

**INVESTIGATING THE EXISTENCE OF MORAL HAZARD: A CASE STUDY
OF INSURED MALARIA OUTPATIENTS AT SAINT PETER'S HOSPITAL,
JACOBUS-ASHANTI REGION, GHANA.**

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BY
AMPONGSAH HENRY (B.A)

**A thesis submitted to the department of Economics, Kwame Nkrumah University of
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degree of**



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DECLARATION

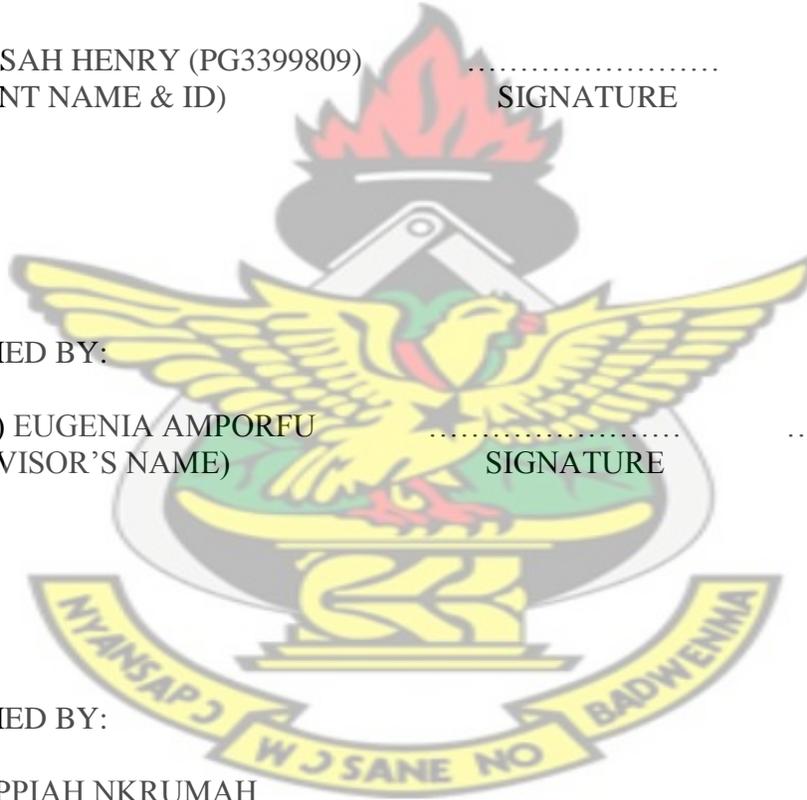
I hereby declare that this submission is my own work towards the Master of Economics degree and that, to the best of my knowledge, it contains no material previously published by another person nor material which has been accepted for the award of any other degree of the University, except where due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

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AMPONSAH HENRY (PG3399809)
(STUDENT NAME & ID) SIGNATURE DATE

CERTIFIED BY:
DR. (SR) EUGENIA AMPORFU
(SUPERVISOR'S NAME) SIGNATURE DATE

CERTIFIED BY:
MR. J APPIAH NKRUMAH
(HEAD OF DEPT. NAME) SIGNATURE DATE



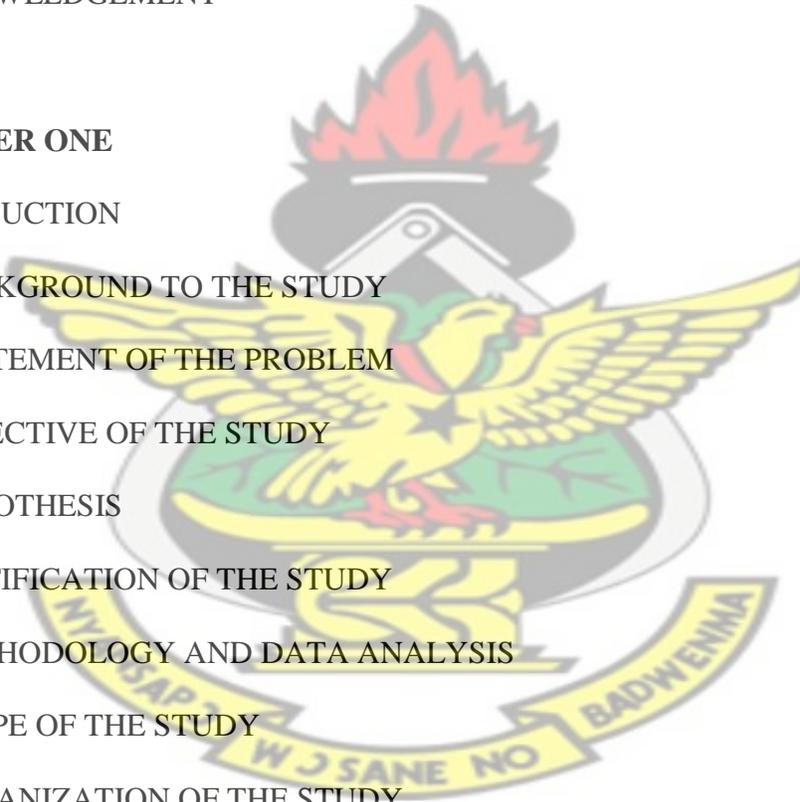
ABSTRACT

Analyses of health insurance markets over the past several decades have recognized that insurance encourages beneficiaries to consume more health care than they would if they were uninsured. Although advocates for universal coverage and improved access to care may view this increase in utilization as positive, standard economic analysis suggests that this extra consumption could diminish economic welfare and the label for this extra use, moral hazard, reflects this negative connotation (Frick & Chernew, 2008). This study adopted Nyman (1999) proposition to establish that moral hazard could be efficient (welfare improving) in malaria treatment; using pure price (substitution) effect of people consuming more health services when its price is low but not the income effect of people consuming more health services because of insurance. The study used personally administered questionnaires to gather information related to the subject matter whilst using purposive sampling method in selecting insured malaria outpatients at the study area. Specifically, the study used logit regression as the empirical method of estimation under quantitative method. The study revealed that, greater percentage of insured malaria outpatients engage in moral hazard at the study area. However, in the case of malaria treatment, the substitutes for medical care are not effective enough to ensure improved health care for Ghana's population. Given this, the study has shown that moral hazard in malaria treatment is welfare improving. It is therefore recommended that, NHIA should strengthen sensitization programmes aimed at improving accessibility to medical care with insurance coverage for malaria treatment. Eventually, the rate of morbidity and mortality as a result of ineffective malaria treatment would reduce for both children and adults in Ghana.

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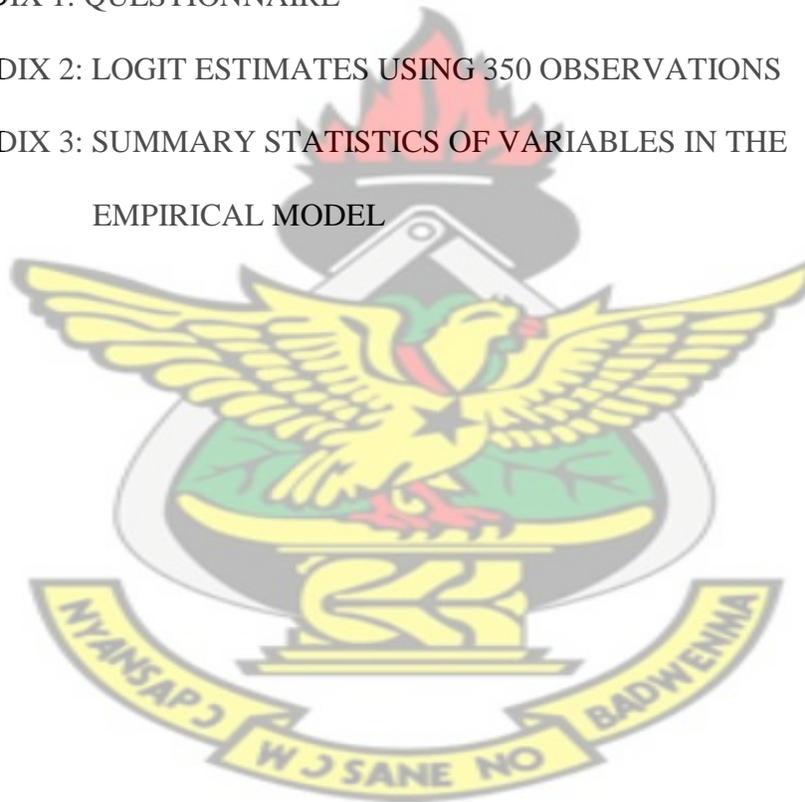
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CHAPTER ONE

INTRODUCTION

1.0 Background to the study

Ghana at the time of independence had a health delivery system that provided free medical services in public health institutions to its citizens; the total costs of health care at that time were fully covered by the Government. However, expanding population and worsening economic conditions placed much pressure on the limited resources available to the Government, resulting in the establishment of a cost-sharing mechanism when the Ministry of Health introduced user fees (out of pocket-payments) to all public health facilities in 1985.

A cash and carry system with drugs charged at full cost to patients was introduced in 1990; it included an exemption policy with an entitlement to free medical services for antenatal care, children under 5 years, adults of 70 years and over and emergency cases where patients could not immediately pay for health services.

The cash and carry system was more harmful than helpful because, patients who did not have the ability to pay for medical services were turned away from hospitals only to die at home (ILO, 2005). According to World Health Organization (WHO), the out of pocket mechanism impoverished about 100 million people every year and about 150 million people faced severe hardships because of payment for health care. It is estimated that between 1973 and 1987, 20 percent of around 18 million of the Ghanaian population who needed health care at any given time actually had access to health care, implying that 80

percent of the population who needed health care could not afford to pay for the services (World Health Organization, 2005a). Other sources estimate that about 50 percent of the population had effectively no access to care (ILO, 2005).

The introduction of user fees further impoverished majority of Ghanaians and it devastated their ability to sustain a livelihood for a long time. Some people especially the poor living below the poverty line had to borrow money, took out loans, sold their animals or furniture, dissolved their little savings, cut down on buying food and even stopped sending their children to school in order to pay for health care (GNA, 2008).

The Government was determined to make health services available and affordable to all Ghanaians and so introduced a National Health Insurance Scheme (NHIS) based on district-wide Mutual Health Organization in 2003 with the aim of increasing accessibility to health care for all Ghanaians. The declared objective for the introduction of NHIS is the improvement of access to health care for all Ghanaians (ILO, 2005). The NHIS is governed by the National Health Insurance Authority (NHIA).

Health insurance is a pre-paid co-payment system that spreads the cost of paying user fees across the sick and the healthy (or better non users) rather than the sick only as in the case of cash and carry system (ILO, 2005). The existence of health insurance means that those who are insured face zero medical cost anytime they access the country's health care systems. There is therefore the tendency for an increase in health care consumption

which may be out of genuine need by the populace or as a result of substitution effect due to low or zero cost.

