MENTIONED)**	Headache................1 Hot body..................2 Vomiting..................3 Chills......................4 Yellow eyes..............5 Diarrhoea..................6 Yellow urine.............7 Cough......................8 Other (specify)...........9 Na......................88	Headache................1 Hot body..................2 Vomiting..................3 Chills......................4 Yellow eyes..............5 Diarrhoea..................6 Yellow urine.............7 Cough......................8 Other (specify)...........9 Na......................88	Headache................1 Hot body..................2 Vomiting..................3 Chills......................4 Yellow eyes..............5 Diarrhoea..................6 Yellow urine.............7 Cough......................8 Other (specify)...........9 Na..........................88	ILLSGN
147.	What type of illness Would you say **(NAME) was suffering from)?**	Pua/paa/fever..............1 Diarrhoea...................2 Cough........................3 Convulsions.............4 Other (specify)..........5 Na.........................88	Pua / fever..................1 Diarrhoea..................2 Cough......................3 Convulsions..............4 Other (specify)...........5 Na.........................88	Pua / fever..................1 Diarrhoea..................2 Cough.......................3 Convulsions..............4 Other (specify)..........5 Na.........................88	ILLTYPI

148	How would you describe **NAME'S** condition when he/she	Severe....................1 Average..................2 Mild........................3 Na.......................88	Severe......................1 Average...................2 Mild......................3	Severe....................1 Average..................2 Mild..................3	CONSEV

	was ill?		Na……88	Na……88	
149	Did you seek any treatment for this/these illness/ illnesses for **(NAME)?**	Yes……1 No……2 Na……88	Yes……1 No……2 Na……88	Yes……1 No……2 → 168 Na……88	SEEKTR
150	What type of treatment did you seek first for **(NAME)**	Modern treatment……1 Traditional treatment……2 Other (specify)……3 Na……88	Modern treatment……1 Traditional treatment……2 Other (specify)……3 Na……88	Modern treatment...1 Traditional treatment……2 Other (specify)……3 Na……88	TRETYP
151	Was NAME admitted to the health facility?	Yes……1 No……2 Na……88	Yes……1 No……2 Na……88	Yes……1 No……2 Na……88	ADMIT
152	At which facility did you Seek for treatment for **(NAME)**?	Government……1 Private ……2 Traditional… ……3 YZ……4 Nurse compound…..5 Drug store……6 Home……7 Drug peddler……8 Na……88	Government……1 Private ……2 Traditional……3 YZ……4 Nurse compound…..5 Drug store……6 Home……7 Drug peddler……8 Na……88	Government……1 Private ……2 Traditional…… …..3 YZ……4 Nurse compound….5 Drug store……6 Home……7 Drug peddler……8 Na……88	FACTRE
153	Why did you seek treatment at **(NAME)** Facility?	Less expensive……1 Drugs available……2 Nearby……3 Credit facility……4 Other ……5 Na……88	Less expensive……1 Drugs available……2 Nearby……3 Credit facility……4 Other ……5 Na……88	Less expensive…..1 Drugs available…..2 Nearby……3 Credit facility……4 Other ……5 Na……88	WHYFA
154	Where did the consultation take place for **NAME?**	Modern provider home.1 Traditionalist home…..2 Health facility……3 Drug store……4 Other specify……5 Na……88	Modern provider home…1 Traditionalist home……2 Health facility……3 Drug store……4 Other specify……5 Na……88	Modern provider home……1 Traditionalist home……2 Health facility……3 Drug store……4 Other specify……5 Na……88	CONSPL

155	How many minutes or hours did it take you to travel to this facility for **NAME**?	Immediately……………1 Less than an hour……..2 Over an hour……………3 Other……………………4 Na…………………88	Immediately……………1 Less than an hour………2 Over an hour…………...3 Other……..……………4 Na…………………...88	Immediately……...1 Less than an hour…2 Over an hour……...3 Other……………..4 Na……………...88	TRAVI
156.	How far is provider/ facility you used for **NAME** from your home ?	Walking distance……..….1 Far……………………..2 Very far…………………3 Other specify……………4 Na……………………88	Walking distance……….1 Far…………………….2 Very far………………...3 Other specify…………..4 Na……………………88	Walking distance….1 Far……………..….2 Very far……….…...3 Other specify………4 Na………………..88	DISTA
157.	Which specific place/ area did you receive treatment for **NAME?**	War Memorial ………….1 KNE……………………..2 Paga Health…..………..3 Chiana Health …….…….4 Biu clinic…………..……5 Sirigu Clinic…………….6 Nakolo clinic……………7 YZ ……………………..8 CHO……………………9 Bolga…………………10 Builsa…………………11 Other (specify)……….12 Na……………………..88	War Memorial ……….1 KNE……………………..2 Paga Health…..………..3 Chiana Health ……..….4 Biu clinic………………..5 Sirigu Clinic…………6 Nakolo clinic…………7 YZ ……………………..8 CHO……………………9 Bolga…………………10 Builsa…………………11 Other (specify)……….12 Na……………………..88	War Memorial …….1 KNE……………...2 Paga Health……….3 Chiana Health ……4 Biu clinic………….5 Sirigu Clinic………6 Nakolo clinic………7 YZ ………………..8 CHO………………9 Bolga……………10 Builsa……………11 Other (specify)…..12 Na………………..88	TREPI
158.	Did you have to pay money for receiving treatment for **NAME?**	Yes……………………1 No……………………..2 Free……………………3 Na…………………….88	Yes…………………1 No…………………2 Free………………..3 Na……………..…..88	Yes………………...1 No……………….....2 → **162** Free………………3 → **162** Na……………..…88	PAYM
159.	How much did you pay for consultation for **NAME?**	[ ] Na……………………..88	[ ] Na…………………….88	[ ] Na………………..88	PAYC
160.	How much did you pay for laboratory test for **NAME?**	[ ] Na……………………88	[ ] Na……………………88	[ ] Na………………..88	PAYL
161.	How much did you pay for drugs for **NAME?**	[ ] Na……………………88	[ ] Na……………………88	[ ] Na………………..88	PAYD

