# Effects of Capitation on the Health Outcomes of Malaria Patients: Evidence from Ashanti and Brong Ahafo Regions of Ghana.

**By**

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## DECLARATION

I hereby declare that this submission is my own work towards Master of Arts (Economics) degree and that, to the best of my knowledge, it contains no material previously published by another person nor material which has been accepted for the award of any other degree of the University, except where due acknowledgement has been made in the text.



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## DEDICATION

This work is dedicated to Mad. Comfort Amoatta (my mum) and Mad. Yaa Kwakyewaa (my grandmother) who have worked tirelessly to bring me this far.

Also to Mr. John Agyemang (my uncle), Mad. Akua Antwiwaa, and my siblings: Kojo, and Kwame.

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## ABSTRACT

How best to pay for healthcare services has been a subject of considerable debate due to the little evidence on the impact of different types of payment systems on providers' attitude towards patients. Hence, provider payment systems are continuously and rapidly going through reforms to mitigate their negative effects and preserve their positives since they can provide strong incentives for improving health worker productivity, usage and quality of care, and affect treatment outcomes. However, payment methods that limit incomes through financial risk transfer may cause resistance from providers and impair their viability. The introduction of capitation in Ghana met fierce resistance and opposition from providers and pressure groups. The argument was that the capitation system would adversely affect patient health outcomes because the financial risk transferred to providers may lead to under-provision of services and reduced quality, as has been suggested by many studies. Using (ordered) logistic and ordinary least squares regressions, this study was basically conducted to find out whether capitation has any negative effect on the health outcomes of patients, provider's attitude towards the patient, visits, referrals and patients' willingness to stay or switch provider within a two month recall period. A sample of 250 NHIS malaria patients each from Ashanti (capitated group) and Brong Ahafo (Diagnosis Related Groupings/fee-for-service (DRG/FFS)) regions of Ghana was used for the study. The principal findings were that income, education (except basic) and mission health providers significantly improved health outcomes, and reduced "doctor shopping". Again, patients under capitation had poorer health outcomes than patients under DRG/FFS. Patients who sought treatment from mission health providers had better health outcomes. Providers' attitude towards patients was better among mission and private health providers than public health providers but the attitudes were poorer under capitation than under DRG/FFS. Visits were fewer under capitation, and these fewer visits (common among private healthcare providers) were significantly influenced by the copayment introduced by the providers. Again, Capitated patients had higher referrals and lower continuity of care than their DRG/FFS counterparts. Clearly, Capitation greatly reduces the quality of treatment and puts patients at a greater health risk. In view of these findings, educational policies should gear towards increasing enrolment and quality in schools to at least secondary school level to improve outcomes and continuity. Policies aimed at raising income levels among the population should be embarked on to improve health outcomes and better provider relations. It is important to also encourage patients in low income groups to report malaria cases to health facilities hence the need for measures to check additional fees charged by providers at the point of service use by NHIS patients. Again, policies should encourage and support religious bodies to build more (expand) and operate health facilities to improve outcomes, continuity of care and better provider relations. Finally, policy makers should restructure the Capitation payment method to prevent patient dumping and under-provision, and better provider relations to improve quality of care.

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# CHAPTER ONE

# INTRODUCTION

## 1.0 Background

How best to pay for healthcare services has been a subject of considerable debate. This is due the little evidence on the impact of different types of payment systems on providers' attitude or incentives towards patients (Donaldson and Gerard, 1989). As a result, provider payment systems are continuously and rapidly going through reforms, especially in low-income countries. The aim has been to mitigate their negative effects and preserve their positives. Most of these payment reforms have attempted to depart from the dependence on the traditional volume driven, i.e. fee-for-service (FFS), method which, most researchers have argued, encourages over-provision of services and increases healthcare costs rapidly (Maceira, 1998; Glass et al, 1999; Park et al, 2007; Waters and Hussey, 2004) as evidenced in Thailand, Taiwan, Korea and several other countries (Mills et al, 2000). Also, the complex nature of diagnostic related groupings (DRG) and its incentive to assign the same disease episode for almost every patient is a contributory factor to the pulling away by purchasers towards various cost sharing methods with providers (Mills et al, 2000; Barnum et al 1995 and Britran et al, 1998).

The experiences under fee-for-service, per diems, DRG etc, perhaps, have given more popularity to capitation as an alternative way, in most reforms, for paying healthcare providers because of its cost saving potential (Fowles et al, 1996). Capitation provides fixed fee per enrolee for all services required within a fixed time period, usually a year ( Jegers et al, 2002; Mills et al, 2000), and can be modified to reflect some features of the DRG approach, e.g. different fees for persons in different risk groups (Walter, 1984). By this, capitation provides no direct connection between payments and a provider's actual healthcare cost of a patient. Under such circumstances, efficient providers may have surpluses to keep

whilst inefficient ones are punished through the trauma of seeking extra funds to cater for their patients (Telyukov, 2001; Jegers et al, 2002). Capitation (either used in isolation or with retrospective payments) aim to improve efficiency, access, and equity without compromising on the quality of care (Gold et al, 1999; Eggleston and Hsieh, 2004; Bloom et al, 2002). In most cases, providers under volume driven and fixed fee payment methods of reimbursements differ in the way they care for patients which may affect patient and treatment outcomes or even satisfaction. The reason is that capitation payments turn providers into risk bearers, becoming financially responsible for each enrolee's cost of care under the contract, therefore providers have incentives to control cost of care per enrolee by either improving on efficiency, or engage behaviours that might adversely affect treatment decisions and patients' outcomes (Yip et al, 2001; Warner and Huxley, 1998; Chalkleya and Tilley, 2006). Provider payment systems are, therefore, crucial in achieving improved access, quality, equity, and above all efficiency in healthcare delivery.

Prior to 2007, Ghana's National Health Insurance Authority (NHIA) paid for all healthcare services for its enrolees through fee-for-service arrangements with providers, but could not escape from rapid cost escalation of healthcare due to large claims payment (caused mostly by increased utilisation), as occurred in most countries, in its early years (NHIA, 2009). For example, in NHIA annual report for 2009, total disbursements for claims payment increased from GH¢ 7.60 million in 2005 to GH¢35.48 million in 2006 showing an increase of 367%. This payment method was, however, reformed in 2007 to reflect patients' disease episode (i.e. Ghana Diagnostic Related Groupings (G-DRG)) to cater for services and arrest the galloping health expenditure. Unfortunately, not much was achieved in cost saving due to fraud on the part of schemes and providers as claims payments continued to rise (because almost every patient was diagnosed of the disease with a higher price, and some facilities got reimbursement for no work done) e.g. claims payment almost quadrupled of its 2007 figure

within two years (Fusheini et al, 2012; NHIA, 2009). Also reported by Fusheni et al (2012) were cases of rural community clinics with no caesarean surgeons and no capacity for caesarean service delivery being reimbursed for such services and monies been paid to non-existing facilities and an abuse of the gatekeeper systems by the providers. Ghana's experience with DRG system and perhaps FFS, however, is not an isolated case as South Korea, Brazil, Thailand, and Taiwan had similar experiences (Bitran et al, 1998; Mills et al, 2000).



To control the escalating expenditures and save its national health insurance from collapsing, the NHIA adopted a payment system based on capitation (patient list system) to cater for primary healthcare expenditures, thus providers are prepaid for future provision of defined services to enrolees in NHIA accredited health facilities, to improve pricing and reimbursement activities, and the efficiency of providers (Atinga et al, 2012). The pilot programme, taking place in the Ashanti Region with a population closed to five million, met fierce resistance and opposition from medical providers, and pressure groups with (sometimes) demonstrations (Adoah, 2012). The region's private medical providers forming 65% of all providers withdrew their services under the capitation for further consultations as politics took a centre stage in the piloting debate (Nsowah-Adjei, 2012). Despite opposition from medical providers, the payment method is still in operation within the Ashanti region and is expected to cover the entire country depending on its success in terms of cost control, access, equity and quality of care. As the NHIA adopts a cost sharing policy with providers through capitation, concerns about quality, access, usage which affect patient outcomes have emerged hence the need for an independent study into the capitation.

### 1.1 Statement of the problem

Provider payment methods can provide strong incentives for improving health worker productivity, access, usage and quality of care, which in the end affect treatment outcomes.

Thus patient outcomes, in a way, are affected by the mechanism through which healthcare providers are paid. As a result, payment methods that limit incomes through financial risk transfer or increase administrative (transaction) costs and threaten professional freedom can cause resistance from providers and impair the viability of such policy initiatives.

It is clear that Ghana's NHIA has joined the growing number of purchasers using capitation to pay for healthcare services. The aim is to contain costs, manage utilization and improve quality of care through better patient – provider relationship towards enhancing treatment outcomes (Agyepong and Yanka,...). In contrast, the potential for both positive and negative impacts of capitation on patients have been suggested by many studies, e.g. Catalano et al (2000), Bloom et al (2002), Cuffel et al (2002), Stearns et al (1992), Sorbero et al (2003), particularly usage, access, quality of care which have effect on patient outcomes and satisfaction with healthcare service.

During the recent introduction of capitation in Ghana, many were of the view that the capitation system was going to significantly affect patient outcomes because the financial risk transferred to providers may serve as an incentive for them to provide less than needed services, even at lower quality, to patients thereby affecting outcomes (Agyepong and Yanka, n.d). Thus the strong incentives of capitation to seek cost-efficiencies could result in reduced access to services, lower treatment outcomes and quality of care compared to those obtained under earlier payment systems (Mechanic and Aiken 1989; Lehman 1987; Mechanic 1991).

Therefore as NHIA seeks to control cost, the question that ultimately arises is whether or not capitation provides better health or patient outcomes compared to other already existing payment methods in use. This paper therefore seeks to find out the effects of capitation on patient and treatment outcomes, given the arguments by most researchers like Mechanic and Aiken (1989), Mechanic (1991) etc that health outcomes under capitation may be adversely

affected, coupled with demands from pressure groups to abolish the capitation. The paper would find out whether or not patient outcomes under capitation are better than other payment systems before the introduction of capitation.

### 1.2 Study Objectives

The study, generally, seeks to find out the effects of capitation on treatment effectiveness i.e. patient – reported outcomes of malaria patients by specifically finding out:

1. Patient health status or treatment outcomes under capitation, and whether they are different from those under DRG/FFS
2. Provider-patient relationship (i.e. providers' attitude towards patients) under capitation
3. The extent of patient access (measured by visits or utilisation) to healthcare services under capitation, and
4. Provide appropriate policy measures emanating from the study to address any problem (s) to achieve the overall objective of health system.

### 1.3 Justification of the Study

Achieving accessible, quality and efficient health system has been the aim of Ghana government. However, one major challenge is financial sustainability of its National Health Insurance Scheme (NHIS) due to faster growth in healthcare expenditure (claims payment) relative to growth in GDP. As various strategies are been used to improve on accessibility, quality, and efficiency of healthcare delivery, it is important to know the potential effects on patient outcomes under such policies, specifically under capitation, in achieving overall objectives of health systems. This study is, therefore, expected to help the government through NHIA, and other stakeholders to know the new behaviours and incentives of providers and their effect on quality, quantity, outcomes and satisfaction on patients under Ghana's recent capitation. It is to provide information on the kind of cost control measures

adopted under the programme and patient – reported outcomes. This is particularly important now that at least the mechanism is likely to cover the entire country.

### 1.4 Methodology and Data Analysis

The study relied mainly on primary data. Administration of well-structured questionnaires alongside interviews was used to gather data from participants, specifically NHIS enrolees who have sought malaria treatment in health facilities within two month period. They were conveniently selected. Descriptive as well as quantitative methods based on ordinary least squares, logistic and ordered logistic regression analysis, using STATA 11.0, was used to analyze the data.

### 1.5 Scope of the study

The study was limited to NHIS malaria patient in the Ashanti and Brong Ahafo Regions. These regions were selected for the study based on proximity, available information, and of course the financial strength of the researcher. In this study, outcomes are the patient – reported health status or health conditions under capitation and FFS/DRG after seeking medical treatment for malaria whereas provider-patient relations refers to how healthcare workers, e.g. nurses, doctors, etc behave towards patients. Thus, it is the provider's attitude towards the patient in the health facility. Again, referral means the transfer of a patient from one healthcare provider (facility) to another provider.

### 1.6 Organization of the study

The study is in five main chapters with each chapter comprising of sections and sub-sections. Chapter one introduced the study, chapter two reviewed literature, and chapter three focused on methodology. The results of data collected were analyzed and discussed in the fourth chapter whiles the fifth chapter presented the summary of findings, policy recommendations as well as conclusions of the study.

# CHAPTER TWO

# LITERATURE REVIEW

## 2.0 Introduction

Providing cost-effective quality healthcare services have been of increasing interest to purchasers, providers, and patients in recent years, especially, for low – income economies (Maceira, 1998; Park et al, 2007), and usually, discussions have focused on provider payment methods and how to restrict needless demand for healthcare (Maceira, 1998; Tang et al, 2012; Smith, 2008) because providers, patients, or payers face different kinds of incentives for efficiency, quality, and usage of healthcare services produced by payment methods (Maceira, 1998). In any case, the payment method should endeavour to avoid waste, improve quality and accessibility, permit choice of physician by the patient, and should also be easy to implement (WHO, 1996).

In the healthcare market, physicians (who have information power) usually act as agents for patients, healthcare facilities, or insurers, and their performance (effort) as agents is very difficult to monitor if not impossible (Robinson, 2001; Maceira, 1998). One important question is whether physicians are perfect agents for their patients by solely basing their treatment decisions on what is in the patient's best interest, or whether physicians behave as rational economic agents acting in a profit maximizing manner. Usually, agents whose efforts cannot be observed may act in their own interest rather than that of the principal hence the need for payment methods that seeks to serve the interest of both the principal and the agent at any point in time (Maceira, 1998; Robinson, 2001).

Paying providers via capitation may constrain costs, but concerns about access, quality, and quantity of care which may affect health outcomes have been raised (Zuvekas and Hill, 2004). Apparently, providers may control costs by providing care more efficiently usually seen in fewer visits and hospitalisation, but what is not clear is whether this implies greater

efficiency or reduced access and quality of care (Zuvekas and Hill, 2004; Shafrin, 2009). If access to healthcare services and quality are reduced then patient health outcomes would be affected.