Health care expenditure can increase rapidly as a result of “Moral Hazard”; those entitled to benefit from insurance coverage have strong incentive to consume more and “better” health care and a weaker incentive to maintain a healthy lifestyle than if they did not have this entitlement (Arrow, 1963). According to the NHIA, the cost of providing health care to Ghanaians has increased astronomically in the last five years, imposing severe strains on the operations of the authority (NHIA, 2010).

However, in the case of malaria treatment, moral hazard could be efficient (welfare improving) due to the available substitutes for medical care. The use of health insurance is able to draw health care consumers from less effectiveness treatment (Self medication/Traditional health care services) to more effectiveness treatment (Medical care), thereby improving the general well-being of the country’s population.

1.1 Statement of the problem

There are a host of problems hampering the operations of the National Health Insurance Scheme in the bid to assure equitable universal access to health care for all residents in Ghana to an acceptable quality package of health services.

In the first place, increasing demand for health care is considered to be one of the most threatening problems undermining the positive impact of the National Health Insurance

Scheme on health care utilization in Ghana. In 2005, a study conducted under the sponsorship of United States Agency for international development (USAID) in six districts of Ghana found that, insured respondents in the household survey were nearly two times more likely to seek formal outpatient care than were their uninsured counterparts. Insured respondents were also significantly more likely than uninsured to seek care within the first two days of illness, and to bypass informal care and go directly to a formal health facility (WHO, 2006). The implication is that the National Health Insurance Authority is facing huge challenge in meeting the demand for health care in the insurance market.

The insured face zero medical cost as and when they access the country's health care system. This is a critical issue if the national health insurance scheme in Ghana is to become universal. There could be an incentive for the insured to consume extra health care with the use of national health insurance contract because the possible alternatives (self medication and traditional/herbal medication) are not effective enough to ensure improved health care for Ghana's population. A research by Stirling (a mission doctor stationed in Tanzania) depicted that "self treatment and traditional health care services in malaria treatment are entirely unscientific and commercial whose practices are painful and often ineffective" (Langwick, 2006). Thus, the ineffectiveness of self treatment and traditional health care services as substitutes for medical care in malaria treatment has increased the demand for medical services among insured individuals.

In summary, zero cost at the point of purchasing medical care with insurance could create incentives for people to engage in moral hazard. There is therefore the need for this study to establish that moral hazard could be efficient (welfare improving) with the given available substitutes for medical care.

1.2 Objective of the study

The main objective of this study is to find out whether insured malaria outpatients are engaging in moral hazard or not. The following are the specific objectives:

- 1) To find out the demographic and socio-economic characteristics of insured malaria outpatients who engage in moral hazard.
- 2) To determine if moral hazard is efficient in malaria treatment with the given available substitutes for medical care.
- 3) To make recommendations to ensure efficient treatment seeking behaviour with health insurance coverage.

1.3 Hypothesis

H_0 : Moral Hazard is inefficient in malaria treatment.

H_1 : Moral hazard is efficient in malaria treatment.

1.4 Justification of the study

Economic development of every country is closely interrelated with the health status of its population and the efficient and equitable health care system in operation (Osei-Akoto, 2003). In response to the government of Ghana's call to attain the Millennium

Development Goals and Middle-Income Status by 2015, the study's topic "Moral hazard and health care utilization" is absolutely necessary since it will investigate moral hazard phenomenon and its consequences on the health profile of Ghana's population.

Also, the study would bring to fore the type of health care consumers would have used for malaria treatment if they were uninsured. This would help the government and health authorities to know the effectiveness of malaria treatment as far as being uninsured is concerned. Recommendations can be made to ensure that effectiveness of malaria treatment is enhanced to improve health care in the country.

Moreover, the study on Moral hazard and health care utilization would help to ascertain the demographic and socio economic characteristics of insured malaria outpatients who are likely to engage in moral hazard. The findings would help policy makers to know the target group as far as moral hazard is concerned.

Lastly but equally important, health insurance plays a central role in the health care arena of every economy. This is because having health insurance is associated with better health related outcomes (Zeckhauser & Cutler, 1999). Therefore, a comprehensive study on moral hazard (additional health care that is purchased when a person becomes insured) would help to illuminate health insurance policy issues, in ensuring efficient treatment seeking behaviour of health care consumers without compromising on the level of effectiveness, especially in malaria treatment.

1.5 Methodology and data analysis

Primary method of data collection was employed by this study. The reason for using primary data is that, the study used information from health care consumers (patients) which did not exist for analysis. The study used personally administered questionnaires to gather information related to the subject matter.

Purposive sampling method was used by the study in selecting insured malaria outpatients at the study area. Respondents gave information on age, income level, educational level, employment and insurance status and premium paid to be insured. Quantitative methods are used for data analysis. Specifically, the study used logit regression model as the empirical method of estimation under quantitative method.

1.6 Scope of the study

As stated in the topic, the sample population of the study is limited to insured malaria outpatients at Saint Peters hospital, Jacobu in Ashanti region. Malaria is chosen as a proxy for all diseases that affects the total population. This is because malaria is hyper endemic in Ghana and continues to be the leading cause of morbidity and mortality among both children and adults (Ghana health service, 2007). The health facility is selected because of its large outpatient population, easy access to patients who visit the facility, proximity to the study and resource constraint. In total, the study used a sample size of 350 to represent insured malaria outpatients at the study area.

1.7 Organization of the study

This study is organized into five chapters. Chapter one deals with introduction whereas chapter two and chapter three deal with the literature review and methodology respectively. Analysis of results is chapter four. Finally, chapter five is on summary of findings and policy recommendation.

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CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

Analyses of health insurance markets over the past several decades have recognized that insurance encourages beneficiaries to consume more health care than they would if they were uninsured. Although advocates for universal coverage and improved access to care may view this increase in utilization as positive, standard economic analysis suggests that this extra consumption could diminish economic welfare and the label for this extra use, moral hazard, reflects this negative connotation (Frick & Chernew, 2008). Today, the phenomenon of moral hazard has become one of the fundamental empirical findings in health economics and the debate associated with changes in health care utilization. Sagi and Pataki (1990) resolved that, the general “boom of costs” in health services and frequent premium adjustment of compulsory health insurance schemes can be explained by the factor of “Moral hazard”. This chapter therefore reviews background information on health services in Ghana, Legal instrument and background information on National Health insurance Scheme in Ghana and, theoretical and empirical literature on moral hazard and health care utilization.

2.1 Health Services in Ghana

At the time of its independence in 1957, Ghana was an economically prosperous country having large gold reserves and high prices from cocoa for which Ghana was a leading producer. An ambitious development programme, unfair world trade practices and a series of disruptive coups d'état led to a decline in the economy in the early 1970s and 1980s. By 1983 inflation had reached a peak of 123 percent. The economic decline had a

profound effect on health. Health infrastructure deteriorated severely with little expansion to meet the needs of the increasing population. Health care equipment and supplies such as drugs became scarce and many health professionals left the country to work elsewhere. As a result of these factors the quality of health care fell drastically. This was accompanied by intense public and media outcry over the shortage of drugs and basic medical supplies and the uncaring attitudes of health personnel (Waddington and Enyimayew, 1989)

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Government responded by introducing user fees in 1983 to supplement central funding. While this led to increased revenue for health facilities and in some instances improved basic supplies, it also led to a sharp and sustained decline in utilization of outpatient services in all facilities, especially in rural health centres. Quality of care received increasing attention as clients demanded value for the money they paid for services. Subsequent local and global initiatives gave impetus for tackling the poor quality of care. These included the Structural Adjusted Programme (SAP) and its related programme of Action to Mitigate the Social Cost of Adjustment (PAMSCAD), Strengthening District Health Systems (SDHS) initiative of the late 1980s and 1990s, the Health Sector reforms, and the experimentation with Mutual Health Insurance which later evolved into the countrywide National Health Insurance Scheme (NHIS) aimed at addressing the negative effects of user fees (Waddington and Enyimayew, 1989).

Two broad categories of services are available in Ghana, namely, curative services and preventive/promotive services. The curative services provide diagnosis and treatment to a

sick client. In more complex facilities like hospitals, these two broad functions may be distributed among several units like outpatients department, inpatient care, laboratory and diagnostic services, pharmacy, and support services for laundry, catering, transport, and administration. Preventive and promotive services provide clients and communities with services that aim at keeping them healthy. Programmes under this category include child health, adolescent health, maternal and reproductive health, communicable diseases, non-communicable disease, health promotion and nutrition (Ghana Health Service, 2007).

Access to health services also reveals a wide variation between socio-economic groupings and geographical areas. For example the Ghana Demographic and Health Survey (GDHS) of 2003 revealed a five-fold difference in access between the best region, Greater Accra region (GAR) and the worst region, Upper West region (UWR) with 62% and 12 % respectively of population living within 30 minutes walk to a health facility.

The Ministry of Health is the central government body with the mandate to formulate policies for the entire health sector, determine priorities for public spending on health, monitor the performance of health sector agencies against agreed objectives, and mobilize funds for the health sector. Its main agencies are the public sector agencies (Ghana Health Service, teaching hospitals, regulatory bodies) and private sector agencies (private not-for-profit like Christian Health Association of Ghana and the private-for-profit institutions). The health sector has a three-tier structure (national, regional and district). The district level which has the main function to implement programmes is subdivided into a sub-district and community based level. The Ghana Health Service is the

largest agency (with 48% of health facilities and 62 % of staff) and is de facto, the leading agency in quality of health care issues (Ministry of Health, 1996).

The Ghana Health Service (GHS) is a Public Service body established under Act 525 of 1996 as required by the 1992 constitution. It is an autonomous Executive Agency responsible for implementation of national policies under the control of the Minister for Health through its governing Council - the Ghana Health Service Council. The GHS continue to receive public funds and thus remain within the public sector. However, its employees will no longer be part of the civil service, and GHS managers will no longer be required to follow all civil service rules and procedures. The independence of the GHS is designed primarily to ensure that staffs have a greater degree of managerial flexibility to carry out their responsibilities, than would be possible if they remained wholly within the civil service. Ghana Health Service does not include Teaching Hospitals, Private and Mission Hospitals (Ghana Health Service, 2010).

The establishment of the Ghana Health Service is an essential part of the key strategies identified in the Health Sector Reform process, as outlined in the Medium Term Health Strategy (MTHS), which are necessary steps in establishing a more equitable, efficient, accessible and responsive health care system (Ghana Health Service, 2010).

The reforms build on the reorganization of the MOH that began in 1993, which was explicitly designed to set the scene for the establishment of the Ghana Health Service. The reforms also provide a sound organizational framework for the growing degree of managerial responsibility that has already been delegated to districts and hospitals.

