

**KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY**

**COLLEGE OF ART AND SOCIAL SCIENCES**

**DEPARTMENT OF ECONOMICS**

**EFFECTS OF CAPITATION ON UTILIZATION OF HEALTHCARE:  
URINARY TRACT INFECTIOUS (UTI) PATIENTS: EVIDENCE OF UTI  
PATIENTS OF KOMFO ANOKYE AND KORLE-BU TEACHING  
HOSPITALS OUTPATIENT'S DEPARTMENT**

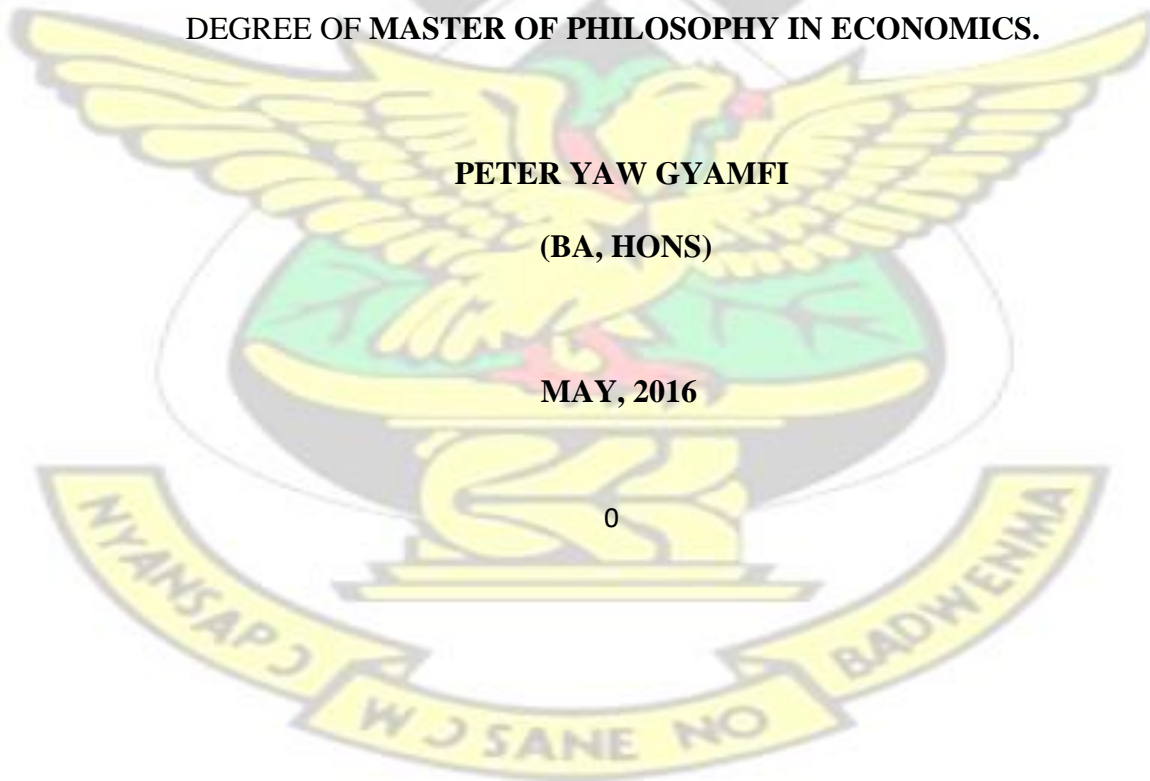
A DISSERTATION PRESENTED TO THE DEPARTMENT OF ECONOMICS IN  
PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE AWARD OF  
DEGREE OF MASTER OF PHILOSOPHY IN ECONOMICS.

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**MAY, 2016**

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## DECLARATION

I hereby declare that the submission of this work is towards the award of a degree in MPhil Economics of the Department of Economics at Kwame Nkrumah University of Science and Technology. The work has never been submitted to any institution unless where recommendations and appropriate references has been indicated

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## DEDICATION

I dedicate this work to Madam Constance Anane (my mum) and Mr. Karikari Kuffour (my uncle) who have assisted me in all endeavors.

Also to Jennifer Osaa Tenkorang (my wife), Williams Adu Sarfo (my brother) and also to Ernestina and Janet (siblings).



## ACKNOWLEDGEMENTS

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## ABSTRACT

Provider payment mechanism has influence on visits, referrals and quality of healthcare (utilization), which capitation healthcare payment is not an exception. As Fee For Service (FFS) payment system is characterized by inducement, Diagnostic Related Grouping (DRG) is attributed with a higher cost episode irrespective of the nature of care. This has resulted in diverse payment reforms to limit the healthcare providers from shopping to ensure efficient delivery of healthcare. The negative effects of these payments mechanisms have brought about a new payment system known as the capitation. Capitation was introduced in Ghana in 2010. It was however accompanied by series of demonstrations from pressure groups (Ashanti Development Union) and healthcare providers. As the providers claim it would reduce their profit margin the ADU thought it would affect utilization as stipulated by several studies. Using Poisson regression, ordered logistic regression and ordered binary regression, this research was primarily conducted to look into the adverse effect of capitation on utilization; visits, referrals, quality of healthcare and the willingness of patients to retain the primary care provider within a period of three months. A sample size of 500 NHIS Urinary Tract Infectious patients was selected with 250 each from Komfo Anokye Teaching Hospital (capitated group) and Korle-Bu Teaching Hospital (FFS/DRG group) was employed for the study. Some of the principal findings of the research using Poisson regression include; age was statistically significant with respect to visits as it had a positive correlation with visits, patients under capitation had less number of visits compared to patients under DRG/FFS (controlled group). However, using ordered logistic regression it was discovered that age impacted positively to quality of healthcare. Patients with a maximum education level of senior high school had positive relation with the quality of healthcare. On the other hand, patients under capitation had less quality of healthcare compared to patients under FFS or DRG (controlled group at Korle-Bu). The research discovered using binary logistic regression that patients under capitation are more likely to change their primary care provider, compared to those under the FFS/DRG payment system. Capitation impacted positively referrals compared to patients under FFS/DRG. This indicates there is a higher probability of being referred as patient under capitation compared to patients under FFS. In view of these findings, policy makers must ensure the populace is educated up to at least the secondary school level since secondary education impacted positively to the quality of healthcare. Secondly, the Ghana statistics service (GSS) must serve as an important point of reference to policy makers with policies associated with healthcare since female and age relate positively with visits. This indicates an ageing population or population with more females must equip itself with more health professional to cater for the increasing demand for healthcare. Finally, since capitation relates inversely with visits, quality of healthcare (compared to FFS/DRG) and positively on referrals (compared to the controlled group), policy makers must make

sure there are inbuilt mechanism to check cream-skimming of patients to ensure adequate healthcare provision of healthcare to patients under capitation.

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# TABLE OF CONTENT

Content	Page
DECLARATION .....	ii
DEDICATION .....	
iii ACKNOWLEDGEMENTS .....	
iv	
ABSTRACT.....	v
TABLE OF CONTENTS .....	vi
List of Tables .....	ix
CHAPTER ONE:INTRODUCTION.....	1
1.0 Background .....	1
1.1 Statement of the problem .....	7
1.2 Objective of the Study .....	8
1.3 Justification of the study .....	9
1.4 Methodology .....	9
1.5 Scope of the study .....	9
1.6 Organization of the study .....	10
CHAPTER TWO: LITERATURE REVIEW .....	11
2.0 Introduction.....	11
2.1 Kinds of Payment System .....	12
2.2 The Concept of Capitation .....	13

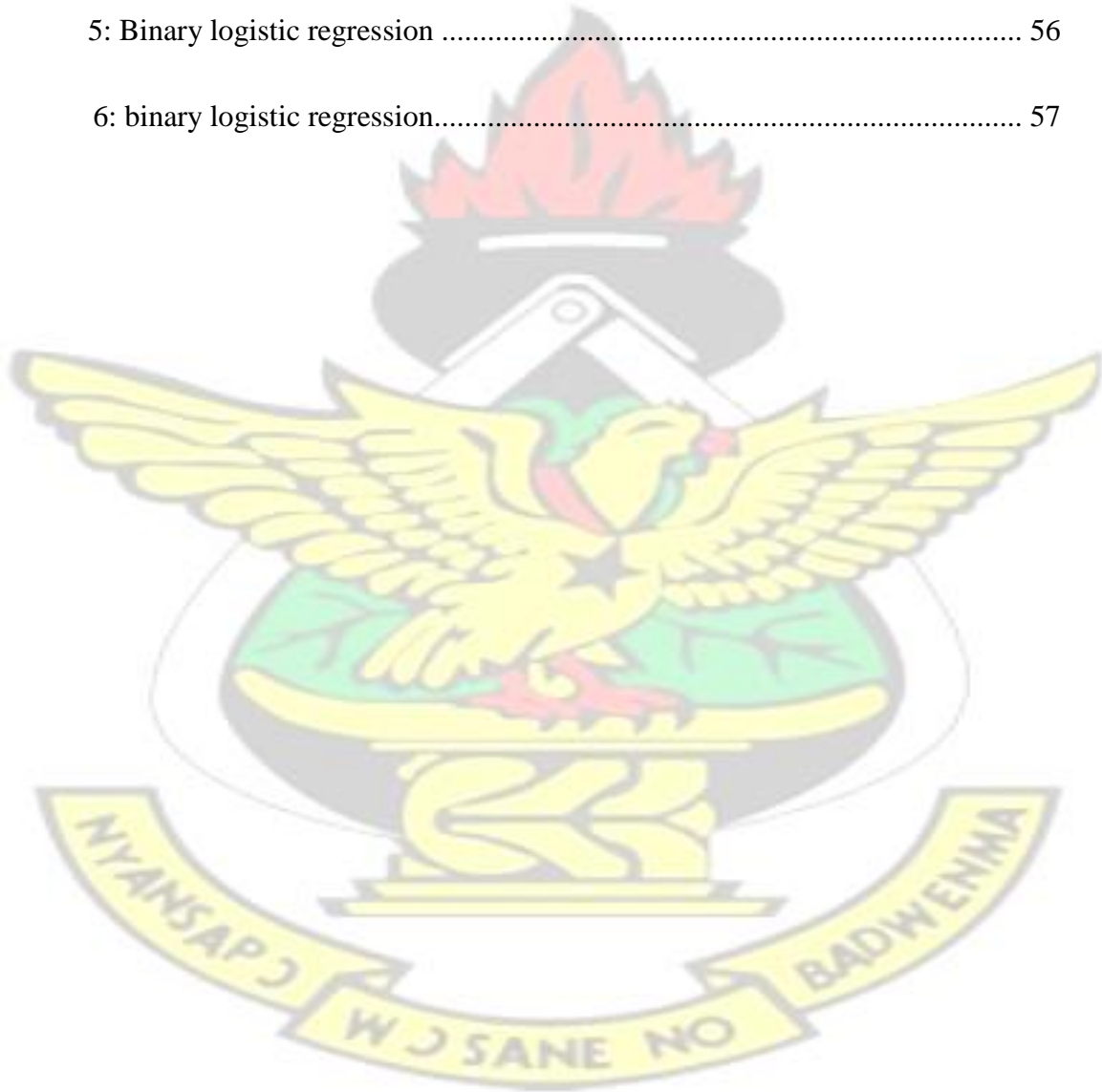
2.2.1 Types of Capitation .....	14
2.3.0 How capitation rate is set .....	17
2.3.1 Capitation in primary healthcare market.....	17
2.3.2 Bottom up cost approach.....	19
2.3.3 Top-Down cost approach .....	20
2.4.0 Other forms of payment mechanism .....	20
2.4.1 Fee for Service (FFS) .....	20
2.4.2 Diagnostic Regulatory Group (DRG) .....	21
2.3.4 Definition of Urinary Tract Infection (UTI) .....	21
2.3.5 Types of Urinary Tract Infection .....	22
2.3.6 UTI in Ghana .....	23
2.3.7 UTI in KATH.....	23
2.5.1 Review of Empirical Studies on the Effects of Capitation on Patients’ Visits, quality of healthcare and willingness to be with primary healthcare provider, referrals .....	23
<b>CHAPTER THREE :METHODOLOGY .....</b>	<b>27</b>
3.0 Introduction.....	27
3.1.0 Background of the study Area .....	27
3.1.1 Ashanti Region.....	27
3.1.3 Komfo Anokye Teaching Hospital (KATH).....	28
3.2.0 Greater Accra Region (DRG/FFS GROUP) .....	29