162	Did you have to pay Any thing in kind for the treatment **for NAME?**	Yes……………………1 No……………………2 Na……………………88	Yes……………………1 No……………………2 Na……………………88	Yes……………………1 No……………………2 Na……………………88	PAYK → **165**
163.	Probe: For item/service for NAME	____________ Na……………………88	____________ Na……………………88	____________ Na……………………88	ITEM
164.	How much would you have paid for such service or item NAME?	☐ Na……………………88	☐ Na……………………88	☐ Na……………………88	ITAM
165.	What mode of transport did you travel with to Provider place?	Foot……………………1 Bicycle………………2 Motorbike……………3 Vehicle………………4 Other…………………5 Na……………………88	Foot……………………1 Bicycle………………2 Motorbike……………3 Vehicle………………4 Other…………………5 Na……………………88	Foot……………………1 Bicycle………………2 Motorbike……………3 Vehicle………………4 Other…………………5 Na……………………88	TRSM
166.	How much did you pay to travel to seek health care in the last month?	1500……………………1 3000……………………2 4500……………………3 6000……………………4 7500……………………5 >7500…………………6 Nothing………………7 Other Specify…………8 Na……………………88	1500……………………1 3000……………………2 4500……………………3 6000……………………4 7500……………………5 >7500…………………6 Nothing………………7 Other Specify…………8 Na……………………88	1500……………………1 3000……………………2 4500……………………3 6000……………………4 7500……………………5 >7500…………………6 Nothing………………7 Other Specify…………8 Na……………………88	TRAN
167.	Are there regular transport services within this village?	Yes………………1 No………………2 Na………………88	Yes………………1 No………………2 Na………………88	Yes………………1 No………………2 → Na………………88	TRAS **171**
168.	Why did you not seek for treatment for **NAME?**	Treated at home…………1 Illness was mild…………2 No money………………3 No service point………4 Service point far………5 Spiritual cause…………6 No knowledge of treatment………………7 The gods forbid………8 Other (specify)…………9 Na……………………88	Treated at home…………1 Illness was mild…………2 No money………………3 No service point………4 Service point far………5 Spiritual cause…………6 No knowledge of treatment………………7 The gods forbid………8 Other (specify)…………9 Na……………………88	Treated at home…………1 Illness was mild…………2 No money………………3 No service point………4 Service point far………5 Spiritual cause…………6 No knowledge of treatment………………7 The gods forbid………8 Other (specify)…………9 Na……………………88	NOTF

169.	What did you treat NAME with at home?	Self bought drugs.....1 Herbs.....2 Na.....88	Self bought drugs.....1 Herbs.....2 Na.....88	Self bought drugs.....1 Herbs.....2 Na.....88	TRHMI
170.	Where did you get the information about the treatment administered to NAME?	Health Centre.....1 YZ compound.....2 Nurse compound.....3 Hospital.....4 Traditional healer.....5 Drug store.....6 Private provider.....7 Other (specify).....8 Na.....88	Health Centre.....1 YZ compound.....2 Nurse compound.....3 Hospital.....4 Traditional healer.....5 Drug store.....6 Private provider.....7 Other (specify).....8 Na.....88	Health Centre.....1 YZ compound.....2 Nurse compound.....3 Hospital.....4 Traditional healer.....5 Drug store.....6 Private provider.....7 Other (specify).....8 Na.....88	INFOT

SECTION 9: COMMUNAL ASSETS

171. Does the locality or cluster have a school? 1. Yes 2. No [ ] LOCSCH

172. Does this locality have pipe born water or a borehole? [ ] LOCWAT

1. Yes 2. No

173. Does this locality have a clinic, health centre, nurse living in the community or YZ living in that community [ ] LOCHFA

1. Yes 2. No

174. Does this community have a common toilet for use? [ ] LOCTOL

1. Yes 2. No

175. Has this locality been connected to the national grid (ELECTRICITY)? [ ] LOCELEC

1. Yes 2. No

176. Does this community have a dam that can be used for dry season farming (NOT DUG OUTS) [ ] LOCDAM

1. Yes 2. No

SECTION10: BASELINE HOUSEHOLD ASSETS INFORMATION

HOUSING:

177. Does household members live in [1. Own house 2. Rented 3. Occupied rent free — OWNHSE

178. Does the house of the household have a modern design? [1.Yes 2. No] — MODD

179. What is the main material used for the walls of the house? [1. Bricks 2. Mud 3. Cement block 4. Brick/cement 5. Other] — WALLM

180. What is the material used for the roof? [1. Zinc 2. Thatch 3. Mud 4. Concrete 5 Other] (EXCLUDING ANIMAL POUNDS) — ROOFM

POSSESSIONS:

181. What are the most frequently used cooking utensils for the household?[1. Earth bowls 2. Aluminium pans 3. Plastic pans — UTENS

182. What are the toilet facilities for this compound?[1. Free range 2. Pit latrine 3. KVIP 4. Pan latrine 5. W. C. 6. Other] — TOILET

183. What is the main source of drinking water for this household? [1. Well 2. Borehole 3. Piped 4. Dam 5.Stream/river 6. Other (specify). — SWATER

184. Does this household own animals [1. Yes 2. No] — ANIMAL

185. How many functioning bicycles do household members own? — BIKE

186. How many functioning vehicles do household members own? [Car, tractor, truck, motor-bike] — VEHIC

187. How many wooden/iron beds are in this household? — BEDS

188. How many functioning radios are in this household? — RADIO

189. How many functioning TVs are in this household? — TV

190. How many functioning sewing machines are in this are in this household? — SEW

191. How many functioning electrical /solar lamps are in this household? — ELECT

192. How many functioning traditional lamps are in this household? — TRADL

193. How many functioning coal pots/kerosene stove are in this household? — CPOT

194. How many functioning gas/electric cooker are in this household? — COOKI

THANK YOU FOR YOUR TIME AND PARTICIPATION IN THIS STUDY.