Themes that were central to the reorganization of 1993 remain important today for the Ghana Health Service: careful stewardship of scarce resources, clear lines of responsibility and control, decentralization, and accountability for performance rather than inputs. The core mandate of GHS is to provide and prudently manage comprehensive and accessible health service with special emphasis on primary health care at regional, district and sub-district levels in accordance with approved national policies (Ghana Health Service, 2010).

Administratively GHS is organized at 3 levels: National level, Regional level and District level. Functionally GHS is organised at Five (5) Levels: National Level, Regional Level, District Level, Sub-district Level and Community Level (Ghana Health Service, 2010).

Ghana Health Service has Quality Assurance Department with the sole responsibility to develop and implement quality assurance, clinical governance and infection prevention and control systems in all health facilities; and, to develop standards and protocols to ensure quality, effectiveness and efficient service delivery (Ghana Health Service, 2010).

The table below shows the distribution of health facilities by type and ownership in Ghana as of 2008:

Table 2.1: Health Facilities by type and ownership in Ghana (2008)

Health Facility	Total	Percent%
Teaching Hospitals	3	0.1
Regional Hospitals	9	0.3
Psychiatric Hospitals	3	0.1
District and other Hospitals		
Mission	57	1.8

Government	109	3.5
Quasi-Government	48	1.5
Private	135	4.3
Polyclinics		
Government	18	0.6
Mission	-	
Health centres and Clinics		
Mission	148	4.8
Government	1081	34.8
Quasi-Government	18	0.6
Private	366	11.8
Maternity Home (Private)	318	10.2
CHPS (Government)	795	25.6
Total	3110	100.0

Source: PPME (Policy Planning Monitoring and Evaluation) Division, Ghana Health Service – Facts and Figures (2009). CHPS-Community Health Planning and Service.

The quality of health services are affected by the quality of resources used. There are about 67,000 people involved in the health care delivery in Ghana; only 48,000 of these are in the formal sector. The Ministry of Health employs about 39,000 (82%) of which 27,000 (54%) are in the Ghana Health Service. GHS employs health workers of all categories. Measures of adequacy of resources reveal that Ghana fares poorly in the distribution of population per health professionals and government health facility (Table 2). The World Bank estimates for doctor per population ratios give an indication of how poorly the Ghana health sector is resourced with human capital. They are: one doctor per 350 population for high income countries; 1:550 for middle income countries; 1:2,000 for low income countries; and, 1:10,000 for Sub-Saharan Africa.

Table 2.2: Distribution of population per Health Professionals and Government Health facility in Ghana

Region	Population per Doctor 2003/2008	Population per Nurse 2003/2008	Population per Health Facility 2004/2007
Ashanti	13494/9537	2243/1336	24011/26856
Brong Ahafo	40729/21475	2879/1140	14521/14883
Central	36877/26140	1713/895	15745/15235
Eastern	33279/16132	1331/959	9726/10413
Greater Accra	5604/5103	917/881	47942/59508
Northern	73262/50751	2380/1534	15175/15893
Upper East	32786/35010	2027/956	9243/8713
Upper West	50541/47932	1860/870	8567/6299
Volta	33930/26538	1440/892	6366/8329
Western	35255/33187	2309/1413	16052/14542
National	16759/12713	1649/1079	14614/15600

Source: Ghana Health Service (2009), “2009 GHS Annual Report”, Ghana Health Service (2008), “The Health Sector in Ghana: Facts and Figures”; Ghana Health Service (2005), “Facts and Figures”.

Current human resource challenges in the public sector include: inadequate numbers and types of staff, inequitable distribution of available staff, attrition of health workers, low morale of health workforce, inadequate supportive supervision, weak management systems and inadequate collaboration between Ministry of Health and Ministry of Education training institutions. Recent real increases in salaries of public sector health workers have not been matched by demonstrable improvements in morale and attitude of staff. Indeed the increases have been accompanied by disruptive strike actions as different professional groups vie with each other for better conditions. There are however anecdotal accounts of a reduced rate of attrition especially among nurses (Ghana Health Service, 2007).

2.2 National Health Insurance Scheme in Ghana

In the year 2003, the government of Ghana passed National Health Insurance Scheme (NHIS) Act 650 to provide the legal framework necessary to facilitate the establishment of the National Health Insurance Scheme. The NHIS built on Ghana's experiences of Community Based Health Insurance to abolish user fees, address inequity in the health system and ensure access to basic health care services to all residents (NHIA, 2010).

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The National Health Insurance Act sets out three (3) distinct types of health insurance schemes to be operational in Ghana: District Mutual Health Insurance Schemes (DMHIS), Private Commercial Health Insurance Schemes and Private Mutual Health Insurance Schemes. The Government of Ghana does not want to take chances and has therefore decided to support DMHIS concept fully to ensure that:

- 1) Opportunity is provided for all Ghanaians to have equal access to the functional structures of Health Insurance.
- 2) Ghanaians do not move from an unaffordable "Cash and Carry" regime to another unaffordable Health Insurance one.
- 3) A sustainable Health Insurance option is made available to all Ghanaians.
- 4) The quality of health care provision is not compromised under Health Insurance.

The National Health Insurance Authority (NHIA), established as part of NHIS Act, holds responsibility for regulating the insurance schemes, including registering, licensing, and supervision. It also accredits providers and manages the National Health Insurance Fund (NHIF). The function of the NHIF is to subsidize the District Mutual Health Insurance Schemes and reinsure them against random fluctuations and shortfalls in financing. The

NHIF also covers health care costs for all exempt patients and supports programmes that improve access to health services.

The government recognized that universal access could not be financed by individual premium payments alone and would need to be subsidized using public funds. The NHIF is financed by a health insurance levy (a 2.5% earmarked addition to the VAT), a diversion of 2.5% of the 17.5% workers' contributions to the Social Security and National Insurance Trust Fund (SSNIT Fund) to the NHIF, premium payments from informal sector adults as well as money allocated to the fund by Parliament and from investments, grants, donations, gifts, and other voluntary contributions.

The NHIS provides what is generally acknowledged as a generous package of benefits covering: over 95% of disease conditions that afflict citizens in Ghana; outpatient attendance; inpatient care (including feeding); deliveries, including complications; diagnostics; medicines (generics); and all emergencies. To become a member of a DMHIS, an individual needs to register with the nearest scheme or through an agent. Formal sector workers are in principle exempt from paying the premium on joining a scheme, since the 2.5% SSNIT contribution is considered their premium (NHIA, 2010).

Other exempt categories are:

- a) All people less than 18 years whose parents have enrolled with the scheme.
- b) Persons classified as indigents (impoverished), based on a means test, up to 0.5% of the total membership of any scheme.
- c) People aged 70 years and above

- d) Pensioners under the Social Security Pension Scheme and
- e) Pregnant women (since 2008).

The NHIF pays a flat rate per “exempt” member to the scheme to which they belong. This subsidy payment started at GHc7.2 per “exempt” member in 2005, rising by about GHc2 per year until it stood at GHc14 per “exempt” member in 2008. The NHIS states that across the country the premium ranges in practice from GHc7.20 to GHc48.00. After registration, an individual is expected to serve a waiting period not exceeding six months and to receive a card from the DMHIS enabling them to access health care. The card is valid for 12 months after which it must be sent back for renewal. The Ghana NHIS has been lauded an early success for health insurance in developing countries by many influential international players in the health community, most notably the World Bank (Ghana web, 2010). Among the major achievements of National Health Insurance Scheme in Ghana include:

- i) Restructured the Authority (NHIA)
- ii) Reviewed ICT implementation and engaged key ICT staff
- iii) Strengthened and re-oriented the Internal Audit Division
- iv) Set up Clinical Audit Division
- v) Instituted comprehensive regional verification/spot audit checks (Financial/Clinical Audit checks)
- vi) Established a claims processing centre
- vii) Introduced an operational centralized claims management centre for teaching and regional hospital claims processing

viii) Introduced operational changes in the free maternal care policy (Mensah, 2010).

The most frequently cited cause for celebration is the rapid expansion in coverage of the scheme ahead of its own targets and faster than health insurance schemes attempted in other low-income countries (NHIA, 2010). The coverage figures are indeed impressive and far exceed the targets set by the scheme. The aim was to reach 30-40% coverage by 2010, rising to 50-60% by 2015. According to the NHIA figures the scheme is now outperforming the targets set for 2015.

A breakdown of the membership as of June 2010 is provided in Table 3.

Table 2.3: NHIS Membership data as of June 2010.

Category of Membership	Number Registered	Percent of total registered
Informal sector Adults	4,546,059	29.2%
70 years and above	1,006,529	6.5%
Under 18 years	7,604,324	48.9%
SSNIT Contributions	915,924	5.9%
SSNIT Pensioners	81,604	0.5%
Pregnant Women	1,051,341	6.7%
Indigents	350,035	2.3%

SSNIT - Social Security and National Insurance Trust. Source: (NHIA, 2010)

The figures above suggest that the membership of the scheme is progressive with the vast majority of members (over 70%) in the 'exempt' category who benefit free of charge.

Estimates suggest that membership of the NHIS brings benefits including a welcome increase in utilization. Outpatient (OPD) attendance in public health facilities alone increased by 136% for NHIS members between 2007 and 2008 against an increase of only 5.71% for non-members. The average outpatient (OPD) attendance for an insured member in 2009 was between 1.4 and 1.551 visits against a national average of 0.81 (NHIA, 2010).

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There are challenges with NHIS in Ghana that continue to hamper progress towards universal access to health care. The key challenges are:

- 1) Breach of the gatekeeper system
- 2) High claims from providers
- 3) Moral hazard
- 4) Autonomy of District Mutual Health Insurance Scheme
- 5) Inadequate capacity to vet claims at scheme level (Mensah, 2010).

The review above indicates that health care utilization has increased in Ghana over the past years with the introduction of National Health Insurance Scheme. The increase in health care utilization could be moral hazard if people consume more health services than other available substitutes due to its low price.

2.3 Theoretical review on moral hazard and health care utilization

The concept of moral hazard was first defined by the French economist Dreze in 1961 (Mooney and Ryan, 1993), but it is also referred to by some economists such as Arrow

(1985) as hidden action, for the reason that “Moral hazard” implies moral failure on the part of individuals, a connotation which is not intended. Moral hazard refers to the “effect of insurance coverage on individuals’ decisions to undertake activities that may change the likelihood of incurring losses” (Nicholson et al, 1996).

Moral hazard is also defined as the likely malfeasance of an individual making purchases that are partly or fully paid for by others (Arrow, 1965; Pauly, 1968, 1974; Zeckhauser, 1970; Kotowitz, 1987). He will overspend, that is, he will use more services than he would were he paying for the medical care himself. Since insurance is an arrangement where others pay for the lion’s share of one’s losses, it could create an incentive to use additional medical resources (Zeckhauser and Cutler, 1999).