3.2.1 Korle-Bu Teaching Hospital .....	30
3.2.2 Contextual Framework.....	31
3.2.3 Source and methods of Data Collection.....	32
3.2.4 Data Analyses .....	32
3.3.0 Empirical Estimation and Regression Analyses .....	33
3.3.1 Model 1 (effect of capitation on demand using Poisson).....	34
3.3.3 Model 2 (quality of healthcare using order logistic regression).....	36
3.3.4 Model 3 (Logistic Regression on Referrals) .....	37
3.3.4 Model 4 (measures willingness to be with current health provider using Binay Logistic Regression) .....	38
3.4.0 Expected signs of the parameter Estimates .....	40
3.4.1 Model 1 .....	40
3.4.2 Model 2 .....	41
3.4.3 Model 3 .....	43
3.4. Model 4 .....	43
<b>CHAPTER FOUR:PRESENTATION AND ANALYSIS OF RESULTS .....</b>	<b>45</b>
4.0 Introduction.....	45
4.1 Descriptive Analyses .....	45
4.3.0 Quantitative Analysis.....	49

4.3.1 Effect of capitation on the Demand for healthcare of UTI patients (model 1) .....	50
4.3.1 Effect of capitation on quality of healthcare provided to UTI patients (Model 2) .....	52
4.3.3 Ancillary or Thresholds Parameter Interpretation in the Ordered Logistic Models.....	54
4.3.3 Effect of capitation on referral using UTI patients (Model 3) .....	56
4.3.3 Effect of capitation on willingness to be with current primary care provider (Model 4) .....	57
<b>CHAPTER FIVE:SUMMARY OF MAJOR FINDINGS AND POLICY RECOMMENDATIONS</b> .....	60
5.0 Introduction.....	60
5.1 Summary of Findings.....	60
5.2 Conclusion .....	62
5.3 Policy Recommendations.....	63
5.4 Limitations of the Study.....	65
Appendix 1.....	69
QUESTIONNAIRE 1 .....	69
Appendix 2.....	75

## List of Tables

1: Descriptive statistics of Variables Applied in the study.....	45
2: Descriptive Statistics of Socio-Economic Variables Used in the Study .....	46
3 Poisson Regression Estimate .....	50
4: Order logistic regression.....	52
5: Binary logistic regression .....	56
6: binary logistic regression.....	57



## CHAPTER ONE

### INTRODUCTION

#### 1.0 Background

Capitation is a health insurance payment system whereby a fixed fee is given to healthcare provider to cater for patients within a defined time period (Jegers et al., 2002; Mills et al., 2000). The fixed fee is paid by the insurance company to the healthcare provider of each individual (enrollee) assigned to the healthcare provider either by the insurance company or by the enrollee (Walter, 1984). This indicates capitation is a predetermined payment system where healthcare providers are given a fixed rate to provide bundle of services to individuals assigned to a particular health facility. The fixed fee is mostly expressed in a form known as Per Member per Month (PMPM) (health economics dictionary, 2005).

Health insurance companies or schemes have recently resorted to capitation payment mechanism as the best mode of insurance systems due to its ability to compel healthcare providers to be risk bearers (Amarteyfio and Yankah, 2012). This is of great importance, since the asymmetric nature of information with regards to demand for healthcare, makes the healthcare provider the sole determinant of supply and demand for healthcare (Grossman 2000). Several countries in recent years have currently subdued themselves to capitation payment system as a mode of payment in their national health insurance schemes. The British National Health Insurance (BNHI), Thailand National Health Insurance (TNHI), Chile National Health Insurance (CNHI), Estonia National Health

Insurance (ENHI) all employed the capitation system of payment ( Agyepong, Amarteyfio, Yankah; 2012).

The National Health Insurance Scheme introduced capitation in Ghana in the year 2010. The Ashanti region was used as a pilot after the scheme realize they were not in position to contain the cost as a result of the Diagnostic Related Grouping (DRG) and Fee For Service. The objective was to contain costs, manage utilization and ensure improvement in the quality of healthcare (Agyepong and Yanka, 2012). This resulted in demonstrations including the Ashanti Development Union (ADU) that capitation must be halted within the region (chronicle February 3rd, 2012).

In the quest of Nations to find for the best mechanism for paying for healthcare services, has resulted in different payment systems with each emanating with its advantages and disadvantages due to the asymmetric nature of demand for healthcare (Grossman M. 2000). For this reason, provider payment mechanisms are gradually undergoing changes especially in low income countries (including Ghana) to obtain the optimum payment mechanism; the one which seeks to minimize cost of production of healthcare but maximizes outcome (Center for Healthcare Quality and Payment Reforms). The purpose of this dynamism is to eliminate the negative consequences and preserve the positives. The payment reforms have an ultimate aim to limit the problems which arise from the traditional Fee For Service (FFS) method; which researchers argue has incentive to encourage overprovision of services (inducement) and increase cost of healthcare cost (Maceira, 1998; Glass et al., 1999; Park et al, 2007; Waters and Hussey, 2004) as evidence in united states, Ghana, Thailand, Korea and several other countries (Mills et al., 2000)

Diagnostic Related Grouping (DRG) is a managed care system which classifies patients by diagnosis, average length of hospital stay, and therapy received; the result is to determine how much money health care providers will be given to cover future procedures and services, primarily for inpatient care. (McGraw Concise Dictionary of Modern Medicine 2002).

However, the complicated nature of diagnostic related groupings (DRG) and its motivation 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; Maceira, 1998; Glass et al., 1999; Park et al, 2007; Waters and Hussey, 2004) as evidenced in Thailand, Taiwan and some other developing countries (Mills et al., 2000).

The experience under the traditional Fee For Service (FFS), Diagnostic Related Grouping (DRG), have given more credence to capitation as an alternative way, for paying for healthcare providers because of the cost saving potential (Fowlesetal,1996). Therefore moving away from the traditional Fee For Service requires realigning the care delivery and payment incentive in healthcare system. We must therefore reimburse not for the sheer volume of services but based on the quality and utilization of care (Barnes, 2012).

Capitation assign fixed fee per enrollee for all services irrespective of the number of visits within a fixed time period, usually a year (Jegers et al., 2002; Mills et al., 2000), capitation can be modified to achieve the purpose of DRG by making high risk individuals to pay more (Walter, 1984). Capitation is a provider payment system which healthcare providers are given a pre-determined fixed rate to provide a defined set of services. The fixed amount

is typically expressed on a Per Member Per Month (PMPM). This is to ensure efficiency, sustainability, accessibility and the attainment of universal health coverage. Since an inducement and poor service delivery will be to the disadvantage of healthcare providers (Amarteyfio & Yankah, 2012). The reason is capitation payments turn healthcare providers into risk bearers, becoming financially responsible for each enrollee's cost of care under the contract, therefore providers have incentives to control cost of care per enrollee by either improving on efficiency, or engage behaviors that might adversely affect treatment decisions and patients' outcomes (Yip et al., 2001; Warner and Huxley, 1998; Chalkley and Tilley, 2006). Provider payment systems are, therefore, achieving improved access, quality, equity, and above all efficiency in healthcare delivery.

**National Health Insurance in Ghana;** The National Health Insurance Scheme (NHIS) was introduced in Ghana in 2003 through an Act of Parliament (Act 650) as a result of the inability of majority of Ghanaians, mostly the poor, to access health care under the "Cash and Carry System" of health care financing.

**Fee For Service Payment System by NHIS in Ghana;** In an attempt to address the challenge of Cash and Carry system, a payment mechanism known as Fee for Service (FFS) was introduced by the Ghana National Health Insurance Scheme started with fee for service (itemization billing) from 2004 to 2008 (Akanzinge, 2009). The FFS billed consumers of healthcare services on every service rendered to its patients. The asymmetric nature of demand for healthcare made healthcare providers to induce patients (Grossmann, 1972). 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% (Boakye, 2013). The escalated expenditure which arose from the FFS resulted in an alternative means of payment to the healthcare providers

**Diagnostic Regulatory Grouping In Ghana;** Diagnostic Regulated Groupings (DRG) also known in Ghana as Ghana-Diagnostic Relation Groupings (G-DRG) mode of payment is where providers billed the scheme based on diagnosis with reference to a new medicines list for treatment that was introduced. The NHIS implemented this mode of payment in the year 2008 (Amarteyfio and Yanker 2012). Again, this system was abused. Example; claims payment increased more than three times. Fusheini and others reported that in 2012 there were rural community clinics in Ghana that received claims for caesarean surgical services which in reality were not capable for such services but were reimbursed. Alternative payment mechanism, capitation, one of the proposed payment mechanisms in the NHIS programme, became the obvious choice for experiment.

**Capitation Payment Mechanism by NHIS in Ghana;** the capitation system of health financing was introduced in Ghana with the support of the World Bank in 2010. This mode of health care financing began in the Ashanti Region as a pilot through parliamentary approval. The pilot scheme which intended to last for two years is currently in progress and now being rolled out in Volta region and other regions. The reason for the choice of Ashanti Region was due to its central location with the outmost believes; it can be evaluated to inform roll out in the Volta Region and other regions in Ghana. Thus, if it succeeds in Ashanti Region it will be successful in the entire country. The capitation system ensures cost sharing or cost containment, shares financial risk among scheme providers and subscribers and introduce managed competition for providers and choice for patients. Under capitation, the subscribers of the NHIS, after registration with the scheme, have the flexibility to change the provider after a period of not less than six months. The capitation

system is practiced alongside other provider payment mechanisms for other levels of care other than the primary level (Nsowah-Adjei, 2012).

This thesis aims to give detail analysis of the impact of capitation on utilization for health care in Ashanti Region using Komfo Anokye Teaching Hospitals (Urinary Tract infested patients ) as a case study, since capitation met a fierce resistant from private healthcare providers and the populace of the region.

### **1.1 Statement of the problem**

The National Health Insurance Scheme (NHIS) of Ghana implemented capitation payment mechanism in the year 2010 as a result of the escalation cost due to Fee- For- Service (FFS) and Diagnostic Regulatory Grouping (DRG) payment system. This payment procedure began as a pilot scheme in the Ashanti Region to be further enrolled to other region if it succeeds to reduce cost of healthcare. (Amarteyfio and Yankah 2012). This sparked series of demonstrations in the region as the populace advocated would reduce utilization. Keen among pressure groups which kicked against this payment method is the Ashanti Development Union (ADU). The purpose of this research intends to identify the impact of capitation on utilization as most researchers" agree would reduce quality of healthcare (Mechanic and Aiken 1989; Lehman 1987; Mechanic 1991)

Nsiah et al in 2014 embarked on a study to identify how capitation affected utilization of National Health Insurance Scheme in the Ashanti region of Ghana. The study discovered that capitation led to an improvement in the use of resources (utilization) of health facilities by patients. However, Utilization according to Farlex and Partners (2009) is the quality and quantity of services, *visits* and a measure of satisfaction of patients of the health facility and referrals. Nsiah et al has not been able to assess the real impact of capitation on utilization of

healthcare for the following reasons; The study limited utilization to only the quality of healthcare, assessment of patients were on different facilities, Patients who were interviewed had different sicknesses (assume comparing AIDS patients with Malaria Patients) on the quality of healthcare and also failed to consider number of visits.

This study intends to contribute to the literature by informing regions and countries yet to implement capitation payment mechanism; by assessing the impact of capitation healthcare payment on utilization of healthcare, taking into consideration visits, quality of healthcare, willingness to retain health facility and also on referrals by using Urinary Tract Infectious patients of Komfo Anokye (KATH) and Korle-Bu (KBTH) teaching hospitals.

## **1.2 Objective of the Study**

The study seeks to find out the impact of capitation healthcare payment on the utilization for healthcare, using Urinary Tract Infection patients at KATH and KBTH.

The research will specifically seek to find:

1. Effect of capitation on demand for healthcare either it is statistically different from patients under DRG/ FSS
2. Effect of capitation on quality (effort) of healthcare given to patients
3. Seeks to find out the effect of capitation on referrals
4. Willingness to be with current healthcare provider

## **1.3 Justification of the study**

As the objective of government is to achieve universal coverage, then accessibility, efficiency and sustainability are important tools the National Health Insurance Scheme is confronted with. However, one of the major challenges confronting the NHIS is due to the fast growth of healthcare expenditure (imbursement) related to GDP growth. As various methods are being applied to improve on accessibility, quality, efficiency of health delivery, it is important to know the potential effect of outcome of patients arising as a result of the new payment mechanism. 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 of care, office visits, and satisfaction on patients under Ghana's recent capitation. This is particularly important now that at least the payment mechanism is likely to cover the entire country.

#### **1.4 Methodology and Data Analysis**

The study relied mainly on primary data. Administration of well-designed questionnaires alongside interviews will be used to gather data from UTI patients, specifically NHIS enrollees who have sought UTI treatment in health facilities within three month period. They will be conveniently selected. Descriptive as well as quantitative methods based on ordinary least squares, logistic and ordered logistic regression analysis, using STATA11.0, will be used to analyze the data.

