

UNIVERSITY OF CAPE COAST

THE EFFECTS OF NATIONAL HEALTH INSURANCE SCHEME ON
OUTPATIENT UTILIZATION AND EXPENDITURE IN GHANA:

A CASE STUDY OF MFANTSEMAN MUNICIPALITY

BY

SAMUEL SEKYI

THESIS SUBMITTED TO THE DEPARTMENT OF ECONOMICS OF
THE FACULTY OF SOCIAL SCIENCES, UNIVERSITY OF CAPE
COAST IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR
AWARD OF MASTER OF PHILOSOPHY DEGREE IN ECONOMICS

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DECLARATION

Candidate's Declaration

I hereby declare that this thesis is the result of my own original work and that no part of it has been presented for another degree in this university or elsewhere.

Candidate's Signature: Date:

Name:

Supervisors' Declaration

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

Principal Supervisor's Signature: Date:

Name:

Co-Supervisor's Signature: Date:

Name:

ABSTRACT

Recognizing the potential of Mutual Health Organizations (MHOs) to eliminate user fees and increase utilization of health care services in the country, the government of Ghana enacted the National Health Insurance Act in 2003, mandating the establishment of district-wide MHOs. The purpose of this study was to analyze the effects of the National Health Insurance Scheme (NHIS) on the probability of utilizing outpatient care and expenditure in the Mfantseman Municipality of the Central Region of Ghana.

Data for the study was obtained through a household survey. In all 384 individuals were randomly selected and interviewed. The main research instrument for the study was an interview. Logit regression model was used to analyze the probability of utilizing outpatient care and the determinants of enrolment in health insurance. Again, a linear regression model was used to analyze the impact of NHIS memberships on out-of-pocket health care expenditure.

The study reveals that insured respondents were more likely to utilize outpatient care and pay less than uninsured respondents. Public education should be embarked upon to encourage families to enrol, as the scheme has an impact on poverty. Factors which influence enrolment at the individual/household level were age, sex (male), literacy/education, income and wealth. Policy makers/donors should be aware that it may be difficult to reach the poorest part of the population.

In order to reach them the cost of participation would have to be reduced or the government would have to subsidize the premiums of indigents.

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DEDICATION

This work is dedicated to Sarah Appiah, my dear mother, Dina Asiedua Sekyi, my supportive wife and Fiifi Essel Sekyi, my son.

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ACRONYMS

CHPS	Community-based Health Planning Services
DHMT	District Health Management Team
GDP	Gross Domestic Product
GHS	Ghana Health Service
GLSS	Ghana Living Standards Survey
GPRS	Ghana Poverty Reduction Strategy
HIE	Health Insurance Experiment
MDGs	Millennium Development Goals
MHIS	Mutual Health Insurance Schemes
MHO	Mutual Health Organization
MoH	Ministry of Health
MTHS	Medium Term Health Strategy
NHI	National Health Insurance
NHIC	National Health Insurance Council
NHIS	National Health Insurance Scheme
POW	Programme of Works
SAP	Structural Adjustment Programme
SSNIT	Social Security and National Insurance Trust

CHAPTER ONE

INTRODUCTION

Background of the Study

Health care financing has gained prominence on the global health policy agenda. Low-and middle-income countries face the problem of providing for the health care needs of their population. Shrinking budgetary support for health care services, inefficiency in public health provision, an unacceptable low quality of public health services, and the resultant imposition of user charges are reflective of the state's inability to meet health care needs of the poor (World Bank, 1993).

Meanwhile, current focus on poverty reduction as reflected in the Millennium Development Goals (MDGs) has generated a growing emphasis on the need for health care financing mechanisms that protect the citizens of these countries from the potentially impoverishing effects of health care costs. While the objective of poverty reduction remains a central concern, there has been a shift of focus away from poverty reduction to social risk management. Such is the case because of the growing appreciation of the role that risk plays in the lives of the poor (Holzmann and Jorgensen, 2000). Of all the risks facing poor households, health risks probably pose the greatest threat to their lives and livelihoods. A health shock leads to direct expenditures for medicine, transport and treatment but also to indirect costs related to a reduction in labour supply and productivity

(Asfaw, 2003). Given the strong link between health and income at low income levels, a health shock usually affects the poor the most (Commission on Macroeconomics and Health, 2001; Morrisson, 2002).

The revival of interest in health care financing is due to the realization that new mechanisms are required. In the 1980s and 1990s, cost-recovery or cost-sharing systems that called for contributions from users of public sector facilities, primarily through direct out-of-pocket payments or user fees, were much in the public eye (Akin et al., 1987). However, in recent years, the consensus has grown that prepayment health care financing, whereby people contribute regularly to the cost of health care through tax payment and/or health insurance contributions, provides greater financial protection to households than out-of-pocket health care financing (Preker and Carrin, 2004; World Health Organization, 2000). As a result, health insurance schemes are seen as the most appropriate health care financing mechanism for low-and middle-income countries.

Given the high latent demand from people for health care services of good quality and the extreme under-utilization of health services in several countries, it has been argued that social health insurance may improve the utilization of health care of acceptable quality. Whereas alternative forms of health care financing and cost recovery strategies like user fees have been criticized by many authors (Gilson, 1992), the option of insurance seems to be a promising alternative as it is possible to pool risks, thereby transferring, unforeseeable health care costs to fixed premiums (Griffin, 1992).

There are many obstacles to utilization of health care services in Ghana,

both physical and financial, particularly for the poorest. Utilization levels are very low with about 0.5 outpatient visits to public facilities per person per year. In 1992, the poorest 20% of the population only secured 12% of the benefit of government health care expenditure while the richest 20% of the population secured 33% of the benefit of government expenditure (McIntyre, 2007).

In an effort to promote access so as to improve utilization of health care services, the government of Ghana introduced the Community-based Health Planning Services (CHPS) initiative in the 1990s. Under the CHPS initiative, community health nurses serve as community resident health care providers. They are provided with a compound within the community (built with community donations of land, materials and labour), where they have residential accommodation and facilities for patient consultation. They undertake door-to-door visits to provide health education, family planning, immunizations, antenatal care, supervised delivery, acute care services and monitor health in the community, in addition to seeing patients within their compound. An evaluation of the pilot CHPS project found that the number of health services encountered within the community increased eight-fold and improved immunization coverage. Scaling-up the CHPS initiative was started in 1999, and there were 210 functional CHPS zones by 2005 (Nyonator et al., 2005).

While the CHPS initiative appears to be addressing physical access constraints, financial access remains a serious problem in Ghana. In 2003, government and donor funding accounted for less than 32% of total health care expenditure (with quite a high dependency on donor funding), while 68% was

attributable to out-of-pocket payments (McIntyre, 2007).

Financing health care has gone through different transformation in Ghana. Immediately after independence health care provision was “free” in public health facilities. This meant that there was no direct out-of-pocket payment at the point of demanding health care at public health facilities. Financing of health in the public sector was mainly through tax revenue. This situation continued until 1985 when the government introduced the user fees. While there were initially relatively nominal fees for various health services, cost recovery fees were charged for drugs (leading to the user fee policy being termed the “Cash and Carry” system). Although the poor are meant to be exempted from fees, very few receive exemptions in practice.

In the 1980s, a number of community-based pre-payment schemes otherwise known as Mutual Health Organizations (MHOs) were developed in response to the access obstacles created by user fees. By 2003, there were 168 of these schemes covering about 1% of the population (Atim et al., 2003). Examples of these schemes were Dangme West Health Insurance Scheme (Dangme Hewani Nami Kpee), Nkoranza Community Financing Health Insurance Scheme, Salamba Women’s Health Insurance Scheme, Jaman South Health Insurance Scheme, Agogo Community Health Insurance Scheme, Micro-Care Ghana Health Insurance Scheme, Asutifi Health Insurance Scheme, Gomoaman Health Insurance Scheme, Awo Pa Health Scheme and the like (Aikins, 2003). One of the oldest and most well known community-based schemes is the Nkoranza scheme. The scheme achieved a relatively high population coverage level of 23%

within the Nkoranza District (McIntyre, 2007). While these schemes have provided financial protection against health care costs, particularly for inpatient care, for their members, the poorest households are unable to afford the contributions and so do not benefit.

In recognition of the potential of MHOs to eliminate user fees and increase utilization of health care, the government of Ghana passed the National Health Insurance Act 650 (HI Act) in August 2003. The HI Act mandates the creation of district-level MHOs in accordance with national guidelines and the establishment of a National Health Insurance Council (NHIC). The law represents a bold and innovative move by government to provide health insurance coverage to all of its citizens. This is meant to provide financial protection for the entire population and move away from the “Cash and Carry” system which was creating considerable equity concerns, largely due to the non-functional exemption mechanisms. Although MHOs are becoming more widespread in Africa, the attempt to build a national health insurance scheme based upon the MHO concept is novel.

Furthermore, through the Ghana Poverty Reduction Strategy (GPRS) the government of Ghana has outlined its strategies for dealing with poverty in the country. A major component of the GPRS is to deliver accessible and affordable health care to all residents particularly the poor and the vulnerable in the society. It must be noted that the method of financing health care to a greater extent determines its accessibility and affordability. The “Cash and Carry” system of partly financing the public sector health care delivery poses a financial barrier to the people especially the poor. As a poverty reduction strategy, the government

has established health insurance in the country. The policy framework allows for the establishment of multiple health insurance schemes with a focus on the social-type known as District Mutual Health Insurance to address the needs of the poor (Ministry of Health, 2004). As of May 2008, more than eight million people had enrolled in MHO, which covers more than 42% of the total population (Graphic Communication Group Ltd, 2008). The government of Ghana regards the National Health Insurance Scheme (NHIS) as one of the instruments to reach the MDGs.

Statement of the Problem

Proponents of health insurance schemes argue that they have the potential to increase utilization of health care (Dror and Jacquier, 1999). The results of the few available studies so far are however less optimistic (Bennett et al., 1998; Criel 1998; Atim, 1998). It is argued that often the risk pool is too small, adverse selection problems arise, the schemes are heavily depending on subsidies, financial and managerial difficulties arise and the overall sustainability seems to be not insured (Jütting, 2001).