Moral hazard is manifested when an individual due to the fact that he is insured, demands more medical services than he would if he were to pay for those services himself (Pauly, 1968; 1983). Moral hazard can be classified into ex ante and ex post moral hazard (Ehrlich and Becker, 1972). Ex ante moral hazard arises prior to sickness, in the healthy state. Assuming that individual can reduce the probability of falling ill through preventive measures, it can be postulated that insurance coverage (which lowers the cost of treatment at the point of consumption) renders being ill a less undesirable state, thereby weakening individual’s incentives to avoid the sick state. Examples of preventive measures are eating healthy meals and taking exercise.

In the context of health insurance, the ex ante moral hazard problem may be small because common forms of health insurance in fact offer very incomplete coverage. Even if the consumer has generous coverage for the monetary components of the loss (medical expenditures and forgone earnings), he will be uninsured for the utility loss (Kenkel, 2000).

Conversely, ex post moral hazard occurs once the individual has become ill. Again, insurance coverage ensures zero or subsidized price for medical services at the point of use, which gives rise to greater demand on the part of the patient than would be the case if he were to pay all costs (Donaldson and Olsen, 1998).

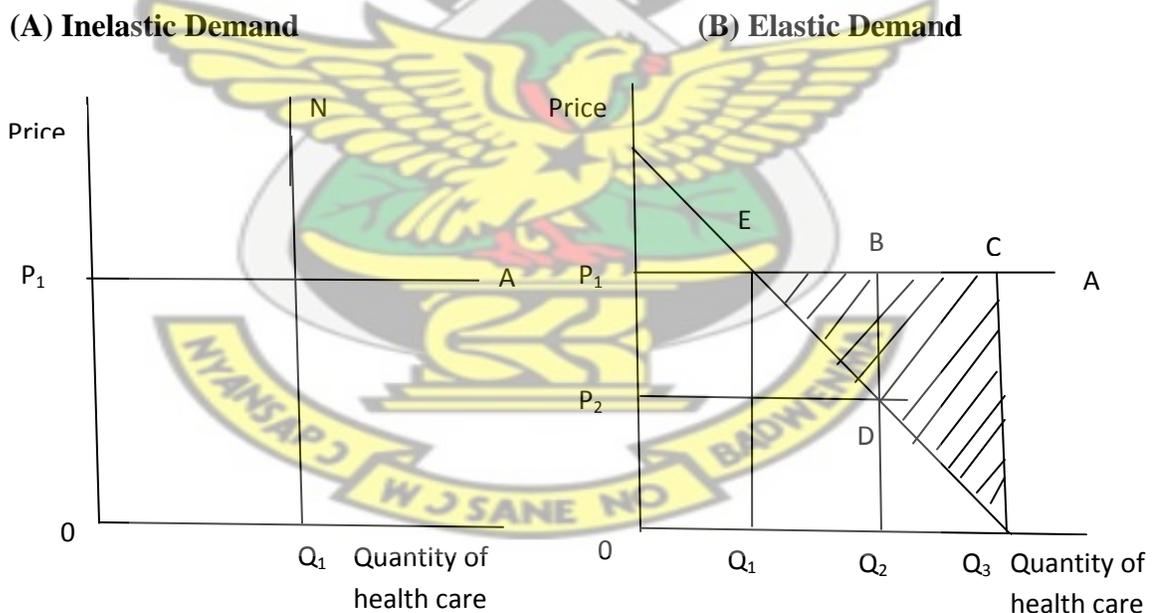
In demand theory, moral hazard is the substitution effect of people spending more on medical care when its price is low, but not the income effect of people spending more on medical care because of insurance. By efficiently transferring resources from the healthy state to the sick state, people become richer when sicker (de Meza, 1983).

Pauly (1968) observed that health insurance often induces moral hazard, resulting in an inefficient reallocation of resources, and that institutionalizing such inefficiency through government regulation could potentially be welfare-reducing. Thus, moral hazard weakened the case for national health insurance.

Pauly's (1968) essay assumed a fixed individual demand curve for health care and a constant marginal cost of production. Together, these determined an efficient optimum

for an uninsured patient: the marginal willingness to pay for care (as represented by the demand curve) was equal to the marginal cost of care. If the same individual were insured, however, she would perceive a lower out-of-pocket price for care (zero, if there was no coinsurance), and move down the demand curve; unless demand had no price elasticity, the insured would then consume more units of medical treatment. The marginal cost of health care would exceed the consumer's willingness to pay for the extra units, and inefficiency would thereby be introduced. Moreover, forcing such individuals to pay for access to this care through taxes could potentially make them worse-off than they would be without insurance. The diagrams for Pauly's essay are shown below:

Figure 2.1: Demand for Health Services in relation to Price Elasticity.



P_1 represents the market price (that is the price an individual without insurance would need to pay). Through a comprehensive insurance without co-payment, the price, seen from the point of view of the insured person falls to quasi zero because he himself does

not have to pay it directly. In figure 1(A), the demand for health services, in the case of comprehensive insurance which is equal to quasi zero price remains constant.

In figure 1(B) on the other hand, the demand for health services rises in relation to a quasi price from zero to the saturation point from Q_1 to Q_3 , because the price elasticity is relatively high. Thus in figure 1(B) health services are also demanded whose marginal utility lies below the price. The pareto-optimal amount of health services would be reached at point E. On reaching this amount, expenses would occur amounting to OP_1EQ_1 while at the amount Q_3 , expenses incurred would be OP_1CQ_3 . The welfare loss resulting from moral hazard is clearly shown by the shaded triangle ECQ_3 . By introducing a proportional co-payment of 50%, the quasi price would rise to P_2 and as a result the amount would fall to Q_2 .

Fifteen years later, de Meza (1983) argued that an ill consumer's demand curve is not the same when insured and when uninsured. Rather, the reimbursement of medical expenses provided by insurance shifts the demand curve outward just as a cash transfer would. Thus, the consumer's willingness to pay increases with insurance coverage, and Pauly's (1968) model therefore overstates the inefficiency induced by moral hazard. In response, Pauly (1983) acknowledged that income effects might indeed matter for critically ill patients, but asserted that moral hazard among healthier consumers was still largely inefficient.

The decomposition of moral hazard into an income transfer effect and a pure price effect is presented by Nyman (1999). According to his analysis, the pure price effect of insurance (that pays off by reducing price) is the change in consumption of medical care that would occur if a consumer who is already ill were to purchase a contract from an “insurer” to reduce the price of medical care in return for an actuarially fair premium.

The welfare loss from health insurance that pays off by reducing the price of medical care has conventionally been calculated using estimates of Marshallian price elasticities of demand to determine the moral hazard effect and willingness to pay (Feldstein, 1973; Feldstein and Friedman, 1977; Feldman and Dowd, 1991; Manning and Marquis, 1996).

The welfare loss must be weighed against the benefits of insurance to determine the net welfare effect. Studies have estimated the net welfare effect by estimating the welfare gain from risk bearing (Feldstein 1973; Feldstein and Friedman, 1977; Feldman and Dowd, 1991; Manning and Marquis, 1996), but generally have found that the welfare losses outweigh the gains.

Rice (1992; 1997; 1998) has disputed Pauly’s welfare loss for other reasons. Rice suggests that economic theory would predict that as cost-sharing increases the price of medical care toward its marginal cost, the quantity demanded of low effectiveness procedures should decrease more than the quantity demanded of high effectiveness procedures. As evidence that this does not occur, Rice cites a study by Lohr et al (1986) which compares the quantity response to price changes of procedures that vary by the

level of effectiveness (and other characteristics). This study finds that, although there is a quantity response to price increase, there is no difference in this response by the effectiveness of procedure. Rice concludes that because of this, analysts cannot use observed demand curves to evaluate the willingness to pay for procedures and that the welfare loss estimates derived from observed demand overstates the true welfare loss.

Zweifel and Manning (2000) point out that some amount of moral hazard may be deemed beneficial for two reasons. First, to the extent that physicians wield a collective monopoly, the quantity of medical care consumed falls short of the optimum. The increase in quantity caused by the moral hazard effect of insurance can be efficiency-enhancing in this situation. Secondly, moral hazard may encourage the use of a more cost-effective medical service at the expense of a less cost-effective one within an insurance scheme. Thus, the optimal amount of moral hazard is positive rather than zero.

Newhouse (1992) argues that the lion's share of the growth of health expenditures is attributable to advances in medical technology, not moral hazard. He concluded that overzealous efforts to limit moral hazard could do more harm than good if policy holders reduce the incentive for medical innovation.

Health insurance could create incentives for efficient moral hazard. This study adopts Nyman (1999) proposition to establish that moral hazard could be efficient in malaria treatment using pure price (substitution) effect of people consuming more health services when its price is low but not the income effect of people consuming more health services

because of insurance. The reason is that, in Nyman's analysis, welfare improving considers only the substitution effect a distortion because only the substitution effect captures the impact of distorted relative prices. In other words, the efficient level of consumption is not the amount an uninsured person would consume if they become ill, but instead the amount an insured person would consume if the insurance transferred the optimal amount of income but did not distort prices.

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2.4.0 Empirical review on moral hazard and health care utilization

The empirical evidence reported on ex post moral hazard comes from three sources: natural experiments, observational comparisons of individuals and the RAND Health Insurance Experiments (RHIE). Influential studies on demand elasticity using RAND Health Insurance experiment devote considerable attention to quantifying the changes in utilization and expenditures associated with greater coverage, and the results have been used to estimate changes in welfare (Frick and Chernenov, 2008).

Zeckhauser and Cutler (2000) tried in their empirical studies to distinguish between the overall moral hazard effect and the residual moral hazard effect. Overall moral hazard effect refers to differences in health care utilization between those who are covered by any insurance arrangement and the uninsured. Residual moral hazard effect refers to differences in utilization across insurance types or policies; this residual effect however, is sometimes too small and cannot be detected.

Also, the empirical evidence on the existence of moral hazard in health insurance markets is mixed. For example, research work by Cardon and Hendel (2001) on health insurance markets and treatment seeking behaviour of consumers, finds no evidence of moral hazard. On the other hand, Zeckhauser and Cutler (2000) reviewed an extensive literature that found evidence of moral hazard based on the coinsurance elasticity of the demand for medical care using a random health insurance experiment in USA. This section reviews empirical literature on moral hazard and health care utilization in developed nations, developing nations, Africa and Ghana.

2.4.1 Moral Hazard and Health Care Utilization in Developed Nations

Bolhaar et al (2009) estimated the market for supplementary private health insurance in Ireland, and test whether moral hazard and or selection (either adverse or advantageous) were present. Ireland has a national insurance scheme that covers all citizens and is characterized by substantial co-payments. They concluded that moral hazard was present. The study found that, medical card holders on average visit the General Practitioners and the Specialist more frequently and stay more nights in hospital than individuals without a medical card. Both within the group of medical card holders and non-holders, those with supplementary private health insurance utilize more health care services than the individuals without supplementary private health insurance.

Cameron et al (1988), using health care data for Australia found that more extensive insurance coverage led to 22% increase in the utilization of health services. They concluded that moral hazard was present among insured individuals.