#### **1.5 Scope of the study**

The study was limited to UTI patients using NHIS in the Ashanti Region (KATH) and Greater-Accra Region (KBTH) at the Out-Patient Departments. These Teaching Hospitals

were selected for the study because on it nearness, identical characteristic and available information related to the research. In this study, demand was proxied by the UTI patients whilst outcomes were the patient– reported health status or health conditions under capitation and FFS/DRG after seeking medical treatment for UTI infection, whereas physician-patient (provider-patient) relations refers to how healthcare workers,(including nurses and doctors) towards patients. Thus, it is the provider’s attitude towards the patient in the health facility. Information on patient’s willingness to be with primary health provider was also obtained as it sought to determine whether patients would change their primary care provider or not. Again, referral means the transfer of a patient from one healthcare provider (facility) to either KATH or KBTH. UTI cases were used for the study because it is treated under capitation system in KATH whilst it is being treated under FFS in KBTH unlike diabetes cases which are under fee-for-service or Diagnostic Related Grouping under the NHIS in all facilities.

### **1.6 Organization of the study**

The study has been structured 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 applied in the study. The results of data collected were analyzed and discussed in the fourth chapter whilst the fifth chapter presented the summary of findings, policy recommendations as well as conclusions of the study.

## **CHAPTER TWO**

### **LITERATURE REVIEW**

## 2.0 Introduction

This chapter contains the literature review on the different payment mechanism, the framework for setting capitation payment systems, objective for capitation rate and the types on capitation as well as empirical review of provider payment systems, on utilization of patients under capitation.

Health systems across all nations are coming under strict scrutiny with a sole objective of cost containment and quality improvement, often as a direct or indirect result of health sector reform which (Buchan and Sercombe, 1994; Kolehmainen-Aitken, 1998) are usually discussed. Discussions have however focused on provider payment methods and how to restrict needless demand for healthcare (Maccera, 1998; 2012; Smith, 2008). This is due to the asymmetric nature of information on the demand for healthcare (Grossman 2000). The fee for service payment method failed to address the high expenses incurred by insurance schemes. This is because providers of healthcare under the FFS induced patients to demand more health cares (Bundorf, 2004). For this reason, there is broad agreement that significant changes are needed to the Fee-for-Service Payments systems that are commonly used today, since they give health care providers strong financial incentives to deliver more services to more people, but often financially punish providers (center for healthcare quality and payment reform). The centre for healthcare quality and payment reforms enumerated two main payment methods. As they inquired to know which payment method was the best. They enumerated the episode payment and a single price payment. Episode Payment, thus, paying a single price for all of the healthcare services needed by a patient for an entire episode; and a single price for

all of the services needed by a specific group of people for a fixed period of time (thus, all of the care needed during the course of a year by the people who work for a particular employer or by people who have chronic diseases) also known as capitation.

Paying healthcare providers by capitation aid to reduce costs because healthcare providers, are compelled to restrict visit but concerns are raised about access and quality of care, which in the long-run affect health outcomes (Zuvekas and Hill, 2004). Apparently, providers may control costs by providing care more efficiently usually seen in fewer visits and less number time patients are hospitalized, but what is difficult to understand 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.

## **2.1 Kinds of Payment System**

Jegers et al. (2002), Park et al (2007), Maceira (1998) grouped reimbursement into two types. These are prospective and retrospective payment systems. The retrospective payment system is where the cost of providers are fully (or partially) paid after service provision, which serves as motivation to providers to decrease costs due to their profit motive of providers, however, Eastaugh (1987) argues that providers may be motivated to increase costs under retrospective system since healthcare cost would be retrieved. Prospective payment system however does not relate cost to the services provided, since cost is predetermined before the provision of healthcare since is determine *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 payments make use of „„I pay you first and you deliver the services later““

## 2.2 The Concept of Capitation

The Health Economic Dictionary (2005) defined capitation as a method of paying physicians or healthcare providers a fixed fee per period per or consumed. The principle that distinguishes capitation payment mechanism to FFS/DRG has been the fact that there is no direct link to the inputs that the provider uses or the volume of services provided. If the providers' cost exceeds the per budget cost, the provider is liable for them. However, if the provider spends less than anticipated from the per- payment within a specific duration due to efficiency, it can usually retain and reinvest this surplus.

According to Bourdon et al. 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“. Thus providers are given a mini-insurance (premium) to cater for patients irrespective of the nature of disease within a defined duration (Bourdon et al., n.d).

The theoretical effect of capitation has been amply elaborated (Schneider and Hanson2007): capitation payment imposes financial risks on providers and discourages them from oversupplying healthcare delivery. Capitation products are essentially insurance contract which shift risk to the providers accepting the capitation premium (Bourdon et al.). Capitation payment is prospective in nature and providers can cream-

skimmed on the patients they cater for (Waters and Hussey, 2004; Langenbrunner and Wiley2002).

Capitation refers to a form of healthcare payment where a provider or hospital is paid by the insurer (third party) an amount per patient during a period of time. An example of a capitation model would be an insurer / payer (third party) who would negotiate to pay a doctor \$500 per year per person in a group. For 1,000 people, the insurer would pay the doctor \$500,000 and the doctor would be expected to supply all services necessary to those 1,000 people. (Trisha Torrey, 2014; ILO, 2009). American Medical Association defined capitation as payment per person instead of payment per service provided (AMA). The American medical association described several different types of capitation, ranging from relatively modest per member per month (pmpm) case management payments to primary, secondary and tertiary care physicians management (American Medical Association)

### **2.2.1 Types of Capitation**

The Healthcare Incentive Institute classified healthcare capitation system into two main types; **Global capitation** and **partial or blended capitation**. Global caption involves whole network of hospitals and physicians come together to receive a single fixed monthly payment for a particular healthcare per each patient per month. The health care providers then adopt a strategy to divide the capitated checks among group responsible for the health upkeep of their enrollees. While **partial or blended capitation** involves the payment for a defined set of services. Thus any services or service that is not defined will be paid on Fee For Service bases (Health Care Incentive Improvement Institute).

**Isenberg** grouped capitation based on the service provided. He classified capitation into **primary care capitation, full physician capitation and full risk capitation.** **primary care capitation** is the type of capitation provided by the physician at the primary care level whilst **sub-specialty capitation** deals with specialists such as; orthopedic surgeons, otolaryngologists, obstetricians (general surgeons). He described **full- physician capitation** as physician services at the primary care. This type of capitation is given to multi-physician specialty group to cater for the health status of its patients. This payment is given to the physicians by means of percentage allocation. **Full-risk capitation** refers to all medical benefit services and caters for all services at the primary care, general surgeons, hospital services, prescription drugs (Stephen f. Isenberg).

Tolley and others in 1987 categorised a payment mechanism known as **Area Capitation and Direct capitation.** Area capitation involves paying fix amount per enrollee in a well-defined geographical area. The populace ensured could use diagnostic related grouping or fee for service for individuals within a particular defined territory as instituted in the contract. (Tolley et al., 1987). Tolley et al. explained direct capitation as a situation whereby the healthcare provider servers as insurer and provider of healthcare. Healthcare providers are paid directly and their services are redereed afterwards (Exante)

Under global capitation, whole networks of hospitals and physicians band together to receive single fixed monthly payments for enrolled health plan members. Payment is made on a per member basis. Generally, providers sign a single contract with a health

plan to cover the care of groups of members, and then must determine a method of dividing up the capitated check among the provider group. Under a partial or blended capitation model, a single payment is made for a defined set of services, while other services involved in a patient's care are paid for on a fee-for-service basis. Under each model of capitation, risk adjustment is essential to adequately compensate providers for the risk they take-on. Payments are differentiated based on the characteristics of the enrollees in each provider patient group. Common risk adjustment factors include age, sex, health status, and prior health care utilization, as well as socio-demographic factors such as residence, income, etc.

The American medical association classified capitation into two different groups. Thus **case management payment to care physicians' payment** covering all professional services. Capitated payment systems are, as the name implies, based on a payment per person, rather than a payment per service provided. There are several different types of capitation, ranging from relatively modest per member per month (pmpm) case management payments to care physicians involved in patient centered medical homes, to pmpm payments covering all professional services, to pmpm payments covering the total risk for all services: professional, facility, pharmaceutical, clinical laboratory, durable medical equipment, etc. And there are innumerable variations on these basic capitation types, depending on the particular services the parties decide to "carve out" and handle on either a fee-for-service basis or by delegation to a separate benefit management company.

### 2.3.0 How capitation rate is set

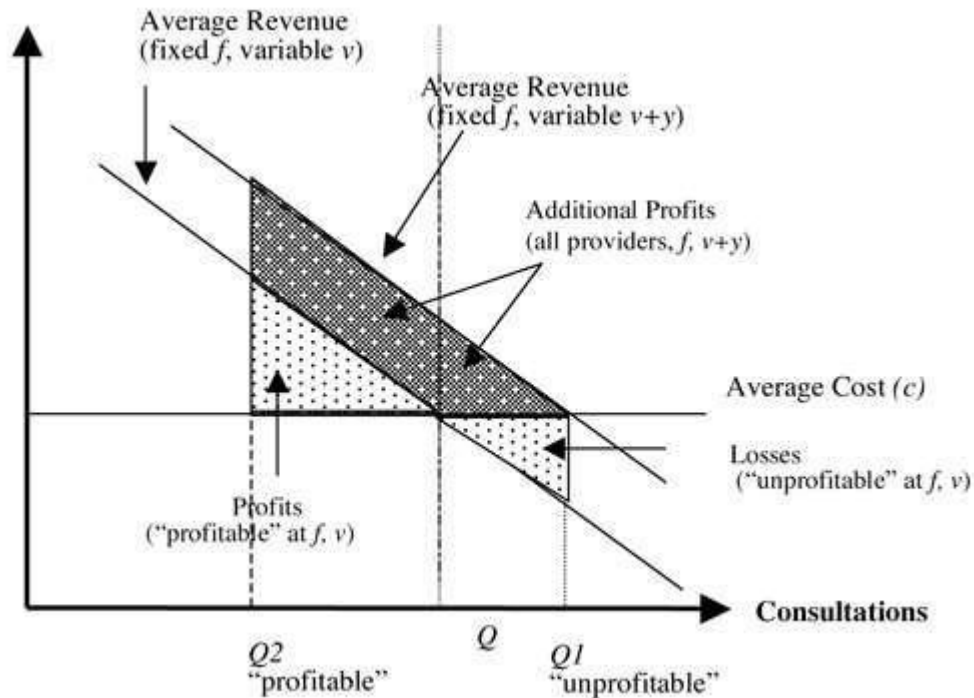
Healthcare providers in choosing for capitation means of payment for healthcare delivery are mostly confronted with the rate to charge patients. Capitation payment is defined as payment per month (PPM) to the healthcare provider. Capitation has the incentive to increase risk of patients (Leibowitz and Buchanan, 1990). Capitation payment which is a prepaid plan is adopted with the aim of contain cost which arise from healthcare delivery. Setting the capitation rate, the following approaches can be adopted; top-down, bottom-up and minimum revenue requirement.

### 2.3.1 Capitation in primary healthcare market

In setting capitation rate in primary healthcare market, one important determinant is whether the healthcare provider can influence consumers of healthcare to pay additional fee (partial capitation) or must only operate within the amount given from scheme holders (full capitation).

In contract for partial capitation, the facility has the opportunity of capitated fixed income per each patient ( $f$ ). The fixed amount is determined by ex-ante characteristic of the population to whom responsibility is attributed to the facility. The variable cost component of the Total Cost is ( $c$ ) for each unit of output of ( $q$ ) which the facility can induce patients to pay. This makes the cost function of the facility to become cost  $c$  (profit =  $f - q(c - v)$ ) as partial capitation attracts revenue to the facility from patients ( $v$ ) However, in full capitated contract ( $v = 0$ ), this implies the total budget for the facility will be equal to the capitated amount given per the period assigned invariant to ( $f$ ) the capitated amount and the number of consultations.

Since the recipient income is invariant to the number of consultations, the greater the resource received prospectively ( $f$ ), the lower the variable cost ( $v$ ) assigned to patients at the facility and the greater the reliance on the income from prospective capitation payment instead of income from the number of consultations.



For the recipient to increase his profit margin, the facility must adopt a strategy to decrease cost of production as it uses more efficient means of healthcare delivery. Since, over-supplying of healthcare will lead to minimum profit if not loss. (Milgrom and Roberts, 1992, Ellis and McGuire, 1986)

### 2.3.2 Bottom up cost approach

This approach summarizes all the cost of the inputs used for the production of healthcare. Thus the Incentives to produce efficiently, ostensibly by adjusting treatment

intensity within a medically acceptable quality range. However, it may also lead to dumping and cream skimming of insured patients or skimping on quality of care. If providers have multiple revenue sources, they may try to shift cost across different financiers (Schneider and Hanson 2007).

### **2.3.3 Top-Down cost approach**

This method is calculated by the leadership of schemes. The leadership assists with dividing the total expenditure incurred by the number of days spent at the hospital or by the number of visits to the hospital. Costs are then allocated to the cost centers of healthcare facilities depending on the service rendered to the patients. This then assist facilities to determine the cost per service which in the long-run determines the per member per month payment (Wiley, 1993).