APPENDX II: QUALITATIVE RESEARCH INSTRUMENTS

Navrongo Health Research Centre

Equity in Access to Health Care Study

Focus Group Discussion Guide

Introduction:
A lot of research or questions have been asked about the causes of malaria in this community. We will like to discuss some of the causes discussed in earlier studies and also will like to identify and classify the symptoms and the amount of disease in our communities. Today's discussion will also include our knowledge of poverty, how we can identify a poor person and some economic and household assets that will help us classify different types of households.

Paa/Pua (Malaria)

1. As I have already indicated, we will like to talk about the causes of malaria. What do you think causes pua/paa?

2. What signs and symptoms usually come with paa/pua?

3. What signs and symptoms do children with paa/pua come down with?

4. What signs and symptoms do adults with paa/pua come down with?

5. Which signs and symptoms in children will you classify as the paa/pua being severe or life threatening?

   Probe: What signs and symptoms will you classify moderate malaria.
   What signs and symptoms will you classify mild malaria

6. What about adults, what signs and symptoms will you classify as the paa/pua being severe or life threatening?

   Probe: What signs and symptoms will you classify moderate malaria.
   What signs and symptoms will you classify mild malaria

7. At what stage (number of signs and symptoms) of the paa/pua illness do you begin to treat the child?

   Probe: What do you treat the child with?
   Where do you get the treatment?
8. Why do you choose to treat the child at this provider's facility?

9. Do you usually do anything at home before sending the child to this place/places you mentioned?

Probe: What do you do before sending the child?
Why do you do what do before sending the child?

10. Where do you get information on how to manage paa/pua (malaria)?

11. For adults, at what time of the illness do you begin to treat?

Probe: What do you treat the adult with?
Where do you get the treatment?

12. Why do you choose to treat the adult at this provider's facility?

13. Do you usually do anything at home before sending the adult to this place/places mentioned?

Probe: What do you do before sending the child?
Why do you do what you do before sending the child?

14. What are some of the services that you receive free from these providers' places (mention all providers mentioned by participants)?

Probe: How did you get information about these services?
Where did you receive the information?

15. Are there some people who do not seek formal modern care for their family members when they are ill?

Probe: what do you think are the reasons why they do not seek care from modern formal health facilities?
Where do they usually seek care?

Poverty

We will now like us to discuss about poverty. As we may know, a lot of discussion has been going on about poverty and poverty reduction in recent times and we will like to discuss what we think is poverty, who can be classified as a poor person and how we manage or find support for poor people in our communities.

1. Thus what is poverty in your opinion?

2. What are the things about a person that will show that the person is poor? (Probe access to food, water, education, health care, job, housing, land, animals, etc).

3. What are the things about a household that will show that the household is poor?

4. What makes a person poor?
Probe: for age
Resource within the community

Location of community

5. What makes a household poor?
   Probe: family size
   Education of household
   Location of community
   Resource within the community

6. Are there some people who were once poor by your definition and classification of poverty that are today better off?

   Probe: What and how did they come out of poverty?

Wealth ranking exercise

We have a set of pictures that we will like you to group according to how you will classify people with the following possessions (poor, very poor, rich, very rich and so on)
(Take each picture one at a time and show to participant or participants and allow them to agree on what it means to own such an item).

Animals
Cattle
Goats
Sheep
Bullock plough

Housing Characteristics
Zinc roof/mud building
Zinc roof/ Cement block building
Brick block building/zinc roof
Brick block/thatch roof
Thatch roof/ Mud building
Mud roof/mud building

Household Items
Wooden bed
Iron bed
Mattress
Mat
TV set
Radio
Aluminium pans
Earthen ware pots and bowls
Plastic pans/bowls
Gas cooker
Electric cooker
Coalpot/charcoal
Kerosene stove
Wood fuel
Millet stalks
Electric lamp
Kerosene lamp
Bednet

Means of Transport
Bicycle
Motorbike
Vehicle
Tractor

NAVRONGO HEALTH RESEARCH CENTRE

EQUITY IN ACCESS TO HEALTH CARE STUDY

In-Depth Interview Guide for Community Elders

INTRODUCTION

We are a team from the Navrongo Health Research Centre and we are here to discuss with you issues concerning your community. We will be discussing with you issues related to disease and illness in this community and livelihood sources of households in this community. Your view and general view of the community on these issues will be very much appreciated.

Disease Profile

We will first like to begin the discussion with diseases and other issues related to health care.

1. What are the main kinds of illnesses in this community?

2. Which of these illnesses affect children most?

3. What about adults, which of these illnesses affect them most?

4. Where do most community members seek care?
   Probe: for formal and traditional sources of care

5. What kinds of services are offered at these facilities?
   Probe: for each source of care mentioned

6. How many of these facilities/providers do you have in your community or where they usually seek care?

7. What are some of the services that are provided free at these facilities?
   Probe: for free service provided by each facility/provider mentioned?