This chapter therefore seeks to review theoretical literature on provider payment mechanisms, their incentives, framework for setting capitated rates, purpose and types of capitation as well as empirical studies on the effects of provider payment mechanisms, particularly capitation, on patient health outcomes.



## 2.1 Kinds of Payment System

Many researchers like Jegers et al (2002), Park et al (2007), Maceira (1998) describe two reimbursement methods in healthcare system. These are retrospective and prospective payment systems. The former is where the provider's costs are fully (or partially) paid after service provision, which to them motivates providers to decrease costs due to their profit maximising motive, but Eastaugh (1987) argues that providers may have an incentive to increase costs under retrospective system since healthcare cost would be recovered, and the latter is where provider's budgets are determined *ex ante* without any relationship with the provider's actual costs. Thus whiles retrospective make use of ''you deliver whiles I pay later'' the prospective paymentsc make use of ''I pay you first and you deliver the services later''

## 2.2 The Concept of Capitation

The Dictionary of Health Economics (2005) defines capitation as a method of paying physicians or healthcare providers a fixed fee per period per patient registered (sometimes differentiated according to age or sex of patient) regardless of the amount of service provided or consumed. Thus the amount of health service funds are assigned to a person (entity) with certain characteristics for the service in question, for the time period in question, subject to

any overall budget constraints, and in effect, puts a 'price' on the head of every enrolee (Rice and Smith, 1999).

According to Bourdon et al (n.d) ''capitation is a fixed sum per person paid in advance of the coverage period to a healthcare entity in consideration of its providing, or arranging to provide, contracted healthcare services to the eligible person for the specified period''. By this, the receiver (provider) agrees to provide healthcare services to all those insured in that health plan irrespective of what the actual cost of services would be. The actual cost may be higher or less than per capita rate collected, and this places a mini-insurance role on the provider as it receives a guaranteed ''premium'' to provide services whose actual cost and value is not initially known, (Bourdon et al, n.d). Capitation payments are prospective and provide for stronger controls on the price and volume of services but may encourage under-provision or poor-quality care if the rates are too low (Waters and Hussey, 2004; Langenbrunner and Wiley 2002).

The ILO (2009) report on Thai UCS describes capitation as a poll tax. Thus, a direct uniform tax is imposed on each person — a uniform amount payable on a per capita basis (normally a year) to a defined health service provider (physician, hospital, etc.) for each eligible patient under a health plan.

Capitation may be partial or full (total or global) whether it applies to some or all types of services. Partial capitation implies that prospectively determined per capita rates and hence the budget only apply to some services (usually primary care) provided by a given medical facility or a network of facilities, and all other services (secondary or tertiary) are paid outside capitation where as full (total or global) capitation implies coverage of the entire package of services negotiated between a purchaser and a provider (Telyukov, 2001; Maceira, 1998). Most researchers suggest that the purchaser organizes all contracting providers to form referral networks for such provider network to cover all levels of care

namely primary, secondary and tertiary level as this can facilitate the use of full capitation (Telyukov, 2001; Tolley et al, 1987).

### 2.2.1 Types of Capitation

Different types of capitation exist based on factors such as the entity accepting the capitation payment and how the capitated entity financially relates to the entity actually providing care (Tolley et al, 1987) namely:



**Area Capitation**

This type of capitation involves paying a fixed per capita rate to provide care for enrolees in a specified geographic area, and the insurer then pays healthcare providers for services (to be) delivered to enrolees based on some payment schedule or contract (Tolley et al, 1987). The area insurer may use a DRG type of "average" cost schedule to set payment amounts for the providers in the area. For example, an insurer or intermediary might be paid a fixed rate per person to provide care for all of the eligible residents of a state, province or region. Under these circumstances, the insurer may attempt to restrict the beneficiaries' use of high-cost providers through closed panels or high co-payments and/or transfer some financial risk to the providers in order to encourage them to be efficient (Gold et al, 1999). The transfer of money to these geographic areas is usually based on the region's specific healthcare needs and disease burden (Apablaza et al, 2006).

**The "Gatekeeper" Capitation Strategy**

This also involves area-wide capitation and the strategy of ''gatekeeper'' adopts a triage role in addition to the financial role of the fund holder. Here, the gatekeeper refers the patient requiring services to a specialist appropriate to the patient's problem e.g. cancer cases are referred to oncologists. These specialists (direct providers) are paid on an "average case" basis similar to a DRG schedule. The insurer adopts a medical as well as a fiscal role though

it is not a direct provider of healthcare, and therefore covers a smaller area or enrols fewer individuals for capitation than under the area capitation model because of the triage role (Tolley et al, 1987).

**Direct Capitation**

In this system, healthcare providers are paid directly and their healthcare expenditures are determined *ex ante*. It blends the insurer/provider roles in one organization and the per capita amount is constant with respect to disease diagnosis as agreed upon though may be reviewed (Tolley et al, 1987). In managed care plans, e.g. for renal disorder, facilities are provided with a prospective flat payment per patient per month and the provider then becomes responsible both for the patient's direct dialysis expenses and for a pre-specified set of dialysis complications requiring additional care (Hirth and Held, 1997).

In any capitation system, a fixed fee is paid to a healthcare provider/insurer at pre-arranged intervals for the healthcare services for an eligible individual, and places providers at risk to encourage more efficient styles of practice (Spitz and Abramson, 1987). In any case, providers are paid, typically in advance, a pre-determined fixed rate to provide a defined set of services for each individual enrolled with the provider for a fixed period of time. In any form, typical capitation contains these crucial elements: 1) payment is tied to a defined patient group, i.e., the money follows the patient; 2) care is prepaid at a predetermined rate; and 3) the recipient of the capitated payments may be at financial risk if expenditures exceed payments (Telyukov, 2001).

The major reason of purchasers adopting capitation has been to control costs (Catalano et al, 2000). Capitation, in any form, is to increase participation of general practitioners in determining clinical strategies, referral patterns, and allocation of resources among levels of care; improve coordination of services among the primary, secondary, and tertiary levels;

broaden access to care and liberalize consumer choice of provider while, at the same time, restricting "doctor shopping" which results in too many visits, tests and prescriptions; encourage efficiency by way of aligning resource to priorities areas, and to offer incentives that promote technically efficient practices amongst providers and hence allow purchasers to implement an optimal allocation of funds to guarantee healthcare for those in need (Smith, 2008; Telyukov, 2001).

Under capitated pools physicians are induced to control cost, to prevent the possibility of depleting available funds, when making treatment decisions, and where provider networks exist, physicians within the network are more likely to coordinate and also pressure their colleagues to work within the capitated budget (AMA, 1997; Telyukov, 2001).

Perhaps, the most important issue of concern is access to (quality) care by patients. Payments systems that are likely to negatively affect access to care should be decided on societal and humanitarian grounds, and physicians (providers) must play an important role in determining services to be covered and the amount payable for such services (all of which must be made known to the public before their enrolment) (AMA Report, 1997)

### 2.3 Setting Capitation Rates for Providers

Once the principle of capitation is to be adopted to pay healthcare providers, the most important issue is how to set the competitive fixed rates to be paid to providers since capitation has the potential of raising health risk of patients. Also, the ability of prepaid plans to reduce health expenditures however, rests importantly, on the level of the capitation rate given to the prepaid plans (Leibowitz and Buchanan, 1990). The capitation rates may be set using top-down costing, bottom-up costing, or minimal revenue requirement approaches (Waters and Hussey, 2004; Telyukov, 2001), and fee-for-service caps with some adjustments (Leibowitz and Buchanan, 1990).

### 2.3.1 Top-Down Costing Approach

This method disaggregates total expenditure to units of service such as patient visits or patient hospital days. Costs are allotted to "cost centres" (units of service activity e.g. laboratory centres), determining the quantity of service per cost centre, and finally allocating costs to units of service (Wiley, 1993). If service-specific data on cost and utilization does not exist, a monthly historical budget may be divided by the served population to yield a fairly accurate projection of per capita spending, and this gives the Per Member Per Month (PMPM) rate (Telyukov, 2001).



### 2.3.2 Bottom-Up Costing Approach

The approach aggregates the costs of each input used to provide a service. It focuses on each type of service included in prospective capitation system, and estimates the cost of service per member per month (PMPM) by multiplying the projected per capita utilization of that service by the service unit cost. The total of service-specific PMPM rates equals the aggregate PMPM rate. This rate is multiplied by the number of enrolled population to yield a cost-based monthly capitated budget (CB) for the provider (Telyukov, 2001).

### 2.3.3 Minimum or Minimal Revenue Requirement Approach

This is where the link between provider revenue and financial viability is thoroughly examined. To prevent shut-down, economic theory postulates that every producer including health care providers must recover costs of labour, utilities, facility maintenance, office supplies, and administrative overheads. These costs become the minimum revenue requirement for continuous operation. Some of this revenue will be generated from enrolees' co-payments and fees from non-enrolled patients, and the remaining amount under prospective capitation. Dividing that remaining amount by the number of enrolees produces an estimated capitation rate. If administrative control or competitive pressure greatly affects pricing, the capitation rate may not be easily increased to make up for the lack of enrolees.

This makes retention and increasing the enrolment base important strategy to leveraging provider revenue and meeting the minimal revenue requirement (Telyukov, 2001).

Telyukov, 2001 suggests that, estimated capitation rates should ensure that each provider receives sufficient funding for contracted services but at competitive and/or affordable rates under available funds; and that enrolment sizes are sufficient to allow the provider to breakeven at competitive level.

In any of the above methods, Smith and Rice (1999) postulates that fundamental choices must be made based on the amount of finance to be distributed for the services in question; the factors to be incorporated into the capitation; and the weights to be placed on those factors but recounts that the amount of money available is solely a political decision. The capitation for a given individual can be thought of as his relative health care expenditure needs and some factors (needs factors) are taken into account in calculating the expected health care expenditure though such factors might be judgmental (Smith and Rice, 1999). The method has been to identify the average expected healthcare expenditure for a citizen with certain characteristics (age, sex, ethnicity, income, residential area, etc) though Newhouse et al (1989) estimate that it is possible to predict – at the very most – 20% of the variation in annual healthcare expenditure for individuals whiles 80% is the subject to random fluctuation and argues that demographic factors explain only a small fraction of the total variance amongst individuals (typically less than 1%).

Kerr et al, 1995 suggest that measures of previous health care utilization or health status, in the form of professional diagnosis, self-reported morbidity, previous inpatient spells, previous healthcare expenditure or previous hospital diagnosis should be considered in setting capitation rates.

In all these, verifiable and timely data are very important but those that can be manipulated are not suitable in determining capitation rates and in the UK, for example, available personal

characteristics are confined to age and sex (Smith and Rice, 1999; Smith, 2008). Some countries, like Sweden, have a much larger set of data available on individual citizens, incorporating issues such as welfare and employment status, housing tenure and marital status whiles others have universal access to certain aspects of patients healthcare utilization records. Thus empirical data on utilization, age, health expenditure etc should be the basis for developing capitation systems. Also mortality and regional differences are important factors to consider when designing capitation rates (Beck and Zweifel, 1998).



A capitation can be very basic and simple by assigning an equal amount for each citizen, regardless of circumstances, i.e. no circumstances vector is required (Carr-Hill et al, 2001). A rudimentary form is to vary the capitation on the basis of a single population characteristics, such as age and/or sex (e.g. as in health care capitation methods in Israel and Switzerland (Beck, 1998; Shmueli et al., 1998)). It is important to note that the chosen vector of circumstances on which the capitation is to be based should incorporate only personal characteristics that are universally recorded (across all recipients of funds), consistent, verifiable, free from perverse incentives, not vulnerable to manipulation and consistent with confidentiality requirements and plausible determinants of service needs (Carr-Hill et al, 2001). Thomas et al (1983), and Waters and Hussey (2004) suggest that capitation rates should be designed to offer providers more protection against the financial consequences of adverse selection since if prices or rates are below the expected costs providers can be expected to cover the deficit by lowering expected costs via selection of lower risk patients or under-provide care. Therefore a mixed payment system i.e. capitation plus other forms of payment would mitigate providers' incentive to select healthier patients (Newhouse 1996) whiles not glossing over risk adjustment since it is a crucial component of any capitation model particularly for chronic patients (Antioch and Walsh, 2002).

In Thailand, for example, the determination of capitation rates for providers is based on outpatient (OP) and inpatient (IP) cost data. The average cost per enrolee is calculated by taking into account the unit costs $u_i$ (e.g. unit OP cost per enrolee's visit to hospital) and the morbidity rate $m_i$ (e.g. the average number of OP visits of enrolee per year) (ILO, 2009).

### 2.4.0 Other Forms of Provider Payment Mechanisms (PPMs)

There are other forms of arrangements through which healthcare providers are paid for the services they render. Some of these payment systems are briefly described below.

### 2.4.1 Fee-For-Service (FFS)

This is a method of remunerating professionals (especially medical doctors) according to an agreed fee-schedule specifying what is payable for each item of service supplied and may be used in conjunction with capitation (dictionary of health economics, 2005). The FFS system requires medical (diagnostic and therapeutic) activities and contacts to be separately identified since the price of each item is determined *ex-ante* and activities that are not on the list are not paid (Jegers et al, 2002). This is largely a variable system since providers increase their returns by producing more services. FFS has two principal benefits: access of care is guaranteed as well as provision of the best care available, at least if marginal payments compensate for the marginal cost of care (Jegers et al, 2002). Nevertheless, negative consequences are possible as providers may produce too much care, i.e. care which does not deliver any significant marginal health benefits, a phenomenon known as 'supplier induced demand' due to providers' information power (Donaldson and Gerard, 1993; Glass et al 1999). Prices are prospectively determined for each service e.g. drugs, diagnosis, etc and are paid for after the service.