Whereas these studies are important contributions to our knowledge about the strengths and weaknesses of the schemes in general, the context in which these schemes have been introduced and the objectives of the schemes themselves have not been given enough attention. Also, the potential social benefit of the schemes, that is their impact on utilization of health care, labour productivity and the risk management capacity of the household has been largely ignored. It is

within this context that this study would analyze whether health insurance improves utilization of outpatient care in Ghana.

The entire study would handle the following questions: What are the effects of health insurance scheme on the utilization of outpatient care comparing members and non-members? Does enrolment in a health insurance scheme provide protection against the financial risks associated with illness? What are the levels of illness-related out-of-pocket expenditures among members and non-members of health insurance scheme? Does enrolment in a health insurance scheme have any effect on out-of-pocket expenditures? Which household and personal characteristics are associated with enrolment in health insurance scheme in Ghana?

Objectives of the study

The general objective of this study is to analyze the effects of NHIS on outpatient utilization of health care services and expenditure. The specific objectives of this study are to:

1. Assess the impact of NHIS membership on outpatient utilization.
2. Analyze the impact of NHIS membership on out-of-pocket health care expenditures.
3. Determine the factors that influence enrolment in NHIS at the individual level.

4. Investigate the effects of household and personal characteristics of household head on enrolment in health insurance scheme (social inclusion).
5. Derive policy recommendations.

Research Hypotheses

1. H_0 : “Membership of NHIS” does not influence outpatient utilization of health services.
2. H_0 : “Membership of NHIS” does not influence out-of-pocket health care expenditures.
3. H_0 : Members of NHIS are more likely to utilize outpatient care and then pay less at the point of utilizing health care services than non-members.
4. H_0 : Sex, age, literacy, income, and wealth do not jointly influence enrolment in NHIS at individual level.
5. H_0 : Household and personal characteristics (Sex, age, education, employment, income, and wealth) of the household head do not influence enrolment in NHIS.

Justification of the Study

Studies on health insurance schemes face the important limitation that most of them are not based on household data and/or rely solely on qualitative methods of investigation. In addition, these studies usually look at the impact of schemes on the health care providers or the insurance scheme, largely neglecting

the effects on the members. It is against this background that this study aims at contributing to filling this gap in the current body of evidence by applying rigorous quantitative methods to household level data in Ghana to analyze the effects of health insurance on utilization of outpatient care and individual out-of-pocket spending on care.

The study would also contribute to the existing empirical literature on the effects of health insurance scheme. We hope that our findings would provide further investigations into health insurance schemes.

Scope of the Study

The study seeks to analyze the effects of NHIS on outpatient utilization and expenditure among individual respondents selected from some communities within the Mfantseman Municipality in the Central Region of Ghana.

Chapter Organization

The study is organized into six chapters. Chapter One covers introduction, which is made up of background of the study, statement of the problem, objectives, research hypotheses, justification of the study, scope of the study, and chapter organization. The profile of the health sector in Ghana constitutes Chapter Two. The review of relevant theoretical and empirical literature of this study constitutes Chapter Three. Chapter Four describes the methodology, including an overview of data collection technique, a description of the study site, econometric considerations and details about key variables. Chapter Five discusses empirical

results. Chapter Six presents the summary, conclusions, policy implications, limitations of the study and the direction of future research.

Summary

Increasing the access of Ghana's population to health care is one of the formidable challenges facing the government. During the 1980s and 1990s, government of Ghana, with the endorsement of the international and bilateral donor partners, implemented health sector reforms intended to improve the efficiency of health systems and the quality of care. These reforms included the introduction and consolidation of cost-recovery mechanisms, in particular out-of-pocket payment at the time of consuming health care services (user fees). The introduction of user fees termed "Cash and Carry" had the effect of decreasing the poor's utilization of health care services.

In an attempt to increase access and improve the quality of basic health care services, the government of Ghana passed the National Health Insurance Act 650 (HI Act) in August 2003. It is therefore worth examining whether the introduction of the National Health Insurance Scheme has improved health care utilization in Ghana. At this stage one may ask which institutions are involved in health care delivery in Ghana. What has been the policies and programmes adopted by governments to improve health care utilization? The next chapter discusses these and other related matters.

CHAPTER TWO

OVERVIEW OF THE HEALTH SECTOR IN GHANA

Introduction

The main reason for this chapter is to review literature on the health sector in Ghana. The chapter first reviews the various organizations involved in health care delivery in Ghana. Also, the chapter examines health policy and structural reforms, health status indicators, evolution of health care financing in Ghana, and the introduction of National Health Insurance Scheme.

Ministry of Health

The Ministry of Health (MoH) is primarily responsible for policy formulation, mobilization of resources, monitoring and evaluation of health services. The Ghana Health Service and Teaching Hospitals are responsible for the implementation of the MoH's policies in relation to agreed norms, standards and outputs. The statutory bodies are responsible for regulating all providers of health care. The Ghana Health Service, the Teaching Hospitals and the Statutory Bodies report directly to the Minister for Health (Ghana Health Services and Teaching Hospitals Act, Act 525).

The MoH provides various forms of support to the Teaching Hospitals, Statutory Bodies and The Ghana Health Service. The functional divisions of the

MoH include Finance and Policy Planning, Monitoring and Evaluation (PPME) Divisions. Planning and Budget, Health Research, Monitoring and Evaluation and The Private Sector Units are the various units under PPME. The Private Sector Unit is mainly responsible for coordinating private sector activities and facilitating policy dialogue at the national level. As a result, the MoH relates to the private sector in health through the Private Sector Unit, the Statutory Bodies and the Ghana Health Service.

The Ghana Health Service

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 establishment of the GHS 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.

The GHS is headed by the Director General who is assisted by Regional Directors of Health Services. The Regional Directors of Health Services are also assisted by District Directors of Health Services. As part of the decentralization of the health sector as a result of the health sector reforms, the District Directors of Health Services have oversight responsibilities for Private Health Care Providers operating in their respective districts. As one of the critical sectors in the growth

and development of the economy of Ghana, the main mission of the health ministry, its departments and agencies, is to improve the health status of all people residing in Ghana through the development and promotion of proactive policies for good health and longevity; the provision of universal access to basic health services and provision of quality health services which are affordable and accessible. These services are intended to be delivered in a humane, efficient, and effective manner by well-trained, friendly, highly motivated and client-oriented personnel.

Teaching Hospitals

Ghana has two teaching hospitals namely the Korla-Bu and the Okomfo Anokye hospitals. The Teaching Hospitals are headed by Chief Executives who report to their respective boards. The Teaching Hospital Boards were set up as a result of the passing of the Hospital Administration Law, 1988 (P.N.D.C. Law 209) to oversee the administration of the hospitals. The objectives of the Teaching Hospitals as determined by the Ghana Health Service and Teaching Hospitals Act 1996 include:

1. Provision of advanced clinical health services to support the health services provided by the Ghana Health Service;
2. Training undergraduate and post-graduate students in the medical profession; and
3. Research into health issues for the purpose of improving the health condition of people in the country.

Statutory Bodies

Basically, there are five statutory bodies in the health sector that are responsible for the regulation of providers (private and public). These bodies keep registers of duly registered professionals within their respective sectors and ensure that the training institutions in the country maintain their set standards. The profiles of these bodies are the Medical and Dental Council, the Pharmacy Council, Private Hospitals and Maternity Home Board, the Nurses and Midwives Council and the Food and Drug Board. The statutory bodies are directly responsible for regulating the operations of the private health care providers in the country.

The Health Care Structure

The health sector in Ghana could be classified into two namely public and private sectors. The government through the MoH and GHS runs the public sector. The organization of the public health sector is decentralized, with district hospitals carrying considerable management responsibility and teaching hospitals functioning as autonomous institutions. Also, management of the public sector is organized hierarchically with national, regional, district and sub-district management teams. Added to this, the MoH is solely responsible for policy, monitoring and evaluation and similar functions since health service provision responsibilities were delegated to a separate organization, the GHS in 1996. The public sector facilities form 47.6% of all facilities (Ghana Ministry of Health, 1997).

Private health care organizations are of two types namely the private not-for-profit and the private for-profit. The non-profit organization can be further divided into two categories: church facilities and other non-governmental organizations (NGOs). The private for-profit sector is made up of allopathic practices (medical, nursing, midwifery and medical laboratories), drug outlets and traditional practices. It must be noted that the drug outlets also form part of the private sector. These range from pharmacies to drug stores who sell drugs in the open market. It is estimated that private for-profit facilities include 140 hospitals, 910 clinics, 108 company clinics, and nearly 400 maternity homes. Also, approximately 2,400 midwives, 1,400 state registered nurses, 570 medical specialists and 930 generalist doctors work in the private sector, although some of these health workers engage in dual government and private sector work (McIntyre, 2007).

Traditional Health System

The health sector review report (1999) estimates that about one third of Ghanaians use formal health sector services, leaving two-third to the informal health system which usually consists of the traditional medical practitioners. Basically, there are two types of the traditional medical practitioners namely herbalists and spiritualists. The herbalists include bonesetters and Traditional Birth Attendants (TBAs). TBAs are an important group of practitioners in the health care systems in Ghana and form part of the Primary Health Care (PHC) strategy of 1978. They receive training from the public health sector and their

output is included in the statistics for maternal services. The practices of the herbalists sometimes include spiritual rituals. Spiritualists see bodily ailments as manifestations of the spiritual beings and depend highly on rituals. A new breed of spiritualists called the faith healers who combine Christian or Muslim rituals with traditional beliefs to treat the sick is a new addition.

Health Policy and Structural Reforms

In recent years, there have been major policy and structural reforms in the health sector. These reforms are in line with the country's aspirations expressed in "Vision 2020" and linked with other sectors to make Ghana a middle income country by the year 2020 (Ghana Ministry of Health, 1999).

The Ghana Poverty Reduction Strategy (GPRS) has outlined strategies for dealing with poverty in the country. A major component of the GPRS is to deliver accessible and affordable health care to all residents particularly the poor and the vulnerable in the society.

GPRS highlighted three priority interventions that needed to be planned for in the 2002-2006 Programme of Work of the Ministry of Health. These are as follows:

- (i) Bridging equity gaps in access to quality health services,
- (ii) Ensuring sustainable financing arrangements that protect the poor,
- (iii) Enhancing efficiency in service delivery.