8. How do you receive or get information about the availability of services at these facilities?

9. How do people pay for services at provided by these health facilities/providers?

10. Are there certain illnesses that are not sent for modern formal care in this community? What kind of illnesses are these?
    Probe: for convulsion if not mentioned.

11. What signs and symptoms usually come with these illnesses?
    Probe: Why do they choose not to seek formal care for these illnesses?

12. What kind of treatment is sought for these illnesses?
    Probe: for treatment for each kind of illness mentioned in Q10

Average income

We will now like to know about the livelihood source of this community in addition to the disease conditions in this community and health care that we have already discussed.

1. What is the main source of income or livelihood in this community?

2. On average how many bags of farm produce does each household have in a given farming season?

3. In terms of income or cash resources available to each household, how much do you think each household spends on household consumption expenditure (food etc)?

4. What are the main resources of this community (farm lands, potable drinking water, electricity, health facilities, schools, etc)?

Poverty

Our next discussion is on poverty and some issues that will help clarify who and which households we consider rich or poor in our community.

1. What is your perception of poverty or what in your opinion constitutes poverty?

2. What is the general opinion on poverty in this community?

3. What do you think makes people poor?

4. What are the characteristics of a poor person?

5. What are the characteristics of a poor household?

Wealth ranking exercise

Following our discussion on poverty, we will now like to discuss about things or possessions that we have in our households that will help to group people or households in different categories.

1. What are the main possessions of households in this community?

2. What does having these possessions mean to a household?

3. From the possessions you have mentioned how will you put households into categories

Probe: For, very poor, poor, rich and so on.

4. Are there households that from your definition of poverty were once poor and now moved into having possessions that can put them in a non-poor class?

Probe: What turned their fortunes around?

5. Are there households that by your definition that have remained poor for a number of years say five years?

Probe: Why have their plight not changed?
What does the community do to help such people?

FACILITY BASED INTERVIEW GUIDE

GUIDE FOR HOSPITAL AND HEALTH CENTRES

Name of facility.....FNAME

Type of facility.....FTYPE

Location.....FLOC

Cluster Code.....FCLUSCOD

Name of officer interviewed: .....FOFFICER

Status of officer interviewed.....FSTATUS

1. Check list of services and cadres of staff at facility

Services	**Yes=1 No=2**	**CODES**
Diagnostic care		FDIAGNS
Antenatal		FANTES
Family planning		FFPS
Immunizations		FIMMUNS
Child welfare		FCHILDWS
Dental care		FDENTALS
Eye care		FEYES
Gynaecological		FGYNAES
Deliveries		FDELIVR
Surgery		FSURG
Drugs		FDRUGS
Laboratory service		FLAB
Convulsions		FCONVUL
X'ray		FXRAYS
Type of services		
Out-patient		FOUTPAT
In-patient		FINPAT
Cadre of staff	**Number**	
Physicians/doctors		FNPHYSIC
Specialists (specify)		FNSPEC
Dentist		FNDENTIST
Medical assistants		FNMEDASS
State registered nurse		FSRNURSE
State Enrolled Nurse		FNENROL
Midwives		FNMIDWIF
Public health nurses		FNPUBNUR
Community health nurses		FNCOMNUR
Nutrition &disease control		FNNUTRI
X-ray technicians		FNXRAY
Laboratory technicians		FNLAB
Dispensary technician		FNDISP

1. What are the working hours at this facility?
2. What is your catchment population?
3. What services do your clients mainly come for?
4. Why do they patronize the services that they do?
5. Are there other services that they do not patronize? Which services are these?
6. Why do they not patronize the services that they do not?
7. On average how many clients does this facility see in a month?
8. What type of emergency services do you offer?

   Probe: For children and adults
   For malaria

9. What kinds of cases have presented themselves as emergencies over the past month?
10. How easy was it for you to deal with these cases?
11. How long does it take you to get to the nearest referral level?
12. How do people pay for services rendered at this facility?
13. Have there been times that people have not been able to pay for the services?
    Probe: for payment for malaria treatment
14. What services could they not afford to pay for?

Probe: what do you do when people are not able to pay for these services?

15. On average, how many people are not able to pay for services in a month?

    Probe: Of those who are not able to pay, how many of them are women?
    How many of them are men?

15. Does this facility offer exemptions on payment of services to clients?
    When did you start operating the exemption policy in this facility?

2. Exemption Policy Implementation

Which of the following groups currently benefit from the exemption policy?

Age groups	**Yes=1 No=2**	**CODES**
0-5		FXUNDFV
6-10		FXYOUN
11-15		FXADLON
16-20		FXADLTW
21-25		FXADLTR
26-30		FXADLFR
31-35		FXADLFV
36-40		FXADLSX
41-45		FXADLSV
46-50		FXADLEG
51-55		FXADLNI
56-60		FXADLTN
61-65		FXADLEV
70+		FXAGED
Pregnant women		FXPREG
Disabled people (specify)		FXDISABLE

3. Presentations for exemptions

Which of the following disease presentations and services are patients exempted from paying?

Presentations Diseases	**Yes= 1 No= 2**	**CODES**
Malaria		FXMAL
Acute respiratory infections		PXARI
Diarrhoea		PXDIAR
Reproductive health infections		PXRTI
Eye problems		PXEYE
Dental problems		PXDENT
Urinary tract infections		PXUTRACT
Ulcerations		PXULCER
Other (specify)		FOTHER
Services		
Diagnostic care		FXDIAGNS
Antenatal		FXNATALS
Family planning		FXFPS
Immunizations		FXIMMUNS
Child welfare		FXCHILDW
Gynaecological		FXGYNAE
Deliveries		FXDELIVR
Surgery		FXSURG
Drugs		FXDRUGS
Laboratory service		FXLABS
X-ray		FXRAYS

1. How did you get information about the implementation of the exemption policy?
2. What resources were put at your disposable to implement this policy?