### **2.4.0 Other forms of payment mechanism**

#### **2.4.1 Fee for Service (FFS)**

FFS which is also known as itemizing billing, is a healthcare payment mechanism where healthcare providers are paid based on each unit of service provided to healthcare consumer (dictionary of health economics, 2005). Healthcare providers can embarked on Fee-For-Service either as an insurance policy or as pay-as –you-go policy. Under this policy, each service required by patients is paid ex-ante if is fee-for-service under pay- as-you-go. However, if the traditional FFS is a Health Insurance Policy, patients will only be compelled to pay for the services that are not enlisted by the policy (Jegers et al., 2002). Due to the asymmetric nature of information for the demand for healthcare, healthcare providers whose objective is to maximize profit induce patients to demand more services that expected. FFS can be done in conjunction with capitation payment system as in Ghana.

#### **2.4.2 Diagnostic Regulatory Group (DRG)**

This is a payment mechanism where healthcare providers are reimbursed based on the nature of case at hand. The cases are sometimes differentiated either as an acute ailment or a mild one. Irrespective of the case, payment to the healthcare provider is determined ex-ante regardless of the cost to the healthcare provider (Jegers et al, 2002). The purpose of DRG was to reduce cost and ensure imbibing effort by healthcare providers but has become a mode of payment to healthcare providers. Example; acute malaria and a mild malaria can be differentiated by payment based on an agree fee to each case by the healthcare providers. Water and Hussey in 2004 postulated steps that aid healthcare providers for setting price based DRG. The steps are; (1) developing a diagnosis classification system, (2) determining the relative weight of the group, (3) determining the level of payment per relative unit, (4) establish adjustment to the payment rate

#### **2.3.4 Definition of Urinary Tract Infection (UTI)**

Urinary Tract Infection (UTI) is any class of infections that involves the kidney, ureters, bladder, or urethra. Thus any form of infections in the structure through which the urine passes before it is eliminated from the body is termed as Urinary Tract Infection. UTI is also termed as acute cystitis or bladder infections. It is termed as cystitis when it affects the lower urinary tract and also termed as pyelonephritis when it affects the upper urinary tract. Continuous symptoms of UTI without any improvement over time (after treatment) could be as a result of Bladder Cancer according to Kyle Richards M.D  
University of Wisconsin-Madison (Ghana health nest)

### 2.3.5 Types of Urinary Tract Infection

The type of UTI depicts its name from the area or organ in the Urinary tract within which the infection occurs. Others are also differentiated based on its cause of the infection. The four most common UTI's include; Urethritis, Cystitis, Ureteritis, and Pyelonephritis

**Urethritis** is as a result of inflammation or in the urethra. This type of infection is mostly attributed to Sexually Transmitted Diseases (STD's).

**Cystitis** is the type of UTI which occurs in the bladder. This is the most common among all the types of UTI's. A patient with this type of infection can have the condition worsens if the bladder fails to empty when urinating.

**Ureteritis** is the type of UTI that occurs in the urethras. This occurs when the bacteria gain access to the urinary tract from above as a result of a failure of ureter-to-bladder valve.

**Pyelonephritis** is the type of UTI which affects the kidney. This condition is very serious and requires urgent attention to prevent kidney malfunctioning.

However, UTI's can generally be categorized into two namely; acute urinary tract infection and chronic urinary tract infections. As the acute is described to cause severe pains the chronic type is difficult to cure and patients live with them for a long time.

### 2.3.6 UTI in Ghana

According to Emmanuel Kweisi Coomson MD, UTI is one of the serious health problems in Ghana that deteriorate health status of patients infested with this kind of

infections. Millions troop in to various healthcare centers to seek for curative measures each year (Ghanaian Chronicle 31<sup>st</sup> march 2006).

### **2.3.7 UTI in KATH**

Urinary tract infection is one of the top ten diseases reported at the out-patients- department at the Komfo Anokye teaching hospital. The out-patients-department in the year 2013 recorded 293 cases of patients below the age of 13 years, male adolescents and adults stood at 297 with female adolescent and adults cases recording 878. However, UTI cases in the year 2014 escalated to 1774 according to the Head of records at OPD (Dennis Sly-Moore). The head of biostatistics at Komfo Anokye Teaching Hospital, Emmanuel Kusi Sarpong also confirmed the escalating number of cases recorded for UTI.

### **2.5.1 Review of Empirical Studies on the Effects of Capitation on Patients' Visits, quality of healthcare and willingness to be with primary healthcare provider, referrals**

Almost all the studies dealing with the effect of capitation payment system on utilization by patients were conducted in the advanced countries. This has being the situation due to the social health insurance and healthcare market situation in developed economies which have the systems that ensure efficiency in healthcare delivery.

This section deals with the empirical reports which emanates from countries and incentives on healthcare providers to react based on the nature of payment mechanism of the social insurance.

Boakye (2013) embarked on a research on malaria patients in Ashanti region to identify the effect of capitation on health outcome of malaria patients. One of the objectives of the

researcher was to indicate the effect of capitation on office visits. After the collation of the questionnaire and the analyses from 500 patients, the study discovered an inverse relationship with capitation and office visits as capitation was found to be statistically significant.

Sorbero et al. (2003) investigated the effect of capitation on switching primary care health physicians. The study used administrative enrollment and claims data for 1994-1995 from four physician organizations. The study developed a model of patients switching behavior which was used to guide the specification of multivariate logistic analyses focusing on interaction between patient case-mix, utilization, and Primary Care Provider (PCP) reimbursement methods. With this study, claims data were aggregated to suit the objective of the researcher. A switch in this study was defined as a change in Primary Care Provider (PCP) since the previous encounter while was reimbursed either by capitation or fee-for-service. As part of the principal findings it was discovered that patients with stable chronic conditions under FFS were 10% more likely to switch the PCP whilst those under capitation were 36% more likely to switch PCP than similar patients under FFS. The conclusion therefore from the study indicates that capitated PCP payments were associated with higher rate of switching among high utilizers of healthcare resources based on the significant level of p-value of 0.002.

Kira et al in 2014 embarked on a research to find the relationship between primary care models and processes of diabetes care in Ontario. The study used 757,928 people who have tested positive for diabetes whose ages range from 40 years and above. Each of the 757,928 was assigned to a primary healthcare physician and later inquired if they have received

three key monitoring tests from 2006-2008. A multivariable generalized estimating equation model was used to test the various primary healthcare models. After estimation, it was realized that patients who were assigned to non-team blended capitation model had a statistical value of 1.18 with a 95% confidence that it would fall between 1.09-1.27, that it received the 3 key motoring test. The patients enrolled with team based blended capitation model had a statistical value of

1.2 with 95% confidence that it received the 3 recommended monitoring within the confidence interval of 1.13-1.28. The research according to Kira, those with capitation model induces effort (quality) and said were more likely to receive the monitoring than those in Fee for Service model.

Iverson and Luras (2000) embarked on a research in Norway to identify the effect capitation on referrals by the General Practitioners (GP). The purpose of the research was to discover the response of these practitioners after the mode of payment changed from „practice allowance component to capitation system of payment. The empirical data gathered from the GP concluded that capitation payment system had a positive correlation with referrals.

## CHAPTER THREE

### METHODOLOGY

#### 3.0 Introduction

This chapter indicates the methodology applied for the study as well as the setting for the study. It also portrays the methodology adopted to elicit information from respondents. The research employed descriptive as well as quantitative methods for the analyses. Ordered logistic regression and poisson regression models, using STATA 11.0, was employed under the quantitative method to determine whether or not capitation has caused changes in utilization of healthcare and patient healthcare.

#### 3.1.0 Background of the study Area

##### 3.1.1 Ashanti Region

Ashanti Region is the most populated Region in Ghana. It had a total population of 3,612,650 **representing** approximately 14.65% of the entire population per the 2000 population census. The population however grew to 4780380 in the 2010 population census representing 32.3% increase in population from the year 2000 to 2010. According to the 2010 population census, the region had male population of 2,316,052 and a female population of 2,464,328. It has an urban population of 2,897,290 with a rural population of 1,883,090. The region contains 19.4% of the entire population of Ghana with 60.6% in the urban centers. (Ghana statistical service 2010).The region is bounded by four of the ten political regions. The region share boundaries with Brong Ahafo in the North, Eastern

Region in the East, Central Region in the South and Western Region in the South-West. It lies between longitudes 0.15W and 2.25W, and latitudes 5.50N and

7.46N. The region has been portioned into 27 districts, each headed by a District Chief Executive. The region which is located in the south of Ghana has a total land surface 24,389 km<sup>2</sup> or 10.2 percent of the entire land area of the republic of Ghana. This area is currently under capitation healthcare payment mechanism

In 2009 the country had 3,217 health facilities of which 548 were located in Ashanti Region. This did representing 17% of the health facilities. These are the breakdown of the facilities in the region as at 2009. The region had one of the three teaching hospitals (Okomfo Anokye Teaching Hospital), 17 CHAG hospital, 3 Islamic hospital, 22 government hospitals, 48 private hospitals, 2 quasi-government hospitals, 32 CHAG health centers, 2 Islamic health centers, 141 government health centers, 161 private health center, 9 quasi-government health center, 106 private maternity homes and 4 government CHP (the health sector in Ghana facts and figures 2010)

### **3.1.3 Komfo Anokye Teaching Hospital (KATH)**

Komfo Anokye Teaching Hospital is one of the five teaching hospitals in Ghana. It is located in Kumasi, the regional capital of Ashanti Region. The hospital was established in 1954 as Kumasi Central Hospital. It was later named after a legendary fetish priest known as Komfo Anokye. It was however converted into a teaching hospital in 1975, affiliated to the medical school of Kwame Nkrumah University of Science and Technology. The hospital is accredited for postgraduate training by the West Africa College of Surgeons in surgery, obstetrics and gynecology, otorhinolaryngology, ophthalmology and radiology.

KATH has both clinical and non-clinical directorates. Some of the clinical directorates include anesthesia and intensive care unit (ICU), child health, Dental, Eye, Nose, and Throat (DEENT), diagnostic, medicine, obstetrics and gynecology, oncology, polyclinic, surgery, accident and emergency department, pharmacy. The Non-clinical directories include; domestic services, security, supply chain management and technical services. 250 UTI patients were chosen from the Outpatient Patient Department (OPD) of this facility to represent to represent patients under capitation healthcare payment.



Komfo Anokye Teaching Hospital

### **3.2.0 Greater Accra Region (DRG/FFS GROUP)**

This region has the least land area in Ghana's ten administrative regions. It has a total land surface of 3247 km<sup>2</sup> representing 1.4% of the entire land area in of the republic of Ghana. Irrespective of the smallness in its land area, it is the second most populated region, after Ashanti. The year 2000 populated census of the region reviewed a total population 2,905,726 representing 15% of Ghana's population. The Greater Accra Region was delineated from eastern region in 1982 and currently harbors the seat of government in the republic. The 2010 population census discovered a total population of the region as

4,010,054 with a female population of 2,071,829 representing 51.7% of the entire region's population. The population of greater Accra grew by 38% from 2000 to 2010 per the two censuses conducted.

The region has 16 administrative districts but 466 health facilities. It is the region with the second highest healthcare centers in the country with Ashanti Region leading with 548 healthcare facilities. These are the breakdown of the healthcare facilities; 1 Teaching Hospital, 1 Region Hospital, 2 Psychiatric Hospitals, 3 CHG Hospitals, 2 Islamic Hospitals, 7 Government Hospitals, 79 Private Hospitals, 6 Quasi Government Hospital, 7 Government Poly Clinics, 5 CHAG Health Center, 1 Islamic Health Center and Clinics, 44 Government Health Centers and Clinics, 232 Private Health Center and Clinics, 17 Quasi Government Health Center and Clinics, 55 Private Maternity Home and 4 Government CHPS.

### **3.2.1 Korle-Bu Teaching Hospital**

Korle-Bu Teaching Hospital was established in 9<sup>th</sup> October, 1923. The hospital depicts its name from Korle Lagoon. The purpose of its establishment was to service the health needs of the indigenous people during Sir Gordon Guggisberg's administration. The hospital gained a Teaching Hospital Status in 1962 when the University of Ghana Medical School (UGMS) was established. Clinical and diagnostic department of Korle-Bu Teaching Hospital include; Child Health, Obstetrics and Gynecology, pathology, Laboratories, Radiology, Anesthesia, Surgery, **Polyclinic**, Accident Center and the Surgical/ Medical Emergency as well as pharmacy.



The Korle Bu Teaching Hospital

### **3.2.2 Contextual Framework**

In order to achieve universal health coverage, healthcare system must be accessible to patients when needed. This means the consumption of healthcare must not be constrained by any variable. However, with the implementation of capitation by the NHIS, healthcare providers have now been compelled to reduce consumption of healthcare due to the risk on their profit margin. To sustain profits of healthcare providers, under the capitation system, is either to compel patients to pay additional fee or deliberately reduce the demand (visits) for healthcare, in order to decrease the financial risk of healthcare providers. If these eminent problems persist as capitation healthcare system is limited to outpatients then an extension to inpatients could lead to tragic health outcome of patients. To mention a few; length of stay needed for patients to recover will be shortened, rate of admission will be low even though it is necessary, the relationship of healthcare providers and patients will could worsen. These repercussions will deteriorate the health status of all patients including UTI patients.