### 2.4.2 Diagnosis Related Groupings (DRG)

This is a payment per case basis where healthcare providers are paid depending on the type of case or disease treated at an agreed fee, and is prospectively determined in that fees are determined *ex-ante* regardless of the actual costs (e.g. the length of stay) of the patient (Jegers et al, 2002). The system requires classification of cases, which is a complex and time consuming task, based on the homogeneity of the resource used and clinical characteristics (e.g. principal diagnosis, secondary diagnosis). Though the DRG-system was developed for hospital managers as a tool for quality improvement and product management (Rosko and Broyles, 1987) it has helped in determining how providers are paid. Besides the principal diagnosis, DRGs take account of concomitant diseases and complications, the age of the patient, and the type of treatment. Therefore, they are not exclusively based on a diagnosis, causing them to be partially retrospective. While the diagnosis is the prospective component of payment, type of treatment and therefore costs actually incurred constitute a retrospective element. For example, payment for a caesarean section is higher than for a natural delivery. In addition, the payer reimburses very expensive cases ('outliers') separately, which serves to further reduce the prospective character of DRG-based payment. Many scholars argue that the information system requirements of case-based payments are substantial and complex which requires social insurance agencies to have the capacity to exercise a strong purchaser role (Mills et al, 2000; Jegers et al, 2002). These steps, in the view of Waters and Hussey (2004) are vital in setting prices for diagnosis-based payments: (1) developing a diagnosis classification system; (2) determining the relative weights of the group; (3) determining the level of payment per relative unit; and (4) establish adjustments to the payment rate. Also Duckett (1998) contends that fixed payments to providers for overhead costs should be separated from the diagnosis-based payments in order to circumvent the incentive of diagnosis-based payments to admit more patients.

### 2.4.3 Per-Diem Payments.

Park et al, 2007 describe these as daily payments to hospitals for inpatients admissions. It gives a strong incentive to increase the number of admissions and to extend the length of stay, thereby enhancing health expenditure as evidenced in Germany. The OECD countries are gradually moving away from this daily payment as for e.g. Norway abandoned per diem payments at the beginning of the 1980s (Park et al, 2007).

### 2.4.4 Budget



Budgets allocate pre-determined fixed amounts of money to providers for a certain period (Park et al, 2007). The amount is usually based on previous levels, and adjusted by an inflation factor (Preker and Feachem 1996). It usually forms the framework for the subsequent introduction of other provider payment schemes (Park et al, 2007). Budgets are of two types namely budgets for the whole healthcare sector (global budget), and budgets for parts of it (line – item budget) such as for ambulatory care, hospital care, pharmaceuticals etc and can be set for health facilities, and are commonly used reimbursement methods for hospitals in low- and middle-income countries (Park et al, 2007; Barnum and Kutzin 1993; Bitran and Yip 1998; Wouters 1999). Other provider payment methods, for example DRGs, may be used to remunerate specific hospital departments, whiles respecting a pre-determined budget for the hospital as a whole. Whether cost-containment can be achieved, depends on the type of budget and its rigidity. The degree of rigidity produces hard and soft budgets. Under hard budgets, providers are fully responsible for all profits and losses while soft budgets entail a fixed amount of spending but without penalty in case of excess expenditure (Park et al, 2007). The hard type is more effective for cost-containment but may reduce access and quality of services. For cost-containment potential, hard global and sectoral budgets are mostly effective as the risk of overspending in a soft budget is large (Park et al, 2007). The disadvantage is that budgets provide no incentives to ensure quality of care and

may encourage the under – provision of healthcare services (Langenbrunner and Wiley 2002).

### 2.5.0 Patient Health Outcomes or Health Status

The term usually refers to the impact healthcare activities have on people. Thus, the effect of healthcare activities on their symptoms, ability to undertake their normal activities, and ultimately on whether they live or die. Health outcomes include whether a given disease process gets better or worse, what the costs of care are, and how satisfied patients are with the care they receive. It focuses not on what is done for patients but what results from what is done, (http://myhealthoutcomes.com/faqs/3000). Thus, what happens to the patient after being ill, e.g., mortality, symptoms, or ability (inability) to do his normal activities would help determine health outcomes. Nutbeam (1998) also describes health outcome as a change in the health status of an individual, group or population which is attributable to planned interventions regardless of whether such interventions were intended to change health status or not. Thus, it can be a change in health status caused by a therapy or factor when compared with a previously documented health status using disease-specific measures, general quality of life measures or utility measures.

In this study patient health outcomes would mean the health status or the health condition of the malaria patient after seeking treatment from his or her medical provider, i.e. patient reported outcomes on their health.

### 2.5.1 Review of Empirical Studies on the Effects of Capitation on Patient Health Outcomes, Provider – Patient relationship, and Visits

Most of the studies dealing with the effects of payment systems on patients were conducted in advanced economies where social health insurance abounds with healthcare market being highly regulated. These economies usually have efficient health systems, and purchasers are able to exercise strong purchaser – role in the healthcare market than what happens in

developing economies. This section therefore reviews empirical studies on providers' incentives under capitation and the effect such payment system on health outcomes of patients.

Murray et al (1992) conducted a study to assess the effects of reimbursement mechanisms on physician behaviour and patient health outcomes in US, using a single group of physicians who provided care for hypertensive patients with either capitation or fee-for-service health insurance plans. Using ordinary least squares regression (OLS) they found that patients under capitation had fewer laboratory tests and lower overall charges than their fee-for-service counterparts, and no clinical significant differences in health outcomes for 1 – year period, specifically blood pressure control after they have controlled for patients' age, severity of hypertension, and level of co – morbidity. Murray et al (1992) conclude that capitation can result in lower cost associated with the management of hypertension without jeopardising immediate health outcomes.

Lee-Feldstein et al (2000) researched on the relationships of HMOs, health insurance, and delivery systems to breast cancer outcomes in US using logistic regression modelling of two outcome variables namely stage at diagnosis and treatment selected. They find that publicly insured or uninsured patients were less likely than FFS patients to be diagnosed of breast cancer at an early stage and that survival rates were no different in group model HMO, non – group model HMO, and FFS plans for breast cancer patients.

Yergan et al (1988) studied the source of payment for healthcare and service intensity using a patient sample of 4369 diagnosed of pneumonia in US, based on multi – linear regression. In their study no prepaid plan was included and they found that Medicaid patients received a significant number of services followed by Blue Cross but death rates was higher i.e. 21.6%

in the Medicaid group than in the Blue Cross. They conclude that the source of payment has a significant impact on the care provided.

Lurie et al (1984) examined health outcomes of patients whose publicly funded insurance was discontinued due to changes in health policies like the loss of Medicaid in California where they report that people whose coverage was terminated had poorer overall health status and worsened blood pressure control in hypertensive patients, which was thought to be related to the lack of access to physician care and antihypertensive medications.

Bloom et al (1998) employed OLS to examine utilization, cost and outcomes of inpatient and outpatient services before and after the implementation of a capitated payment system for Colorado's Medicaid mental health services compared to services that remained under FFS reimbursement in USA using a stratified random sample of 513 mental health consumers. They report that no significant differences were recorded in patient outcomes under capitation and FFS after controlling for patients demographic characteristics.

Using two capitation and random regression models, Cuffell et al (2002) examined the effects of capitation on the clinical outcomes of Medicaid beneficiaries in Colorado State in US. Their study used three samples (591 beneficiaries) to compare treatment outcomes assessed over 2 year period and found that rates of homelessness in the direct capitation group were lower than the FFS group by a statistically significant margin, and therefore conclude that capitated payment arrangements with providers do not affect the treatment outcomes of adult persons with severe mental illness negatively.

Escarce et al (2003) examined the association between characteristics of eye care practices and satisfaction with eye care among working age patients with open-angle glaucoma (OAG) or diabetic retinopathy (DR) with 913 patients enrolled in six managed care health plans. Using logistic regression models to assess the association of patient and practice

characteristics with high levels of patient satisfaction they found that patients were satisfied with the treatment in a practice with a glaucoma specialist or a retina specialist but treatment in a practice obtained under capitation payments or in a group practice was associated with lower satisfaction.

Feldman et al (1998) researched on the effects of managed care on physician – patient relationship, quality of care, and ethical practice of medicine in US descriptively and found that quality of care was compromised by the limits on diagnostic test, length of admission, and choice of specialist. Thus patient health outcomes were adversely affected under capitation since managed care plans usually use capitation.

Sorbero et al (2003) examined the relationship between patient case-mix, utilization, primary care physician (PCP) payment method, and the probability that patients switch their PCPs. Using multivariate logistic analysis, they find that patients with stable chronic conditions and capitated PCPs were 36 percent more likely to switch PCPs than similar patients with FFS PCPs, after controlling for patient age and sex and physician fixed effects. Again, high consumers with capitated PCPs were significantly more likely to switch PCPs than were similar patients with FFS PCPs. The findings suggest that the quality and continuity of care were lower under capitation.

Warner and Huxley (1998) studied the outcome for people with schizophrenia before and after Medicaid capitation at community agency in Colorado, US using two random samples (100 each). They found that psychopathology was lower after capitation and admissions were 57% lower than before capitation but respondents had improved quality of life.

Using weight-adjusted multivariate regression techniques and a sample of 46320 ambulatory care visits, Balkrishnan et al (2002) examined the effects of capitation on duration of physician-patient encounters and number of preventive and health counselling services. They

found that there was a modest decrease in the amount of time physicians spend with their patients and with increased receipt of preventive and health counselling services under capitation and was more severe among physicians who received payment based on capitation only.

Udavarhelyi et al (1991) reviewed the medical records of patients cared for under FFS and prepaid (capitation) methods by four group practices within a network model health maintenance organization in US. They report that the quality and quantity of ambulatory care for Health Maintenance Organisation (HMO) patients was equal to or better than that for fee-for-service patients.

The related literature and empirical works give cognizance of the important role played by provider payment mechanisms in affecting provider behaviour and patient outcomes in the healthcare market. Using ordered logistic regression model, this study looks at effects that capitation (as a method of paying providers) has on treatment and patient health status in Ghana. This work is unique in the sense that it focuses on developing country experience as it is the first of its kind in Ghana. Also, it finds the impact of patient – physician relationship and visits or encounters on health outcomes of patients.

# CHAPTER THREE

# METHODOLOGY

## 3.0 Introduction

This chapter spells out the conceptual framework of the methods employed by the study as well as the background of the setting. It also explores the methods used to elicit information from respondents. The study employed descriptive and quantitative methods for the data analysis. Ordered logistic regression analysis model, using STATA 11.0, was employed under the quantitative method to determine whether or not capitation has caused a change in patient health outcomes and other variables.



## 3.1 Background of the Study Areas

### 3.1.1 Ashanti Region (Capitated Group)

The Ashanti Region is centrally located in the middle belt of Ghana and is currently going through the capitation pilot project. It lies between longitudes 0.15W and 2.25W, and latitudes 5.50N and 7.46N. The region shares boundaries with four of the ten political regions, Brong-Ahafo in the north, Eastern region in the east, Central region in the south and Western region in the South west. The region occupies a total land area of 24,389 square kilometres representing 10.2 per cent of the total land area of Ghana. It is the third largest region after Northern (70,384 sq. kms) and Brong Ahafo (39,557 sq. kms) regions with a population density of 196 persons per square kilometre, the third after Greater Accra and Central Regions. More than half of the region lies within the wet, semi-equatorial forest zone. The forest vegetation of parts of the region, particularly the north-eastern part, has been reduced to savanna due to bushfires.

There are 27 administrative districts in the Ashanti Region including the Kumasi metropolis. The region is the most populous and one of the most rapidly growing regions in the country

as well as a large proportion of hard to reach areas, especially in the Afram Plains sections of Sekyere Afram Plains, Ejura Sekyedumase, Sekyere Central and Asante Akim North districts.

The region's population is 4,780,380 representing 19.4 per cent of the country's population (GSS, 2010). A number of factors, particularly high fertility and migration, may account for the rapid population growth in the region e.g. Total Fertility Rate, (TFR) is high (4.8), compared with the national average of 4.0. The other reason for the growth is the centrality of the region and its economic potentials in the cocoa and mining industries, which attract people from other parts of the country to the region.

The urban population (51.3%) in the region exceeds that of the rural population (48.7%). The growth of the mining industry in Obuasi and the increase in commercial activities in Kumasi may account partly for the relatively high urban population in the region. One other factor that has also contributed to the high urban population in the region is the growth in some of the localities which were hitherto considered as rural settlements, but have now attained urban status (localities with population of 5000 and above). The major occupation is Agriculture particularly food and cash crop production, except in the Kumasi metropolis, where Sales workers predominate. Majority of the economically active population are self-employed, mainly in the private informal sector, which provides job opportunities, particularly for females with little or no formal education (www.modernghana.com).

In terms of health facilities, the region has five hundred and twenty-seven (527) health facilities with the Ghana Health Service operating about 33% of all health facilities. Kumasi metropolis has the highest number of facilities (29%) with Ejura – Sekyedumase having the least of health facilities (2%). The population hospital ratio is 48,276 (Ghana Health Service, Ashanti Half Year Report, 2010).

### 3.1.2 Brong Ahafo Region (DRG/FFS Group)

This region, formerly a part of the Ashanti Region, covers an area of 39,557 square kilometres and shares boundaries with the Northern Region to the north, the Ashanti and Western Regions to the south, the Volta Region to the east, the Eastern Region to the southeast and La Cote d'Ivoire to the west.

With 19 administrative districts and Sunyani as the regional capital, the region lies in the forest zone and is a major cocoa and timber producing area. The northern part of the region lies in the savannah zone and is a major grain- and tuber-producing area. The region has a population of 2,310,983 showing an Intercensal growth rate of 2.3% (GSS, 2010) and a sex ratio is 98.2. The region has more females than males and therefore has a higher total fertility rate (TFR) of 4.2 which is higher than the national level of 4.0. Urban population constitutes 44.5% per cent of the total population of the region. Sunyani, Techiman and Berekum are the only Districts with high percentage of the population in urban settlements.

With population composition, the Akans dominate in the region, and in all the districts, except Sene district where the Guans constitutes the largest ethnic group. The Mole Dagbon constitutes the second largest ethnic group in the region and in all districts, except Sene and Atebubu. The proportion of the population who have never been to school is 42.4 per cent (37.2% males and 47.7% females). There are more illiterates in the region than the national average, and the level of illiteracy is higher among females than males in all districts in the region.

Agriculture is the major occupation for the economically active population. Majority of the economically active are self-employed with or without employees, and are dominated in the informal sector. In terms of health facilities the region can boast of 24 hospitals, six of which are government-owned, with one quasi-public and 17 privately-owned. Sene is the only district with no hospital. Other health facilities are health centres (35), rural clinics (106) and

maternity homes (54). Traditional healers and healing facilities are wide spread throughout the region and are most accessible to the population than all the other facilities (www.modernghana.com). Healthcare providers in this region are paid based fee-for-service and diagnosis related groupings methods.