3. Why did they choose these groups to benefit from this exemption policy?

Probe: are there other categories of people who also benefit from the exemption scheme apart from these groups? Which category of people are they?

4. How did people or the communities you serve get information about the exemption scheme?

5. What has been the level of health service uptake since the implementation of the exemption scheme (check medical records)?

6. What has been some of the problems you have encountered in implementing the exemption scheme?

Probe: What are the reasons why you encountered this/these problems (pick one problem at a time)?

7. What do you think you will like to do to improve the services you offer to the people in your catchment area in the future?

PRICE LIST FOR MALARIA TREATMENT FOR STATIC HEALTH FACILITIES

Out-patient Care

Item	Unit price	Total cost	CODES
Lab test			FOPXLAB
X-ray			FOPXRAY
Syringes and needles			FOPXSYR
Injections			FOPXINJEC
Chloroquine, syrup			FOPXCHLO
Chloroquine tablets			FOPCHLTA
Drug3: Paracetamol syrup			FOPXPARS
Paracetamol tablets			FOPXPARA
Multivitamin syrup			FOPXMUL
Multivitamin tablet			FOPXMUT
Fansidar			FOPFANSID
Other (specify)			FOPXOTHR

In-patient care

Item	Unit price	Total cost	CODES
Lab test			FIPXLAB
X-ray			FIPXRAY
Needles and syringes			FIPXSYR

Drug 1: injections			FIPXINJEC
Chloroquine syrup			FIPXCHLO
Chloroquine tablet			FIPXCHLT
Paracetamol syrup			FIPXPARS
Paracetamol tablets			FIPXPARA
Multivitamin syrup			FIPXMULS
Multivitamin tablets			FIPXMULT
Drips-Lactogen			FIPDRIPL
Drip-Destrox			FIPDRIPD
Drip: 541 infusion			FIPDRIP5
Bed cost			FIPXBED
Food			FIPXFOOD
Other (specify)			FIPXOTHR

PRIVATE PROVIDER/ DRUG STORE/TRADITIONAL HEALER INFORMATION GUIDE

Name of facility.....FNAME

Type of facility.....FTYPE

Location.....FLOC

Cluster Code.....FCLUSCOD

Name of provider interviewed: .....FPROVIDR

1. Check list of services and cadres of staff at service depot

Services	**Yes=1 No=2**	**CODES**
Diagnostic care		SERDIAGN
Antenatal		SERVANTE
Family planning		SERVFP
Immunizations		SERIMMUN
Child welfare		SERCHILDW
Deliveries		SERVDL
Drugs		SERDRUG
Convulsions		SERCONV
Incisions		SERVINCI
Incantations		SERINCAN
Gynaecological		
Type of services		
Outpatient		OUTPAT
Cadre of staff	**Indicate number**	
Midwives		NMIDWIFE
Public health nurses		NPUBNUR
Community health nurses		NCOMNUR
Pharmacist		NPHARM
Doctors		NDOCS
Registered nurse		NRNURSE
Herbalist		NHERB
Soothsayer/spiritual healer		NSOOTH
Other (specify)		NOTHER

16. What are the working hours at this service point?

17. What is your catchment population?

18. What services do you offer to your patients?

19. What services do your patients mainly come for?

20. On average how many patients do this your facility see in a month?

21. Are there other services that they do not patronize? Which services are these?

22. Why do they patronize the services that they do?

23. Why do they not patronize the services that they do not?

24. What type of emergency services do you offer?

25. What kinds of cases have presented themselves as emergencies over the past month?

26. How easy was it for you to deal with these cases?

27. Do you usually refer your patients? Yes/NO
(If NO SKIP TO Q14)

28. How long does it take you to get to nearest referral level?

29. I will now like to discuss with you about payment for the services that you render to your patients. How do people pay for services that you render?

30. Have there been times that people have not been able to pay for the services?

31. What services could they not afford to pay for?

Probe: what do you do when people are not able to pay for these services?

17. On average, how many people are not able to pay for your services in a month.

2. Exemption Policy Implementation

Do you offer exemptions or free service to some of your patients? Yes/No
(If NO skip to last section on Malaria treatment cost)

Which of the following groups currently benefit from the exemption policy?

Age groups	**Yes=1 No=2**	**CODES**
0-5		EXUND5
6-10		EXYOUNG
11-15		EXADOL1
16-20		EXADOL2
21-25		EXADULT1
26-30		EXADULT2
31-35		EXADULT3
36-40		EXADULT4
41-45		EXADULT5
46-50		EXADULT6
51-55		EXADULT 7
56-60		EXADULT8
61-65		EXADULT9
65+		EXAGED
Pregnant women		EXPREG
Disabled people (specify)		EXDISABLE

3. Presentations for Free service

Which of the following disease presentations and services are patients exempted from paying?

Presentations **Diseases**	**Yes= 1** **No= 2**	**CODES**
Malaria		EXMALD
Acute respiratory infections		EXARID
Diarrhoea		EXDIARD
Reproductive health infections		EXRTID
Convulsions		EXCOND
Other		EXOTHERD
Services		
Diagnostic care		EXDIAGNOS
Antenatal		EXNATALS
Family planning		EXFPS
Child welfare		EXCHILDS
Deliveries		EXDEVLS
Drugs		EXDRUGS
Incantations		EXINCANTS
Incisions		EXINCIS
Herbal medicine		EXHERBS
Other		EXOTHERS

7. You are a private provider, why do you choose to provide free service?

8. Why do you choose these groups to benefit from these free services?

3. How did people or the communities you serve get information about the services your provide free?

PRICE LIST FOR MALARIA TREATMENT

Out-patient Care

Item	Unit price	Total cost	CODES
Syringes and needles			OPXSYR
Drug 1: injections			OPXINJEC
Drug 2: Chloroquine, syrup and tablets			OPXCHLO
Drug 3: Paracetamol syrup /tablets)			OPXPARA
Drug 4: Multivitamin syrup/tablets			OPXMUL
Convulsions treatment			CONVULS
Herbal medicine			HERBALM
Other (specify)			OPXOTHER

GUIDE FOR DHS/RHS/NATIONAL POLICY UNIT

The Ministry of Health of Ghana has set out itself to improve equity in access to health care among different socio-economic groups, the vulnerable and across regions.