### **3.2.3 Source and methods of Data Collection**

The study employed primary data from a well-structured questionnaire as a mode of data collection. Random sampling method will be used to solicit information from the

respondents. The questions were centered on whether or not enrollees paid additional fee in addition to the national health insurance subscription. Questionnaire also sought to know the number of visits after the initial visit/discharge. The quality of healthcare; the questionnaire will range from excellent to poor. Information on the following will also be addressed by the question are; income, age, employment status, educational level. It is only UTI patients who have sought medical care either in Komfo Anokye teaching hospital (capitated patients) or Korle-Bu teaching (FFS/DRG patients) in the last one month period will be considered. Urinary Tract Infection patients will be used as a proxy because of its high rate of reinfection. 500 questionnaires will be used for both Komfo Anokye Teaching Hospital and Korle-Bu teaching Hospital with 250 respondents from each health facility to ensure efficient comparism.

### **3.2.4 Data Analyses**

In assessing and analyzing the effect of capitation on health status of UTI patients, accessibility as well as utilization will be measured by the number of times patients visited the health facility. The relationship between patients and providers will also be obtained to enable the research develop the basis to predict future health output of patients (Cormack, 1991). Quantitative methods as well as qualitative method will be used to enable a proper forecast of the trends and the ability to determine the statistical significance of the variables to be estimated. The research will employ Order Logistic Regression (OLS) methods for the empirical study whilst gender, facility previously attended will be descriptively analyzed.

### 3.3.0 Empirical Estimation and Regression Analyses

Diverse regression methods (Ordered logistic regression, logistic regression models as well as Poisson Regression) have been employed in the study, to aid us to determine the actual consequences of capitation payment system on utilization; demand (number of visits), referrals, willingness to be with current provider and quality of healthcare

The inability to assign numerical values to our qualitative data that are dependent variables will call for the usage of order logistics and binary logistic models where by probabilities of all the outcome of independent variables were modeled on a cumulative normal distribution (stock and Watson, 2007). The reason for the usage of the Ordered logistic model is due to its potential ability to determine the statistical significance of the relation between the dependent and the independent variables and its capability to determine the unequal differences between the ordinal categories in the explained variables (Greene, 2002). The ordered logistic model has been indicated below. This follows the procedure of Agresti (2007) and Greene and Hensher (2009)

$$Y_i = j \text{ if } j = 1, \dots, J \text{ for } j = 1, \dots, J \dots \dots \dots (1)$$

Where the structural model is given by

$$Y_i = \underset{\sim}{\beta}_j + X_i \beta_j + \epsilon_i, \epsilon_i \sim N(0, \sigma^2 / 3), i = 1, \dots, n$$

..... (2)

And

$$\beta_0 = \beta_1, \beta_j = \beta_{j+1}, \beta_m = \beta_n$$

Given that the error term is logistically distributed, the probability of observing a particular value of  $Y$  is given by:

$$P(Y_i = j / X) = P(j - 1 < \epsilon_j / X)$$

$$P(Y_i = j / X) = P(j - 1 < \epsilon_j < j / X)$$

$$P(Y_i = j / X) = P(\epsilon_j < j / X) - P(\epsilon_j < j - 1 / X)$$

$$P(Y_i = j / X) = f(j - 1) - f(j - 1) \text{ for } j = 1, \dots, J \dots \dots \dots (3)$$

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

$$Y = 0 \text{ if } \epsilon_1 < Y^* < \epsilon_1$$

□

$$Y = 1 \text{ if } \epsilon_0 < Y^* < \epsilon_1$$

□

$$Y = 2 \text{ if } \epsilon_1 < Y^* < \epsilon_2$$

$Y = \dots$

$$Y = J \text{ if } \epsilon_{j-1} < Y^* < \epsilon_j$$

### 3.3.1 Model 1 (effect of capitation on demand using Poisson)

The prime reason for model 1 is to digest the consequences (effect) of gender, education, age, income and most importantly capitation on the number of visits (demand) for healthcare using Poisson regression by Stata 11. Poisson regression model has been applied because it fits the following assumptions; visits (demand) are a count variable and the values ranges from 0, 1, 2, ..., the probability of one occurrence does not affect the other, the same level of interval is designated for all variables, no two can occur at the same time.

In this model  $Y_i$  (proxy by the NHIS enrollee) will indicate the dependable variable whilst  $Y^*$  will be the independent variables. The function will therefore be in the form:  $\log_e(Y_i) = f(Y_i^*)$ . The symbol  $f$  indicates a functional notation showing the relationship between demand for healthcare and all the independent variables including capitation.

The model is indicated below as:

$$\text{Log}_e Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9 + \dots \quad (1)$$

$Y$  = number of visits to the facility

$X_1$  = income (the amount spent on food weekly)

$X_2$  = age of the patient

$X_3$  = the time spent travelling to the facility

$X_4$  = dummy variable ( $X_4 = 1$  if employed,  $X_4 = 0$  if unemployed)

$X_5$  = dummy variable ( $X_5 = 1$  paid additional fee,  $X_5 = 0$  if no additional fee was paid)

$X_6$  = dummy variable ( $X_6 = 1$  if educated,  $X_6 = 0$  if uneducated)

$X_7$  = dummy variable ( $X_7 = 1$  if under capitation,  $X_7 = 0$  if other FFS/DRG)

$X_8$  = dummy variable ( $X_8 = 1$  if a female,  $X_8 = 0$  if male)  $\mu$  = stochastic error term

### 3.3.3 Model 2 (quality of healthcare using order logistic regression)

This model seeks to explain the effect of age, employment status, and time spent travelling to the health facility, gender, income and capitation on the quality of care provided to patients. Order logistic regression will be used since the dependent variable (quality of healthcare) has been ordered as 0, 1, 2, 3, 4 as indicated by Scott Long &

Freese, 2005. The structure of this model is indicated below: The dependent variable (quality of healthcare)  $Y_i$ , has been ordered (with the range as very poor, poor, good, very good, excellent) with the code as 0,1,2,3, and 4 respectively.  $Y_i$  in turn is a function of other independent variables (age, gender, income and capitation.

The functional form is illustrated as:  $Y_i=f(Y^*)$ ,  $f$  indicates the functional relationship that co-exists between HealthCare providers and patient's relationship.  $Y^*$  which is the representation of the independent variables has various threshold points. The model is of this form

$$Y_i = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9 + \beta_{10} X_{10} + \dots$$

(2)

$X_1$ =income (the amount spent on food weekly)

$X_2$  = age of the patient

$X_3$  = the time spent travelling to the facility

$X_4$ = dummy variable ( $X_4=1$  if employed,  $X_4=0$  if unemployed)

$X_5$ = dummy variable ( $X_5=1$  paid additional fee,  $X_5=0$  if no additional fee was paid)

$X_6$ =dummy variable ( $X_6=1$  for basic education,  $X_6=0$  if others)

$X_7$ =dummy variable ( $X_7=1$  for senior high school education)

$X_8$ =dummy variable ( $X_8=1$  for tertiary education)

$X_9$ =dummy variable ( $X_9=1$  if patients is under capitation,  $X_9=0$  if under FFS/DRG)

$X_{10}$ =dummy variable ( $X_{10}=1$  if patient is a female,  $X_{10}=0$  if patient is a male)

### 3.3.4 Model 3 (Logistic Regression on Referrals)

The main reason for model 3 is to indicate whether capitation, type of facility has any effect on referrals. Binary logistic regression was used for the analysis because the dependent variable indicate as to if a feature was present or not. Let us represent  $Q_i$  (as a binary variable) indicating either the NHIS enrollee was referred to the teaching hospital or not. We will therefore represent  $Q_i=1$ , if the patient was referred to the teaching hospital and  $Q_i=0$  if the UTI patient was not referred the Hospital. The equation will be in the form;  $Q_i=f(X_i)$ . The  $f$  represent the functional notation indicating the nature of relationship between referrals,  $Q_i$ , and the other explained variables,  $X_i$ , portraying the value of probability to be referred or not. According to Greene and Hansen (2009) the model is presented below.

$$\text{Logit } Q_i = \log \left( \frac{Q_i}{1-Q_i} \right) = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9 + \beta_{10} X_{10} + \beta_{11} X_{11} + \beta_{12} X_{12} + \beta_{13} X_{13} + \mu \dots \dots (3)$$

Where;  $X_1$  to  $X_9$  has the same meaning as in model 3

$Q_i$  = qualitative explained variable: thus 1 if the patient was referred to the Teaching Hospital; 0, if he was not referred.

$X_{10}$  = dummy variable; 1 if the facility referred from is a government owned hospital, 0 if others

$X_{11}$  = dummy variable; 1 if the facility referred from is a mission healthcare center, 0 if others

$X_{12}$  = dummy variable; 1 if the facility referred from is a private owned health center, 0 if other

$X_{13}$  = dummy variable; 1 if the facility referred from is a government owned facility, 0 if others

$X_{14}$  = dummy variable; 1 if the facility referred from is a mission owned facility, 0 if others

$\mu$  = stochastic error term

### 3.3.4 Model 4 (measures willingness to be with current health provider using Binay Logistic Regression)

What model 4 sought to measure is the effect of age, income, employment status, capitation, type of capitated facility and its ownership status to determine either a patient will be willing to stay with current provider or not

This can however be measured by making the dependent variable ( $Y_i$ ) a dummy variable. Thus  $Y_i=1$  if patients are in position to retain his current healthcare provider and  $Y_i=0$  if a patient is not in position to retain his current healthcare provider. The equation of the model is in the form  $Y_i=f(X_i)$ , the  $f$  indicates the functional notation depicting the relationship between patients willingness to the current healthcare provider,  $Y_i$ , and the other random variables,  $X_i$ , indicating the probability of UTI patients eagerness to retain the prevailing healthcare provider under capitation payment system. The nature of model is indicated below;

$$\text{Log} \frac{Y_i}{1 - Y_i} = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9 + \beta_{10} X_{10} + \beta_{11} X_{11} + \beta_{12} X_{12} + \beta_{13} X_{13} + \mu \dots \dots (4)$$

Where;  $X_1$  to  $X_9$  has the same meaning to model 3

$Y_i$  = qualitative explained variable: thus 1 if the patient was willing to be with current primary care provider; 0, if patient in unwilling.

$X_{10}$  = dummy variable; 1 if the facility refereed from is a government owned hospital, 0 if others

$X_{11}$  = dummy variable; 1 if the facility referred from is a mission healthcare center, 0 if others

$X_{12}$  = dummy variable; 1 if the facility referred from is a private owned health center, 0 if other

$X_{13}$  = dummy variable; 1 if the facility referred from is a government owned facility, 0 if others

$X_{14}$  = dummy variable; 1 if the facility referred from is a mission owned facility, 0 if others

$\mu$  = stochastic error term

The following questions were of great interest for the purpose of the research;

- The number of office visits after the initial visit
- The quality of healthcare provided
- Either the patient was referred or not
  - Will the patient retain the current primary care provider or not

### **3.4.0 Expected signs of the parameter Estimates**

#### **3.4.1 Model 1**

It is anticipated that there will be a positive relationship between income ( $X_1$ ) and demand for healthcare (number of visits). This is due to the fact that wants of consumers must always be backed by willingness and ability to pay. For this reason, as a person's income increases, demand for healthcare is also expected to increase. The coefficient of income, employed, and that of the educated which is  $B_2$ ,  $B_5$  and  $B_7$  respectively are expected to be positive.  $B_3$  is the coefficient of age ( $X_2$ ). I expect a positive relation between age and number of visit; this is because health status deteriorates over time. This implies as an individual age increases, it is however expected to increase the consumption of healthcare to restore the health status.  $B_6$  is the coefficient of an additional fee paid ( $X_5$ ). I expect a positive coefficient. This is because; healthcare providers are able to increase their profit margin by being able to charge an additional fee different from what they will receive from

NHIS. As long as healthcare providers can induce patients to pay additional fee, they will compel patients to seek for more healthcare.

$\beta_4$  and  $\beta_8$  are the coefficients of Time spent travelling to the health facility ( $X_3$ ) and that of capitation ( $X_7$ ) respectively. It is expected that the two coefficients will be negatively related to quantity of healthcare demanded. This is because capitation ( $\beta_8$ ) is not demand driven, but effort driven to contain cost of healthcare. Thus as healthcare providers are given a fixed rate to cater for patients for a specific duration, inducing patients for more visits will be to the detriment of their profit margin. They instead decrease the number of visits and imbibe more effort to their care.  $\beta_4$  will also be negatively related because a patient that spends less than 30 minutes to seek for healthcare is likely to visit the facility more often than the one that spends 3 hours to attend the same health facility, all other things being equal.