### 3.2.1 Contextual Framework

The framework of the study is based on the premise that in order to achieve the goal of health system, patients should be able to access and utilise healthcare services when needed. However, this may be jeopardized if providers find innovative ways of restricting necessary healthcare consumption due to the financial risk imposed on them. Providers may charge patients additional fees aside their insurance to reduce visits. If the capitation, in the near future cover inpatient care, admission rates may be low even though they might be necessary and in case the patient is put on admission, the normal Length of stay for the patient to recover may be shortened as well as providers not having good relationship with their patients, all in an effort to discourage the patient from consuming healthcare services which may endanger patient health outcomes for malaria patients.

### 3.2.2 Sources and Method of Data Collection

This study used primary data in the form of structured interviews (questionnaire) as the means of data collection since enrolees were the best source of the kind of information needed. The structured interviews contained questions that centred on type of facility they visited and the ownership status of such facilities, whether enrolees paid additional fees aside their health insurance subscription, whether they were admitted and if so how long they were hospitalised. Respondents were also asked to give the number of visits they have had after the initial visit/discharge, and finally they were asked to rate their health condition/outcomes as well as the relationship they have had with their providers, based on the medical treatment they sought for malaria, ranging from very poor to excellent. Also information on income,

age, employment and educational levels were collected. In all these, the convenient sampling method was employed in selecting the participants (malaria patients) in the study areas as it was dependent on who was an enrolee of NHIS and has visited a health facility due to malaria at the time, using a two month recall period. Malaria was chosen as a proxy for all diseases since it has been the major cause of morbidity and mortality in both children and adults in Ghana. For example, Malaria accounted for 38.6% of outpatient visits and was responsible for over 18% of deaths reported at health facilities (Ghana Health Service, 2007). Data collection started in late November and December, 2012. In all 500 (i.e. 250 from each region (capitated and DRG/FFS groups)) participants took part in the study. The participants came from both rural and urban settings in each region to reflect the entire populations they represent.

### 3.2.3 Data Analysis

In order to know the effect of capitation on health outcomes of malaria patients, access and utilization as measured by visits as well as the quality of provider – patient relationship, quantitative methods were used. This is because they provide sufficient information about the relationship between the variables under investigation to enable prediction and control over future outcomes (Cormack, 1991). It also indicates the extensiveness of attitudes held by people, makes statistical comparison between various groups possible, measures level of occurrence, actions, trends, etc. and forms the framework for actual estimates of the degree of relationships between variables (Sukamolson, n.d). The dependent variables being studied are dichotomous or binary (ordinal) hence the choice of (ordered) logistic regression technique as the empirical method of estimation under the quantitative method. Other variables such as type of facility visited, gender, etc were analysed descriptively.

### 3.3.0 Empirical Estimation and Regression Analysis

Different regression techniques (ordinary Least Squares or OLS, ordered logistic, and logistic regression models) were used in this study to determine the effect of capitation on patient health outcomes, access and utilisation (visits), and the quality of relationships that exist between providers and their patients by accounting for respondents' age, education, income among other variables in the sampled population. As noted earlier, the qualitative nature and lack of natural numerical values of the dependent variables necessitated the use of ordered logistic and logistic models in which the probabilities of each outcome conditional on the independent variables are modelled based on the cumulative normal distribution (Stock and Watson, 2007). Ordered logistic model is appropriate due to its ability to identify statistically significant relationship between the explanatory variables and the dependent variable, and also discerns unequal differences between ordinal categories in the dependent variable (Greene, 2002). The ordered logistic model is expressed below and it follows the procedures of Greene and Hensher (2009) and Agresti (2007):

$Y_i$ = j if $\mu_{j-1} <= Y_i^* < \mu_j$ for j = 1,...**J**.....(1)

where the structural model is given by

$Y_i^* = X_i\beta + \varepsilon$, $\varepsilon_i \sim L[0, \pi^2/3)]$, i = 1, .....n .....(2)

and $\mu_0 = -\infty$, $\mu_j \leq \mu_{j+1}$, $\mu_m = \infty$. Given that the error term is logistically distributed, the probability of observing a particular value of $Y_i$ is given by:

$$P(Y_i = j|x) = P(\mu_{j-1} < Y_i^* <= \mu_j |x)$$

$$P(Y_i = j|x) = P(\mu_{j-1} < X_i\beta + \varepsilon <= \mu_j |x)$$

$$P(Y_i = j|x) = P(\varepsilon < \mu_j - X_i\beta |x) - P(\varepsilon <= \mu_{j-1} - X_i\beta |x)$$

$$P(Y_i = j|x) = F(\mu_j - X_i\beta) - F(\mu_{j-1} - X_i\beta), \text{ for } j = 1,....\mathbf{J} \quad .....(3)$$

Further suppose that while we cannot observe $Y_i^*$, we instead can only observe the categories of response:

$Y_i$ = 0 if $\mu_{-1} < Y_i^* < \mu_1$,

$Y_i$ = 1 if $\mu_0 < Y_i^* < \mu_1$,

$Y_i$ = 2 if $\mu_1 < Y_i^* < \mu_2$

$Y_i$ = .....

$Y_i$ = J if $\mu_{j-1} < Y_i^* < \mu_j$.

Then, the ordered logistic technique will use the observations on $Y_i$, which are a form of censored data on $Y_i^*$, to fit the parameter vector. The variable $Y_i^*$ is a continuous, unmeasured latent variable whose values determine what the observed ordinal variable $Y_i$ (health status/outcome, provider – patient relationship) equals. The continuous latent variable has various thresholds points. In the ordered logistic model, $Y_i$ = j is the observed discrete outcome where as β is the vector of estimated parameters and $X_i$ is the vector of explanatory variables. $\varepsilon$ is the error term which is assumed to be logistically distributed (zero mean and non-constant variance) with the logistic distribution function denoted by F (•). The estimated threshold parameters are the $\mu_j$ (in which $\mu_j > \mu_{j-1}$ for positive probabilities) and n is the number of observations.

The threshold parameters (cut points) are used to differentiate the adjacent levels of the response variable (health outcome/status, and provider-patient relations). A threshold is referred to as points on the latent variable, continuous unobservable mechanism/phenomena that result in the different observed values on the proxy variable (the levels of health outcome, and provider – patient relationship used to measure the latent variable).

In STATA 11.0, the actual values of the response variables are irrelevant in the estimation of these parameters in ordered logistic, and larger values are taken to correspond to higher or better outcomes where positive value means that the explanatory variable improves the ratings. The ordered logistic regression models to be estimated are given in **Models 1 – 2** as:

### 3.3.1 Model 1 (Health Outcomes of Malaria Patients)

The purpose of model 1 is to find out the effect of education, income, age, employment status, gender, and most importantly capitation on patient health outcomes.

Let $Y_i$ (ordinal response variable) represent the observed response of each NHIS enrolee ($i^{th}$ observation) and $Y_i$ in turn, is a function of another variable, Y*, that is not measured. Therefore, it follows that: $Y_i = f(Y_i^*)$, for $f$ is the functional relationship that exist between health outcome, $Y_i$, and the unmeasured latent variable, $Y_i^*$, whose values determine what the observed ordinal variable Y equals. The continuous latent variable $Y_i^*$ has various threshold points. The general model to be estimated is given as:

$$Y_i^* = \beta_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9 \ \beta_{10} X_{10} + \beta_{11} X_{11} + \beta_{12} X_{12} + \beta_{13} X_{13} + + \beta_{14} X_{14} + \beta_{15} X_{15} + \beta_{16} X_{16} + \beta_{17} X_{17} + \beta_{18} X_{18} + \beta_{19} X_{19} + \varepsilon_i \rightarrow \mathbf{1}$$

For $Y_i^*$ = ordered dependent variable (health outcomes/status) coded as 0, 1, 2, 3, 4 (very poor, poor, good, very good, excellent respectively)

$X_2$ = Age

$X_3$ = Monthly Income

$X_4$ = Dummy variable ($X_4$= 1 if female, $X_4$= 0 if male)

$X_5$ = Dummy variable ($X_5$= 1 if employed, $X_5$= 0 if unemployed)

$X_6$ = Dummy variable ($X_6$ = 1 if basic education, $X_6$ = 0 if otherwise)

$X_7$ = Dummy variable ($X_7$ = 1 if senior high education, $X_7$ = 0 if otherwise)

$X_8$ = Dummy variable ($X_8$ = 1 if tertiary education, $X_8$ = 0 if otherwise)

$X_9$ = Dummy variable ($X_9$ = 1 if uneducated, $X_9$ = 0 if otherwise)

$X_{10}$ = Dummy variable ($X_{10} = 1$ if on capitation, $X_{10}$ = 0 if otherwise)

$X_{11}$ = Dummy variable ($X_{11}$ = 1 if the facility is a mission one, $X_{11}$ = 0 otherwise)

$X_{12}$ = Dummy variable ($X_{12}$ = 1 if the facility is a private one, $X_{12}$ = 0 otherwise)

$X_{13}$ = Dummy variable ($X_{13}$ = 1 if the facility is a clinic, $X_{13}$ = 0 otherwise)

$X_{14}$ = Dummy variable ($X_{14}$ = 1 if the facility is a health centre or post, $X_{14}$ = 0 otherwise)

$X_{15}$ = Dummy variable ($X_{15}$ = 1 if the patient was admitted, $X_{15}$ = 0 otherwise)

$X_{16}$ = Dummy variable ($X_{16}$ = 1 if the facility is a teaching or regional hospital, $X_{16}$ = 0 otherwise)

$X_{17}$ = Dummy variable ($X_{17}$ = 1 if the facility is a district hospital, $X_{17}$ = 0 otherwise)

$X_{18}$ = Dummy variable ($X_{18}$ = 1 if a patient paid additional fees, $X_{18}$= 0 if a patient did not pay any additional fee

$X_{19}$ = Dummy variable ($X_{19}$ = 1 if the facility is a Government one, $X_{19}$ = 0 otherwise)

$\varepsilon_i$ = Stochastic error term.

### 3.3.2 Model 2 (Provider-Patient Relationship, i.e. providers' attitude towards patients)

Model 2 accounts for the effect of education, income, age, employment status, gender, and capitation on the provider – patient relationship (i.e. provider's attitude towards patients) and is presented below:

Let $Y_i$ (ordinal response variable) represent the observed response of each NHIS enrolee ($i^{th}$ observation) and $Y_i$ in turn, is a function of another variable, Y*, that is not measured. Therefore, it follows that: $Y_i = f(Y_i^*)$, for $f$ is the functional relationship that exist between provider – patient relationship, $Y_i$, and the unmeasured latent variable, $Y_i^*$, whose values determine what the observed ordinal variable Y equals. The continuous latent variable $Y_i^*$ has various threshold points.

$$Y_i^* = \beta_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9 \ \beta_{10} X_{10} + \beta_{11} X_{11} + \beta_{12} X_{12} + \beta_{13} X_{13} + + \beta_{14} X_{14} + \beta_{15} X_{15} + \beta_{16} X_{16} + \beta_{17} X_{17} + \beta_{18} X_{18} + \beta_{19} X_{19} + \varepsilon_i \rightarrow \mathbf{2}$$

For $Y_i^*$ = ordered dependent variable (provider – patient relationship) coded as 0, 1, 2, 3, 4 (very poor, poor, good, very good, and excellent respectively) and the meanings of the X variables are the same as presented in model 1.

### 3.3.3 Model 3 (OLS Estimation of Physician encounters by Patients)

Model 3 is to find out the effect of paying additional fees, education, income, age, capitation, employment as well as gender on visits to a health facility and is presented below:

Let $H_i$ represent the response of each NHIS enrolee ($i^{th}$ observation). Therefore, $H_i$ = number of visits to a health facility after initial visit or discharge. It follows that: $H_i = f(Y_i)$, for $f$ is the functional relationship that exist between visits, $H_i$, and the random variable, $Y_i$, determining the probability of patient's visit to a health facility.

$$Y_i = \beta_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9 \ \beta_{10} X_{10} + \beta_{11} X_{11} + \beta_{12} X_{12} + \beta_{13} X_{13} + + \beta_{14} X_{14} + \beta_{15} X_{15} + \beta_{16} X_{16} + \beta_{17} X_{17} + \beta_{18} X_{18} + \beta_{19} X_{19} + \varepsilon_i \rightarrow \mathbf{3}$$

For $Y_i$ = Quantitative dependent variable: visits to a health facility

Here again, all the meanings of the X variables are the same as presented in model 1.

### 3.3.4 Model 4 (Logistic Regression on Referrals)

The purpose of model 4 is to find out the effect of education, income, age, employment status, capitation, visits, type of facility, who owns the facility etc on whether a patient would be referred to another provider or not.

Let $H_i$ (Binary variable) represent the response of each NHIS enrolee ($i^{th}$ observation). Therefore, $H_i$ = 1 if a patients was referred and $H_i$ = 0 if a patient was not referred to another provider. It follows that: $H_i = f(Y_i)$, for $f$ is the functional relationship that exist between referrals, $H_i$, and the random variable, $Y_i$, determining the probability of a patient being

referred to another facility under capitation. The model to be estimated is given as below following the procedures of Greene and Hensher (2009), Nicoletti (2011) and Agresti (2007).

$$Y_i = ln\left(\frac{P_i}{1-P_i}\right) = \beta_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9 \ \beta_{10} X_{10} + \beta_{11} X_{11} + \beta_{12} X_{12} + \beta_{13} X_{13} + + \beta_{14} X_{14} + \beta_{15} X_{15} + \beta_{16} X_{16} + \beta_{17} X_{17} + \beta_{18} X_{18} + \beta_{19} X_{19} + \varepsilon_i \rightarrow \mathbf{4}$$

For $Y_i$ = Qualitative dependent variable: 1 if a patient was referred to another provider; 0 if patient was not referred. $P_i = \frac{1}{1+e^{-(\beta_1+\beta_2 X_i)}}$ and it represents the probability of a patient being referred to another provider under capitation. All the meanings of the X variables are the same as presented in model 1.

### 3.3.5 Model 5 (Logistic Regression on the Willingness to stay with current provider)

The purpose of model 5 is to find out the effect of education, income, age, employment status, capitation, visits, type of facility and who owns the facility on whether a patient would change provider or not.