1. How do you perceive this goal to be achieved or to be addressed?

2.What structures have been put in place to address equity in access to health care?
3.What is an acceptable level of access do you hope to attain?

4. How do you perceive the role of the new Ghana Health Service in influencing and improving access to equal health?

5. When the Ghana medium health strategy says that is goal in to achieve equal health for all, what does this necessarily imply?

6. The exemption policy is been stated as one way of addressing financial barrier to access for vulnerable. What has been the success of the exemption policy? IE what has been the level of service uptake by the groups that it proposed to cover?

7. What are the key problems institutions are currently facing in its implementation.

8. One other way the health sector is trying to address financial barriers to access is the use of health insurance schemes? How far has this been implemented?

Probe: Which groups does the scheme cover? Formal and informal employees?

Have there been any pilot studies the health insurance schemes?
How do you see the feasibility of implementing the scheme? (Are people willing and able to pay? What quality issues are being addressed? Does physical access to health service a problem in its implementation? How are these issues listed being addressed?

9. The introduction of the CHPS program is to bring services to the doorsteps of the populace. Does this program has an equity oriented goal?
What is the equity goal and how is the CHPS program addressing it?

10. How wide has this program been implemented?
Probe: What has been the successes of this program i.e. percentage increase (in service provision, decreased distance to service point?

11. What are some of the problems with the implementation of the CHPS program?

12. How does the GHS hope to address these problems?

13. The health sector has been operating a decentralized system, how has decentralization impacted on equity in access to health care?

14. The new five-year program of work 2002-2006, indicate disparities in access to health care and mortality levels across regions and proposes to bridge these gaps. What are some of the steps taken to correct or reduce these disparities?

15. What other policies are being formulated to bridge the gap in access to health care in the future?

16. Does access to health service vary by the kind of disease? Which diseases would you say access is more widely distributed?

17. Does the focus of donors on particular disease prevention and eradication introduce inequality in access to health care among socio-economic and disease groups?

18. How is the Ministry policy regarding how disease control program be implemented to ensure the goal of equal access for all is achieved?

THANK YOU FOR YOUR TIME AND PARTICIPATION IN THIS STUDY.

APPENDIX III

CONSENT FORM

STATEMENT OF INFORMATION FOR MEN AND WOMEN PARTICIPATING IN THE DETERMINANTS OF EQUITY IN ACCESS TO HEALTH CARE: CASE STUDY OF MALARIA TREATMENT AND CONTROL IN THE KASSENA-NANKANA DISTRICT OF NORTHERN GHANA

Purpose: The Ministry of Health through the Navrongo Health Research Center and the University of Cape Town is undertaking this study with the aim of understanding the problem of malaria as a disease, the signs that indicate access to health care and the factors that affect the ability to use health services among women and men in this community and in other communities within the district. In this study, issues about malaria and how you treat or manage malaria as well as factors that affect use of health services will be discussed with household heads individually or with a group of individuals. Information that is obtained from this study will be used to design good health plans that will ensure that all community's members can have equal opportunity to use health care.

Procedures: You are being asked to participate in an interview, which will take about one hour. I will be asking you questions related to the management of malaria and access to health services and other information that will help to provide more information on access to health care. There are no correct answers to these questions. You are free to answer or not.

Risks and discomforts: The risks to you of participating in this study are minimal. However, some of the issues that may be discussed are of a personal and sensitive nature (household property and expenditure). If at any time you do not want to answer questions you are not obliged to do so.

Benefits: Your participation in this study will not benefit you directly, but it may benefit other people in your household and community in the future. After the interview we can discuss any questions you may have related to the issues discussed.

Confidentiality: We do not intend to ask you about your own private matters, and you should not feel under any obligation to answer all these questions. On the other hand if you do wish to share your personal experiences, the research team will ensure absolute confidentiality. Your name will not be mentioned on any written document. Nobody will be able to trace anything we discuss back to you.

Right to refuse or withdraw: Before being interviewed or participating in the study, please understand that your participation is voluntary. You do not need to answer questions or to participate in the research if you do not want to. You can stop participating in this study at any time.

Do you have any questions?
Do you agree to participate in the study?
If at any time following this interview you have any questions or would like to speak to someone involved in this study, please feel free to contact Patricia Akweongo, Dr. Abraham Hodgson, Director, Navrongo Health Research Centre and Dr. Micheal Thiede of the University of Cape Town, South Africa.

Thank you.

CONSENT FORM FOR HEALTH FACILITY AND HEALTH PROVIDERS PARTICIPATING IN THE EQUITY IN ACCESS TO HEALTH CARE: CASE STUDY OF MALARIA TREATMENT AND CONTROL IN THE KASSENA-NANKANA DISTRICT OF NORTHERN GHANA

Purpose: The Ministry of Health in collaboration with the Navrongo Health Research Centre and the University of Cape Town is undertaking this study to understand levels and distribution of access to health services among different socio economic groups in your service or catchment area. Information on the type of health services you offer, the cadres of staff, prices of services in relation to malaria treatment, issues of exemption for groups and equity issues in your service area will be solicited for.