In order to bridge the equity gaps in health care, the following direct interventions were suggested. Resource allocation criteria and a facility

distribution plan were to be developed to improve targeting of poor groups and geographical areas. In addition, there will be redistribution of health workers in favour of deprived areas. Provision of outreach services and clinics in deprived rural and peri-urban areas, especially in northern Ghana, was to be a priority for the period. The intention is to achieve by the end of the planned period, a “good” quality or “model” health centre for each district.

As the basis of reaching the poor in the short term, measures were to be put in place for improvement of the exemption policy to ensure coverage of obstetric emergencies and life threatening pregnancy related conditions, mortality due to childhood diseases and effective ways of reaching poor elderly citizens. In the medium term, exemption policy was to be harmonized with the proposed health insurance scheme to protect the poor. Government was to phase out the “Cash and Carry” system and replace it with a more humane and effective system of financing health care.

Government’s share of the budget for providers of basic services for the poor, especially at the district level and below was to be increased and the institutional, legal and financial framework established for effective partnership with *not-for profit* and private providers. To further protect the poor in deprived areas, a low acceptable rate of payment was to be fixed for outpatients and inpatients at the sub-district and district levels in the Central and the three northern regions.

The GPRS focuses on standardizing the quality of basic health care to ensure that wherever one is in the country, one has access to good quality health

care. Strategies that ensure availability of health workers especially in deprived regions include: provision of financial incentives, accommodation, opportunities for career development and expanding enrolment in training institutions in deprived regions.

To further enhance efficiency in service delivery, human resource management was to be decentralized to the regional level. Staff and resources were to be provided to expand community-based health service delivery and collaboration with informal providers was to be strengthened, particularly in the three northern and central regions.

The strategy for improved health care in Ghana under GPRS, envisaged increasing total health expenditure as percentage of the total government expenditure from about 5% in 2000 to about 7% in 2004 and 7.5% in 2005 (National Development Planning Commission, 2003). This increased expenditure, which was likely to guarantee a per capita health expenditure equivalent to \$10, was too low to bring Ghana anywhere near the internationally recommended levels of about \$30-40 per capita expenditure necessary to cover the costs of a basic minimum package of preventive and curative services. The Ghana, Macroeconomic and Health Initiative (GMHI) report recommends in the short term increasing government spending on health for the 2003 to 2007 financial years to the level that would raise the contacts for preventive and curative care from 0.34-0.44 OPD visits/ per-capita/year to 0.75 OPD visits/capita/year or raising the health expenditure per capita per year to around \$20 by 2007. Table 1 shows health care targets as expressed under GPRS.

Table 1: Health Care Targets under GPRS

Health Care Target	2000*	2005
% Total government expenditure on health	5.7%	7%
% Recurrent spending on sub districts	21%	30%
% Capital spending on sub districts		15%
Proportion of people consulting qualified health personnel when ill	30%	50%
At least 10% increase in amount budgeted for exemptions from fees	¢12bn	¢13.2bn
Per capita OPD attendance at public facilities	0.49	0.55
Uptake of antenatal care	96%	98%
Post-natal care coverage	52%	58%
DPT 3 coverage	75%	90%
Proportion of supervised deliveries	49%	55%
Ratio of population per nurse in Northern: Greater Accra	4:1	3:1
Ratio of population per doctor in Northern: Greater Accra	5:1	4:1

*Data for 2000 or most recent year

Source: National Development Planning Commission

Under GPRS II, effort is made by government in order to accelerate access to quality health services. As a result, the health sector will continue to deepen efforts and focus on the following three broad policy objectives:

- (i) Bridge equity gap in access to quality health and nutrition services;
- (ii) Ensure sustainable financing arrangements that protect the poor;
- (iii) Enhance efficiency in service delivery.

Strategies to be implemented in order to bridge the equity gap with regard to access to quality health and nutrition services include: develop “close to client” services to the poor; develop resource allocation criteria and a facility distribution plan to improve targeting of poor groups and geographical areas; redistribute health workers in favour of deprived areas; provide outreach services and clinics in deprived rural and peri-urban areas; improve CHPS; develop and implement high impact yielding strategies for Under 5 Mortality (U5M) and malnutrition; including scaling-up the successful Accelerated Child Survival and Development (ACSD) interventions; develop at least one fully functioning and well equipped hospital in each district etc.

Strategies to be adopted to ensure sustainable financing arrangements that protect the poor include: accelerate the implementation of the NHIS including the exemption policy through guided introduction of district MHIS, fix low acceptable levels of payment for the poor. The exemption policy will be strengthened to enhance access of poor and vulnerable groups to health care by improving the eligibility criteria, procedures, public awareness and responsiveness of the health service facilities.

Strategies to strengthen efficiency in service delivery include: expand pre-service health training institution facilities to increase intakes of trainees; providing incentive schemes to support the retention and redistribution of trained health personnel; decentralize human resource management to the regional level; strengthening systems for accountability in health service delivery; collaborate

with informal health service providers, expand community-based health service delivery; improve the quality of traditional health service delivery system etc.

The health sector has developed a MTHS which is accompanied by Programme of Works (POW) with specific targets to be achieved. Financing decentralization has been made possible with the establishment of Budget and Management Centres (BMCs) in the districts, sub-districts and health institutions. Donors have agreed on a sector-wide approach in the country so as to achieve common goals accompanied by common monitoring mechanisms. This is seen as a major departure from the numerous projects ran by donors in the past years. The GHS and Teaching Hospital Board had been created to allow for more flexibility in service delivery.

The annual programmes of work are built on an overall five year programme of work (5YPOW). The first 5YPOW ran from 1997 to 2001. In analyzing the health of the country, the 5YPOWI identified several challenges as constraints to improving the health status in the medium term. These include geographical access, access to basic services, financial access, inadequate service quality, inadequate funding of health services, inefficient allocation of resources and poor linkages between communities, inter-sectoral and private sector. The MTHS underlines the objectives, targets and priority health interventions, of which the relevant ones for health financing are increasing geographical and financial access to basic services and also increasing overall resources in the health sector, equitably and efficiently distributed.

One of the strategies under POWI is to look at access in general and

encompasses exploring “new pricing initiatives” under which “the exemption policy will also be revised, to aid the poor and priority group”. But, the actual implementation of the exemption policy has been tainted with problems, and its revision to some extent has been elusive. Moreover, POWI did not consider the emerging pre-paid financing strategies—health insurance schemes, mutual health organizations and health credit schemes (Aikins, 2003).

The second 5YPOW which ran from 2001 to 2006 was an integral part of the GPRS. It recognized that improving the health of the poor is crucial in reducing poverty. Therefore, one of its priority areas was to ensure sustainable financing arrangement that would protect the poor. As a result, POWII recognizes improving financial access as vital in its areas of intervention. This was to ensure that financial barriers do not limit access to health care services and also to develop community prepayment schemes/health insurance plans to replace the “Cash and Carry” system in both formal and informal sectors of the economy. Other priority areas of the POWII were bridging equity gap in access to quality health and nutrition services and enhancing efficiency in service delivery.

The third 5YPOW will run from 2007 to 2011. POWIII recognized the need to move from curative health care to promotion of health and prevention of diseases. The theme of the POWIII is “creating wealth through health”. This theme attempts to identify the link between poverty and health and how healthily lives could be a source of wealth creation. The POWIII is also placed within the context of the GPRS, National Health Insurance Scheme and what the health sector ought to do to achieve the MDGs (Ghana Ministry of Health, 2007).

The Health Status

Table 2: Health Indicators for Ghana

Health Indicator	1988	1993	1998	2003
Infant Mortality Rate (per 1000 live births)	77	66	57	64
Under 5 Mortality Rate (per 1000 live births)	155	119	108	111
Neonatal Mortality Rate (per 1000 live births)	44	41	30	43
Post-Neonatal Mortality Rate (per 1000 live births)	33	26	27	21
Crude Birth Rate (per 1000)	47	44	39	33
Crude Death Rate (per 1000)	17	12.5	10	10
Life Expectancy at birth (in years)	54	55.7	57	58
Total Fertility Rate	6.4	5.5	4.6	4.4

Source: Ghana Statistical Service

Generally, the health of Ghanaians is improving even though the improvement had occurred at a low pace. Since independence in 1957, more infant and children are surviving, and people are living longer. For instance, between 1957 and 1998, infant mortality rate has decreased from 133 to 61 and life expectancy has increased from 45 to 55 years (Ghana Ministry of Health, 1997). The country has also recorded progress in the control of vaccine preventable diseases such as poliomyelitis, measles, diphtheria and tetanus. Table 2 shows some health status indicators for the country.

Even though the health status indicators in Ghana are slightly above average compared to the Sub-Sahara Africa and low-income countries averages,

Ghanaians still bear a large burden of ill-health. Malaria continue to be the leading cause of ill-health and premature death, especially among children under five years and pregnant women. In 2002, for instance, malaria was estimated to account for 44.5% of all outpatient illnesses, 36.9% of all admissions and 13.2% of all deaths in health facilities in the country. The disease is responsible for a substantial number of miscarriages and low birth weight babies among pregnant women. Among this group, malaria accounts for 13.8% of OPD attendance, 10.6% of admissions and 9.4% of deaths (National Development Planning Commission, 2005).

Apart from the health consequences of malaria, the disease also puts heavy burden on economic development. It is estimated that a single bout of malaria costs a sum equivalent to over 10 working days in Africa. In Ghana malaria accounts for significant portion of the disease burden, causing about 10.6% of lost Disability Adjusted Life Years (DALY) and costing an equivalent of about 3% of Gross Domestic Product (GDP) annually in economic burden (National Development Planning Commission, 2005). According to a news paper publication, treatment of malaria in 2007 cost \$772.4m which was the nation's entire health budget for 2008 and also amounted to 10% of GDP for the year 2006 (Graphic Communication Group Ltd, 2007)

In addition to the malaria menace, HIV/AIDS pandemic at the prevalence rate of 3.4% has a negative impact on productivity (National Development Planning Commission, 2005). It results in loss of productive assets, high treatment costs and the break in the transfer of valuable livelihood knowledge from one

generation to the next. Meanwhile, maternal, infant and child mortality are still very high while non-communicable diseases are on the increase mainly due to lifestyle changes and nutrition. Also, infectious diseases and injuries, particularly from road traffic accidents are increasing.