Let $H_i$ (Binary variable) represent the response of each NHIS enrolee ($i^{th}$ observation). Therefore, $H_i$ = 1 if a patient is willing to stay with current provider and $H_i$ = 0 if a patient unwilling to stay with current provider. It follows that: $H_i = f(Y_i)$, for $f$ is the functional relationship that exist between willingness to stay with current provider, $H_i$, and the random variable, $Y_i$, determining the probability of a patient willing to stay with his current provider under capitation. The model to be estimated is given as:

$$Y_i = ln\left(\frac{P_i}{1-P_i}\right) = \beta_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9 + \beta_{10} X_{10} + \beta_{11} X_{11} + \beta_{12} X_{12} + \beta_{13} X_{13} + + \beta_{14} X_{14} + \beta_{15} X_{15} + \beta_{16} X_{16} + \beta_{17} X_{17} + \beta_{18} X_{18} + \beta_{19} X_{19} + \varepsilon_i \rightarrow \mathbf{5}$$

For $Y_i$ = Qualitative dependent variable: 1 if a patient was willing to stay with current provider; 0 if a patient was unwilling to stay with current provider. $P_i = \frac{1}{1+e^{-(\beta_1+\beta_2 X_i)}}$ and it represents the probability of a patient willing to stay with current provider under capitation. All the meanings of the X variables are the same as presented in model 1.

The following questions were paramount in the study as they formed the basis for comparison.

- Whether patient's health status under capitation and FFS/DRG are good or not.
- How many visits they have had with their doctors after initial visit/discharge.
- Whether the provider's attitudesc towards patients are good or bad.
- Whether NHIS members pay additional fees aside insurance at the point of service use and the effect of such payments on health outcomes, visits, referrals etc.

### 3.4.0 Expected Signs of the Parameter Estimates

#### 3.4.1 Model 1

It is expected that age ($X_2$) would impact negatively on health outcomes/status. This is due to the fact that as a person advances in age, his health status depreciates. Also, capitated plans are not volume driven hence it would be in the interest of the provider to raise efforts so as to better the effectiveness of treatment. Thus patients under capitation are expected to have better health outcomes/status than others. However, given the mix feelings and the oppositions to the payment method, the capitation is expected lead to a decrease in treatment outcomes relative prior payment system. Therefore the signs of $\beta_2$ and $\beta_{10}$ are expected to be negative. Income, employment, and education are expected to move in the same direction with health outcomes/status hence $\beta_3, \beta_5, \beta_6, \beta_7, \beta_8$ are expected to be positive. This is because as one is educated, and/or employed, he receives higher income which puts him in a better position to live a healthy life. He is therefore expected to have a better health outcome as he advances in education and income. Females are also expected to have better health

outcomes/status than males. This is because females are less likely to engage in risky lifestyles e.g. smoking, drinking alcohol etc hence $\beta_4$ is expected to be positive. Again, outpatients, private health facilities, health centres or post are expected to impact negatively on health outcomes; given that in the case of health centres or posts, their resources are not adequate as compared to teaching and district hospitals, and as such their coefficients are expected to be negative. Mission health providers, teaching hospital, district hospitals and clinics as well as paying additional fees at the facility are expected to impact positively on health outcomes hence their signs are expected to be positive. Being an inpatient means the doctors would be readily available to cater for patients and are therefore expected to have better health condition hence its sign is expected to be positive.

### 3.4.2 Model 2

This paper expects age to impact positively on provider – patient relationship. This is due to the culture of respect for the elderly in the traditional Ghanaian society. As a person advances in age, his relation with his provider is expected to be more intimate and better. Therefore $\beta_2$ is expected to be positive. Also, capitated plans are not volume driven hence it would be in the interest of the provider to raise efforts so as to better the effectiveness of treatment. As a person visits the hospital frequently, he drains the financial resources of the provider hence the provider would engage in behaviours that discourages the patient from further visits. This makes relations bad. Therefore the sign of $\beta_{10}$ is expected to be negative.

Income is expected to impact positively on patient – physician relations. This is due to the fact that people with higher income are able to pay any additional fee charged by the provider and also give cash gifts to physicians. This makes relations better due to the ‘‘hands go, hands come’’ adage. Therefore $\beta_3$ is expected to be positive.

Education is expected to move in the same direction with provider – patient relationship hence$\beta_6$, $\beta_7$, $\beta_8$ are expected to be positive. This is because as one is educated, he receives

income which puts him in a better position to live a healthy life and also obey the instructions of his provider by following all medical prescriptions. The educated is likely to demand more from his provider as they are more likely to know their rights as a patient. Therefore his relation with his provider is expected to be good.

The relationship between gender and physician – patient relationship is unknown as it is unclear which sex has bad temperament. Therefore the sign of $\beta_4$ is unknown. Also, private and mission health facilities as well as clinics and health centres (most of which are owned by private and missions) are expected to impact positively on the provider – patient relationship and as such their coefficients are expected to be positive. This is because salaries of non – government workers are tied to productivity and hence it is in their own interest to relate well with patients. The impact of inpatients, and the type of facility on provider – patient relations are unknown and so are their expected signs. Paying additional fees are expected to impact positively on provider – patient relations and so is its expected sign.

### 3.4.3 Model 3

It is expected that age, uneducated, females, would impact positively patient – physician encounters (visits). This is due to the fact that as a person advances in age, his health status depreciates and would therefore utilise more medical care. Also because females have lower opportunity cost compared to males in sacrificing working hours for medical care (usually accompanied by long waiting hours), females are more likely to have frequent visits than males. Uneducated people (usually) have low income and lower economic cost of forgoing working hours for extra medical care hence are more likely to have more encounters with doctors. Therefore $\beta_9$, $\beta_4$ are expected to be positive on visits. The relations between visits and Education is unknown since at one breath educated people are more likely to use scientific methods in curing diseases thereby consuming more healthcare, and another educated people are more likely to live a healthy lifestyles since the opportunity cost of

hospital visits are high due to loss of working hours hence are less likely to visit hospitals frequently. Therefore signs of $\beta_6$, $\beta_7$, $\beta_8$ are unknown. However, capitation is expected to reduce visits since revenues are not volume driven hence it would be in the interest of the provider to raise efforts so as to better the effectiveness of treatment. Thus patients under capitation are expected to have fewer visits. Again, if patients are charged additional fees, it may reduce their visits since those who cannot afford may not seek treatment when sick. Therefore the signs of $\beta_2$, $\beta_3$, $\beta_{11}$, and $\beta_{10}$ are expected to be negative. Those employed ($\beta_5$) are expected to have less incentive to have more visits than the unemployed, therefore the expected sign of $\beta_5$ is negative. This is because one's labour supply determines the wage he receives, hence every rational economic agent would want to maximize the benefits of consuming health services i.e. he chooses less visits and consume more drugs to have better outcomes. Also, private and mission health providers, and health centres/post as well as the payment of additional fees (copayment) are expected to affect visits negatively and as such their coefficients are expected to be negative the constant term is expected to be positive. Again, teaching or regional hospitals, and district hospitals are expected to be positive on visits given their ownership status. It is also expected that inpatients will have more visits due to follow ups on medical checkups after discharge.

### 3.4.4 Model 4

It is expected that capitation, clinics, health centres, private and mission health facilities would impact positively on referrals on the part of provider, and as such their coefficients are expected to be positive. This is due to the fact that health providers under capitation would want to avoid cost and therefore would dump their patients with others. This is more likely to so among private and mission providers. Clinics and health centres have less medical resources and equipment and as such they are more likely to refer to other health facilities they may consider appropriate. Outpatients are expected to negatively affect referrals hence

its coefficient is expected to be negative. The signs of the coefficients of age, income, education and employment status in terms of referrals are unknown. The constant term is expected to be negative. Teaching hospital serves as last resort hospitals in the regions hence their impact on referrals are expected to be negative and those who pay fees at the health facility are less likely to be referred hence the signs are expected to be negative.

### 3.4.5 Model 5

It is expected that capitation and private health facilities would impact negatively on a patient's willingness to stay with current providers, and as such their coefficients are expected to be negative. This is due to the fact that health providers under capitation were not happy about the capitation and do things which might not be in the interest of patients, all to discredit the capitation. Mission health providers, and inpatients are expected to have a positive impact on continuity and hence its coefficient is expected to be positive since missions hospitals are not usually concerned with profitability but goodwill and quality of care. The signs of the coefficients of age, income, education, type of facility, and employment status in terms of continuity of care are unknown. Paying additional fees are expected to impact negatively on continuity of care and so is its expected sign. The constant term is expected to be positive.

# CHAPTER FOUR

# PRESENTATION AND ANALYSIS OF RESULTS

## 4.0 Introduction

This chapter presents and analyses (descriptively and quantitatively) the results of the regressions run by STATA 11.0 using 500 participants. OLS, Logistic and Ordered logistic regression estimates were used to find out the impact of age, income, employment status, capitation, education etc. on patient health outcomes as well as other dependent variables mentioned earlier in chapter three.



## 4.1 Descriptive Analysis

**Table 1 Descriptive Statistics of Variables Used in the Study.**

| Variable | Mean Value | Standard Deviation | Minimum Value | Maximum Value |
|---|---|---|---|---|
| Age (Years) | 35.05 | 13. 99268 | 15 | 90 |
| Income(GH¢ p. m) | 585.00 | 352.0851 | 40 | 1800 |
| Visits | 4.418 | 3.824727 | 0 | 20 |
| Length of stay (days) | 3.763725 | 2.216654 | 1 | 14 |

*Source: Author's Field Work, 2012*

The above table summarizes the demographic factors and healthcare consumption pattern of the participants in the study areas, and it revealed that, the age structure of malaria patients sampled ranged between 15 years and 90 years. On the average, a respondent was 35 years (approx.) and falls within the labour force. The average income per month for the group was GH¢585.00. The highest earner in the sampled population earned an amount of GH¢1800.00 per month whilst the lowest earner received GH¢40.00 per month implying that there was a significant variation in income. The average number of days spent by a malaria patient in a health facility upon admission was 3.76 days (approximately 4 days) for the group.

**Table 2: Descriptive Statistics of Socio-Economic Variables Used in the Study**

| Patient Information/ Variable | Percentage |
|---|---|
| **Gender:** | |
| Male | 44.80 |
| Female | 55.20 |
| **Level of Education:** | |
| uneducated | 17.80 |
| Basic | 31.00 |
| Secondary | 29.40 |
| Tertiary | 21.80 |
| **Employment Status** | |
| Employed Patients | 62.20 |
| Unemployed Patients | 31.80 |
| **Ownership status of facilities visited** | |
| Government | 55.20 |
| Mission | 16.20 |
| Private | 28.60 |
| **Type of facility Visited** | |
| Teaching/ Regional Hospital | 18.40 |
| (District) Hospital | 17.40 |
| Clinic | 35.40 |
| Health Centre/ Post | 28.80 |
| **Payment of Additional fees aside Insurance** | |
| Paid Additional Fees | 73.80 |
| No Additional Fees Paid | 26.20 |
| | |

| | |
|---|---|
| **Type of Patient** | |
| Inpatients | 40.80 |
| Outpatients | 59.20 |
| **Preferred Primary Care Provider (PPP, Ashanti)** | |
| Chosen PPP | 68.00 |
| **Referral Pattern** | |
| Patients referred | 42.20 |
| **Health outcomes/ status** | |
| Very poor health status | 9.00 |
| Poor health status | 6.60 |
| Good health status | 20.60 |
| Very good health status | 32.40 |
| Excellent health status | 31.40 |
| **Provider – patient relationship** | |
| Very poor relations | 12.80 |
| Poor relations | 12.80 |
| Good relations | 12.20 |
| Very Good relations | 28.00 |
| Excellent relations | 34.20 |
| **Continuation of care** | |
| Willing to stay with current provider | 48.60 |
| Unwilling to stay with current provider | 51.40 |

*Source: Author's Field Work, 2012*

From Table 2, we could see that there was not much difference in terms of gender as 55.20% of the respondents in the sampled population were females with males representing 44.80% of the group. Most of the respondents were employed though a significant number (31.20%)

were unemployed as at the time this study was conducted. In terms of education, 21.80% of them were graduates from tertiary institutions. Majority (31.00%) had received basic education whiles those with secondary education were 29.40% and 17.80% had no formal education.

Concerning the type of facilities patients sought malaria treatment and who owns such facilities, majority (55.20%) sought treatment from public owned health facilities whiles 16.20% sought treatment from health facilities owned and operated by religious bodies usually known as Mission hospitals and/or clinics. The remaining 28.60% sought treatment from facilities owned and operated by private individuals. On the nature and type of the facilities, 18.40% of the respondents sought their malaria treatment from Teaching or Regional hospital whilst those who sought treatment from (District) Hospitals, Clinics, and Health Centers/Post were 17.40%, 35.40%, and 28.80% respectively.

The study also revealed that a significant number of patients constituting 73.80% of the sampled population paid additional fees irrespective of the fact that they were NHIS enrolees whiles 26.20% reported that they did not pay any additional fees at the point of service use due to their NHIS status. Most of the patients attributed the copayment to the inability of the insurance to cover essential drugs given them. Again, most of the payments went into hospital card, and some laboratory test. In the Ashanti region, out of the 250 respondents, 32.00% sought treatment from health facilities other than their Preferred Primary Care Providers (PPPs) whiles the remaining 68.00% sought treatment from their PPPs. Majority of those who visited health facilities other than their own PPP attributed it to the fact that they were assigned to providers without their knowledge. This also accounted for the additional fees paid by NHIS enrolees in most facilities in the region. Another interesting revelation was that most of the patients were randomly assigned to providers (facilities) outside their jurisdiction which they found it costly to visit such facilities.

With referrals, there was a significant amount of referrals as 42.80% of the population sampled were referred to other facilities for treatment. Most of the patients, particularly in Ashanti, attributed their referral to the non membership of such facilities. Others attributed their referral to the absence of doctors, and lack of adequate laboratory facilities in such facilities. On the health/treatment outcomes of the 500 patients sampled, 6.60% and 9.00% rated their health condition/status/outcome to be poor and very poor respectively. Most of the respondents, i.e. 20.60%, 32.40%, and 31.40% respectively rated to have their health outcomes to be good, very good, and excellent.