Coulson et al (1995) using the RAND health insurance experiment in USA concluded that the consumption of health services in the population increased as the level of out-of-pocket expenditures on health declined. The study resolved that moral hazard was present because supplementary insurance increases the number of prescription filled among the elderly.

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Deb and Trivedi (1997) analysed voluntary private health insurance and health care utilization of people aged 50 and above. The study estimated the effect of voluntary private health insurance on health care utilization using the survey of health, ageing and retirement in Europe. The main finding was that voluntary private health insurance coverage increases dental care utilization but decreases the visits to general practitioners. The conclusion was that moral hazard was present in the use of health insurance for dental care.

Damien et al (2010) used 2004 and 2005 Australian National Health survey to estimate the impact of private hospital insurance on the utilization of hospital care services in Australia. The study employed the two-stage residual inclusion approach (2SRI) to account for the endogeneity of supplementary private hospital insurance purchases. Moral hazard was calculated using a difference of means estimator. The study found strong evidence of moral hazard when private hospital insurance was treated exogenous. After controlling for the endogeneity of hospital insurance, the study found strong and

robust evidence of substitution from private to public hospital care but no evidence of moral hazard in the number of nights spent in hospital.

Stabile (2001) examined the effects of government subsidies to employer-provided health insurance on the decision to purchase and on utilization of publicly funded health services. Using unique variation in tax subsidies across Canadian provinces as an instrument, the study estimated the effects of these subsidies on the demand for supplemental health insurance and their extended effects on the decision to use publicly-funded health services. The results showed that government subsidies through exemptions have significant effects on treatment seeking behaviour of patients. The conclusion was that inefficient moral hazard was present in the use of publicly funded health services.

2.4.2 Moral Hazard and Health Care Utilization in Developing Nations

Jowett et al (2004) analysed the effect of being insured under the voluntary component of Vietnamese Health Insurance on patterns of treatment seeking behaviour. A multinomial logit model was estimated using household survey data from three provinces in Vietnam. Decisions regarding both the type of provider sought and type of care received were analyzed. Insurance status was treated as both exogenous and endogenous to account for potential selection bias. The overall results indicated that insured patients were more likely to use outpatient facilities inefficiently, an effect that is particularly strong in the presence of moral hazard.

Hassan et al (2007) did a study using count and binary data models with an endogenous dummy variable, and propensity score matching to evaluate the effect of the subsidized health care program in Medellin (Colombia). The subsidized program was found to be plagued with moral hazard after parametric specification of preventive utilization, an effect that compensated appropriately.

Nyman and Barleen (2005) wrote a paper that used a new theory and data from Brazil to estimate the gain in health-related quality of life that is caused by the additional care that is generated by health insurance. The study found that supplemental private health insurance generates significant increases in quality of life and that the cost of the quality adjusted life year gains appears to be commensurate with cost-utility ratios that are deemed welfare-increasing. The finding was contrary to the conventional theory that posits that additional care (moral hazard) is welfare decreasing.

2.2.3 Moral Hazard and Health Care Utilization in Africa

Akande et al (2010) compared the pattern of utilization of the staff clinic two years before and after the commencement of National Health Insurance Scheme at the University of Ilorin Teaching Hospital. Descriptive cross-sectional study was carried out using records of patients at staff clinic, Unilorin Teaching Hospital, Ilorin two years before and after the commencement of National Health Insurance Scheme. Information obtained from the hospital records was entered into the epi-info software of the computer. A P-value less than 0.05 was statistically significant for the study. The conclusion was that, National Health Insurance Scheme led to 144% increase in the utilization of health

services at staff clinic of Unilorin Teaching Hospital which could be as a result of moral hazard.

Yip and Berman (2000), using observational comparison of individuals in Egypt found that, children insured under the school health insurance programme are likely to seek more than the uninsured, particularly those in the lowest income quintile. The study resolved that moral hazard was present among insured school children.

Kiwara (2005) studied on Mutual Health Insurance Scheme (UMASIDA) designed for informal sector workers in urban areas of Tanzania. UMASIDA insurance scheme provides comprehensive package covering maternal and child health services, treatment for infectious diseases, surgical services among others. The study found that there was moral hazard tendency among clients of the scheme. The study discovered that members of the scheme brought in unregistered extended family members, neighbours and friends to benefit from the scheme. Members of the scheme insisted on receiving certain types of medication and there was increased demand for laboratory services.

2.4.4 Moral Hazard and Health Care Utilization in Ghana

In 2005, a study conducted under the sponsorship of United States Agency for international development (USAID) in six districts of Ghana found that, insured respondents in the household survey were nearly two times more likely to seek formal outpatient care than were their uninsured counterparts. Insured respondents were also significantly more likely than uninsured to seek care within the first two days of illness,

and to bypass informal care and go directly to a formal health facility. The findings presented in the final report found few examples of moral hazard, or the practice of over-utilizing health care services. For example, among the sample of women, 15 percent insisted on delivering by Caesarean, whereas universal indications for this surgical procedure range from 5 percent to 10 percent (WHO-Health service report, 2006).

Amporfu (2009) studied on “Does Ghana’s National Health Insurance Scheme Encourage Moral Hazard? An Approach Using Matching Estimation”. The study used maternity data to test for the existence of moral hazard in the demand for caesarean section. The study used matching estimation approach to randomize the data and so made unbiased comparison of insured and uninsured patients possible. The results showed that moral hazard exists.

Sekyi (2009) analysed the effects of the National Health Insurance Scheme (NHIS) on the probability of utilizing outpatients care and expenditure in the Mfantseman municipality of the central region of Ghana. Data for the study was obtained through a household survey. Logit regression was used to analyse the probability of utilizing outpatient care and the determinants of enrolment in health insurance. The study revealed that insured respondents were more likely to utilize outpatient care and pay less than uninsured respondents. The conclusion was that moral hazard was present among insured respondents for the study.

2.5 Demographic and socio-economic factors that influence moral hazard

The effects of demographic and economic factors such as age, marital status, employment and gender on health insurance and health care utilization have been variously studied. Most of the work on health insurance demand is empirical and focus on the socio-economic characteristics of the insured and non-insured (Nketiah-Amponsah, 2009).

In many European health systems the demographic problem is becoming increasingly urgent. On the one hand, fewer children are being born. As a result, the proportion of the total population over 60 years of age (or which is no longer gainfully employed) is constantly growing, inducing greater demand for health care (Jonas, 2004).

Temple (2002) studied the factors influencing the insurance decision of older Australians and found economic and demographic factors particularly income and age as significant covariates of increasing private insurance demand. In Malawi, Makoka et al (2007) found income and education as significant determinants of private health care in a free public health care regime. The study concluded that, moral hazard was present in the free public health care plan due to increased consumption of health services.

Propper (2000) found that the demand for private health care was strongly influenced by income, political allegiance, and the attitude of government in the provision of health care and past use of health services. Grossman (1972), Van De Ven and Van Praag (1981) also reported significant positive relationship between income and education on health care demand. Thus increases in both income and education are expected to

increase the probability of purchasing health insurance and health care utilization. However, income and education predict negatively about the likelihood of moral hazard.

Those unemployed are more likely to undertake insurance coverage and over utilize health care consumption. The unemployed do not earn regular income on any job. They have enough time to frequent health services which may be out of genuine need (Butler, 1997; Savage and Wright, 1999).

Nketiah-Amponsah (2009) cross sectional survey of the demand for Health Insurance among women in Ghana resolved that, women aged between (30–34) and over 40 years are more likely to participate in health insurance and consume more health services. The demographic variables (age and household size) in his model were statistically significant at 1% and 5% levels respectively. Women aged over 40 years (menopausal range) were identified to visit health facilities for services more than necessary compared to their counterpart in lower age brackets. The study concluded that moral hazard was present among aged women.

The works of the above literature largely concluded on inefficient moral hazard based on natural experiments, observational comparison of individuals and RAND health insurance experiment using income effect of people consuming more medical care because of insurance. This study used logit regression model to establish that moral hazard could be efficient in malaria treatment; using substitution effect of people consuming more health services when its price is low. The reason is that, income effect

considers extra consumption of health services with insurance as inefficient treatment seeking behaviour (Moral hazard) but fails to account for physician inducement which plays a significant role for extra consumption of medical services. There is efficient moral hazard when insured individuals decide to consume more effective medical services with low price instead of less effective substitutes.

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CHAPTER THREE

METHODOLOGY

3.0 Introduction

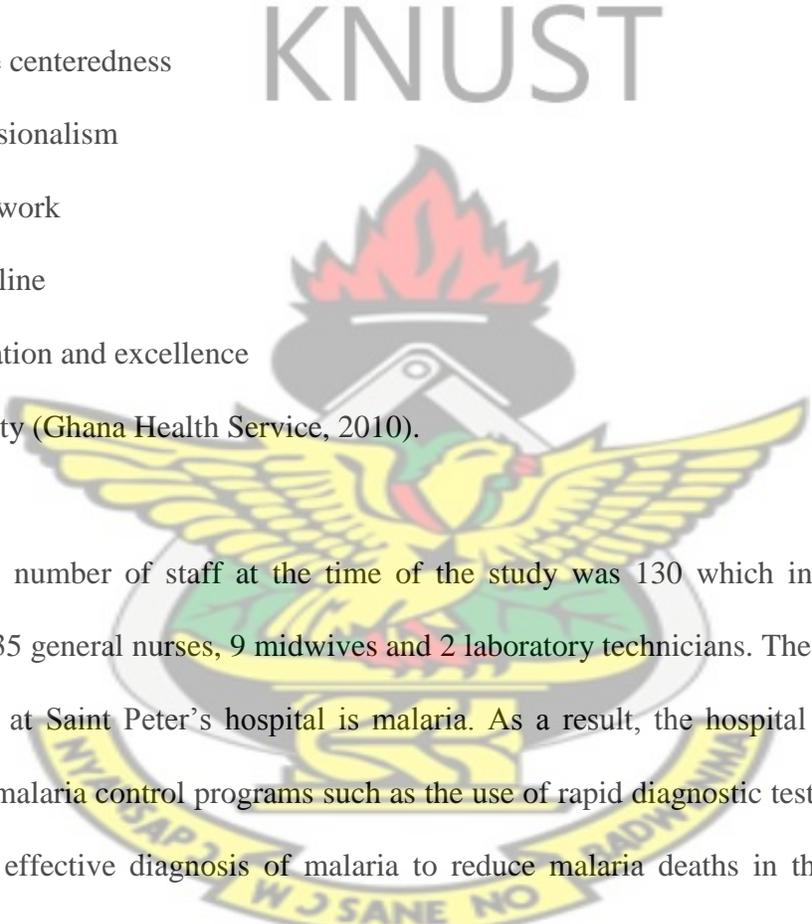
This chapter explores on background to Saint Peter's Hospital at Jacobu in Ashanti region of Ghana, the method of data collection and the study design to determine whether insured malaria outpatients are engaging in moral hazard or not. It also seeks to ascertain the demographic and socio-economic characteristics of insured malaria outpatients who are likely to engage in moral hazard. Quantitative methods are used for the data analysis. Specifically, the study used logit regression as the empirical method of estimation under quantitative method.