Evolution of Health Care Financing in Ghana

Ghana's independence in 1957 brought about among others "free" health care for all Ghanaians. This meant that there was no direct out-of-pocket payment at point of consumption of health care. Financing of health care was mainly done through tax revenue and donor support. However, with the decline in the economy in the 1960s and 1970s sustaining "free" health care became a problem. As a result, in 1969 user fees was introduced at public health facilities in the country (Ministry of Health, 2003).

In the 1980s, cost recovery programmes were implemented as part of the World Bank financed macro economic policies of Structural Adjustment Programmes (SAP). This became necessary because the health sector was beset with deteriorating health infrastructure, falling standards of quality care and budgetary constraints. With the objective of raising additional revenue and improving efficiency so as to prevent frivolous use of health care facilities, the government in 1985 increased the user fees substantially. It must be noted that, fees were charged for all medical conditions except some communicable diseases. The payment mechanism put in place was termed "Cash and Carry".

The introduction of the user fees resulted in the decline in utilization of

health services in the country, thereby creating financial barrier to health care access especially among the poor. For instance, 1985 the year in which user fees were substantially increased outpatient visits decreased from 4.5m to 1.6m. In one region, it was found that urban utilization fell by more than 50% one year after the increase in fees (Lund, 2003). Furthermore, it was estimated that out of the 18% of the population who required health care at any given time, only 20% of them were able to access it. This implied that almost 80% of Ghanaians who needed health care could not afford it (Ghana Statistical Service, 2000).

Evidence from other countries suggest that cost recovery policies had caused a significant low utilization of health services especially by the poor, excluding them from access to basic health care (Watkins, 1997). A 1999 MoH report estimates that about 40% of the population does not have physical access to health services while the remaining 60% who have physical access are constrained by poverty and socio-cultural norms from having access to these services.

To cushion the burden of out-of-pocket payment for health care services as a result of the user fees, the government introduced an exemptions policy. The policy exempted children under the age of 5, prenatal care for pregnant women, and health care services for the indigent, the elderly (those above 70 years), and for disease-specific services. However, implementation problems at the district level meant that a significant number of clients who qualified for exemptions continued to face barriers in accessing basic health care. For example, in some hospitals, decision making was decentralized and exemptions practices were

inconsistent, so that exemptions would be granted for some but not all services (Sulzbach et al., 2005).

These problems prompted some health care facilities, mainly mission hospitals, to introduce insurance schemes managed jointly by the facility and the community as a strategy to avoid the problems associated with paying for services at the point of care (i.e., user fees). Schemes such as Nkoranza and Dangme West were established in the early 1990s and became models for other communities to replicate. The subsequent growth in MHOs in Ghana was noteworthy. Whereas 47 MHOs existed in 2001 (Atim and Sock, 2000), this number tripled to 159 by 2002, and it continued to rise to 168 by 2003. However, less than 40% of MHOs were functional at that time, and the combined total coverage they extended to the population was just 1% (Atim et al., 2003).

Recognizing the problems that the “Cash and Carry” system posed to accessing health care services, the government of Ghana declared its intention to abolish the system, and began exploring the feasibility of introducing a national health insurance scheme.

Introduction of National Health Insurance Scheme

To mitigate the negative effects of the “Cash and Carry” system, especially its effects on the poor, the government commissioned various studies into alternative health care financing mechanisms, principally insurance-based ones. Initially, a lot of efforts were put into examining whether or not a National Health Insurance Scheme (NHIS) is feasible. Proposals to set up and run a NHIS

have been on the policy agenda for a very long time. Since the early 1980s, various experts both local and international have been contracted by the MoH to study and make recommendations for setting up a national health insurance scheme. Upon the request of the MoH, organizations such the International Labour Organization (ILO), World Health Organization (WHO), European Union (EU) and London School of Hygiene and Tropical Medicine have all visited the country and provided technical advice.

In August 1995, the MoH received definite proposal from a private consultancy group in a report entitled “A Feasibility Study for the Establishment of a National Health Insurance Scheme in Ghana”. The study proposed that a centralized National Health Insurance Company should be set up to provide a compulsory “Mainstream Social Insurance Scheme” for (i) all contributors to the Social Security and National Insurance Trust (SSNIT) and (ii) all registered cocoa farmers. Also, the report recommended pilot “rural-based community financed schemes” for the non-formal sector but gave no further details as to how the MoH was to do this (Aikins, 2005).

In 1997, the NHIS pilot project was formally launched in the Eastern Region intended to cover four districts namely; New Juaben, Suhum/Kraboah/Coaltar, Birim South and Kwahu South. The objectives were stated in the presidential sessional address of the year 1997 as:

...the national health insurance scheme will contribute to resolving the cost of health care. This year, a pilot insurance scheme will be implemented in the Eastern Region to test the work done so far. Its

performance will be studied, as well as the performance of existing rural health insurance scheme ...so that problems can be identified and eliminated before implementation begins on a national scale.

As a result, a NHIS Secretariat was established to undertake the preparatory work and carry out the NHIS programme. This Secretariat prepared the grounds for nationwide coverage of the pilot schemes by providing public educational materials such as brochures and pamphlets.

Soon after, the implementation of the pilot scheme stalled amid some debates about the strategic direction of health financing policy generally and the pilot scheme in particular. There was no consensus among the technocrats at the MoH about a government-run insurance scheme, and it seemed no need that it was only a small minority of them that favoured such a strategy (Atim and Sock, 2000). However, government still recognized the problems associated with the “Cash and Carry” system, and has made its intention clear to abolish the system by replacing it with health insurance. This method of financing health care took cognizance of the fact that a successful health insurance scheme is dependent on the willingness of individuals to subscribe to it and also the attractiveness of the benefit package. Thus, the implementation of the health insurance programme would be a gradual process (Akor, 2002).

In 2003, the ‘National Health Insurance Act’ was passed to operationalise the policy decision to move from user fees towards a pre-payment financing mechanism. Therefore, the government wanted to use health insurance as one of the methods of financing health care in the country. The health insurance scheme

is expected to bring at least 20% of the health bill to the public sector, just as the “Cash and Carry” is contributing. This means that the government will still continue to provide at least 80% funds for the health sector (Lund, 2003).

The NHIS is designed to incorporate those in the formal and informal employment sectors into a single insurance system. The government is committed to universal coverage under the NHIS. However, the government of Ghana recognizes that coverage need to gradual and the aim is to achieve enrolment levels of about 60% of residents in Ghana within 10 years of the implementation of the NHIS.

The aim of health insurance is to spread the risks of incurring health care costs over a group of subscribers. Hence, the larger the subscribers the lower the risk burden on the individual and vice versa. The vision is to assure equitable universal access to quality basic package of health services to all residents in Ghana without being required to pay out-of-pocket at the point of consumption of service. The long-term policy objective for introducing health insurance is for every resident of Ghana to belong to a health insurance scheme that adequately covers him or her. Thus the design of the NHIS is based on the following principles; equity, risk equalization, cross-subsidization, quality care, efficiency in premium collection and claims administration, community or subscriber ownership, partnership and reinsurance (Ministry of Health, 2004).

The basis of the NHIS is district-wide “Mutual Health Insurance Schemes” (MHIS) in each district. The Act explicitly requires every Ghanaian to join either a MHIS or a private mutual or commercial insurance scheme.

However, government subsidies is provided for those belonging to the district MHIS, thus creating an incentive for people not to “opt out” from the integrated national health insurance system by purchasing coverage through private insurance organizations.

To mobilize additional funds to support the implementation of the district MHIS, the government of Ghana instituted a National Insurance Levy of 2.5% on specific goods and services. This is intended to subsidize all fully paid contributions to the district health insurance schemes. In addition, 2.5% of the 17.5% social security contributions paid by formal sector employees. Those in the informal sector are expected to make direct contribution based on one’s ability to pay. For the informal sector, community health insurance committees are to identify and categorize residents into social groups to enable individuals in each group pay in line with ability to pay. Children under 18years whose parent(s) or guardian(s) pay their contributions and the elderly are exempted from paying any contribution. By law, the core poor or indigent are exempted from contributing to any district MHIS. In order to identify the core poor, an efficient social grouping validation is put in place in all districts/sub-metro to ensure that the real core poor is listed for government to pay their contributions from the National Health Insurance Fund. However, in practice it has proved difficult to distinguish between income groups, as a result most districts MHIS are charging a single flat rate, usually the minimum contribution.

The NHIS provides a relatively comprehensive benefit package. The government has come out with a minimum benefit package of diseases which

every district-wide scheme must cover. This package covers about 95% of diseases in Ghana. Diseases covered include among others malaria, diarrhoea, upper respiratory tract infection, skin diseases, hypertension, diabetics, asthma, and a host of other diseases. However, all district-wide schemes have the right under the law to organize their schemes to cover many diseases and services as they desire, provided it is approved by the National Health Insurance Council (NHIC). However, certain diseases are excluded from the benefit package. This is so because these diseases are too expensive to treat. Currently, services that are not covered include: appliances and prostheses (optical aid, hearing aid, dentures etc) beautification surgery, supply of AIDS drugs, treatment of chronic renal failure, heart and brain surgery, medicines not on the essential drug list (EDL), VIP ward (accommodation) etc. The diseases which are not covered constitute about 5% of the total number of diseases that attack most Ghanaians.

Under the HI Act, local district assemblies have the responsibility for initiating the district MHIS. Specifically, district assemblies are tasked with promoting the schemes, identifying human resources to provide technical support for the establishment of the schemes, and carrying out social mobilization. The district MHIS are mandated to operate exclusively for the benefit of their members.

The HI Act provides the legislative framework for the establishment of a regulatory body, the National Health Insurance Council (NHIC). The role of the NHIC is to register, license, and regulate health insurance schemes and to accredit and monitor health care providers operating under the schemes. Also, the NHIC

educates the public on issues related to health insurance and resolve complaints that arise from insurance schemes, members or providers. It plays a key role in guiding implementation efforts and management of the National Health Insurance Fund.

Summary

The MoH is mainly responsible for policy formulation, mobilization of resources, monitoring and evaluation of health services in the country. However, institutions that are directly involved in health care delivery are the Ghana Health Service, the Teaching Hospitals, Statutory Bodies and the traditional medical practitioners.