Moreover, the patients were also asked to rate their relations with their providers (providers' attitude towards patients) within the two month recall period they sought treatment. A number of respondents, i.e. 12.80% and 12.80% of the sampled population rated to have had poor and very poor relations with their healthcare providers, especially with the nurses. A significant number of the respondents also rated to have had good, very good and excellent relations with their providers in the two month recall period and they represented 12.20%, 28.00%, and 34.20% respectively. Most patients (those who were treated with disrespect) attributed such rude behavior of providers, particularly nurses, to congestion in health facilities which usually result in delays in most health facilities. The nurses were accused of showing a clear sense of favoritism and nepotism among patients.

Finally, in this section, most of the patients were willing to continue to receive healthcare services (primary care) from their current providers whiles others did not mince words to say that they do not desire to continue with their providers in relation to the question of whether they would like to continue with their current provider (s) or not. These figures, 48.60% and 51.40%, represent those willing and those unwilling to continue with their providers respectively. This can be attributed to the poor nature of services received or patients' desire

to shop for providers. This is worrying given the fact that the NHIA would like to extend the capitation to cover the entire country.

### 4.3.0 Quantitative Analysis

In the ensuing analysis of the regression results, a positive sign of an estimated coefficient implies that increases in that particular variable tend to improve (increases) the dependent variable in question and a negative coefficient predicts otherwise. Also, the significance of a parameter estimate is determined by the p – value of that particular parameter. The p – value should be or below 0.05 for that parameter to be significant at 5% error level. The overall tests of significance for the models are also based on Likelihood Ratio whose p – values should be or below 0.05 for a particular model to be significant at 5% error level.

### 4.3.1 Effect of capitation on the Health outcomes of malaria patients (Model 1)

The results of ordered logistic regression with health outcomes as the dependent variable are presented in Table 3. A positive sign of an estimated coefficient implies that increases in that particular variable tend to improve the health condition or outcome of malaria patients, and a negative coefficient predicts otherwise. The overall test of significance of model 1 shows that the model is statistically significant. This is because its p – value of 0.000 is less than 0.05. This implies that, collectively, the variables have a significant impact on health outcomes or status of malaria patients at 5% error level. For example, income, education (Secondary and Tertiary), Mission health providers (facilities), and capitation had a significant impact on the health status or outcome of malaria patients in the sampled population whiles the other variables (age, employment, private providers, being an inpatient, visiting teaching/ regional hospitals, district hospitals or clinics) had no impact on a patient's health outcome though their signs were expected except payment of additional fees, and inpatients whose coefficients had a sign different from the expected signs of the study.

Of a particular interest is the capitation variable which had significantly affected the health outcomes of (malaria) patients negatively in the sampled population. This is because the p – value for its negative coefficient was 0.001 and also below 0.05. Thus, patients under the capitation payment method had poorer health outcomes/status compared to patients under FFS/DRG arrangements as seen in the results, and is consistent with the findings of Sorbero et al (2003); and Feldman et al (1998). This can be attributed to the strong opposition from providers due to poor publicity and lack of adequate consultation with stakeholders before its implementation as well as lack of adequate supervision and monitoring of providers.

Income and education (except basic) appeared to have a positive significant impact on health outcomes. This means that as a person advances in education he/she is able to undertake preventive measures like personal hygiene, exercising, good eating habits etc, and even take drug dosages properly to improve health outcomes. Also, as his income rises, ceteris paribus, he is able to afford good and quality food, clothing, and afford all medical expenses to be in a better health condition.

Furthermore, those who attended mission health facilities (hospitals, clinics, health centre/posts) had better health outcomes compared to those who visited private and government health facilities (control group). This could be due to the fact that such hospitals have better facilities such as wards, laboratories, nurses, physicians etc though such information were not explored. Age was, however, not statistically significant in influencing the health status of the patient though the expected sign of age was met. The above results are in tune with the a priori expectations of the signs of the coefficients except the payment of additional fees and inpatients parameters which deviated from the study's expectation. The sign of employment was unknown. The results of the ordered logistic regression are presented in Table 3.

**Table 3: Ordered Logistic Regression Estimates**

| Dependent variable: Health outcomes | Estimates | | |
|---|---|---|---|
| **Explanatory Variables** | **Coefficient** | **Standard Error** | **P – value** |
| Age | -.0118432 | .0062125 | 0.057 |
| Income (monthly) | .0006622 | .0002695 | 0.014 |
| Female | .5117459 | .1683993 | 0.002 |
| Employed | -.0986037 | .1915968 | 0.607 |
| JHS | .5020661 | .2654566 | 0.059 |
| SHS | .8547157 | .2769763 | 0.002 |
| Tertiary | .6295652 | .2866151 | 0.028 |
| Capitation | -.5902043 | .1832401 | 0.001 |
| Mission Health Facility | .562694 | .2609081 | 0.031 |
| Private Health Facility | -.0843852 | .2189986 | 0.700 |
| Paid Additional fees | -.2754517 | .2050698 | 0.179 |
| Teaching/ regional hospital | .4099141 | .2709208 | 0.130 |
| District hospital | .3390687 | .2537234 | 0.181 |
| Clinic | .2964911 | .2173112 | 0.172 |
| Inpatients | -.0817292 | .1748727 | 0.640 |
| /cut1 | -2.003244 | .4511492 | |
| /cut2 | -1.335012 | .4432537 | |
| /cut3 | -.0969432 | .4398561 | |
| /cut4 | 1.382831 | .4427192 | |

*Source: Author's Field Work, 2012*

It should be emphasised that most of the inpatients had just been discharged from health facilities few days before the study as well as the aged, most of whom were going through recovery period. This could probably be the reason for the sign of the coefficient of inpatients in the study. In Table 3, it should, however, be noted that information on the health facilities

like number of beds, wards, medical personnel (e.g. nurses, medical doctors, pharmacist, dentists etc) and their qualifications, laboratory equipments etc were not considered due to the difficulty in obtaining such information despite their likelihood in affecting health outcomes.

### 4.3.2 Effect of capitation on provider-patient relations (Model 2).

The ordered logistic regression results in Table 4 below, with provider – patient relationship as the dependent variable, showed that income had a sign that met the expectation of the study. Also income, private and mission health facilities had a positive significant impact on the probability that a healthcare provider will relate well with his/her malaria patients (i.e. provider's attitude toward patient is better) since their p-values were below 0.05. The positive sign of income also means that, the higher a patient's income, the higher the likelihood that, the provider will relate well with him/her. Thus providers (nurses, pharmacists, physicians, etc) will relate very well with richer patients (as may be seen by their physical appearance), and this is true at 95% confidence level. Again, the positive significance of private and mission health providers (facilities) met the expectation of the study, and implies that private and mission health providers related well or better with their patients as compared to their counterparts in public health facilities (control group). Thus, mission and private healthcare personnel (nurses, doctors etc) treat their patients nicely and with respect than their counterparts in public health facilities (control group). This may be due to the fact that remuneration (salaries, wages, bonuses etc) of these personnel are usually tied to output (usually measured by number of patients) unlike the case in public health facilities. The results are presented in Table 4.

**Table 4: Ordered Logistic Regression Estimates**

| Dependent variable: provider – patient relationship | Estimates | | |
|---|---|---|---|
| **Explanatory variables** | **Coefficient** | **Standard Error** | **P – value** |
| Age | -.0046974 | .0062796 | 0.454 |
| Income (Monthly) | .0005839 | .0002638 | 0.027 |
| female | .2600704 | .1691979 | 0.124 |
| employed | -.1460398 | .1902694 | 0.443 |
| JHS | -.2623896 | .2732552 | 0.337 |
| SHS | .2935346 | .2807929 | 0.296 |
| Tertiary | -.341298 | .2823308 | 0.227 |
| Capitation | -.9952588 | .1860661 | 0.000 |
| Mission health facility | .7548907 | .2587405 | 0.004 |
| Private health facility | .686752 | .223115 | 0.002 |
| Paid Additional fees | -.364149 | .2061614 | 0.077 |
| Teaching/ Regional hospital | .1285117 | .269356 | 0.633 |
| District hospital | -.422181 | .2530732 | 0.095 |
| Clinic | .2122693 | .2234156 | 0.342 |
| Inpatients | .1590902 | .1726579 | 0.357 |
| /cut1 | -2.371908 | .464882 | |
| /cut2 | -1.442712 | .4555552 | |
| /cut3 | -.7983296 | .4517728 | |
| /cut4 | .4945281 | .4501562 | |

*Source: Author's Field Work, 2012*

With regards to capitation in Table 4, the sign was negative and it was also significant at 5% error level. This is because its p – value of 0.000 was less than 0.05. This implies that capitation increases the possibility of a provider behaving rudely towards patients in the sampled population as compared to the DRG/FFS group (the control group). Thus, patients

under capitation were more likely to be treated with disrespect and have poorer relations with providers compared to their counterparts under the DRG/FFS payment methods. This implies that the introduction of capitation has resulted in poorer relations towards patients as compared to DRG/FFS patients as some of the respondents complained that most healthcare personnel, e.g. nurses in particular, don't respect at all. This could be a deliberate ploy by providers to turn away patients or deter them from further visits.

Still on Table 4, one's age, gender, educational level, employment status, being an inpatient, the type of facility a patient visited, and paying additional fees at the facility were insignificant at 5% error level in influencing provider – patient relations. This means these variables had little or no impact on whether malaria patient in the sampled population will have better relations or not with their healthcare providers (i.e. providers treat patients with respect). The signs of the coefficients of age, and payment of additional fees were not expected. The overall regression was statistically significant at 5% error level since its P-value of 0.0000 was less than 0.05. This means that, the variables collectively had an impact on the likelihood that sampled malaria patient will have better relations with his/her provider (i.e. providers attitude towards patients were better).

**4.3.3 Ancillary or Thresholds Parameter Interpretation in the Ordered Logistic Models.**

In the ordered logistic model, health outcome y is an observed dependent variable. Health outcome, y is a function of a continuous, unmeasured latent variable y* whose values determine what the observed ordinal variable y (health status of malaria patient) equals. The continuous latent variable y* has various thresholds points (i.e. Cut1, cut2, cut3 and cut4 in the Tables 3 and 4 above). A respondent value on the observed variable y (health outcome) depends on whether or not that respondent has crossed a particular threshold.

Health outcome and provider – patient relations were coded as 0, 1, 2, 3, and 4 (very poor, poor, good, very good and excellent respectively). There are five possible values for health outcomes, and provider patient relationship. Hence, in **Model 1**, for example:

y = very poor if $y^* \leq -2.003244$

y = poor if $-2.003244 \leq y^* \leq -1.335012$

y = good if $-1.335012 \leq y^* \leq -.0969432$

y = very good if $-.0969432 \leq y^* \leq 1.382831$

y = excellent if $y^* \geq 1.382831$



For **Model 2**:

y = very poor if $y^* \leq -2.371908$

y = poor if $-2.371908 \leq y^* \leq -1.442712$

y = good if $-1.442712 \leq y^* \leq -.7983296$

y = very good if $-.7983296 \leq y^* \leq .4945281$

y = excellent if $y^* \geq .4945281$

The above implies for example in Model 1, that:

Cut1 is the estimated cut point on the latent variable used to differentiate very poor health outcome from poor, good, very good and excellent health outcomes when values of the independent variables are evaluated at zero. This means that patients with a value of -2.003244 or less on the underlying latent variable that gave rise to health outcome variable would be classified to have very poor health condition.

On the other hand, Cut2 is the estimated cut point on the latent variable used to differentiate very poor and poor health status or outcome from good, very good and excellent health outcomes when values of the independent variables are evaluated at zero. Patients with a value between -2.003244 and -1.335012 on the underlying latent variable would also be classified to have poor health.

Cut3 is the estimated cut point on the latent variable used to differentiate very poor, poor and good health outcome from very good and excellent health outcome when values of the independent variables are evaluated at zero. Patients with a value between -1.335012 and -.0969432 on the underlying latent variable are classified to have a good health outcome.

Cut4 is the estimated cut point on the latent variable used to differentiate very poor, poor, good and very good health outcomes from excellent health outcomes when values of the independent variables are evaluated at zero. Patients having a value between -.0969432 and 1.382831 on the underlying latent variable would be classified as very good health status or outcome. Those patients with a value of 1.382831 or higher on the underlying latent variable would be classified to have an excellent health outcome/ status. The interpretations are derived the same way for model 2.

### 4.3.4 Effect of capitation on Visits by malaria patients (Model 3)

With respect to physician – patient encounters, age, income, and gender (female) met the study's expectation and significantly impacted positively on visits as seen in the Table 5 below since their p – values were below 0.05. This means that as one ages he/she consumes more healthcare due to the deterioration of his health status or outcome. Again, as one's income rises, he/she able to afford most of the medical expenses and will therefore consume more healthcare hence more visits to health facilities were expected. Unsurprisingly, females had more visits to health facilities than their male counterparts (control group). This could attributed to the lower opportunity cost that females have as compared to males (control group), in the traditional Ghanaian setting, in sacrificing working hours for medical care (usually accompanied by long waiting hours)

Furthermore, the expectations of the signs concerning employment status, capitation, private health providers (facilities), and payment of additional fees were met, and they significantly impacted negatively on visits. Patients under capitation had fewer visits compared to their

counterparts in the control group (DRG/FFS). The fewer visits were however significantly common among private health facilities as seen from Table 5. This, perhaps, was highly due to the financial risk imposed on providers under capitation. This revelation is consistent with the findings of Bloom et al (1998) study on Colorado's Medicaid mental health service. Also the copayment (additional fees paid aside insurance) in some health facilities significantly reduced visits.