### 3.4.2 Model 2

$\beta_2$  is the coefficient of income ( $X_1$ ) and a determinant of the nature of quality of care that exist between healthcare providers and patients. As a person income increases, he will be in better position to pay any additional fee charged at the healthcare facility. Not only can the patient pay all the additional bills but can also be in the best position to grease the palm of healthcare providers and consequently receive quality healthcare. This will enhance a cordial relationship between healthcare providers and patients thereby making  $B_2$  positive.

This implies whenever a patient's income level increases, such a patient will be in a better position to receive a quality healthcare and therefore the coefficient is expected to be

positive.  $\beta_3$  is the coefficient of age ( $X_2$ ). Ghanaians have a great respect for tradition, and our tradition mandates us to respect the aged. This shows as a person's age increases, there is high possibility that healthcare provider will accord him the needed respect, thereby boosting the good relation between healthcare providers and patients to enhance quality of care. This will make  $B_3$  to be positive.

$\beta_4$  is the co-efficient of Time spent travelling ( $X_3$ ). This measure the time healthcare consumers spent on the road before getting to the health facility. The determinant of these factors include: how bad the road is, traffic situation, bad roads, the state of the means of transportation and including the state of transport system in the country. It is however anticipated, these factors will have an effect on the patient-provider relationship. The lesser the time patients spend travelling to the facility, the better the quality of care provided. Patient's tiredness and their level of frustration will have an impact on their ability to listen to rules and methods as a result of the carry-over effect.

$\beta_4$  is thus expected to have a negative.

$\beta_5$  and  $\beta_6$  are the co-efficient of *the employed* and *Ability to charge an additional Fee* respectively. Thus an employed patient is more likely to earn more money compare to those not working. This will enable such a patient to be capable to foot all bills and subsequently grease the palm of healthcare providers. The African adage, which literary means "you scratch my back and I also scratch your back", will reinforce the good relationship between the patients and the provider. This is because an employed patient will be in the best capacity to pay all additional bills to enhance the quality of care. For this reason  $\beta_5$  and  $\beta_6$  will be positive.

$\beta_7$ ,  $\beta_8$ , and  $\beta_9$  are all coefficient of the educated, at various levels of education, as a result it is anticipated to move in the same direction and are expected to be positive. This is because education enhances patients to know their right, and the level of consumption of healthcare which is due, to the patient. Most of the educated do not only demand their right for healthcare, but are able to follow all rules prescribed by physicians. Therefore  $\beta_7$ ,  $\beta_8$ , and  $\beta_9$  are all expected to be positive to reinforce a quality healthcare provision.

$\beta_{10}$  indicates the coefficient of female patients ( $X_9$ ). We however do not anticipate any specific relationship between female patients and their patient –provider relation. This is because there is no clear evidence which indicate either women are temperamental or not to influence the relationship between patience and healthcare providers. Therefore  $\beta_{10}$  has no specific relation to the dependent variable.

### **3.4.3 Model 3**

It is anticipated that health centers ( $X_{13}$ ), private health facilities ( $X_{11}$ ), district health facilities ( $X_{10}$ ), and capitation will have a positive relationship with referral cases. These health facilities are positively related to referrals, because healthcare providers under capitation healthcare mechanism will wish to cream-skim; by transferring the patients who are more likely to be sick to the Referral Hospital. Therefore their coefficients are expected to be positive. However, the same cannot be said about mission healthcare facilities, because of the picture and the image it want to paint for itself. Therefore the sign of the coefficient of mission hospitals to referral is unknown. It is also difficult to assign any

specific sign for the following; age, female patients, income, employment status and education. Therefore their coefficients are unknown.

### 3.4. Model 4

I anticipate private healthcare providers, health posts, capitation payment mechanism, to have a negative impact on patients' willingness to be with current healthcare provider. For this reason it is expected that their coefficients will be negative. Patients that chose mission hospital will be unwilling to change their facility, due to the quality of care and services they render and standards they have set for themselves. Therefore the sign of the coefficients of mission hospitals are expected to be positive. The signs for the coefficients of income, education, age, employment status with regard to continuity are unknown.



## CHAPTER FOUR PRESENTATION AND ANALYSIS OF RESULTS

### 4.0 Introduction

This chapter portrays the analyses; thus quantitative and quantitative of the respondents using stata11 to run the regression of the 500 participants. Poisson Logistic and Order logistic regression estimates were applied to estimate the impact of income, employment status, capitation, number of hours spent travelling to the health facility, capitation, educated, etc. on the demand for healthcare (visits) as well as other dependent variables aforementioned in chapter three.

### 4.1 Descriptive Analyses

**Table 1 Descriptive statistics of Variables Applied in the study**

Variable	Observation	Mean	Std. Dev.	Min	Max
Income	500	789.506	483.8537	0	3500
Visits	500	8.294	2.42721	1	17 Age
	500	39.12	16.04145	7	76
Travel	500	2.9404	1.840473	.1	9

*Source: Author's Field Work, 2015*

The table above represents a summarized version of the demographic factors applied in the consumption pattern of UTI patients in the study area, and this discovered that, the age

structure of the patients sampled ranges between 7 years and 76 years. The mean age recorded is approximately 39 years. This indicates most of the patients interviewed falls within the labor force. Whilst the highest income earner recorded as high as 3,500 Ghana cedis there were patients in the working force who earned no income at all but the average income received per month by the patients stood at approximately GH ¢ 790 per month. The average number of hours spent travelling to the health facility stood at approximately two hours for the group. The mean number of visits per the three month stood at 8 visits with the maximum as high as 17 visits with the least number of visits as 1 visit.

**Table 2: Descriptive Statistics of Socio-Economic Variables Used in the Study from UTI patients of both KATH and KBTH**

<b>Patient Information</b>	<b>Statistics in percentage</b>
<b>Gender:</b>	
Male	<b>31.00</b>
Female	<b>69.00</b>
<b>Employment status:</b>	
Employed patients	<b>89.00</b>
Unemployed patients	<b>11.00</b>
<b>Educational status</b>	
Uneducated	<b>24.60</b>
Basic	<b>20.80</b>
Secondary	<b>27.40</b>
Tertiary	<b>29.20</b>
<b>Ownership Status of Referral Facilities</b>	
Non-referred patients	<b>50.40</b>
Government	<b>10.40</b>
Mission	<b>20.40</b>
Private	<b>22.80</b>
<b>Payment of Additional Fees aside Insurance</b>	
No Additional Fees Paid	<b>60.80</b>
Paid Additional Fees	<b>39.20</b>
<b>Type of facility visited:</b>	
Komfo Anokye Teaching Hospital (KATH)	<b>50.00</b>

Korle-Bu teaching Hospital (KBTH)	<b>50.00</b>
<b>Type of patient</b>	
Outpatient	<b>100</b>
	<b>0.00</b>
Inpatient	
<b>Health outcome:</b>	
Very poor	<b>2.4015.00</b>
Poor	
Good	<b>52.20</b>
Very good	<b>26.00</b>
Excellent	<b>4.40</b>
<b>Relationship between patients and physician</b>	
Very poor	<b>1.0011.20</b>
Poor	
Good	<b>30.40</b>
Very good	<b>34.20</b>
Excellent	<b>23.20</b>
<b>Continuation of healthcare</b>	
Unwilling to continue with primary healthcare Provider	<b>51.6</b>
Willing to continue with primary healthcare Provider	<b>48.4</b>

*Source: Author's Field Work*

From the table above (table 2) it was realized that there was a wide difference with regard to gender as 69% were captured as females the men instead were 31% indicating how women are susceptible to UTI infections.

With regard to the employment status of the respondents, most of patients sampled were employed. As the employed represent as high as 89%, the unemployed patients had a significant percentage of 11%. The uneducated among the sampled patients represent

24.6% whilst there were varied levels of educational levels among the 75.4% of the sampled patients thus 20.8%, 27.4% and 29.2% representing Basic Educational Level, Secondary School Level and Tertiary School respectively.

It was however discovered per Table 2 that out of the 500 patients interviewed 50.4% of the respondents had the Two Teaching Hospitals (KATH&KBTH) as their preferred hospital or chosen as their preferred primary healthcare facility. 40.6% of the patients were however referred from different health facilities with diverse ownership status.

10.4%, 20.4% and 22.8% were referred from Government Hospitals, Mission Hospital and privately Private Health Facilities respectively.

60.8% of the respondents claimed to have made additional payment besides the NHIS premium whilst 32.8% did indicate there was no additional fee charged besides the premium. 50% of the respondents were chosen from Komfo Anokye Teaching Hospital (KATH) whilst the remaining 50% was sampled from Korle-Bu Teaching Hospital (KBTH). The parameter was however restricted to outpatient cases. This indicates that all response and sampled patients were in relevance to only outpatient cases. Thus the outpatients constitute the 100% of the sampled patients.

Patient was made to range their health outcome using; Very Poor, Poor, Good, Very Good and Excellent with regard to betterment in health outcome. 2.4% chose Very Poor, 15% chose Poor, 52% opted Good, 26% chose Very Good whilst 4.4% of the respondents chose Excellent.

Patients were also made to rate the Patient-Physician relationship with regards to its goodness using; Very Poor, Poor, Good, Very Good and Excellent. From the table 1%, 11.2%, 30.4%, 34.2%, and 23.2% chose Very Poor, Poor, Good, Very Good and Excellent respectively. However, 51.6% of all the 500 sampled patients did indicate of their unwillingness to continue with the health facility for their preferred primary healthcare whilst 48.4 expressed continuity with the chosen health facility for their primary healthcare.

The response to the questionnaire is not evenly distributed to the Two Teaching Hospitals chosen for the analyses but differs from one question to the other. However, the outcome of the response is disturbing as NHIS will wish to extend capitation to remaining geographical regions in Ghana.

#### **4.3.0 Quantitative Analysis**

In regression analyses, the interpretation of a negative and positive signs to the dependent variable differs in the analyses. A positive coefficient means a unit increase in that variable will lead to an increase in the dependent variable by the coefficient of that independent variable whilst the negative coefficient predicts otherwise. The statistical significance of a variable is determined by the p-value of that specific parameter. For a variable to be significant, the p-value of that variable must be at most 0.05 ( $p \leq 0.05$ ). If the p-value is 0.05 then it indicates an error level of 5% with 95% Confidence Interval (CI). If the p-value is 0.01 then it indicates a 99% confidence interval with 1% error level.

##### **4.3.1 Effect of capitation on the Demand for healthcare of UTI patients (model 1)**

**Table 3 Poisson Regression Estimate**

Dependent variables: visits	Estimates		
Independent variables	coefficients	Standard Error	P-value
Income	-0.0000273	0.0000363	0.452
Age	0.0059209	0.0010802	0.000
Time spent travelling	-0.0092194	0.0053553	0.0085
Employed	0.0607700	0.05688727	0.285
Basic education	0.0548638	0.0442254	0.215
Secondary education	0.5148670	0.455511	0.258
Tertiary education	0.05388825	0.04302	0.215
Additional Fee	0.0188462	0.0197774	0.341
Patients under capitation	-0.2329937	0.0339884	0.000
Female patients	0.8322959	0.0355759	0.016
Constant	1.874926	0.0763184	0.000

From the table above, age, the educated, additional fees, female (gender), and the employed impacted positively on the number of visits (Demand) with regard to patient- physician encounter. However, age, capitation, female are the variables that are statistically significant because the p-values of less than or equal 0.05. This is because health status deteriorates over time and as a person ages, there is the need to consume more healthcare to restore the health status. Females (gender) are more susceptible to UTI compared to males. Whilst some of these infections are contracted through sexual intercourse others can easily contract such diseases by attending public (females). This is due to how their sex organ is exposed when attending nature-call. This makes them more vulnerable to such infections. The variables additional fee paid and that of the educated though impacted positively but had a p-value of more than 0.05, indicating it is not statistically significant. These aforementioned variables met the researcher's expectation.

Female patients had a p-value of 0.018 indicating is less than the 0.05 statistical level. This portrays female to be statistically significant. From the count outcome regression analyses using Poisson, female UTI patient's is expected to increase visits by 0.04 units compared to their male counterparts.

These variables; Income, Travel Time, capitation impacted negatively on the number of visits of UTI patients. Aside Income and Time spent Travelling which did not meet the researcher's expectation due to its p-value; capitation instead met the researcher's expectation because they had a p-value of less than 0.05. Since capitation is cost containment payment mechanism, healthcare providers are compared to reduce the number of visits and induce more effort to reduce cost of healthcare delivery. This is why capitation is statistically significant with a p-value of than 0.00, therefore the estimated value of -0.2329937 for capitation coefficient means patients under capitation will attend less visits by a margin of 0.2 compared to DRG/FFS all other variables are set constant.

This is similar to the findings of Blumenthal et al. (1999).