In order to deliver accessible and affordable health care to all residence in Ghana particularly the poor and the vulnerable in the society, various policies and programmes have been implemented. Notable among them are GPRS and the Five Year Programme of Work (5YPOW). The introduction of the NHIS is seen by many as a bold decision taken by government to improve utilization of health care in the country. Proponents of NHIS argue that it has a positive effect on health services utilization and reduce out-of-pocket payments. Does NHIS affect health care utilization and health? What does the literature say? These questions would be answered in the next chapter.

CHAPTER THREE

LITERATURE REVIEW

Introduction

This chapter is developed with the motive of reviewing past works so as to get theories and empirical evidence to support our study. The chapter is divided into two parts. The first part takes a look at the theoretical literature on health care demand and health insurance. The final part reviews empirical works by other authors in the area of health insurance worldwide.

Theoretical Literature

From health economics perspective, there are, in principle, two alternative views on the demand for health care. The first view is that the individual demands care as an input into her production of health (Grossman, 1972). This view which is often referred to as the Grossman model suggests that the demand for health care is a derived demand in the process of investment in health capital. Thus, the model views health care as an input along with other health inputs such as nutrition and personal exercise. Specifically, the model views the individual as the sole decision maker as to if and how much health care to use.

The key innovation in the Grossman model was that he described the demand for health and health care through the theory of human capital. Health

was to be viewed as a dimension of human capital, similar but not identical to education. The model goes beyond traditional demand analysis in the following ways: First, consumers do not want medical care *per se*, but health itself. Medical care is a derived demand for an input to produce health. Note that consumers do not value health above everything else. Second, the consumer does not purchase health from the market but instead produces it, spending time upon health improving activities as well as purchasing medical inputs. Third, health is a capital good—it lasts for more than one period—it depreciates but not instantly. Thus

$$H_t = H_{t-1} + I - \delta$$

Where: H_t = stock of health; H_{t-1} = Initial endowment of health; I = Investment in health and δ = health depreciation. Lastly, health is both a consumption and investment good. That is consumption good because it is valued because it makes people feel better. Also, health is desired as an investment good because good health enhances earning capacity.

However, over the past decade, the Grossman model of the demand for health has been challenged by a complementary view that sees the demand for health care within a principal-agent framework (Zweifel and Breyer, 1997). In this view, the individual decides if and when to seek health care while the provider of the services decides how much care to use once the first decision has been taken. Sarma and Simpson (2006) criticized the Grossman model on the bases that many of its predictions were not supported by empirical evidence. Depending on the particular view of the demand for health care that one adopts,

the methods for analyzing the effect of for instance health insurance on the demand for care will vary.

The role of health insurance in health care financing could be seen in two ways: Firstly, to raise revenues for health care services; Secondly, to pool resources so that health risks could be shared among members of a health insurance scheme (Folland et al., 2004). Given the uncertainty with which ill health affects a given individual in the population, risk sharing is both an equitable and an effective way of financing health care. Indeed, important policy outcomes of health insurance are to improve access to care and to reduce individual spending at the time of use, which is particularly important for those with limited ability to pay. By bringing the direct price of health care down, consumption of care is expected to increase, other things being equal. However, the extent to which this occurs in any given context is an empirical issue, given other factors, such as indirect costs, that may still impede access to care by some groups of the population.

Generally, health insurance is treated as a consumer good whose value lies in smoothing consumption across risky states. Adverse selection and moral hazard play important roles when modelling demand for health insurance. Adverse selection refers to the case where individuals differ according to their risk (of ill health) and when faced with the same menu of insurance options, riskier persons are more likely to purchase insurance or purchase higher coverage since the expected benefits are greater (Rothschild and Stiglitz, 1976). It is expected that individuals with worse health are more likely to purchase insurance *ceteris*

paribus since they have greater expected use of the health care facilities and greater health related expenditure. In the absence of knowledge about the risks of illness in different population groups, insurers may be compelled to charge a uniform premium that is likely to be higher than people in low-risk groups are willing to pay. This may lead to an upward movement of the premiums, making them unaffordable to many, including even the high-risk individuals. This explains why there is a general lack of market for health insurance in sub-Saharan Africa (Odwee et al., 2006).

Simple models of self-selection support this intuition (Chiappori and Salanie, 2000). For instance, in models with two type of risk, a separating equilibrium would show that insurance contracts taken up by low-risk individuals have low premiums and high co-payments as opposed to the contracts chosen by high-risk types, characterized by high premiums and low co-payments. These models also predict the likelihood of incomplete markets in equilibrium since the low-risk individuals may be driven out of the market. This situation occurs when we have universal public insurance system. Low-risk types may prefer the public system as opposed to a private contract offering incomplete insurance (Vera-Hernandez, 1999).

Moral hazard effects occur after the purchase of insurance and refer to the consumers' change of behaviour in such a way as to alter the distribution of probabilities across health states. Individuals who are insured have lower costs in the ill health states and take fewer precautions or invest less in preventative measures. That is, the insured's demand for health care is sensitive to the

excessive demands for medical attention. If insurers do not make adequate allowances for such behaviour, premium may be too small to cover treatment cost. This definition follows the general microeconomic treatment of moral hazard rather than the alternative definition given by Pauly (1968) which is often used in the health economics literature. It must be noted that adverse selection and moral hazard are not the subject of this study.

The conventional theory of health insurance has held that becoming insured acts like a reduction in the price of health care, just as if the price reduction had occurred exogenously in the market. Newhouse (1978) writes:

For the purpose of studying the relationship between health insurance and demand, the important point is that insurance is like a subsidy to purchase medical care; that is, it lowers the per-unit price of care. Although there is an income effect caused by premiums or taxes paid to finance the insurance benefits, these income effects can be shown to be empirically negligible in their effect on the demand for care....

According to this theory then, the mechanism by which insurance is financed can be ignored because the effect of premiums on the demand for medical care—an income effect—is empirically negligible.

Because of this theory, many health economists have focused on policies that would reduce consumption at the margin. For example, Feldstein (1973) argues that the tax subsidy for employer-based health insurance has resulted in American families spending too much on health care. He concludes that raising the coinsurance rate from 33% to 67% would increase society's welfare. Others

(e.g., Manning and Marquis, 1996; Feldman and Dowd, 1991) have drawn similar conclusions.

In viewing insurance as a price effect, however, the origins of the insurance contract as a vehicle for transferring income to the ill have been overlooked. The prototypical insurance contract is a voluntary *quid pro quo* exchange where many consumers pay a premium in exchange for a claim on the pooled premiums, contingent on becoming ill. The smaller the probability of illness, the smaller is the premium that each purchaser of insurance must pay for any given payoff if ill. The difference between the payoff and the premium is a transfer of income from those who remain healthy to the person who becomes ill. Health insurance is purchased to obtain this income transfer when ill. For example, for a payoff of \$10,000 if ill, the fair premium would be \$10 if the probability of illness were 1/1000, but \$5,000 if the probability of illness were 1/2. The income transfer is \$9,990 in the former case, and \$5,000 in the latter.

As a result of this income transfer those who become ill purchase more health care (and other goods and services) than they would without insurance. For example, they may purchase an extra day in the hospital to recuperate, or they may purchase an expensive life-saving procedure that would otherwise be unaffordable. This additional health care is the income transfer effect of insurance. But because of the problems with verifying illness, fraud, and the complexity of writing contingent-claims contracts, the payoffs in actual private health insurance contracts occur through a reduction in the price of health care. Thus, of the additional health care purchased, that is, of the moral hazard, a

portion is an opportunistic response to the reduced price, but a portion remains the original intended response to the income transfers.

The principal goal of insurance, as assessed by economists, is to transfer resources from low marginal utility of income states to those where the marginal utility of income is high. If insurance is actuarially fair, this process will continue until the marginal utility of money is constant across states. When unfair, insurance will be partial, and greater the greater is risk aversion.

Insurance is most effective when losses are common enough to be of concern but not frequent enough to be routine. Neither asteroid strikes nor car scratches make for good insurable events. Insurance for routine events requires repeated administrative expense that makes the insurance less valuable; the risk spreading benefits are also low. Insuring extremely rare risks also involves reasonable expense, with little compensating gain. Similarly, transactions costs make it important that risks be relatively well defined and assessable once they happen. Otherwise, claims assessment and litigation can be exceedingly expensive.

Effective insurance also requires that unobservable actions, i.e., moral hazard, not be too significant. Fortunately, major aspects of non-monetary, uncovered loss often assure that this is the case. Thus, for example, rational drivers are not likely to drive at too high speeds because they are insured, and people are unlikely to smoke because they know that if they get cancer, they will receive treatment. The potential for death and disability in these cases counts at least as heavily as covered losses. Monitorable actions (e.g., determining whether

a building is kept in safe condition), and risks due to an external source (e.g., earthquakes) also diminish the moral hazard problem.

These important attributes for effective coverage are generally associated with the demand for insurance. The supply side of insurance also determines significantly how well it works. Two critical questions are how diversifiable the risk is, and whether there is an entity that is capable of bearing it. Most familiar insured risks, e.g., the risk of death, are readily diversified cross-sectionally, since the experiences of members of large pools of insured's are effectively independent. There are, however, many critical risks—e.g., the costs of long-term care—where expected costs for different individuals are strongly correlated; they are so-called aggregate risks. Cross-sectional diversification is not possible with these risks, and other risk-sharing arrangements need to be made.

Concerns about the supply-side may seem misplaced in an industry like insurance, where there are many firms and barriers to entry seem relatively modest. Still, competition in insurance seems far from perfect. As one demonstration of this, consider a fundamental attribute of perfectly competitive markets: the law of one price. In a competitive market, the same good should sell at the same price everywhere.

Empirical Literature on Utilization and Out-of-Pocket Expenditure

Based on above theoretical underpinnings, the effects of health insurance on utilization and expenditures have been analyzed in different ways in the empirical literature. As suggested, the general task has been to choose an

appropriate model to deal with the dual decision process of the demand for health care, i.e. the first decision to see a health care provider, and then, the second decision of how much care to obtain (Pohlmeier and Ulrich, 1995; Santos-Silva and Windmeijer, 2001).