**Table 5: OLS Regression Estimates**

| **Dependent Variable: Visits** | **Estimates** | | |
|---|---|---|---|
| **Explanatory Variables** | **Coefficient** | **Standard Error** | **P – value** |
| Age | .048166 | .0125449 | 0.000 |
| Income (Monthly) | .0016708 | .0005192 | 0.001 |
| female | .6684622 | .3304231 | 0.044 |
| employed | -1.186726 | .3762858 | 0.002 |
| JHS | -.3338002 | .5139244 | 0.516 |
| SHS | -.1637736 | .52917 | 0.757 |
| Tertiary | -.2077269 | .5481986 | 0.705 |
| Capitation | -1.273811 | .3598142 | 0.000 |
| Mission health facility | -.3893941 | .4911894 | 0.428 |
| Private health facility | -.9507384 | .4354203 | 0.029 |
| Paid Additional fees | -1.889709 | .4033606 | 0.000 |
| Teaching/ regional hospital | -.1090365 | .5402292 | 0.840 |
| District hospital | .2201749 | .4947198 | 0.656 |
| Clinic | .3104039 | .4384838 | 0.479 |
| Inpatients | .0752156 | .3417366 | 0.826 |
| Constant | 4.661119 | .8814794 | 0.000 |

*Source: Author's Field Work, 2012*

Also, those employed had significantly fewer visits compared to the unemployed (control group) due to the higher opportunity cost of lost labour hours and its sign met the expectation of the study. Even though education (basic, secondary, and tertiary), mission health facilities, health centres or posts had negative signs, they were not significant in terms of their impact on visits. The sign of the coefficient of inpatients was positive but it was not significant (p – value above 0.05) in impacting on visits. With the exception of teaching or regional hospitals, district hospitals and clinics had signs that corroborated the study's expectation though they were not significant in terms of their impact on visits as can be seen from Table 5.



### 4.3.5 Effect of Capitation on Referrals by Providers (Model 4)

On providers' referral of patients to other health facilities, paying additional fees, teaching/ regional hospitals, district hospitals, and clinics had signs that were expected even though they were insignificant at 95% confidence level in impacting on providers' decision to refer malaria patients to other facilities. Their p – values were above 0.05. The ownership status of facilities (e.g. Mission or private) was significant at 5% error level since the p – values were below 0.05. This implies that providers' decision to refer patients was significantly affected by the ownership status of the facility involved. From Table 6, mission and private health facilities referred more of their patients than government health facilities (control group).

Capitation, in Table 6, met its expected sign and it significantly impacted positively on providers' decision to refer their patients. This is because its p – value of 0.000 was below 0.05. Thus patients under capitation were more likely to be referred to other facilities than the patients under DRG/FFS (control group), and this is true at 95% confidence level. From the results, we could see that the referrals were more common among private and mission health providers compared to public health facilities (control group). The reason for this trend could be that providers under capitation saw this as a way to dump their patients on other providers

to avoid using their capitated funds. Conversely, it could also be due to inadequate medical resources, equipments, and qualified personnel in such health facilities.

**Table 6: Logistic Regression Estimates**

| **Dependent variable: Referrals** | **Estimates** | | |
|---|---|---|---|
| **Explanatory variable** | **Coefficient** | **Standard Error** | **P – value** |
| Age | .0152217 | .0083842 | 0.069 |
| Income (monthly) | -.0004977 | .0003414 | 0.145 |
| female | -.8598922 | .2261023 | 0.000 |
| employed | .2996566 | .251046 | 0.233 |
| JHS | -.5011518 | .3393121 | 0.140 |
| SHS | .2597749 | .3465164 | 0.453 |
| Tertiary | .0435751 | .3597127 | 0.904 |
| Capitation | .9667044 | .2361561 | 0.000 |
| Mission health facility | .8225317 | .3138746 | 0.009 |
| Private health facility | .790015 | .2771238 | 0.004 |
| Paid Additional fees | .7493825 | .2771406 | 0.007 |
| Teaching/ regional hospital | -2.379075 | .4764041 | 0.000 |
| District hospital | .2238181 | .3050024 | 0.463 |
| Clinic | .256251 | .2691871 | 0.341 |
| Inpatients | .7155963 | .2298303 | 0.002 |
| Constant | -1.856545 | .5825064 | 0.001 |

*Source: Author's Field Work, 2012*

Inpatients were more likelihood to be referred to other facilities, given that its p – value of 0.002 was below 0.05, compared to their outpatient counterparts (control group).

However, age, income, education, and employment had no significant effect on whether a provider would refer a patient or not (i.e. their p – values were above 0.05) whereas education

(except basic) had positive signs (though such signs were initially unknown) as can be seen from the results presented in the Table 6 above.

### 4.3.6 Effect of capitation on patients' willingness to stay with his/her current Provider

Finally, respondents were asked on their willingness to continue to receive care from their current providers or change their providers in the future. The results, as shown in Table 7, indicated that age, income, employment, teaching or regional hospital, district hospital, and clinics as well as private health facilities were not significant in determining one's willingness to stay with his current healthcare provider even though their signs were expected. However, gender (female), education (secondary and tertiary except basic education though positive) had a significant positive effect on the probability of a patient staying with his/her current primary healthcare provider. Again, patients under capitation were more likely to move or change provider compared with patients under DRG/FFS (control group) since the sign of the coefficient was negative and was also significant (i.e. p – value of 0.000 was below 0.05). This confirms the findings of Escarce et al (2003), and Sorbero et al (2003). Mission health facilities or providers had a positive significant impact on the probability of a person staying with his current provider. Thus, patients were more likely to stay with mission healthcare providers compared to public healthcare providers (control group). Again, paying additional fees was not significant in determining whether a patient would stay with the current provider or not. This is because its p – value of 0.720 was above 0.05 but its negative sign was expected. Inpatients were also more willing to stay with their current providers to receive care as compared to outpatients (control group). These results are present in Table 7.

**Table 7: Logistic Regression Estimates**

| Dependent variable: continuation of care | Estimates | | |
|---|---|---|---|
| **Explanatory variables** | **Coefficient** | **Standard Error** | **P – value** |
| Age | -.0148606 | .0081664 | 0.069 |
| Income (monthly) | -.000117 | .0003269 | 0.720 |
| female | .810883 | .2126188 | 0.000 |
| employed | .0238518 | .2436835 | 0.922 |
| JHS | .3332398 | .3400177 | 0.327 |
| SHS | .8324667 | .3459636 | 0.016 |
| Tertiary | .9291032 | .3569412 | 0.009 |
| Capitation | -1.666584 | .2298775 | 0.000 |
| Mission health facility | .7307277 | .3176716 | 0.021 |
| Private health facility | .0125124 | .2781078 | 0.964 |
| Paid Additional fees | -.091866 | .2566316 | 0.720 |
| Teaching/ regional hospital | .2353622 | .3454218 | 0.496 |
| District hospital | -.0814701 | .3151742 | 0.796 |
| Clinic | .4078862 | .2830289 | 0.150 |
| Inpatients | .7565505 | .2178174 | 0.001 |
| Constant | -.2002104 | .5639636 | 0.723 |

*Source: Authors Field Work, 2012*

It should, however, be emphasized that variables like monitoring and evaluation, customer care, capitated rates, and referral networks were not included in the models estimated, these findings of poorer health outcomes, more referrals and fewer visits as well as poorer relations with or attitude towards patients could be due to their absence or their inadequacy in the health system. These variables could also influence health outcomes, provider-patient relations (i.e. attitude towards patients), visits, and referrals.

# CHAPTER FIVE

# SUMMARY OF MAJOR FINDINGS AND POLICY RECOMMENDATIONS

## 5.0 Introduction

This study was basically carried out to find out the impact of capitation payment method on the health outcomes, provider relations as well as healthcare utilisation of malaria patients in Ashanti region by comparing it to those under DRG/FFS method (Brong Ahafo Region). This chapter, therefore, presents the summary of major findings of this study, conclusions from the entire study as well as policy recommendations.

## 5.1 Summary of Major Findings

The study revealed that factors like payment methods significantly affect the health outcomes of (malaria) patients. As revealed by the study, capitation seriously affected the health outcomes of malaria patients negatively. Clearly, as revealed by the results, patients under capitation had poorer health outcomes than patients under DRG/FFS. There was no statistical evidence, in the study, to show that age and health outcomes/status are inversely related such that age deteriorates one's health condition or otherwise. However, gender (i.e. females), income, mission health providers (health facilities), and education (except basic education) significantly influenced the health outcomes of malaria patients positively. Thus, education, income, and health facilities operated by religious bodies improved the health outcomes of patients. One can conclude that the ownership status of health facilities affect health outcomes of patients.

Other variables like private providers, type of facility (teaching or regional hospitals, district hospitals and clinics) were not found to have any statistically significant positive effect on patient health outcomes though their signs were expected. There was no statistical evidence that inpatients and those who paid additional fees had poorer health outcomes than

outpatients (control group) and its negative sign deviates from a priori expectation. Again, there was no statistical evidence that one's employment status would have a negative effect on his/her health condition. Thus being employed had no effect on health outcomes.

Concerning provider – patient relations, the study revealed that private and mission healthcare providers had better relations with their patients than public health providers. Again, malaria patients under capitation were found to have had poorer relations with their providers than their counterparts under DRG/FFS. Providers were more likely to treat richer patients with respect as income was found to have a significant influence on the likelihood that providers would have better relations with their patients. Inpatients, teaching or regional hospitals, district hospitals, and clinics, education, payment of additional fees, gender and age were not found to have any impact on the provider – patient relations.

Concerning hospital visits, patients under capitation had fewer visits than DRG/FFS patients. Age, income, gender, employment status, and the ownership status of facility significantly affected visits by patients, and their signs were expected. Again, majority (73.80%) of malaria patients paid additional fees at the point of service use which significantly impacted negatively on visits. The fewer visits were more common among private healthcare providers. Education, type of the facility and mission health providers were not found to have any effect on visits since there was no statistical evidence to that effect. Those patients employed had fewer visits than their counterparts who were unemployed (control group).

The study also showed that teaching or regional hospitals were less likely to refer their patients to other health facilities. Thus such facilities did not even refer their patients except in extreme cases since the teaching and regional hospitals serve as the last resort in the regions. Capitation impacted more positively on the probability that a healthcare provider would refer its malaria patient to other health facilities than under DRG/FFS (control group).

The referrals were, however, higher among private and mission health facilities than in government health facilities (control group). Inpatients were more likely to be referred to other health providers than outpatients (control group). Females were also found to be less likely to be referred than their male (control group) counterparts. Age, income, employment status, paying additional fees and education were not found to have any significant effect on providers' decision to refer malaria patients.

On the patient's willingness to stay with current provider, patients under capitation were found to be more likely to change providers than their DRG/FFS counterparts. Inpatients were found to be more likely to stay providers as compared to outpatients (control group). Also, females were more likely to stay with their current providers than their male counterparts. Again, the educated were more likely to stay with current providers as compared to the control group (the uneducated). All the other variables (age, employment status, income, health centres, and private providers were found to have no effect on a person's willingness to stay with his current provider.

The study also found that a significant number of malaria patients received care from health facilities other than their chosen PPP in the Ashanti region and this number constituted 32% of the patients in Ashanti. They cited reasons as been assigned to facilities that were far away from them without their consent. The study also revealed that a significant number of patients receive healthcare services from private and mission health providers. This number constituted 28.60% and 16.20% respectively.

### 5.2 Conclusion

The study concludes that because capitation imposes a financial risk on healthcare providers, they are more likely to reduce the quality of treatment which in turn affects patient health outcome negatively. Again, providers under capitation have poorer relations with their

patients to deter them from further visits, and also refer their patients to other healthcare providers. The study's prior expectations and objectives were met. Capitation has, indeed, adversely affected the health of malaria patients in Ashanti region.

### 5.3 Policy Recommendations

Formal (classroom) education should be given attention so that majority of the people get access to education to at least secondary school level since both tertiary and secondary education significantly help improve patients' health outcomes, and also encourages continuity of care (i.e. reduces "doctor shopping"). Thus, educational policies should, therefore, be geared towards increasing enrolment and quality in schools to at least secondary school level.

Since it has been revealed that Capitation affects health outcomes, providers' attitude towards patients, healthcare utilisation (visits), and continuity of care negatively as well as referral patterns positively, this study would recommend Capitation (and other provider payment methods) to have an inbuilt monitoring and evaluation mechanisms to mitigate their negative effects. Thus, policy makers should structure the Capitation method as well as other payment methods to prevent patient dumping and under-provision to improve quality of care. For example, Government of Ghana and other institutions regulating the healthcare market should make policies that would check the (higher) referrals among mission and private healthcare providers as well as fewer visits found in private health facilities to establish their authenticity in order to protect patients.

Again, policies should gear towards raising income levels among the population since income has been found to improve health outcomes and better provider relations with patients. It is also important that patients in low income groups be encouraged to report malaria cases to health facilities since such people are less likely to visit health facilities in times of sickness

as has been revealed by the study. Policy makers should therefore institute measures to check additional fees that providers charge at the point of service use by NHIS patients since such additional fees have been found to reduce access and utilisation (visits).

Furthermore, policies should encourage and support religious bodies to build more or expand their health facilities and train more staff since their services have been found to significantly improve patients' health outcomes, and also encourages continuity of care. Also, since the mission and private healthcare providers have been found to have better relations with their patients than those in the public sector, there should be policies to encourage health workers in the public sector to have better relations (good attitudes) with patients.

Finally, since a significant number of malaria patients to have received care from health facilities other than their chosen PPP, due the reasons above, in the Ashanti region, this study would recommend that policies should also encourage people in choose and use their PPPs.

### 5.4 Limitations of the Study

The major limitation of the study had to do with the sample size. The sample size used for the study was small. This was due to financial and time constraints. The ordered logistic and logistic models employed by the study use Maximum Likelihood Estimation (MLE) which requires a larger sample size for the efficiency and significance of the estimated parameters. Thus, the statistical insignificance of some of the estimated parameters could be as a result of the small sample size. Again, information on health facilities was not considered. For example, number of nurses (degree and non – degree), pharmacists (degree and non – degree), number of beds, availability of laboratories, whether the facility is in network or not, monitored and evaluated or not, etc all of which affects health outcomes, referrals, relations (providers' attitude) etc can be looked at in future research. Further studies can be conducted on this subject by looking at a larger sample and also take account of facility information.