#### 4.3.1 Effect of capitation on quality of healthcare provided to UTI patients (Model 2)

**Table 4: Ordered logistic regression**

Quality of healthcare provided	Estimates		
	coefficients	Standard Error	P-value
Income	0.0001362	0.0001872	0.488
Age	0.0353173	0.0062021	0.000
Time spent travelling to health facility	0.0098768	0.0186465	0.596
Employed patients	0.1007628	0.2955913	0.733
Patients that paid additional fee	- 0.001671	0.1047859	0.987
Basic education	0.4386264	0.2387434	0.084
Secondary education	0.6099278	0.2443369	0.010
Tertiary education	0.0694085	0.2269755	0.760
Capitation	-2.034651	0.2328123	0.000

Female	0.182992	0.1840527	0.320
Referred UTI patients	-0.358922	0.1848105	0.052
/cut1	-4.455404	0.5937195	
/cut2	-1.708563	0.4145942	
/cut3	0.4408989	0.4054114	
/cut4	2.375717	0.414393	

Table 4 is a schedule representing quality of healthcare as a dependent variable whilst age, income, travel time, education, additional fee, capitation, female, referrals and employed patients are the independent variables. An independent variable is said to be significant if it has a p-value of less than or equal to 0.05. The p-value of 0.05 also indicates 5% error level with 95% confidence interval.

The schedule portraying model 2 shows the following variables to be statistically significant; age, education (secondary education), capitated patients with these statistical significance level 0.000, 0.010, and 0.000 respectively.

There is a positive relationship between age and quality of care provided. The p-value of the variable, age is 0.00 indicating is statistically significant. The coefficient of age is 0.0353173. The ordered log-odds of the coefficient is in a good quality category and will therefore increase by 0.0353173 in a unit change of age, holding all other variables constant. This can be attributed to the social-cultural background of the Ghanaian populace due to the respect attributed to the elderly and as such accord the aged with the quality healthcare. The outcome is in accordance with the expectation of the research.

Education (secondary education) has a positive coefficient. This implies patients with the maximum educational status of secondary education; believe they were provided with the

quality of healthcare. The p-value of 0.010 indicates a statistical significant level of the variable. 0.6099278 is the coefficient of patients with a maximum of senior high school education from the ordered logistic regression. Thus a unit increase in senior high school education when all other variables are held constant is 0.6099278 in the excellent category of quality of healthcare, all other variables unchanged.

-2.034651 indicates the order logistic regression estimate of comparing capitation healthcare payment system to FFS/DRG on the anticipated quality of healthcare if all the other variables remain unchanged in the model. The ordered logistic regression for capitation is in the very poor category is -2.034651 less than FFS/DRG when all other variable is held unchanged in the model. This is however contrary to the findings of Kira et al in 2014.

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

In model 2 order logistic regression model was used for quality of health provided. Quality of healthcare,  $Y$ , became the dependent variable that was observed,  $Y$  is however a function of a continuous, unmeasured independent variable  $y^*$  whose values will be the determinant of the dependent variable and thus in total equates the dependent variable  $y$  (quality of healthcare provided relationship). The latent variables  $y^*$  that are continuous has the following threshold point (cut1, cut2, cut3, and cut 4 in the table 3). The response of a respondent value on an observable variable  $y$ , depend on either the respondent did actually cross a particular threshold or not.

Quality of healthcare provided were give the following codes; 0, 1, 2, 3, and 4 representing very poor, poor, good, very good and excellent respectively. There are five possible values for the quality of care provided

**For Model 2:**

$y = \text{very poor if } y^* \leq -4.45404$

$y = \text{poor if } -4.45404 < y^* \leq -1.708563$

$y = \text{good if } -1.708563 < y^* \leq 0.4408989$

$y = \text{very good if } 0.4408989 < y^* \leq 2.375717$

□

$y = \text{excellent if } y^* > 2.375717$

Model 2 above implies that:

Cut 1 indicates the estimated range (cut point) of latent variable applied to differentiate between very poor quality of healthcare and other (poor, good, very good and excellent) health outcome. With this, independent variable's values are evaluated as zero. With this patients with a value of less than or equal to -4.45404

Cut2 is the estimated cut point on the latent variable used to differentiate nature of care provided; very poor, poor, good, very good and excellent. This implies quality of care (effort), when values of the independent variables, are evaluated at zero. This means that patients with a value between -4.45404 to -1.78563 on the underlying latent variable are estimated to have had poor healthcare.

Cut3 indicates the estimated range (cut point) of latent variables applied to differentiate between good healthcare and other (very poor, poor, very good, excellent) healthcare. With this method, values of the independent variable are estimated to be zero. This mean the patient with the range of -1.78563 to 0.4408989 on the latent variables are denoted to have a good healthcare

Cut4 portrays the estimate range for very good health outcome. It indicates the range within which a patient will be categorized to have very good health outcome. With this, values of the independent variables are estimated to be zero. Thus any patient that falls between the ranges of 0.4408989 to 2.375717 has a very good healthcare.

However, any patient that exceeds the value of 2.375717 is classified to have an excellent health outcome.

#### 4.3.3 Effect of capitation on referral using UTI patients (Model 3)

**Table 5: Binary logistic regression**

Dependent variable: referrals	Estimates		
Independent variables	Coefficient	Standard Error	P-value
<b>Income</b>	<b>-0.000698</b>	<b>0.0004898</b>	<b>0.122</b>
Age	0.016007	0.0134498	0.234
<b>Time spent travelling to the health facility</b>	<b>0.005669</b>	<b>0.0825347</b>	<b>0.07</b>
<b>Employed patients</b>	<b>0.484972</b>	<b>0.4849716</b>	<b>0.553</b>
<b>Additional fee</b>	<b>-0.224746</b>	<b>0.2941734</b>	<b>0.445</b>
<b>Basic education</b>	<b>0.679249</b>	<b>0.5169494</b>	<b>0.189</b>
<b>Secondary education</b>	<b>1.00769</b>	<b>0.5602566</b>	<b>0.072</b>
<b>Tertiary education</b>	<b>0.877982</b>	<b>0.5217497</b>	<b>0.092</b>
<b>Females</b>	<b>-0.640877</b>	<b>0.3868007</b>	<b>0.098</b>
<b>Privately owned health facility</b>	<b>4.8995</b>	<b>0.6680536</b>	<b>0.000</b>

<b>Mission health facility</b>	<b>5.896433</b>	<b>1.168168</b>	<b>0.000</b>
<b>Government owned health facility</b>	<b>4.467689</b>	<b>1.067555</b>	<b>0.000</b>
<b>Patients under capitation</b>	<b>0.25435</b>	<b>0.00234</b>	<b>0.000</b>

Table 5 is a schedule portraying module 3. It indicates the relationship between the factors that influence patients to be referred and non-referrals. Among all the factors: age, income, education, females, time spent travelling, privately owned health facilities, mission and public health facilities, additional fees paid, employed patients. Among all the independent variables only additional fees, capitation health facilities, and income related negatively to referrals.

Privately owned health facilities, mission hospital and public health facilities had a p- value of less than 0.05 indicating they are all statistical significance. All the three ownership status had a positive relation with respect to referrals. This proves that almost all UTI patients under capitation were all referred from a health facility irrespective of the ownership status. The coefficients of **4.8995, 5.896433, and 4.467689** are the coefficient of private, mission and government own owned health facilities, indicate a unit change will result to a respective increases to the log-odd referrals by it coefficients. Creamskimming has not only become a feature of private hospitals due to capitation but also to mission and government owned facilities. This is due to how important internally generated fund has become to various hospitals in Ghana (Arthur et al, 2012).

#### **4.3.4 Effect of capitation on willingness to be with current primary care provider (Model 4)**

**Table 6: binary logistic regression**

Dependent variable: willingness to be with current primary healthcare provider	Estimates		
	Independent variables	coefficient	Standard Error
<b>Income</b>	<b>3.72005</b>	<b>0.001987</b>	<b>0.985</b>
Age	-0.0048322	0.0072619	0.506
<b>Time spent travelling to the health facility</b>	<b>0.1185033</b>	<b>0.693565</b>	<b>0.171</b>
<b>Additional fee</b>	<b>0.0004933</b>	<b>0.1301152</b>	<b>0.997</b>
<b>Basic education</b>	<b>-0.245322</b>	<b>0.2809805</b>	<b>0.383</b>
<b>Secondary education</b>	<b>-0.1001441</b>	<b>0.275488</b>	<b>0.715</b>
<b>Tertiary education</b>	<b>-2.405152</b>	<b>0.2626421</b>	<b>0.000</b>
<b>Females</b>	<b>-0.2620075</b>	<b>0.2140634</b>	<b>0.221</b>
<b>Privately owned health facility</b>	<b>0.3446954</b>	<b>0.2444882</b>	<b>0.159</b>
<b>Mission health facility</b>	<b>-0.0033237</b>	<b>0.272679</b>	<b>0.990</b>
<b>Government owned health facility</b>	<b>0.4112946</b>	<b>0.4348955</b>	<b>0.344</b>
<b>Capitation</b>	<b>-0.961796</b>	<b>0.2568498</b>	<b>0.000</b>

Table 6 is a representation of module 4. It indicates the schedule of patients willingness (dependent) to be with with current Primary Care Provider (PCP) in relation to the following independent variables; income, age, travel time, additional fee paid, educational level, gender (females), ownership status of health facility and capitation using Binary Order Logistic Model.

The output indicate the following variables related inversely to the dependent variable. These include; mission owned health facility, females, patients that are educated irrespective of educational status and also age and patients under capitation payment system.

Income, time spent travelling, and additional fee paid all related positively to patients willingness to be with the current primary care provider. This means patients earning

income, those that paid additional fee and those that had their health facility from a far place and had no option were all willing to retain the current health facility under capitation.

Among all the independent variables, only capitation was statistically significant with a p-value of 0.000. coefficient of capitation was **-0.961796**. This therefore indicates patients under capitation are expected to be 0.96196 less compared to FFS/DRG patients on patients willingness to retain the primary healthcare provider.. This conforms to the expectation (Boakye, 2013) and thus as long as capitation payment system continues, there is a higher probability for patients to change their primary care provider.

## **CHAPTER FIVE**

### **SUMMARY OF MAJOR FINDINGS, CONCLUSIONS AND POLICY RECOMMENDATIONS**

#### **5.0 Introduction**

One of the major reasons behind this research was to assess the Impact of capitation payment system on utilization; however, the study measured utilization by using these variables; number of visits, quality of healthcare, referrals and willingness of patients to be with current primary healthcare provider. Patients from the following facilities; Komfo Anokye Teaching Hospital (capitated hospital) in Ashanti Region and Korle-Bu Teaching Hospital in Greater Accra Region (hospital with Diagnostic Related Groupings or Fee For Service payment system) were chosen as sample for the study. This chapter therefore entails, summarized version of major findings of the research, the conclusion and also the policy recommendation.

#### **5.1 Summary of Findings**

The research proved that capitation payment systems significantly affected demand (visits) for healthcare. As indicated by the study, capitation payment mechanism significantly impacted on the number of visits of UTI patients inversely. As discovered by the study, patients under capitation had less number of visits compared to patients under DRG/FFS. There was however no statistical evidence in the study to indicate income, additional fee paid affected visits positively. On the other hand, time spent travelling impacted negatively on the number of visits because it was statistically significant whilst gender (female), the employed, and age had a positive influence on visits because there was statistical significance to support that claim based on the research findings.

When the quality of healthcare (effort) was made a dependent variable using order logistic regression, the study discovered patients in high income bracket had better quality healthcare as richer patients were treated with respect and dignity and with more effort in restoring health stock. Age also impacted positively on the quality of healthcare from healthcare providers. The quality of healthcare (effort) between health care providers and UTI patients under capitation compared to UTI patients under DRG/FFS deteriorated and thus proved to be inverse. Education (secondary) impacted positively on the relationship with quality healthcare. Age proved to be statistically significant with a positive relationship with quality of healthcare. to the relationship with patient-physician relationship. However, employment status, gender (female), Times spent travelling, payment of additional fees was all found to be statistically insignificant with regard to the quality of healthcare.

Referral; the research disclosed that the influence of age, income, time spent travelling, employment status, gender, education on referrals were all statistically insignificant.

However Private and Mission health facilities impacted positively on referral taken into consideration the statistical significance. The study also proved that almost all patients that chose Government facilities for their primary health care for capitation came to KATH with a referral letter. This could be how important Internal Generated Fund (IGF) has being to the management of these government facilities and therefore the need to shift the cost to the referral hospitals. The study also disclosed out of the 500 patients 49.6% were referred with most cases in KATH compared to KBTH.

With regard to patients' *willingness to retain the current primary health care provider* (dependent variable) under capitation, the research using logit regression revealed that almost all patients under capitation payment system reviewed displeasure on capitation payment system. This registered capitation payment mechanism to have an inverse relationship with patients' *willingness to be with chosen facility for primary healthcare* with a p-value of 0.000. This findings is similar to the one obtained by Blumenthal et al. 1999.

## **5.2 Conclusions**

The research discovered capitation healthcare payment system restricts healthcare providers from inducing demand (visits), there is a high possibility to introduce effort which in turn affect patients health outcome positively. The study also brought to the known that the number of visits varies inversely to profit of healthcare providers under capitation; providers deliberately decide to adopt bad relationship strategies to compel patients to reduce their demand for healthcare. Again to reduce the financial risk of providers,

providers usually referred UTI patients with deteriorating health status to the teaching hospital KATH.