The principal focus of the sizable literature on health insurance has been the U.S. health care market with its highly fragmented third-party payment structure, involving both public and private programmes while at the same time leaving some 16 percent of the population without health insurance at any given time (Folland et al., 2004). The best known health insurance study is the Rand Health Insurance Experiment (HIE) (Newhouse, 1993). The randomized design of the HIE provided a unique opportunity to study the effect of insurance on the health care seeking behaviour of individuals. The RAND study finds, among other things, evidence for increased health spending when insurance coverage is complete, compared with incomplete coverage.

Another early contribution uses household level data from Australia to look at two things (Cameron et al., 1988). These authors first, develop a microeconomic model for individual choice under uncertainty for various health insurance programmes and health care types. They find that utilization choices vary considerably across insurance types, but that health status proves to be a stronger determinant of utilization of care than for insurance choice. Secondly, they find evidence of both self-selection and moral hazard due to insurance for some health care types although not for all.

In recent years, a small but growing number of studies have looked at the effect of health insurance on access and expenditures in low- and middle-income countries. For instance, in Vietnam, one study looked at the effects of voluntary health insurance on the choice of provider and type of care (Jowett et al., 2003). Using instrumental variable (to control for the possible endogenous nature of insurance status) multinomial logit estimations for a sample of 1,800 individuals and controlling for, among other factors, individual health status, the authors find evidence of moral hazard, as poorer insured persons tend to use inpatient care more compared with poorer uninsured individuals, a difference that is not found at higher income levels. In another study on Vietnam the effect of public voluntary health insurance on private expenditures is analyzed (Jowett et al., 2003). Here, the authors used a version of the Heckman sample selection bias model to correct for possible endogeneity of the health insurance status dummy variable. For a sample of 980 individuals, the authors find evidence of an insurance protection effect while controlling for a set of exogenous explanatory variables including health status and income.

In a South American country, specifically Ecuador, Waters (1999) used probit estimation techniques to study the effect of health insurance on utilization of curative and preventive care. Correcting for potential endogeneity the author finds that in a sample of around 3,300 individuals, insurance has a positive effect on the utilization of curative care, but only a small effect on preventive care.

Finally, Yip and Berman (2001) studied the effect of a national school health insurance programme on utilization and expenditures in Egypt. Using a

two-step estimation approach in a sample of 17,000 eligible school children, their findings suggest that on average the programme increases access to care and reduces financial outlays.

Although the above studies find a positive insurance effect on the average, the effect is not uniform across income groups. To assess the role of insurance across various groups, all of the above studies [with the possible exception of the one conducted by Waters (1999)] use insurance/income interaction terms. The sign of these variables suggests that this effect varies across income groups. For example, Jowett et al. (2003) found that insurance reduces health expenditures more for the poor than for the rich in Vietnam. In Egypt, only the middle-class children benefited from a reduced financial burden due to insurance. However, it is unclear whether these interaction effects are computed correctly as the true effect of an interaction term in logit or Probit estimation may differ, both in sign and magnitude as well as in statistical significance, from the one reported by the initial estimation command (Norton et al., 2004). In the statistical software programme Stata, a special 'inteff' command can be invoked to correctly calculate the interaction effect (World Bank, 2005). Moreover, Cameron et al. (1988) in their studies in Australia looked at the effect of more than two insurance programmes simultaneously.

Chenq and Chianq (1997) using before and after analyses, evaluated the effect of Taiwan's national health insurance on health care utilization. They found out that after the introduction of universal health insurance, the newly insured consumed more than twice the amount of outpatient physician visits and hospital

admissions than before universal health insurance was implemented, bringing them to the same amount of health care contacts as the previously insured group. The newly insured also experienced an insignificant increase in emergency department visits. In contrast, the previously insured group had a small but statistically significant increase in outpatient visits and insignificant changes in hospital admissions and emergency department visits. They concluded that health insurance removed some barriers to health care for those newly insured.

Liu et al. (2002) studied the impact of National Health Insurance (NHI) on the utilization of neonatal care and childhood vaccination in Taiwan. They used a bivariate probit estimation procedure to examine the factors that determine the probability of neonatal care use and vaccination. It was observed that generally mothers who are older, more educated and more satisfied with birth delivery services were found to be more likely to use neonatal preventive care. The likelihood of receiving such care also tends to rise with advancing gestational age and higher probability of neonatal complication and being born in a hospital. The likelihood of care was also found to vary regionally with northern neonates having higher odds of receiving preventive care than non-northern neonates. They concluded that in spite of NHI having an insignificant impact on the use of care, it does lessen the inequality in use of services in various regions.

Yeh (1997) examined the distribution of out-of-pocket medical expenditures among households under Taiwan's NHI and, like most international studies, found regressivity in out-of-pocket financing scheme of NHI, but that study did not evaluate how or if regressivity especially evolved from

implementing NHI. One comparative study of pre- and post-NHI household out-of-pocket medical expenditures (Chen et al., 2005) reported that NHI reduced the gap between the richer and the poor. That study found household out-of-pocket expenditures of those household with incomes in the highest quintile was 2.64 times that of those in the lowest quintile before NHI was implemented, and that this figure was reduced to 2.30 after NHI was implemented. That study, however, did not delineate the differences in out-of-pocket medical expenditures incurred by different income level of households under NHI. This motivated the study by Tu-Bin et al. (2005). Their study examined the impact of NHI on reducing financial burdens and regional differences in medical care expenditures.

The study by Tu-Bin et al. (2005) which looked at household out-of-pocket medical expenditures and national health insurance in Taiwan, observed that the implementation of the NHI was the most important health care reform in that country. They noted that NHI has not only increased accessibility of health care service, but it has also made impressive strides towards the reduction of out-of-pocket medical expenditures. These researchers used pool data which include a year dummy variable. In addition, the estimated model contains two groups of interaction effects, $Income_t/NHI_t$ and $Region_t/NHI_t$, to examine whether NHI reduced financial barriers and regional differences in household out-of pocket medical expenditures.

The empirical model was specified below:

$$\begin{aligned} \ln(Exp_t) = & \beta_0 + \beta_1 Income_t + \beta_2 Region_t + \beta_3 NHI_t + \beta_4 Income_t/NHI_t \\ & + \beta_5 Region_t/NHI_t + \beta_6 Z_t + a_t \end{aligned}$$

Where Exp_i is out-of-pocket expenditures on health care by household i . For linearity in the equation, the dependent variable (Exp_i) is transferred into logarithm. $Income_i$ is a set of household income dummy variables. $Region_i$ is a set of regional dummy variables. NHI_i is National Health Insurance programme. $Income_i/NHI_i$ and $Region_i/NHI_i$ are two groups of interactions of income and region and NHI. Z_i is a vector of socioeconomic and demographic characteristics of economic household head, which are marital status, sex, employed status, age, education level and family members

Among their findings, $Income/NHI$ interactions were significantly related to household out-of-pocket expenditures. The coefficients of three $region/NHI$ interaction effects were all significant. Only one interaction effect (East/NHI) was negative; Centre/NHI and South/NHI were surprisingly found to be positive, suggesting that households in the central and southern areas tended to have more out-of-pocket medical expenditures than those in the northern areas, though NHI had been implemented. Moreover, only households in the eastern area tended to have less out-of-pocket medical expenditure than those in the North after NHI.

Nonetheless, the evidence by Tu-Bin et al suggests that major improvements are still required to reduce the financial burden imposed on certain disadvantaged groups, such as the poor and aborigines. The time and money it takes to reach health facilities increases as the distance to these medical institutions increases. Such costs create a greater financial burden on socio-economically disadvantaged groups. In spite of free health services provided by NHI, it is likely that the cost of accessing health care negatively affects their

decisions to receive medical assistance. To solve the problem, they suggested that outreach services that target groups for whom access to health care remains problematic should be expanded under the auspices of universal health insurance.

In 2003, China launched a heavily subsidized voluntary health insurance programme for rural residents. Wagstaff et al. (2007) evaluated the impact of China's voluntary health insurance programme. They analyzed factors affecting enrolment and combined differences-in-differences with matching methods to obtain impact estimates. Data collected from programme administrators, health facilities and households were used in their study. They found out that enrolment was lower among poor households, and higher among households with chronically sick members. The scheme has increased outpatient and inpatient utilization (by 20-30%), but has had no impact on out-of-pocket spending or on utilization among the poor. The results from the supply-side data were broadly consistent with household data, and also show that the scheme has had significant effects on bed-occupancy, staffing, and capital investments, at least at township-level providers.

Their finding that the scheme had increased utilization of services was not especially surprising, and was consistent with the previous literature on subsidized health insurance programmes and health insurance programmes more generally. For example, all the studies to date find that coverage by Vietnam's health insurance programme was associated with higher rates of utilization (Jowett et al., 2003 etc). In Colombia, coverage by the subsidized programme has been estimated in all studies to increase preventive and ambulatory care (Trujillo

et al., 2005 etc.); though not—with the exception of one study (Trujillo et al., 2005)—hospital utilization.

By contrast, their finding that the scheme has not reduced out-of-pocket spending or the risk of catastrophic spending was somewhat surprising, and was at odds with the literature on other countries. Most studies of Vietnam's insurance programme find that coverage reduced out of-pocket spending and the risk of catastrophic payments (Jowett, et al., 2003; Sepehri et al., 2006 etc), though in one study the effect is not significant (Trivedi, 2003) and in another the effect goes from positive to negative when unobserved heterogeneity is taken into account through fixed effects specification (Sepehri et al., 2006).

Jütting (2002) taking the example of mutual health organization in rural Senegal analyzed whether or not members in a mutual health insurance scheme have a better access to health care than non-members. A binary probit model was estimated for the determinants of participation in a mutual health insurance scheme. The model was specified as:

$$P_i^* = \alpha Y_i + \beta Z_i + \gamma H_i + \delta C + \mu_i$$

$P_i = 1$ if $P_i^* > 0$, meaning the household i is member of the insurance scheme

$P_i = 0$ otherwise.

The independent variables include current income of the household (Y), characteristics of the household head (H): age, gender, education, employment status; household characteristics (Z): marital status, household size, health status, religion, self-wealth; community characteristics (C): town & area councils, solidarity, α , β , γ , and δ are vector of coefficients and u measures unobserved

factors which influence the demand for health insurance. Also, a logit/log linear model was used to measure the impact on health care utilization and financial protection. He used the two-part model which was developed as part of the Rand Health Insurance Experiment in the United State (Manning et al., 1987).