3.1 Background to Saint Peter's Hospital at Jacobu in Ashanti region

Saint Peter's hospital was established in 1987 as a health centre with the goal of bringing healing to the people of Amansie Central and surrounding districts in the provision of total quality patient care through professionally competent and dedicated staff who are united in their common respect for fundamental human values. In the year 2004, the then Saint Peter's health centre officially became hospital through the approval of Ghana Health Service directorate. The hospital is a mission hospital under Catholic diocese of Obuasi.

Saint Peter's hospital is the only hospital in Amansie Central district and serves 206 settlements with the population of 81, 871. The hospital is a member of Christian Health Association of Ghana (CHAG) registered under National Catholic Health Service (NCHS). The goal of NCHS is to provide and sustain health care services for the poor,

neglected and marginalized segments of the society. NCHS also seeks to empower the people it serves to take ownership of their own individual and collective health needs. There are twelve (12) main units in the hospital. These are the Administration, Accounts, Pharmacy, Theatre, Emergency, Laboratory, Maternity, Children's department, Morgue, General ward department, Stores and Dental service. Saint Peter's hospital is committed to the core values of Ghana Health Service which are:

- 
- 1) People centeredness
 - 2) Professionalism
 - 3) Team work
 - 4) Discipline
 - 5) Innovation and excellence
 - 6) Integrity (Ghana Health Service, 2010).

The total number of staff at the time of the study was 130 which include 3 medical doctors, 35 general nurses, 9 midwives and 2 laboratory technicians. The leading cause of mortality at Saint Peter's hospital is malaria. As a result, the hospital is committed to national malaria control programs such as the use of rapid diagnostic tests (RDTs) for the safe and effective diagnosis of malaria to reduce malaria deaths in the district. Other causes of deaths at the hospital include maternal mortality, infant mortality among others. Health care utilization has more than doubled especially in the treatment of malaria through the introduction of the National Health Insurance Scheme (NHIS). The main challenges of the hospital are:

- 1) Inadequate staff quarters

2) Inadequate health personnels to attend to health needs of the people of Amansie Central district and surrounding areas as against the increasing demand for health services with the introduction of NHIS.

3.2 Method of Data Collection

Primary method of data collection was employed by this study. The reason for using primary data is that, the study used information from health care consumers (patients) which did not exist for analysis. The study used personally administered questionnaires to gather information related to the subject matter. The questions were centered on the effects of health insurance on treatment seeking behaviour of insured malaria outpatients. Personally administered questionnaires are considered by researchers like Kumekpor (2002) to provide rich information because it is useful and appropriate with all categories of populations, especially, low-level education and rural populations. It is also believed to provide greater sense of security because the collection of data is by face-to-face interaction with respondents.

Purposive sampling method was used by this study in selecting insured malaria outpatients at the study area. The reason for using purposive sampling was to focus on particular characteristics of the population that are of interest to answer the questionnaire for the study. Insured malaria outpatients of eighteen years and above who were willing to assist the study were interviewed after going for their drugs at the pharmacy department.

Malaria is chosen as a proxy for all diseases that affect the total population. Malaria is hyper endemic in Ghana and continues to be the leading cause of morbidity and mortality among both children and adults. In 2007, malaria was responsible for 41.6% of outpatient attendance compared to 37.83% in 2006. It was the highest cause of mortality, accounting for over 18% of deaths reported at health facilities (Ghana health service, 2007). Also, according to 2009 report of Policy Planning Monitoring and Evaluating (PPME) division - Ghana Health Service, malaria was the leading cause of outpatient morbidity in 2008 with the percentage of 44.74%, followed by upper respiratory tract infection with the percentage of 6.20% nationwide. The health facility is also selected as the main source of information because of its large outpatient population, easy access to patients who visit the facility, proximity to the study and resource constraints.

In total the study used a sample size of 350 to represent insured malaria outpatients at the study area. The sample size is calculated with recourse to the estimated proportion approach (Cochran, 1977) since the total population of insured malaria outpatients who visit the facility is unknown. The sample size for the estimated proportion approach is given as;

$$N = \frac{z^2 p (1-p)}{e^2} = \frac{(1.96)^2 0.65 (1 - 0.65)}{(0.05)^2} = 350$$

Where;

N = the sample size

z = the number relating to the degree of confidence anticipated in the result; in this study a 95% confidence level (z =1.96) which is the abscissa of the normal curve.

p = an estimate of the proportion of insured people among malaria outpatients at the study area in a day (0.65). Source: (Administrator of Saint Peter's hospital at Jacobu, 2011 January 31).

e = the level of significance (0.05). The study has chosen 5% as the anticipated error because it is the standard level for social science research work. Respondents gave information on age, income level, educational level, employment and marital status and premium paid on the insurance contract.

3.3 Data Analysis

Quantitative methods are used for data analysis. Quantitative methods provide a deeper analysis and allows for a richer and an in-depth understanding of how people make meaning of their situation or interpret phenomena (Denzin & Lincoln, 1994; Merriam, 1998). By quantitative method, the study used tables to describe the data on sampled respondents and also to know the effectiveness of malaria treatment with the various health care practices.

Also, quantitative study is usually based on causal inference and the use of standardized measures to produce qualified data that can be statistically analyzed (Patton, 2002). As Strauss and Corbin (1990) state, quantitative methods are useful to unveil knowledge and to facilitate our understanding on phenomenon that little is known about. This means that using quantitative method is appropriate for this study because it is relatively an unexplored topic of Health Economics research in Ghana.

3.4 Empirical Estimation

Logit regression model is used by the study to determine the tendency of moral hazard among the sampled respondents. This study used the substitution effect of people consuming more medical care when its price is low but not the income effect of people consuming more health services because of insurance to determine the tendency to engage in moral hazard among the sampled respondents.

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3.4.1 Determination of Moral Hazard in sample data

The average cost for the treatment of malaria at Saint Peters hospital, Jacobu-Ashanti region (case study health facility) is compared to the premium paid on the health insurance scheme by each patient. If the study discovers that, a patient is willing to spend up to the average cost for the treatment of malaria without insurance, there is no tendency to engage in moral hazard. In other words, there is no substitution effect of consuming medical services with insurance if a patient indicates that he or she will opt for medical care without health insurance. On the other hand, if the study discovers that, a patient is not willing to spend up to the average cost for the treatment of malaria without insurance, there is a tendency to engage in moral hazard. Thus, there is a substitution effect of consuming medical services with insurance if a patient indicates that he or she will opt for self medication and or herbal/traditional medication without health insurance. However, concerns are constantly raised by government officials, health authorities, international organizations and researchers as to the reliability and safety of self medication and traditional health care services in malaria treatment.

Let M_i (Binary variable) represents the observed response of each insured malaria outpatient (i th observation). Therefore, $M_i = 1$ for moral hazard and $M_i = 0$ for no moral hazard. It follows that:

$$M_i = g(Y_i)$$

Where g is the functional relationship between observed moral hazard behaviour (M_i) and the random variable (Y_i) which determines the probability of moral hazard. The equation to be estimated is given as:

$$Y_i = \ln \frac{p}{1-p} = \beta_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9 + \varepsilon_i$$

Where Y_i = Qualitative dependent variable: 1 if moral hazard; 0 if no moral hazard.

X_2 = Age

X_3 = Monthly Income

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

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

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

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

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

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

ε_i = Stochastic error term.

The probability to engage in moral hazard among the sampled respondents is given by:

$$P = e^{\beta X} / (1 + e^{\beta X})$$

Where βX = the mean of the predicted Y_i values.

If $P \approx 1$, there is a tendency to engage in moral hazard among the sampled respondents.

On the other hand, if $P \approx 0$, there is no tendency to engage in moral hazard among the sampled respondents.

Table 3.1: Expected signs of Regressors

Variable	Estimated Parameter	Expected Sign
Age (Years)	$\hat{\beta}_2$	Positive (+)
Income (Monthly)	$\hat{\beta}_3$	Negative (-)
Female (Dummy Variable)	$\hat{\beta}_4$	Positive (+)
Employed (Dummy Variable)	$\hat{\beta}_5$	Negative (-)
Basic Education (Dummy Variable)	$\hat{\beta}_6$	Negative (-)
Senior High School (Dummy Variable)	$\hat{\beta}_7$	Negative (-)
Tertiary Education (Dummy Variable)	$\hat{\beta}_8$	Negative (-)
Married (Dummy Variable)	$\hat{\beta}_9$	Unknown

The study expects age (X_2) to predict positively about the tendency to engage in moral hazard among insured malaria outpatients. A positive sign of β_2 means that as an individual advances in age, there is a high tendency for the person to engage in moral hazard. This is because the young adult are likely to be engaged in active labour supply for a living compared to the aged. The implication is that the young adults are unlikely to forgo their working hours for extra consumption of medical care with insurance. On the

other hand, the aged have enough hours for extra consumption of medical care with insurance, especially in the case of malaria treatment where there are no close substitutes for medical care.

The study expects income (X_3) to predict negatively about the tendency to engage in moral hazard among insured malaria outpatients. A negative sign of β_3 suggests that an increase in income reduces the tendency for the individual to engage in moral hazard. Because increase in income is associated with long working hours, the insured individual would not have enough time to engage in extra consumption of medical care. Moral hazard is extremely low with an increase in income though it is efficient (welfare improving), in the case of malaria treatment because the substitutes for medical care are not effective enough to improve health care.

Females (X_4) are expected to have a higher tendency to engage in moral hazard than males (control group). Therefore the expected sign of β_4 is positive. In the family context, men are expected to cater for the home with the support of women. In other words, males are often engaged in active labour supply for a living compared to their female counterpart. The implication is that females have lower opportunity cost compared to males in forgoing working hours for medical care which is usually accompanied by long waiting hours. Thus, females on the average go for extra medical care with insurance, especially in malaria treatment where there are no close substitutes for medical care.

The employed (X_5) are expected to have less incentive to engage in moral hazard than the unemployed (control group), therefore the expected sign of β_5 is negative. Because the wage rate depends on the supply of labour, every rational consumer would want to maximize the earning capacity by consuming health services as and when it becomes necessary and would not forgo working hours for extra consumption of medical care. The unemployed on the other hand have more time to spend at the health facility, in most cases for malaria treatment where close substitutes for medical care do not exist

Health care consumers with basic education (X_6), senior high education (X_7) and tertiary education (X_8) are expected to have less incentive to engage in moral hazard than those without any formal education (control group). Therefore the expected sign of β_6 , β_7 and β_8 is negative. The reason is that people with formal education have trained their minds for high income jobs compared to those without any formal education. The implication is that, people with formal education on the average have high income and high opportunity cost of forgoing working hours for extra medical care. In other words, most people without any formal education have low income and low opportunity cost of forgoing working hours for extra medical care, especially in malaria treatment where there are no close substitutes for medical care.