Procedures: You are being asked to participate in an interview, which will take about forty-five minutes. I will be asking you questions related to the services provided at this facility, cadres of staff, access to health services and other information that will help to provide more information on access to health care. There are no correct answers to these questions and you are free to answer or not.

Confidentiality: Information you provide on your institution will remain private and will not be shared with any other institution or person under any circumstance. Information will be treated in the aggregate and no mention of this institution and its set up will be particularly made reference to in this report.

Benefits: It is recognized that your institution's participation in this study is voluntary and there are no direct benefits to your institution for participating in this study. You will however receive a feedback of findings of this study at a dissemination seminar at the Navrongo Health Research Centre that might be helpful in the running of your institution in the future.

Right to refuse or withdraw: You are free to withdraw from participating in this study at anytime without any obligation or penalty.

Do you have any questions?
Does your institution agree to participate in this study?

If at any point in time following this interview you have any questions or would like to speak to someone involved in this study, please feel free to contact Patricia Akweongo, Dr. Abraham Hodgson, Director, Navrongo Health Research Centre and Dr. Micheal Thiede of the University of Cape Town, South Africa.

Thank you.

APPENDIX IV BACKGROUND CHARACTERISTICS OF RESPOENDENTS

Background Characteristics	Percent	Number
Sex of respondent		
Male	70.53	1,326
Female	29.47	554
Ethnicity or respondent		
Kassena	51.65	971
Nankana	42.34	796
Other	6.01	113
Mean age of respondent *		
47 years		
Religion of respondent		
Traditional	62.18	1,169
Christian	31.76	597
Muslim	4.73	89
Other	1.33	25
Marital status of respondent		
Married	73.24	1,377
Divorced	5.21	98
Widow	17.39	327
Never married	4.15	78
Ever attended school		
Yes	33.78	635
No	66.22	1,245
Level of education respondent		
Primary	44.79	284
JSS/Middle	28.86	183
Secondary	13.88	88
Tertiary	12.46	79

Background Characteristics Continued...	*Percent*	*Number*
Main Occupation of respondent		
Farmer	80.37	1,511
Trader	11.06	208
Civil servants	5.90	111
Other	2.66	50
Other Occupation respondent		
Trading	43.49	207
Farming	40.13	191
Other (fishing)	13.87	66
Civil servant	2.52	12
Mean Household size	5	1880
Sleeping rooms per household	2	1880
Household interviews Per CHFP cell*		
Cell 1 (Village volunteers only)	16.18	237
Cell 2 (Community health nurses)	20.20	296
Cell 3 (Cell 1 + Cell 2)	45.67	669
Cell 4 (MOH,)	17.95	263
Household Interviews per NDSS Zone*		
North zone	16.97	319
South zone	33.78	635
East zone	13.99	263
West zone	22.13	416
Central zone	13.14	247

Background Characteristics Continued...	*Percent*	*Number*
Sex of household members		
Male	43.45	817
Female	56.55	1,063
Age of household members		
0-4	14.59	274
5-15	36.74	691
16-40	33.76	655
41+	13.8	260
Educational level of household members		
Primary	37.56	631
JSS/Middle	11.77	197
Secondary	6.07	102
Tertiary	1.32	22
None	43.28	727

Age and sex distribution of household members

Age	Male	Female	Number
0-4	51.55	48.45	274
5-15	51.6	48.40	691
16-40	44.18	55.82	655
41+	17.70	82.25	260

Appendix V: Asset Factor Scores (Weights)

Asset/Housing Characteristics	*Score*
Brick wall	0.136
Concrete wall	0.425
Zinc roofing	0.269
KVIP-Pit latrine	0.503
Renting a house	0.573
Lives in own house	-0.272
Flush Toilet	0.271
Well water	0.173
Pipe water	0.436
Bore-hole	0.034
Bicycle	0.129
Vehicle/car	0.195
Wooden bed	0.219
Radio	0.158
Television set	0.331
Sewing machine	0.197
Battery lamp	0.085
Coalpot/kerosene stove	0.202
Electric/ gas cooker	0.247
Aluminum cooking utensils	0.078
Kerosene lamp	-0.037
Animals	-0.127

APPENDIX VI: MALARIA MANAGEMENT AND HEALTH SEEKING BEHAVIOUR

Table 1: Malaria Signs and Symptoms

	Percent Children	*Percent Adults*
General Malaria signs		
Vomiting	10.62	7.2
Chills	13.14	16.17
Diarrhoea	19.44	11.61
Yellow urine-eyes	12.87	6.82
Headache- weak	43.92	44.55
Paint in joints		13.65
N	1826	1861
Severe Malaria signs		
Hot body	3.19	
Vomiting	8.35	9.30
Chills	10.31	18.32
Diarrhoea	20.73	11.61
Yellow urine-eyes	12.33	9.78
Lack appetite- weak	42.11	52.38
Convulsion	2.98	
N	1880	1861
Moderate Malaria signs		
Hot body	12.08	
Vomiting	14.26	10.76
Chills	21.29	25.91
Diarrhoea	8.62	8.26
Yellow urine-eyes	13.89	5.11
Lack appetite- weak	29.86	34.38
Headache		15.59
N	1879	1841

Table 1: Continued

	Percent Children	*Percent Adults*
Mild Malaria Signs		
Warm body	43.19	
Vomiting	7.26	
Diarrhoea	4.31	
Chills	30.05	34.21
Yellow urine-eyes	15.19	8.64
Weak		32.46
Headache		24.69
N	1764	1841