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## Appendix 1

**Kwame Nkrumah University of Science and Technology, Kumasi**
**Department of Economics**
**Topic: Effects of Capitation on the Health Outcomes of Malaria Patients: Evidence from Ashanti and Brong Ahafo Regions of Ghana.**
**Questionnaire 1**

This questionnaire is designed to aid in the collection of data to enable me carry out a study on the above topic for the award of MA (Economics) degree. It would be much appreciated if you could help answer these questions. The responses are for academic purposes only and would be treated confidentially. **Region: Ashanti [ ]**

1. a Gender: Male [ ] Female [ ] b. Age: [ ]

2. Employment Status: Employed [ ] Unemployed [ ]

3. Monthly Income: [GHS ]

4. Educational level: Basic or J.H.S [ ] Senior High [ ] Tertiary [ ] None [ ]

5. What was the ownership status of the facility you visited? Government [ ] Mission [ ] Private [ ]

6. Type of facility visited: Teaching/Regional Hospital [ ] District hospital [ ] Clinic [ ] Health centre [ ]

7. Did you pay additional fees aside your insurance? Yes [ ] No [ ]

8. Was this facility your preferred primary care provider? Yes [ ] No [ ]

9. Were you, at a point, referred to another facility/hospital? Yes [ ] No [ ]

10. Were you admitted? Yes [ ] No [ ] If yes, how long (in days) [ ]

11. How many visits have you made to your doctor after the initial visit/discharge? [ ]

12. In general, how would you rate your health condition: Excellent [ ] Very Good [ ] Good [ ] Poor [ ] Very Poor [ ]

13. What has been the relationship (provider's attitude) between you and the staff (e.g. doctor, pharmacist, nurses) of your healthcare provider for the past two months?

Excellent [ ] Very Good [ ] Good [ ] Poor [ ] Very Poor [ ]

14. Do you expect to receive all your medical care from your current provider in the year ahead of you? Yes [ ] No [ ]

**Kwame Nkrumah University of Science and Technology, Kumasi**
**Department of Economics**
**Topic: Effects of Capitation on Health Outcomes of Malaria Patients: Evidence from Ashanti and Brong Ahafo Regions of Ghana.**
**Questionnaire 2**

This questionnaire is designed to aid in the collection of data to enable me carry out a study on the above topic for the award of MA (Economics) degree. It would be much appreciated if you could help answer these questions. The responses are for academic purposes only and would be treated confidentially. **Region: Brong Ahafo**

1. a Gender: Female [ ] Male [ ] b. Age: [ ]

2. Employment Status: Employed [ ] Unemployed [ ]

3. Monthly Income: [GHS ]

4. Educational level: Basic or J.H.S [ ] Senior High [ ] Tertiary [ ] None [ ]

5. What was the ownership status of the facility you visited? Government [ ] Mission [ ] Private [ ]

6. Type of facility visited: Teaching/Regional Hospital [ ] District hospital [ ] Clinic [ ] Health centre [ ]

7. Did you pay additional fees aside your insurance? Yes [ ] No [ ]

8. Were you, at a point, referred to another facility/hospital? Yes [ ] No [ ]

9. Were you admitted? Yes [ ] No [ ] If yes, how long (in days) [ ]

10. How many visits have you made to your doctor after the initial visit/discharge? [ ]

11. In general, how would you rate your health condition: Excellent [ ] Very Good [ ] Good [ ] Poor [ ] Very Poor [ ]

12. What has been the relationship (provider's attitude) between you and the staff (e.g. doctor, pharmacist, nurses) of your healthcare provider for the past two months?

Excellent [ ] Very Good [ ] Good [ ] Poor [ ] Very Poor [ ]

13. Do you expect to receive all your medical care from your current provider in the year (s) ahead of you? Yes [ ] No [ ]

## Appendix 2

### Regression Results of the Models

```
1. ologit   Healthoutcomes Age Monthlyincome female employed JHS SHS Tertiary
Capitation Mission Private Paid
> Additionalfees Teachinghosp Districthosp Clinic Inpatients

Iteration 0:   log likelihood =  -725.2212
Iteration 1:   log likelihood =  -693.2573
Iteration 2:   log likelihood = -692.88697
Iteration 3:   log likelihood = -692.88663
Iteration 4:   log likelihood = -692.88663

Ordered logistic regression                     Number of obs   =        500
                                                LR chi2(15)     =      64.67
                                                Prob > chi2     =     0.0000
Log likelihood = -692.88663                     Pseudo R2       =     0.0446

------------------------------------------------------------------------------
Healthoutc~s |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         Age |  -.0118432   .0062125    -1.91   0.057    -.0240195     .000333
Monthlyinc~e |   .0006622   .0002695     2.46   0.014     .0001341    .0011904
      female |   .5117459   .1683993     3.04   0.002     .1816893    .8418024
    employed |  -.0986037   .1915968    -0.51   0.607    -.4741266    .2769191
         JHS |   .5020661   .2654566     1.89   0.059    -.0182194    1.022351
         SHS |   .8547157   .2769763     3.09   0.002     .3118521    1.397579
    Tertiary |   .6295652   .2866151     2.20   0.028     .0678099     1.19132
  Capitation |  -.5902043   .1832401    -3.22   0.001    -.9493482   -.2310604
     Mission |    .562694   .2609081     2.16   0.031     .0513235    1.074065
     Private |  -.0843852   .2189986    -0.39   0.700    -.5136146    .3448443
PaidAdditi~s |  -.2754517   .2050698    -1.34   0.179    -.6773811    .1264777
Teachinghosp |   .4099141   .2709208     1.51   0.130     -.121081    .9409091
Districthosp |   .3390687   .2537234     1.34   0.181      -.15822    .8363574
      Clinic |   .2964911   .2173112     1.36   0.172    -.1294309    .7224132
  Inpatients |  -.0817292   .1748727    -0.47   0.640    -.4244733     .261015
-------------+----------------------------------------------------------------
       /cut1 |  -2.003244   .4511492                     -2.88748   -1.119007
       /cut2 |  -1.335012   .4432537                    -2.203773   -.4662504
       /cut3 |  -.0969432   .4398561                    -.9590454     .765159
       /cut4 |   1.382831   .4427192                     .5151174    2.250545
------------------------------------------------------------------------------



2. ologit     relationship Age Monthlyincome female employed JHS SHS Tertiary
Capitation Mission Private PaidA
> dditionalfees Teachinghosp Districthosp Clinic Inpatients

Iteration 0:   log likelihood =  -753.1493
Iteration 1:   log likelihood = -716.44974
Iteration 2:   log likelihood = -716.11596
Iteration 3:   log likelihood = -716.11564
Iteration 4:   log likelihood = -716.11564

Ordered logistic regression                     Number of obs   =        500
                                                LR chi2(15)     =      74.07
                                                Prob > chi2     =     0.0000
Log likelihood = -716.11564                     Pseudo R2       =     0.0492

------------------------------------------------------------------------------
relationship |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         Age |  -.0046974   .0062796    -0.75   0.454    -.0170053    .0076105
Monthlyinc~e |   .0005839   .0002638     2.21   0.027     .0000669    .0011009
      female |   .2600704   .1691979     1.54   0.124    -.0715514    .5916923
```

```
    employed |  -.1460398   .1902694    -0.77   0.443    -.5189609    .2268813
         JHS |  -.2623896   .2732552    -0.96   0.337      -.79796    .2731809
         SHS |   .2935346   .2807929     1.05   0.296    -.2568094    .8438785
    Tertiary |   -.341298   .2823308    -1.21   0.227    -.8946562    .2120601
  Capitation |  -.9952588   .1860661    -5.35   0.000    -1.359942    -.630576
     Mission |   .7548907   .2587405     2.92   0.004     .2477686    1.262013
     Private |    .686752    .223115     3.08   0.002     .2494547    1.124049
PaidAdditi~s |   -.364149   .2061614    -1.77   0.077    -.7682178    .0399199
Teachinghosp |   .1285117    .269356     0.48   0.633    -.3994164    .6564399
Districthosp |   -.422181   .2530732    -1.67   0.095    -.9181953    .0738334
      Clinic |   .2122693   .2234156     0.95   0.342    -.2256172    .6501559
  Inpatients |   .1590902   .1726579     0.92   0.357     -.179313    .4974935
-------------+----------------------------------------------------------------
       /cut1 |  -2.371908    .464882                     -3.28306   -1.460756
       /cut2 |  -1.442712   .4555552                    -2.335583   -.5498397
       /cut3 |  -.7983296   .4517728                    -1.683788    .0871287
       /cut4 |   .4945281   .4501562                    -.3877619    1.376818
------------------------------------------------------------------------------
```

```
3. fit   Visits Age Monthlyincome female employed JHS SHS Tertiary Capitation
Mission Private PaidAdditionalf
> ees Teachinghosp Districthosp Clinic Inpatients

      Source |       SS       df       MS              Number of obs =     500
-------------+------------------------------           F( 15,   484) =    5.28
       Model |  1026.66907    15  68.4446047            Prob > F      =  0.0000
    Residual |  6272.96893   484  12.9606796            R-squared     =  0.1406
-------------+------------------------------           Adj R-squared =  0.1140
       Total |    7299.638   499  14.6285331            Root MSE      =  3.6001

------------------------------------------------------------------------------
      Visits |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         Age |    .048166   .0125449     3.84   0.000     .0235167    .0728152
Monthlyinc~e |   .0016708   .0005192     3.22   0.001     .0006506    .0026909
      female |   .6684622   .3304231     2.02   0.044     .0192213    1.317703
    employed |  -1.186726   .3762858    -3.15   0.002    -1.926082   -.4473708
         JHS |  -.3338002   .5139244    -0.65   0.516    -1.343599    .6759983
         SHS |  -.1637736    .52917    -0.31   0.757    -1.203528    .8759806
    Tertiary |  -.2077269   .5481986    -0.38   0.705     -1.28487    .8694161
  Capitation |  -1.273811   .3598142    -3.54   0.000    -1.980802   -.5668208
     Mission |  -.3893941   .4911894    -0.79   0.428    -1.354521    .5757328
     Private |  -.9507384   .4354203    -2.18   0.029    -1.806286    -.095191
PaidAdditi~s |  -1.889709   .4033606    -4.68   0.000    -2.682263   -1.097155
Teachinghosp |  -.1090365   .5402292    -0.20   0.840    -1.170521    .9524476
Districthosp |   .2201749   .4947198     0.45   0.656    -.7518889    1.192239
      Clinic |   .3104039   .4384838     0.71   0.479    -.5511631    1.171971
  Inpatients |   .0752156   .3417366     0.22   0.826    -.5962549    .7466861
       _cons |   4.661119   .8814794     5.29   0.000     2.92912    6.393118
------------------------------------------------------------------------------
```

```
4. logit    Refferal Age Monthlyincome female employed JHS SHS Tertiary Capitation
Mission Private PaidAddit
> ionalfees Teachinghosp Districthosp Clinic Inpatients

Iteration 0:   log likelihood = -340.46467
Iteration 1:   log likelihood = -263.40329
Iteration 2:   log likelihood = -260.56034
Iteration 3:   log likelihood = -260.52037
Iteration 4:   log likelihood = -260.52035

Logistic regression                             Number of obs   =        500
                                                LR chi2(15)     =     159.89
                                                Prob > chi2     =     0.0000
Log likelihood = -260.52035                     Pseudo R2       =     0.2348
```

```
------------------------------------------------------------------------------
    Refferal |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         Age |   .0152217   .0083842     1.82   0.069    -.0012109    .0316544
Monthlyinc~e |  -.0004977   .0003414    -1.46   0.145    -.0011669    .0001716
      female |  -.8598922   .2261023    -3.80   0.000    -1.303045   -.4167398
    employed |   .2996566    .251046     1.19   0.233    -.1923845    .7916976
         JHS |  -.5011518   .3393121    -1.48   0.140    -1.166191    .1638877
         SHS |   .2597749   .3465164     0.75   0.453    -.4193849    .9389346
    Tertiary |   .0435751   .3597127     0.12   0.904    -.6614488    .7485989
  Capitation |   .9667044   .2361561     4.09   0.000     .5038469    1.429562
     Mission |   .8225317   .3138746     2.62   0.009     .2073488    1.437715
     Private |    .790015   .2771238     2.85   0.004     .2468624    1.333168
PaidAdditi~s |   .7493825   .2771406     2.70   0.007     .2061969    1.292568
Teachinghosp |  -2.379075   .4764041    -4.99   0.000     -3.31281    -1.44534
Districthosp |   .2238181   .3050024     0.73   0.463    -.3739755    .8216117
      Clinic |    .256251   .2691871     0.95   0.341     -.271346    .7838481
  Inpatients |   .7155963   .2298303     3.11   0.002     .2651372    1.166055
       _cons |  -1.856545   .5825064    -3.19   0.001    -2.998236   -.7148532
------------------------------------------------------------------------------
```

```
5. logit     continuationofcare Age Monthlyincome female employed JHS SHS Tertiary
Capitation Mission Privat
> e PaidAdditionalfees Teachinghosp Districthosp Clinic Inpatients

Iteration 0:   log likelihood = -346.37756
Iteration 1:   log likelihood = -279.28643
Iteration 2:   log likelihood = -278.68866
Iteration 3:   log likelihood = -278.68684
Iteration 4:   log likelihood = -278.68684

Logistic regression                             Number of obs   =        500
                                                LR chi2(15)     =     135.38
                                                Prob > chi2     =     0.0000
Log likelihood = -278.68684                     Pseudo R2       =     0.1954

------------------------------------------------------------------------------
continuati~e |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         Age |  -.0148606   .0081664    -1.82   0.069    -.0308665    .0011453
Monthlyinc~e |   -.000117   .0003269    -0.36   0.720    -.0007577    .0005237
      female |    .810883   .2126188     3.81   0.000     .3941578    1.227608
    employed |   .0238518   .2436835     0.10   0.922    -.4537592    .5014628
         JHS |   .3332398   .3400177     0.98   0.327    -.3331827    .9996623
         SHS |   .8324667   .3459636     2.41   0.016     .1543905    1.510543
    Tertiary |   .9291032   .3569412     2.60   0.009     .2295112    1.628695
  Capitation |  -1.666584   .2298775    -7.25   0.000    -2.117135   -1.216032
     Mission |   .7307277   .3176716     2.30   0.021     .1081028    1.353353
     Private |   .0125124   .2781078     0.04   0.964    -.5325688    .5575935
PaidAdditi~s |   -.091866   .2566316    -0.36   0.720    -.5948548    .4111227
Teachinghosp |   .2353622   .3454218     0.68   0.496    -.4416522    .9123765
Districthosp |  -.0814701   .3151742    -0.26   0.796    -.6992002    .5362599
      Clinic |   .4078862   .2830289     1.44   0.150    -.1468402    .9626127
  Inpatients |   .7565505   .2178174     3.47   0.001     .3296361    1.183465
       _cons |  -.2002104   .5639636    -0.36   0.723    -1.305559     .905138
------------------------------------------------------------------------------
```