Finally, the relationship between the married and singles in regards to the group with increased tendency to engage in moral hazard is unknown. The reason is that, some singles (widowed/divorced) like many married couples have children and are mostly engaged in active labour supply for income to cater for the family. Also, some singles are

outside the working population and live on the earnings of their dependents. The implication is that, marital status provides a complex scenario of explaining the tendency to engage in moral hazard.

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CHAPTER FOUR

DATA ANALYSIS AND DISCUSSION OF RESULTS

4.0 Introduction

This chapter describes the data on the sampled respondents and uses Logit regression results in discussing the tendency to engage in moral hazard among the sampled respondents. Also, estimates from the logit regression are used for the analysis of the demographic and socio-economic characteristics of insured malaria outpatients who engage in moral hazard. Again the chapter determines if moral hazard is efficient in malaria treatment with the given available substitutes for medical care.

4.1 Description of sample data

Table 4.1: Statistics of variables in the empirical model

Variable	Mean Value	Standard Deviation	Minimum Value	Maximum Value
Moral Hazard	0.585714	0.493303	0	1
Age (Years)	36.7200	14.5420	18	85
Income (Monthly)	154.000	83.8294	30	430
Female	0.737143	0.440816	0	1
Employed	0.842857	0.364456	0	1
Basic Education	0.502857	0.500708	0	1
Senior High School	0.225714	0.418650	0	1
Tertiary Education	0.0914285	0.288630	0	1
Married	0.614286	0.487460	0	1

A summary of the demographic and socio-economic characteristics of the sampled respondents in the study area revealed that, the actual mean estimates for the variables in the empirical model did not show much variation. The age structure of the sampled respondents ranged from 18 to 85 years with the mean age of 37 years which falls within the productive age. The minimum and the maximum monthly income of the sample population were ₦30.00 and ₦430.00 respectively with the average income of ₦154.00. Majority (74%) of respondents in the sample population were females and the remaining 28% as males. Also 84% of the sampled respondents were employed while 16% were unemployed. On academic qualification, people with basic education, senior high education and tertiary education were 50%, 23% and 9% of the sample population respectively while 18% of the sampled respondents were people without any formal education. Finally, 61% of the sampled respondents were married with the remaining 39% as singles.

4.2 Analysis of Logit regression results

The regression results of the logit model: $Y_i = \ln \frac{p}{1-p} = \beta_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9 + \varepsilon_i$, are presented in the table below;

Table 4.2: Dependent Variable: Moral Hazard (Y_i)

Explanatory Variable	Coefficient	Standard Error	P-Value
Constant	2.82093	0.794857	0.00039
Age	- 0.0101617	0.0110185	0.35641
Income	- 0.0072226	0.0020241	0.00036

<u>Gender</u>			
Male	-	-	-
Female	0.284708	0.290474	0.32701
<u>Employment Status</u>			
Unemployed	-	-	-
Employed	- 0.893301	0.483183	0.06449
<u>Educational Level</u>			
None	-	-	-
Basic Education	0.101197	0.39036	0.79545
Senior High Education	- 0.482506	0.452378	0.28615
Tertiary Education	- 0.841693	0.657969	0.20082
<u>Marital Status</u>			
Singles	-	-	-
Married	- 0.432255	0.268705	0.10769

McFadden $R^2 = 0.143133$

Likelihood Ratio (LR Statistic) = 67.9688 (P-value: 0.00)

Number of Observations = 350

Mean of the Predicted Y = 0.5857

$$P = \frac{e^{\beta X}}{1 + e^{\beta X}}$$

Where βX = the mean of the predicted Y values.

$$\beta X = 0.5857$$

$$P = \frac{e^{0.5857}}{1 + e^{0.5857}}$$

$$P = 0.64238.$$

Since $P = 0.64238$ is closer to one than zero, there is a greater tendency to engage in moral hazard among the sampled respondents. In other words, with the sample evidence at hand, about 64% of the sampled respondents engage in moral hazard. The implication is that moral hazard exists among insured malaria outpatients at the study area.

The above logit regression results using Gretl software package shows that most of the coefficients are consistent with hypothesized relations and their test of significance (P values) help to indicate their importance in explaining the tendency to engage in moral hazard among the sampled respondents, although there are no policy variables in the empirical model.

Age (years) as a quantitative variable has not met the expected sign in the empirical model. The negative sign of the coefficient of age means that an increase in age reduces the tendency to engage in moral hazard among the sample population, holding all other variables constant. But the P-value (0.35641) indicates that, the coefficient of age is statistically insignificant in the empirical model at 5% significance level. The implication is that, age has no significant impact on the tendency to engage in moral hazard according to the statistical evidence at hand.

Income (monthly) as a quantitative variable has met the expected sign in the empirical model. The negative sign of the coefficient of income means that an increase in income reduces the tendency to engage in moral hazard among the sample population, holding all other variables constant. The P-value (0.0036) indicates that the coefficient of income is

statistically significant in the empirical model at 5% significance level. The implication is that, income has a significant impact on the tendency to engage in moral hazard according to the statistical evidence at hand.

Female as a dummy variable has met the expected sign in the empirical model. The positive sign of the coefficient of female means that females are more likely to engage in moral hazard more than males (control group), holding all other variables constant. But the P-value (0.32701) indicates that the coefficient of female is statistically insignificant in the empirical model. The implication is that, gender has no significant impact on the tendency to engage in moral hazard according to the statistical evidence at hand.

Employed as a dummy variable has met the expected sign in the empirical model. The negative sign of the coefficient of employed means that the employed are less likely to engage in moral hazard than the unemployed (control group), holding all other variables constant. The P-value (0.06449) indicates that, the coefficient of employed is statistically insignificant at 5% significance level but at 10% significance level, it is statistically significant. The implication is that at 10% significance level, employment status has a significant impact on the tendency to engage in moral hazard according to the statistical evidence at hand. This corroborates with Butler (1997) and Savage and Wright (1999) finding that the unemployed are more likely to undertake insurance coverage and over utilize health care consumption because they have enough time to frequent health services.

Basic education as a dummy variable has not met the expected sign in the empirical model. The positive sign of the coefficient of basic education means that people with basic education are more likely to engage in moral hazard than people without formal education (control group), holding all other variables constant. This is contrary to Grossman (1972) and Van De Ven and Van Praag (1981) finding that education predicts negatively about the tendency for moral hazard. The P-value (0.79545) also indicates that the coefficient of basic education is statistically insignificant in the empirical model at 5% significance level. The implication is that, having basic education has no significant impact on the tendency to engage in moral hazard according to the statistical evidence at hand.

Senior High education as a dummy variable has met the expected sign in the empirical model. The negative sign of the coefficient of senior high education means that people with senior high education are less likely to engage in moral hazard than people without formal education (control group), holding all other variables constant. This is consistent with Grossman (1972) and Van De Ven and Van Praag (1981) finding that education predicts negatively about the tendency for moral hazard. But the P-value (0.28615) indicates that the coefficient of senior high education is statistically insignificant in the empirical model at 5% significance level. The implication is that, having senior high education has no significant impact on the tendency to engage in moral hazard according to the statistical evidence at hand.

Tertiary education as a dummy variable has met the expected sign in the empirical model. The negative sign of the coefficient of tertiary education means that people with tertiary education are less likely to engage in moral hazard than people without formal education (control group), holding all other variables constant. This is consistent with Grossman (1972) and Van De Ven and Van Praag (1981) finding that education predicts negatively about the tendency to engage in moral hazard. But the P-value (0.20082) indicates that the coefficient of tertiary education is statistically insignificant in the model at 5% significance level. The implication is that, having tertiary education has no significant impact on the tendency to engage in moral hazard according to the statistical evidence at hand.

Married as a dummy variable has a negative sign as against unknown in the empirical model. The negative sign of the coefficient of married means that married people are less likely to engage in moral hazard than singles (control group), holding all other variables constant. But the P-value (0.10769) indicates that the coefficient of married is statistically insignificant in the empirical model at 5% significance level. The implication is that, marital status has no significant impact on the tendency to engage in moral hazard according to the statistical evidence at hand.

Together, all the regressors have significant impact on the tendency to engage in moral hazard because the LR statistic (67.9688) has P-value (0.00) which is statistically significant at 5% significance level.

4.3 Test of Multicollinearity in the empirical model

Variance Inflation factor of variable (x) is given as $VIF = \frac{1}{1 - R^2_{(x)}}$,

where $R^2_{(x)}$ is the multiple correlation coefficient between variable x and other independent variable(s). The minimum possible value of Variance Inflation Factor is 1. If VIF is greater than 10 ($VIF > 10$), there is a collinearity problem with the sample data. If on the other hand, VIF is less than 10 ($VIF < 10$), there is no collinearity problem with the sample data. The table below gives the VIF of each variable in the empirical model using Gretl software package:

Table 4.3: Variance Inflation Factor (VIF) of each independent variable

Variable	Variance Inflation Factor (VIF)
Age (years)	1.604
Income (Monthly)	2.054
Female (Dummy Variable)	1.112
Employed (Dummy Variable)	1.637
Basic Education (Dummy Variable)	2.844
Senior High Education (Dummy Variable)	2.623
Tertiary Education (Dummy Variable)	2.256
Married (Dummy Variable)	1.219

From the table above, the Variance Inflation Factor between each variable and other independent variables gives a value less than 10 ($VIF < 10$) in all cases. The implication is that, there is no collinearity problem with the sample data of the study. In other words, multicollinearity has no role to play with the statistical evidence of the study.

4.4 Types of Health care and Effectiveness of malaria treatment

Likert five point scale (Very good, Good, Neutral, Bad and Very Bad) is used in assessing the effectiveness of malaria treatment with various health care practices. The sampled views at the study area are shown in the table below:

Table 4.4: Effectiveness of malaria treatment with various health care practices

Type of health care	Very good	Good	Neutral	Bad	Very Bad	Total
Medical Care	285	65	-	-	-	350
Self medication	-	-	58	95	197	350
Traditional health care	-	45	62	178	65	350

Source: Field of study (2011)

From the table above, greater percentage of the sampled respondents agreed that the effectiveness of malaria treatment is very good with the conventional medical care. However, greater percentage of sampled respondents agreed that the effectiveness of malaria treatment is very bad and bad with self medication and traditional health care services respectively. This means that, the effectiveness of medical care in malaria treatment has improved accessibility to health services with the introduction of health insurance at the expense of self medication and traditional health care services whose effectiveness is being challenged by even contemporary researchers.