Table 2: Malaria Treatment for Levels of Severity

Management of Malaria by Severity	*Children*	*Adults*
Treatment of severe Malaria		
Paracetamol/Chloroquine	6.73	6.50
Paracetamol and Chloroquine together	30.34	22.2
Herbs	53.21	61.23
ORS-other pain killers	9.72	9.43
N	1872	1876
Treatment of Moderate Malaria		
Paracetamol/Chloroquine	13.58	22.63
Paracetamol and Chloroquine together	31.05	17.06
Herbs	50.13	55.60
ORS-other pain killers	5.24	4.72
N	1871	1876

Management of Malaria by Severity Continued	Children	Adults
Choices of Managing Malaria by Stages		
Mild		
Give paracetamol	9.13	4.85
Give Chloroquine	39.69	34.88
Herbs	47.02	57.14
Use Qualified provider	4.16	3.13
N	1829	1880
Moderate		
Give paracetamol	1.97	0.85
Give Chloroquine	26.10	26.45
Herbs	19.56	22.14
Use Qualified provider	52.37	50.19
N	1880	1879
Severe Malaria		
Give paracetamol	0.05	0.05
Give Chloroquine	0.85	0.43
Herbs	33.69	34.33
Use Qualified provider	65.41	65.25
N	1876	1876

Table 3: Sources of Information for Managing Malaria

	Percent	N
Mild Malaria		1880
Drug stores	7.34	
Public facility	22.22	
Relative	62.57	
Radio-television	7.87	
Moderate		1880
Drug stores	6.75	
Public facility	35.99	
Relative	47.05	
Radio-television	10.21	
Severe Malaria		1396
Drug stores	4.37	
Public facility	45.42	
Relative	41.55	
Radio-television	8.69	

Table 4: Utilisation of Health Care

Utilisation of Health Services	Percent	N
Reported general ill-health	52.7%	1880
Among those who were ill		
Sought Health care	86.2	853
Source of Health Care		853
Government Facility	69.9	
Chemical drug store	27.3	
Traditional healer	2.8	
Type of Provider used		853
Nurse at Health Centre	17.6	
Community Health Officer	8.4	
Drug Store	35.2	
Doctor	28.8	
Traditional Healer	4.5	
Village Volunteer	15.6	1066
Malaria Prevention		
Repellents	9.7	
Mosquito net	65.5	
Scented leaves	12.8	
Environmental/sanitation	12.10	
Bed Net Use by Age and Sex		839
Children under 5	21.8	
Children older than 5	16.7	
Father	19.6	
Mother	41.9	

Table 5: Physical Accessibility to Health Care

Distance to Health Facility	0-5km (%)	>5km (%)
Hospital	28.8	71.2
Drugstore	75.9	24.1
Village Volunteer	68.3	31.7
Traditional Healer	65.3	34.7
Health centre	50.3	49.7
Community health nurse compound	65.2	34.6

APPENDIX VII: ACCESS FACTOR LOADINGS OF EACH DIMENSION

Table 1: Factors of Availability Dimension

Variables	Supply Factor	Demand factor
Distance	0.96071	0.01164
Inpatient care	0.91436	0.05346
Travel time	0.17223	0.77342
Car/bicycle	0.23156	-0.69285
Residence	-0.91010	0.03608
% Total variance explained	53	22

Table 2: Factors of Affordability Dimension

Variables	Demand Factor	Cost of Health Care Factor
Consumption level	0.68158	0.11376
Male	0.77256	0.04606
Household size	0.78285	-0.01919
Cost of treatment	0.14842	0.83709
Transport cost	-0.31737	0.65719
Married	0.83111	-0.07453
% of variance explained by factor	**42**	**19**

Table 3: Factors of Information Dimension

Variables	Treatment Factor	Information Source Factor
Anti-malarials for severe malaria child	0.82171	0.09184
Anti-malaria for mild malaria in child	0.81511	0.09570
Anti-malarials for severe malaria adult	0.83066	0.04088
Anti-malaria for mild malaria in Adult	0.84071	0.05417
First source of information for mild-government provider	0.10900	0.81684
Second source of information for –moderate malaria-government provider	0.08663	0.83759
Third source of information for severe malaria government provider	-0.00127	0.70752
% of variance explained by factor	**42**	**25**

Table 4: Factors of Acceptability Dimension

Variables	General Malaria Management Factor	Severe Malaria Management Factor	Mild Malaria Management factor
Anti-malarials for severe malaria child	0.82192	-0.02578	0.22910
Anti-malaria for moderate malaria in child	0 76298	-0.09488	0.03022
Anti-malarials for mild malaria in child	0.60936	0.04385	0.04005
Anti-malarials for severe malaria adult	0.90552	0.04194	00.05296
Anti-malaria for moderate malaria in adult	0.89156	0.04194	0.05296
Anti-malarials-Managing first malaria symptoms in child	0.27868	-0.07727	-0.12640
Qualified provider -Managing first symptoms in a child	0.07082	0.04472	0.90968
Antimalarial-Managing second stage symptoms in a child	0.18980	-0.82919	-0.14192
Qualified provider -Managing second stage symptoms in a child	0.15617	0.88054	-0.05949
Qualified provider -Managing third stage symptoms in a child	-0.01034	-0.64731	0.01833
Anti-malarials -Managing first malaria symptoms in adult	0.32874	-0.00716	-0.11696
Qualified provider-Managing first malaria symptoms in adult	0.05882	0.03589	0.91098
Anti-malarials -Managing second symptoms in an adult	0.22178	-0.79183	-0.15060
Qualified provider-Managing second symptoms in adult	0.13588	0.88108	-0.02673
% Total Variance explained by factor	**40**	**31**	**14**