Part one is probit model which assesses the probability of visiting a health care provider:

$$\text{Prob}(\text{visit} > 0) = X_t' \beta + \mu_t$$

Part two is a log-linear model that estimates the incurred level of out-of-pocket expenditures, conditioning on positive use of health care services:

$$\text{Log}(\text{out-of-pocket expenditure} / \text{visit} > 0) = X_t' \phi + \varepsilon_t$$

Where X represents a set of individual and household characteristics hypothesized to affect individual patterns of utilization and expenditures. The results show that while the health insurance schemes reach otherwise excluded people, the poorest of the poor in the communities are not covered. Regarding the impact of the insurance variable on access to health care, members had a higher probability of using hospitalization services compared to non-members and pay substantially less when they need care. Also, income had a strong positive influence on both the frequencies of hospitalization and expenditure. Severity of illness had significant positive influence on expenditure. Besides, sex (1=male) and age group <26 had strong negative influence on hospital visit while age group <26 had strong negative effect on expenditure. Type of illness had significant positive influence on expenditure.

Finally, in a study in Jordan on the impact of health insurance on outpatient utilization and expenditure, Ekman (2007) observed that around 60% of the population was covered by some type of insurance. However, the distribution varies across income groups and the effect of insurance on the outcome indicators differ substantially across the various programmes. Generally, insurance was found to increase the intensity of utilization and reduce out-of-pocket spending. Moreover, neither income nor insurance significantly increase the probability of making a visit to a health service provider when ill. Instead, the study shows that health status was the most important factor determining outpatient use as those in worse health, as indicated by the self-assessed health indicator and the presence of a chronic illness significantly increase health care utilization. One notable finding was the sign of the age variable. Age had a strong negative influence on outpatient utilization. Other variables which significantly increase health care utilization were married and income interacted with insurance variable. However, education and male dummy had positive sign but were not significant.

Empirical Literature on Enrolment in Health Insurance

Several studies have been conducted in recent years on the demand for health insurance. The Indiana Family and Social Services Administration (2000) conducted a survey which used approximately 10,000 households. The highlights of their findings were as follows: first, uninsured rates were higher among those

with lower incomes, African Americans and young adults (18 to 24); however, insured rates were higher among married persons and full time employees.

Furthermore, a survey conducted by the U.S. Census Bureau (2002) found similar results. Full-time employees were more likely to be insured. Also, the probability of being insured increased with age and higher income. However, persons with less education and males were more likely to be uninsured.

Munkin and Trivedi (2003) focused on variables which relates to the demand for health care, and found the following results. Positive correlations were seen between the purchase of private insurance and being married, having more years of education and having a higher family income. Negative correlations were found between purchase of health insurance and having excellent or poor health, having an increasing number of chronic conditions, being male, and being older.

Sulzbach et al. (2005) studies revived that household head characteristics (older age, female gender, higher education, and employment) predict insurance enrolment at the household level, whereas these factors plus household wealth increased the likelihood of enrolment at the individual level. With regard to outpatient care, insured respondents were more likely than uninsured to seek treatment and they do so promptly.

In Rwanda, Diop et al. (2006) found that household size, education and employment status of the head of household have a positive association with Mutual Health Organization (MHO) membership. Also, households headed by women were seen more likely to enrol in MHOs than households headed by men.

However, evidence on the association between household economic status and MHO enrolment was inconclusive. With this result the researchers suggested that enrolment in a MHO may have depended on other dimensions of social inclusion, such as type of MHO ownership. Adverse selection appeared to have operated primarily at the individual level as there was some evidence that those with disability or chronic illness and the elderly were seen more likely to enrol in MHOs than individuals with healthier profiles. With regards to utilization, MHO coverage had positive effect on the use of modern health care.

Summary

The chapter has considered two main issues: first, the theories on health care demand and health insurance; second, the empirical works on health insurance. According to Grossman, demand for health care is a derived demand in the process of investment in health capital. His model views health care as an input along with other health inputs such as nutrition and personal exercise. But, the model has been challenged by a complementary view that sees the demand for health care within a principal-agent framework (Zweifel and Breyer, 1997).

Empirically, the two-part model developed as part of the Rand Health Insurance Experiment in the United States (Manning et al., 1987) had been used by many researchers to analyze the effects of health insurance on health care utilization and expenditure. Findings of these studies show that insurance increase utilization of health services and reduce out-of-pocket spending. Methodological issues are discussed in the next chapter.

CHAPTER FOUR

METHODOLOGY

Introduction

The main aim of this chapter is to discuss the various methods adopted for this study. The chapter is sub-divided into three sections. The first section examines the potential problem of modelling the effects of health insurance on health care use and expenditure. In the second section, we explained the methodology adopted in this study so as to investigate the effects of health insurance on outpatient utilization and expenditure. The third section describes data and expected results.

Econometric Considerations

When modelling the effect of health insurance on health care use and expenditure one encounter the problem of “endogeneity” and “self-selection”. This problem had received a lot of attention in different areas of development economics: publications focus on measuring the impact of micro-finance institutions (Coleman, 1999; Nada, 1999), estimating the returns of education (Bedi and Gaston, 1999) as well as analyzing the impact of health insurance on various outcomes such as health demand and financial protection (Waters, 1999; Yip and Berman, 2001). In each of these cases the evaluation of a policy

intervention or institutional innovation poses the problem that it is very difficult to assign individuals randomly to non-programme control groups and others to programme treatment groups. It is within this context that the identification of an adequate control group is the first and even most important step when trying to control for self-selection.

With respect to the impact of health insurance on the health care use, Waters (1999) names the potential endogeneity of the choice of insurance for health care use as the main problem, leading to potential selection bias. Individuals who self-select into the insurance programme have unobservable characteristics—related to preference or health status (adverse selection)—that might make them more likely than other to join the programme and also might influence their decision to use health care services. An observed association between health insurance affiliation and health care use and expenditure may therefore be due not to insurance but to the underlying unobservable characteristics.

To control for this effect an omitted variable version of the Hausman test (Hausman, 1978) could be applied. This test is based on two steps: First, the reduced form of the participation equation is estimated. Second, the fitted values are included into the health care demand equation as a regressor. A significantly non zero coefficient for the predicted value term is an indication that the suspected endogenous variable is in fact endogenous (Waters, 1999).

Alternative method for testing endogeneity is to use the Durbin-Wu-Hausman (DWH) class of test (Davidson and MacKinnon, 2004). Here, the

insurance variable would be endogenous if covariance of the insurance variable and the error term differs from zero. This would render the coefficient biased and inconsistent. The DWH test is performed as follows: first, the insurance variable is regressed on all other exogenous variables, including selected instrumental variables (in this case, employment status and formal sector workers). We then obtain the reduced form residual terms, say, \hat{y} . We include \hat{y} in the original models i.e. (1) and (2) and formally test if the coefficient for \hat{y} is statistically significant from zero. Failure to reject the null hypothesis would suggest that insurance variable is exogenous.

One way of handling endogeneity would be to use instrumental variable estimation techniques. While obtaining valid instruments for the endogenous variables is no easy task, and using poor instruments may be inferior to using the possibly endogenous variable and accounting for bias, some instruments that have been suggested in the literature on the demand for health and insurance include the relationship of the individual to the head of household and mean rate of affiliation of the insurance type in the community (Waters, 1999). It must be noted that DWH test was applied in this work when testing whether membership of health insurance is actually exogenous.

To control for self-selection into the programme, proxies for the health status and health risks was included. Finally, the models were tested for stability and robustness through adding and subtracting key variables and by applying the likelihood-ratio test for the logit models and F-test for the linear model.

Econometric Models

To empirically assess the effects of health insurance organization on outpatient utilization and expenditure we used the two-part model developed as part of the Rand Health Insurance Experiment in the United States (Manning et al., 1987). The first part of the model analyzes the determinants of using modern health care services. Modern health care facilities as used in this study include health centres/health post, district hospitals, and private hospitals. This excludes sick individuals who sought care at traditional healers and others (for example, drug vendors, pharmacies). The second part of the model analyzes the determinants of health care expenditures for those who reported any health care use.

Part one of the model is a binary logit model. The model estimates the probability of an individual's visiting a modern health care provider. Formally, the model can be written as follows:

$$\text{Prob}(\text{visit} = 1) = X_i' \beta + \mu_i \quad (1)$$

The dependent variable takes the value of 1 if an individual had visited a modern health care provider in the last 4 weeks and 0 otherwise. X is a set of covariates, including membership of health insurance.

Part two is a linear model that estimates the incurred level of out-of-pocket expenditures, conditioning on positive use of health care services. Formally, part two of the model can be written as follows:

$$(\text{out-of-pocket expenditure} / \text{visit} = 1) = X_i' \phi + \varepsilon_i \quad (2)$$

The dependent variable is total out-of-pocket expenditure at the point of consuming health care services. This includes cost for transport, medicaments (drugs), consultation and any other expenditure related the use of modern health care services and also payment made to private providers not covered by health insurance. Where X represents a set of individual and household characteristics hypothesized to affect individual patterns of utilization and expenditures. These include age, sex, education, household size, marital status, employment, severity of illness, health status, type of illness, wealth, income and membership of NHIS. Whiles β and Φ represent vectors of coefficient estimates of the respective models and u and e are error terms. The primary variable of interest is membership of NHIS. Other control variables were also included in the estimation model to control for the differences in need for health care (for example, age and sex), differences in preferences toward seeking health care (for example, sex), and differences in the cost (direct and indirect) of seeking health care (for example, distance).