This finding is consistent with the government of Ghana's quest for the achievement of Millennium Development Goals and Middle-Income status by 2015. Thus, H_0 hypothesis is rejected and instead H_1 accepted at 95% confidence level. The implication is that,

moral hazard is efficient in malaria treatment. The explanation is that, the given available substitutes for medical care are not effective enough to ensure improved welfare for the country's population and as a result increased consumption of medical services is welfare improving.

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CHAPTER FIVE

SUMMARY OF FINDINGS AND POLICY RECOMMENDATION

5.0 Introduction

The study was carried out mainly to find out whether insured malaria outpatients are engaging in moral hazard or not. This chapter therefore reviews the major findings from the data analysis and discussion of results. It also includes the conclusion of the study after which policy recommendations are made.

5.1 Summary of major findings

The study revealed that, there was greater tendency to engage in moral hazard among the sampled respondents. In other words, 64% of the sampled respondents engage in moral hazard. This means that moral hazard exists among insured malaria outpatients at the study area.

Also the study found that, effectiveness of medical care in malaria treatment has improved accessibility to health services with the introduction of health insurance at the expense of self medication and traditional health care services whose practices are not effectiveness enough to ensure improved health care for the country's population. This is consistent with the alternative hypothesis in chapter one that, moral hazard is efficient in malaria treatment. The explanation is that, increased consumption of health services is welfare improving due to the given available substitutes for medical care.

In addition, the study discovered that, all the independent variables in the empirical model were not statistically significant apart from income and employment status, at 5%

and 10% respectively. The implication is that, age, gender, educational level and marital status have no effect on the tendency to engage in moral hazard according to statistical evidence of the study. However, all the independent variables have significant impact on the tendency to engage in moral hazard because the LR statistic (67.9688) has P-value (0.00) which is statistically significant at 5% level.

Furthermore, the study discovered that the employed are less likely to engage in moral hazard than the unemployed. The study revealed that, at 10% significance level, employment status has a significant impact on the tendency to engage in moral hazard.

Finally, the study found an inverse relationship between income and the tendency to engage in moral hazard. The implication is that an increase in income reduces the tendency to engage in moral hazard among the sampled respondents.

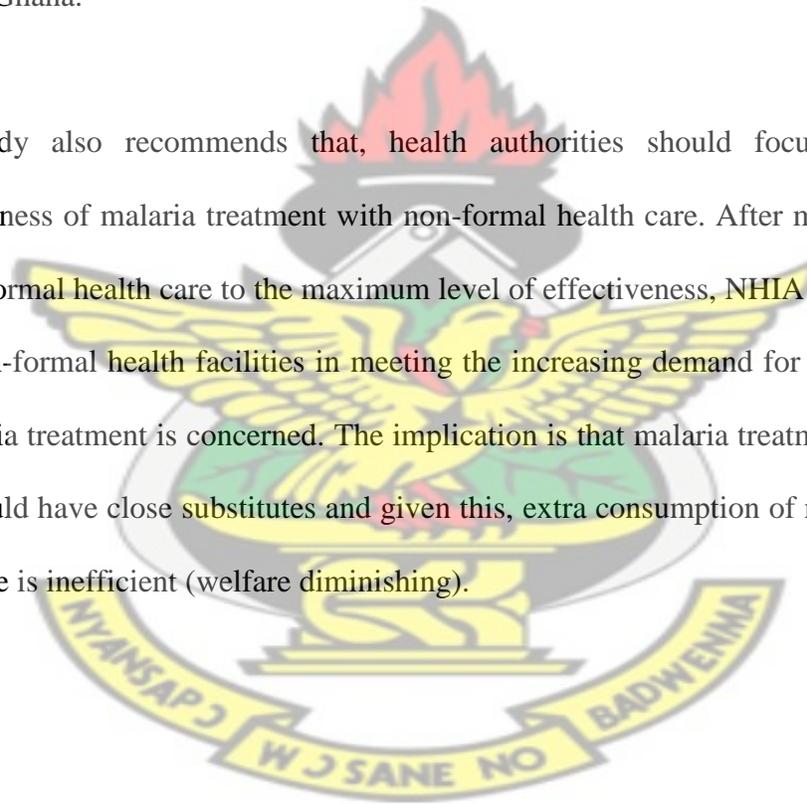
5.2 Conclusion

It can be concluded from the findings above that, greater percentage of insured malaria outpatients engage in moral hazard at the study area. The set objectives in chapter one are fully achieved and the alternative hypothesis confirmed as true. The implication is that moral hazard is welfare improving in malaria treatment because the given available substitutes for medical care are not effective enough to ensure improved health care for the country's population.

5.3 Policy recommendation

The study recommends that, NHIA ought to strengthen sensitization programmes aimed at improving accessibility to medical care with insurance coverage for malaria treatment. The implication is that, individuals would have less incentive to opt for self medication and traditional health care services whose practices are not effective enough to ensure improved welfare of the entire country's population. Eventually, the rate of morbidity and mortality as a result of ineffective malaria treatment would reduce for both children and adult in Ghana.

The study also recommends that, health authorities should focus on improving effectiveness of malaria treatment with non-formal health care. After monitoring quality of non-formal health care to the maximum level of effectiveness, NHIA could collaborate with non-formal health facilities in meeting the increasing demand for health care as far as malaria treatment is concerned. The implication is that malaria treatment with medical care would have close substitutes and given this, extra consumption of medical care with insurance is inefficient (welfare diminishing).



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Appendix 1:

QUESTIONNAIRE

Moral Hazard and health care utilization: A case study of insured malaria outpatients at Saint Peters Hospital, Jacobu-Ashanti region.

This study is being conducted in partial fulfillment of the requirements for the award of a second degree in Economics. All information received would be used for academic purposes only and treated in the strictest of confidence.

1. Gender: [] Male [] Female
2. Age:
3. Employment Status: [] Unemployed [] Employed
4. Educational level: [] Basic [] Senior High [] Tertiary [] None
5. Marital Status: [] Married [] single
6. Monthly Income:
7. How much did you pay for health insurance (premium)?
[] Premium [] Exempt
8. Average cost of treating Malaria is ₵25.00
9. If the difference [] is given to you, will you spend all in the treatment of malaria?
[] YES [] NO
10. How do you assess the effectiveness of the following in malaria treatment? Use Likert scale: Very good – 1, Good – 2, Neutral – 3, Bad – 4 and Very Bad – 5.
Medical care []
Self medication []
Traditional/Herbal medication []

Appendix 2:

Logit estimates using 350 observations, 1-350

Dependent variable: Moral

<i>Variable</i>	<i>Coefficient</i>	<i>Std. Error</i>	<i>t-statistic</i>	<i>p-value</i>	
const	2.82093	0.794857	3.5490	0.00039	***
Age	-0.0101617	0.0110185	-0.9222	0.35641	
Income	-0.00722259	0.00202411	-3.5683	0.00036	***
Female	0.284708	0.290474	0.9802	0.32701	
Employed	-0.893301	0.483183	-1.8488	0.06449	*
Basic	0.101197	0.39036	0.2592	0.79545	
Senior	-0.482506	0.452378	-1.0666	0.28615	
Tertiary	-0.841693	0.657969	-1.2792	0.20082	
Married	-0.432255	0.268705	-1.6087	0.10769	

Mean of Moral = 0.586

Number of cases 'correctly predicted' = 241 (68.9%)

f(beta'x) at mean of independent vars = 0.241

McFadden's pseudo-R² = 0.143133

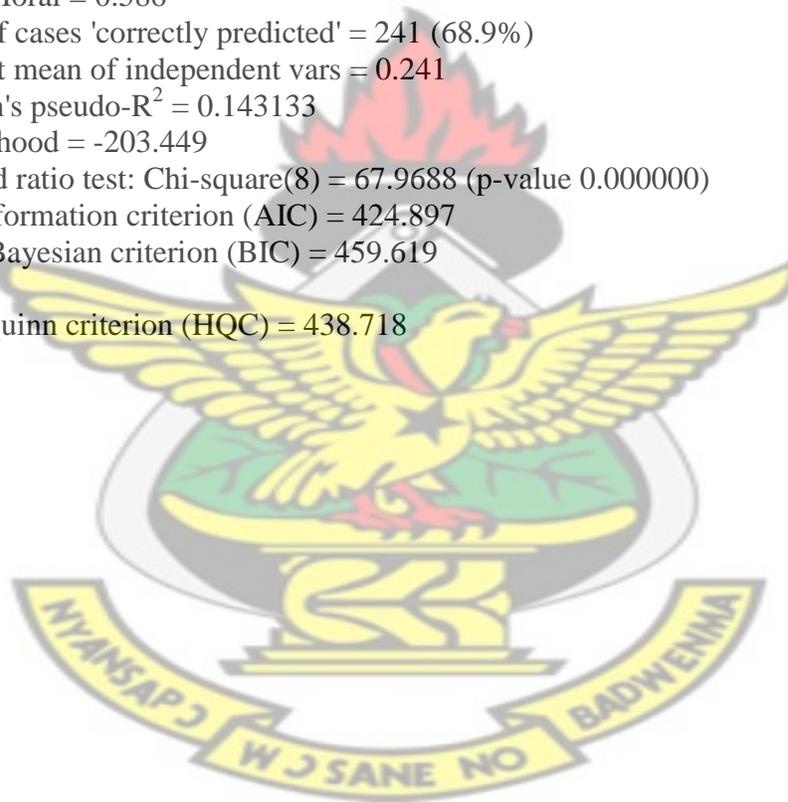
Log-likelihood = -203.449

Likelihood ratio test: Chi-square(8) = 67.9688 (p-value 0.000000)

Akaike information criterion (AIC) = 424.897

Schwarz Bayesian criterion (BIC) = 459.619

Hannan-Quinn criterion (HQC) = 438.718



Appendix 3: Summary Statistics of variables in the empirical model

Variable	Mean	Median	Minimum	Maximum
Moral	0.585714	1.00000	0.000000	1.00000
Age	36.7200	32.5000	18.0000	85.0000
Income	154.000	150.000	30.0000	430.000
Female	0.737143	1.00000	0.000000	1.00000
Employed	0.842857	1.00000	0.000000	1.00000
Basic	0.502857	1.00000	0.000000	1.00000
Senior	0.225714	0.000000	0.000000	1.00000
Tertiary	0.0914286	0.000000	0.000000	1.00000
Married	0.614286	1.00000	0.000000	1.00000

Variable	Std. Dev.	C.V.	Skewness	Ex. kurtosis
Moral	0.493303	0.842225	-0.348009	-1.87889
Age	14.5420	0.396023	1.07431	0.541935
Income	83.8294	0.544347	0.626802	-0.211413
Female	0.440816	0.598006	-1.07747	-0.839063
Employed	0.364456	0.432406	-1.88416	1.55008
Basic	0.500708	0.995725	-0.0114288	-1.99987
Senior	0.418650	1.85478	1.31221	-0.278107
Tertiary	0.288630	3.15689	2.83516	6.03813
Married	0.487460	0.793540	-0.469574	-1.77950