### **5.3 Policy Recommendations**

Age must be given enough consideration when embarking on policies that relates to healthcare matters. This is because the research discovered age, to be statistically significant on visits, and also on referrals significantly. For this reason, the Ghana Statistical Service must serve as an important call of reference in any policy that relates to healthcare matters. This indicates an aging population (between the age of 60 and above), must be accompanied by more trained health workers, installation of more health facilities due to its capability to increase visits since health stock deteriorate with age.. Secondly, the government can build at least one healthcare facility in each region to cater for the aged. This policy will aid quality healthcare between the aged and the healthcare providers, mitigate referrals of the aged, give an opportunity to the aged-patients to interact with each other and also between healthcare providers to enhance cordial relationship and again sensitize the aged, that no matter the number of visits, they can never restore their health status as to when they were young and their situation is not statistically different from the other aged patients.

Capitation healthcare system was discovered based on this research as statistically significant on demand for healthcare (visits), quality of healthcare, willingness to be with current Primary Care Provider (PCP) and also on referrals. As it impacted inversely on visits, quality of healthcare, and willingness to be with current PCP, it however impacted positively on referrals. Since the research used a Teaching Hospital (KATH) and discovered that healthcare providers did not put in enough effort to reduce visits but succeeded in

improving the health status of patients, the government must build in each region a Teaching Hospital to bring about an improve the health outcome of patients. The study would recommend that all health facilities recommended to cater for patients under the NHIS must have attained a minimum level of facilities needed to cater for enlisted class of diseases to prevent those facilities from cream-skimming.

The government must institute an independent body to investigate the type of diseases that are referred to the referral Hospitals, as to if patients referred were above the capability of the facility that referred the patients. The government must establish a complaint box in each health facility accredited to cater for NHIS patients and facility owners must be made to answer from complains received before issuing them the next accreditation.

Though the impact of educated patients is not statistically significant on visits, it however has on health outcome. The various levels of education attained by patients impacted differently on the health outcome of patients. As the aim of the government for the establishment NHIS is not basically on the number of visits but on health outcome, the government must ensure citizens attain Secondary education as the minimum level of education reached, to reduce cost of healthcare expenses. This is because patients that attained at least secondary education had a positive correlation on patient health outcome (Boakye, 2013).

Finally, since capitation healthcare system has resulted into the reduction of healthcare expenditure and prevented the healthcare providers from shopping but instead instigated healthcare practitioners to imbibe more effort, the system must be implemented in all

regions of the country but the government must have an inbuilt mechanism to check referrals, quality of healthcare and reasons behind unwillingness of patients to retain the same Primary Care Provider (PCP).

#### **5.4 Limitations of the Study**

The research was constrained with time and finance. This compelled the researcher to opt for a small sample size which is not the most appropriate for logistic and order logistic regression. This is due to the fact that these models employ Maximum Likelihood Estimation (MLE) which needs larger sample size to ensure efficiency and significance of parameters estimated. The research did not consider patient to doctor ratio and patient to nurse ratio but instead over generalize all health workers as physician or healthcare providers including record personnel. I will suggest further investigations on the nature of qualifications used by healthcare providers and the number of years spent working if it has impact on utilization; visits, referrals, quality of healthcare and on patient's willingness to retain the current primary care provider.

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## APPENDIX 1

### QUESTIONNAIRE 1

**Kwame Nkrumah University of Science and Technology**

**College of Arts and Social Science**

**Department of Economics**

Topic: Effect of capitation on utilization of healthcare of UTI patients: evidence from Komfo Anokye Teaching Hospital and Korle-Bu Teaching Hospital

**This questionnaire is purely for academic purpose. We entreat you to tick the appropriate parenthesis to aid in the collection of data for the above topic. All answers relating to the questions will be kept confidential. The responds is related to the last three months.**

**KATH ( )**

1. Do you use NHIS service in this facility    yes ( )    no ( )
- 2a. Are you able to read and write    yes ( )    no ( )
- 2b. if yes, which level is the highest completed? Basic ( )    SSS/SHS ( )    Tertiary ( )
3.    What is your gender    male ( )    female ( )
4.    Are you employed    yes ( )    no ( )

5. How much do you receive averagely as monthly salary

.....

6. How many hours do you spend travelling to this

hospital.....

7a. were you referred to this hospital? Yes ( ) no ( )

7b. which health facility was you referred from? Mission hospital ( )  
private healthcare ( ) government hospital ( )

8. How will you describe how the doctors and nurses relate to you in effort (quality of care)? Very poor ( ) poor ( ) good ( ) very good ( )  
excellent ( )

9. Did you pay additional fee at the hospital? Yes ( ) no ( )

10. Will you be willing to change your healthcare center under the capitation yes  
( ) no ( )

11. How many times have you visited this hospital in the last three  
weeks.....

12. How will you describe your health outcome? Very poor ( ) poor ( )  
Good ( ) very good ( ) excellent ( )

12. How will you rank your health status in the hospital after treatment?

Very poor ( ) poor ( ) good ( ) very good ( ) Excellent  
( )

13. Are you willing to be with your current Primary Care Provider (PCP) Yes ( )  
No ( )

**QUESTIONNAIRE 2 Kwame Nkrumah University of Science and Technology**

**College of Arts and Social Science**

**Department of Economics**

Topic: Effect of capitation on utilization of healthcare of UTI patients: evidence from  
Komfo Anokye Teaching Hospital and Korle-Bu Teaching Hospital

**This questionnaire is purely for academic purpose. We entreat you to tick the appropriate parenthesis to aid in the collection of data for the above topic. All answers relating to the questions will be kept confidential. The responds is related to the last three months.**

**KBTH ( )**

1. Do you use NHIS service in this facility yes ( ) no ( )

2a. Are you able to read and write yes ( ) no ( )

2b. if yes, which level of education is the highest completed/ pursuing? Basic ( )

SSS/SHS ( ) Tertiary ( )

3. What is your gender male ( ) female ( )

4. Are you employed yes ( ) no ( )

5. How much do you receive averagely as monthly salary

.....

6. How many hours do you spend travelling to this hospital.....

.....

7a. were you referred to this hospital? Yes ( ) no ( )

7b. which health facility was you referred from? Mission healthcare facility ( )

private healthcare facility ( ) government healthcare facility ( )

8. How will you describe how the doctors and nurses relate to you in effort (quality of care)? Very poor ( ) poor ( ) good ( ) very good ( ) excellent ( )

9. Did you pay additional fee at the hospital? Yes ( ) no ( )

10. Will you be willing to change your healthcare center under the capitation

yes ( ) no ( )

11. How many times have you visited this hospital in the last three months.....

12. How will you describe your health outcome? Very poor ( ) poor ( )

Good ( ) very good ( ) excellent ( )

12. How will you rank the quality of healthcare provided in the hospital after treatment?

Very poor (     )     poor (     )     good (     ) very good (     )  
Excellent (     )

13. Are you willing to be with your current Primary Care Provider (PCP)

Yes (     ) No (     )

KNUST



## Appendix 2

```

. *(21 variables, 500 observations pasted into data editor)

. poisson visits income age travelt basic snrhigh tertiary addfee capita female

Iteration 0: log likelihood = -1098.0228
Iteration 1: log likelihood = -1097.8969
Iteration 2: log likelihood = -1097.8968

Poisson regression              Number of obs   =       496
                               LR chi2(9)         =       111.05
                               Prob > chi2          =       0.0000
                               Pseudo R2           =       0.0481

Log likelihood = -1097.8968
    
```

visits	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
income	-.0000128	.0000334	-0.38	0.701	-.0000783	.0000527
age	.005928	.0010792	5.49	0.000	.0038127	.0080433
travelt	-.0092509	.005361	-1.73	0.084	-.0197583	.0012565
basic	.0562228	.0442178	1.27	0.204	-.0304424	.1428881
snrhigh	.0555437	.0453902	1.22	0.221	-.0334195	.1445069
tertiary	.0576588	.0428849	1.34	0.179	-.0263942	.1417117
addfee	.0210875	.0196356	1.07	0.283	-.0173976	.0595726
capita	-.241179	.0334443	-7.21	0.000	-.3067285	-.1756294
female	.084139	.0355501	2.37	0.018	.0144621	.153816
_cons	1.918487	.0643214	29.83	0.000	1.792419	2.044554

```

. ologit relatin referred income age travelt basic snrhigh tertiary addfee capita female employed

Iteration 0: log likelihood = -674.48543
Iteration 1: log likelihood = -609.63234
Iteration 2: log likelihood = -595.07435
Iteration 3: log likelihood = -594.91356
Iteration 4: log likelihood = -594.91352

Ordered logistic regression      Number of obs   =       496
                               LR chi2(11)         =       159.14
                               Prob > chi2          =       0.0000
                               Pseudo R2           =       0.1180

Log likelihood = -594.91352
    
```

relatin	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
referred	-.3589224	.1848105	-1.94	0.052	-.7211443	.0032994
income	.0001362	.0001872	0.73	0.467	-.0002308	.0005031
age	.0353173	.0062021	5.69	0.000	.0231614	.0474732
travelt	.0098768	.0186465	0.53	0.596	-.0266697	.0464232
basic	.4386264	.2387434	1.84	0.066	-.0293021	.9065549
snrhigh	.6301529	.2443369	2.58	0.010	.1512615	1.109044
tertiary	.0694085	.2269755	0.31	0.760	-.3754554	.5142724
addfee	-.0016717	.1047859	-0.02	0.987	-.2070484	.203705
capita	-2.034651	.2328123	-8.74	0.000	-2.490954	-1.578347
female	.182992	.1840527	0.99	0.320	-.1777446	.5437286
emplyed	.1007628	.2955913	0.34	0.733	-.4785855	.6801111
/cut1	-4.455404	.5937195			-5.619073	-3.291735
/cut2	-1.708563	.4145942			-2.521153	-.8959736
/cut3	.4408989	.4054114			-.3536929	1.235491
/cut4	2.375717	.414393			1.563522	3.187912

Logistic regression

Log likelihood = -81.870542

 Number of obs = 497  
 Wald chi2(12) = 90.05  
 Prob > chi2 = 0.0000

referred	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
income	-.0007584	.0004898	-1.55	0.122	-.0017184	.0002017
age	.0160007	.0134498	1.19	0.234	-.0103604	.0423619
travel	.0056696	.0825347	0.07	0.945	-.1560955	.1674347
basic	.6792486	.5169494	1.31	0.189	-.3339536	1.692451
snrhigh	1.00769	.5602566	1.80	0.072	-.0903926	2.105773
tertiary	.8779824	.5217497	1.68	0.092	-.1446282	1.900593
addfee	-.2247467	.2941732	-0.76	0.445	-.8013156	.3518222
female	-.6408765	.3868007	-1.66	0.098	-1.398992	.117239
private	4.8995	.6680536	7.33	0.000	3.590139	6.20886
govt	4.467689	1.067555	4.18	0.000	2.375319	6.560058
mission	5.896433	1.168168	5.05	0.000	3.606865	8.186001
emplyed	.4849716	.8165721	0.59	0.553	-1.11548	2.085424
_cons	-2.940898	1.001115	-2.94	0.003	-4.903047	-.9787492
referred	(offset)					



```
. logit willingness income age travelt basic snrhigh tertiary addfee capita female private govt mission
```

```
Iteration 0: log likelihood = -342.81588
Iteration 1: log likelihood = -321.56779
Iteration 2: log likelihood = -317.95486
Iteration 3: log likelihood = -317.92857
Iteration 4: log likelihood = -317.92856
```

```
Logistic regression
```

```
Number of obs = 495
LR chi2(12) = 49.77
Prob > chi2 = 0.0000
Pseudo R2 = 0.0726
```

```
Log likelihood = -317.92856
```

willingness	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
income	3.72e-06	.0001987	0.02	0.985	-.0003857	.0003931
age	-.0048322	.0072619	-0.67	0.506	-.0190652	.0094007
travelt	.1185093	.0693565	1.71	0.088	-.0174269	.2544455
basic	-.2453377	.2809805	-0.87	0.383	-.7960494	.3053739
snrhigh	-.1001441	.275488	-0.36	0.716	-.6400907	.4398025
tertiary	-.2405152	.2626421	-0.92	0.360	-.7552842	.2742539
addfee	.0004933	.1303152	0.00	0.997	-.2549199	.2559065
capita	-.961796	.2568498	-3.74	0.000	-1.465212	-.4583796
female	-.2620075	.2140634	-1.22	0.221	-.681564	.157549
private	.3446954	.2444882	1.41	0.159	-.1344927	.8238834
govt	.4112946	.4348955	0.95	0.344	-.4410849	1.263674
mission	-.0033237	.272679	-0.01	0.990	-.5377647	.5311174
_cons	.4597195	.5133512	0.90	0.371	-.5464304	1.465869