Model Specification

The probability of going to a modern health care provider (i.e. outpatient visit) when ill can be specified as follows:

$$Pr (visit > 0 | ill) = F (\alpha_0 + \beta_1 Sex + \beta_2 Age + \beta_3 HH_size + \beta_4 MNHIS + \beta_5 SAHS + \beta_6 Mal_dummy + \beta_7 Pain_dummy + \beta_8 Res_dummy + \beta_9 Diar_dummy + \beta_{10} Inj_dummy + \beta_{11} SOI + \beta_{12} Sex_H + \beta_{13} Educ_h + \beta_{14} Employ + \beta_{15} Mar + \beta_{16} DIS + \beta_{17} INC + \beta_{18} Wealth + e_i)$$

Where $Pr(\text{visit} > 0 | \text{ill})$ is the probability that an individual visited a modern health care provider (i.e. outpatient visit) when ill; Sex is a dummy variable for male sex of respondent; Age is the age of respondent; HH_size is the household size; $MNHIS$ is a dummy variable for respondent who are members of NHIS; $SAHS$ is Self Assessed Health Status which serves as a proxy for health status; Mal_dummy is a dummy variable for respondent who suffered malaria; $Pain_dummy$ is a dummy variable for respondent who suffered aches and pains; Res_dummy is a dummy variable for respondent who had respiratory diseases; $Diar_dummy$ is a dummy variable for respondent who suffered diarrhoea; Inj_dummy is a dummy variable for injury; SOI represent severity of illness; Sex_H is a dummy variable for male sex of the head of household; $Educ_h$ is education level of head of household; $Employ$ is a dummy variable for respondent who are employed; Mar is a dummy variable for respondent who are married; DIS is the distance to a nearby health facility; INC is income; $Wealth$ is household wealth; and e_i is the error term. It must be noted that the independent variables used to predict outpatient utilization were also used as a predictor for out-of-pocket expenditures.

A parsimonious model was employed in our analysis and this can be specified as follows:

$$Pr(\text{visit} > 0 | \text{ill}) = F(\alpha_0 + \beta_1 Sex + \beta_2 Age + \beta_3 HH_size + \beta_4 MNHIS + \beta_5 SAHS + \beta_6 Mal_dummy + \beta_7 Pain_dummy + \beta_8 Res_dummy + \beta_9 Diar_dummy + \beta_{10} Inj_dummy + \beta_{11} SOI + \beta_{12} Sex_H + \beta_{13} Employ + \beta_{14} INC + e_i)$$

Table 3: Expected Signs for Outpatient Utilization and Out-of-Pocket

Variable	Expected	Sign	Expected	Sign	Out-of-
	Outpatient Utilization		Pocket Expenditures		
<i>Sex</i>	–		–		
<i>Age</i>	+		+		
<i>HH_size</i>	+		+		
<i>MNHIS</i>	+		–		
<i>SAHS</i>	–		–		
<i>Mal_dummy</i>	+		+		
<i>Pain_dummy</i>	+		+		
<i>Res_dummy</i>	+		+		
<i>Diar_dummy</i>	+		+		
<i>Inj_dummy</i>	+		+		
<i>SOI</i>	+		+		
<i>Sex_H</i>	–		–		
<i>Employ</i>	–		+		
<i>INC</i>	+		+		

Description of the Expected Signs

In order to test the hypothesis that members of a health insurance organization have better access to modern health care facilities than non-members, our variable of interest would be membership. We hypothesized that the probability of members to frequent a modern health care provider is higher,

while at the same time they pay less for their treatment in comparison to non-members after controlling for individual and household characteristics. Hence, we expected that membership would have a positive coefficient for the demand for outpatient care and a negative coefficient for out-of-pocket health care expenditure.

Health status which was measured by self assessed health is expected to have a negative coefficient on both outpatient utilization and out-of-pocket expenditures. This so because the more individuals perceive their health status as very good the less likely they would visit a modern health provider and the less out-of-pocket expenditure they would incur.

The more individuals perceive their illness as severe the more likely they would visit a modern health provider and the more out-of-pocket expenditure they would incur. We expect severity of illness variable to have a positive coefficient on both outpatient utilization and out-of-pocket expenditures. Additionally, the sorts of illness measured by five dummies (Mal_dummy and Pain_dummy etc) are expected to have positive coefficients on both outpatient utilization and out-of-pocket expenditures.

There are five demographic variables—sex, employment status, age, education, and household size. Females were found to consume somewhat more health care than males do primarily because of childbearing (Miller, 1994). Additionally, since females are more careful about the health condition of the members in their family and possibly more likely to take them for medical care than males, the female household heads would incur more household out-of-

pocket medical expenditures than the male. We expect that the sex variable should have a negative coefficient in both models.

Because it would cost the employed work time to seek health care, they should be less likely to seek care, therefore, we expect employed dummy variable to have a negative coefficient with respect to probability of utilizing modern health care. Since cost is involved in seeking health care the employed are in a better position to afford it. Therefore, we expect that being employed would have a positive coefficient on out-of-pocket.

Because health often deteriorates as a result of aging, we could assume that the older an individual, the more health care he/she would seek. We expect the age variable to have a positive impact on outpatient utilization and out-of-pocket medical expenditures.

Most often the higher an individual's education, the more socially advantaged he/she will probably be and the more access he/she will have to medical care. In turn, the more medical care one seeks, the more his or her out-of-pocket medical expenditures. We expect education variable to have a positive impact on outpatient utilization and out-of-pocket expenditure.

Household size is another important factor in the demand for medical care and the amount of out-of-pocket medical expenditures. An increase in household size should increase the likelihood of health care use and result in more out-of-pocket expenditures. The household size was expected to have a positive coefficient on outpatient utilization and out-of-pocket expenditure.

The Logit Model

Logit model is used in our study. The rationale for this model selection is that we are exploring whether an individual visited a health care provider or not when ill which is dichotomous dependent variable. Generally, logit regression model is given as:

$$P_i = F(\alpha_0 + \beta X_i) = \frac{1}{1 + e^{-(\alpha_0 + \beta X_i)}}$$

The model we employed can be specified as follows:

$$\begin{aligned} Pr(\text{visit} > 0 / \text{ill}) = & F(\alpha_0 + \beta_1 \text{Sex} + \beta_2 \text{Age} + \beta_3 \text{HH_size} + \beta_4 \text{MNHIS} + \beta_5 \text{SAHS} \\ & + \beta_6 \text{Mal_dummy} + \beta_7 \text{Pain_dummy} + \beta_8 \text{Res_dummy} + \beta_9 \text{Diar_dummy} + \\ & \beta_{10} \text{Inj_dummy} + \beta_{11} \text{SOI} + \beta_{12} \text{Sex_H} + \beta_{13} \text{Employ} + \beta_{14} \text{INC} + e_i) \end{aligned}$$

Transforming the above equation in the log form we have the following:

$$\begin{aligned} \ln\left(\frac{P_i}{1-P_i}\right) = & \alpha_0 + \beta_1 \text{Sex} + \beta_2 \text{Age} + \beta_3 \text{HH_size} + \beta_4 \text{MNHIS} + \beta_5 \text{SAHS} + \beta_6 \text{Mal_dummy} \\ & + \beta_7 \text{Pain_dummy} + \beta_8 \text{Res_dummy} + \beta_9 \text{Diar_dummy} + \beta_{10} \text{Inj_dummy} + \beta_{11} \text{SOI} + \beta_{12} \\ & \text{Sex_H} + \beta_{13} \text{Employ} + \beta_{14} \text{INC} + e_i \end{aligned}$$

The above equation is the model we estimated to generate the parameters of interest in our study.

Estimation Procedure of the Logit Model

The parameters of logit model are usually estimated with the use of maximum likelihood method. Maximum Likelihood Estimation (MLE) yields

consistent parameter estimators and is not difficult to calculate appropriate large sample statistics. Besides, it is possible to show that unique maximum always exist under logit model and this makes MLE to be particularly appealing (Pindyck and Rubinfeld, 1981). This implies that the MLE estimator will produce the most likely values of the parameters given our sample data. In other words, the estimated coefficients best describe the full distribution of the data. That is as the sample size increases, the most likely values become even closer to the values of the parameters. Under general conditions the likelihood estimators can be shown to be consistent, asymptotically efficient, and asymptotically normal.

Logit models are non-linear probability models and coefficient estimates render log-odds. To simplify interpretation, coefficients can be exponentiated and interpreted as odds-ratios.

The logit model we estimated could be written as:

$$Pr(y_i = 1 | X_i) = \frac{\exp^{X_i\beta}}{1 + \exp^{X_i\beta}}$$

Where $Pr(y_i = 1)$ refers to the probability of an individual visiting a health care provider, and index $X_i\beta$ is a linear function of factors influencing utilization of health care services. On the other hand, the probability that an individual do not visit a health care provider when ill becomes:

$$\begin{aligned} Pr(y_i = 0) &= 1 - Pr(y_i = 1) = 1 - \frac{\exp^{X_i\beta}}{1 + \exp^{X_i\beta}} \\ &= \frac{1 + \exp^{X_i\beta} - \exp^{X_i\beta}}{1 + \exp^{X_i\beta}} = \frac{1}{1 + \exp^{X_i\beta}} \end{aligned}$$

Considering the observed value of y as realizations of a binomial process which varying from trial to trial (depending on X_i), the likelihood function becomes:

$$L = \prod_{y_i=1} \frac{e^{X_i\beta}}{1 + e^{X_i\beta}} \prod_{y_i=0} \frac{1}{1 + e^{X_i\beta}}$$

And so the log-likelihood function becomes:

$$\text{Log } L = \sum \{y_i \log F(.) + (1 - y_i) \log [1 - F(.)]\}$$

Where $F(.) = \frac{e^{X_i\beta}}{1 + e^{X_i\beta}}$

Maximizing the log-likelihood function with respect to vector β gives the maximum likelihood estimator of β . It must be noted that the estimated coefficient reflect the effect of a change in the independent variable upon the log of the odd ratio. This is given as:

$$\frac{\partial}{\partial x_{ij}} \left(\log \frac{P_i}{1 - P_i} \right) = \beta_j$$

Marginal Effects and Goodness-of-fit

The marginal effects measure the change in the predicted probability as a result of a unit change in the independent variable. In other words, marginal effects are the partial derivatives of probabilities with respect to the vector of characteristics. Hence, marginal effects measure the slope effects of the dependent variables with respect to a change in the independent variable. They are computed at the means of the X s. Observations used for the means are all

observations of the data. Generally, the marginal effects are given as follows:

$$\frac{\partial P_i}{\partial x_{ij}} = P_i(1 - P_i)\beta_j$$

Where:

$P_i(1 - P_i)$ = the height of the logistic density function.

β_j = the estimated coefficients of the independent variable.

In predicting the effect of changes in one of the independent variables on the probability of an individual visiting a health care provider when ill, we need to calculate these derivatives at different levels of the explanatory variables so as to realize the range of variation of the resulting changes in the probability. According to Green (2000), because most applications contain at least one dummy variable, the computation of partial derivatives or marginal effects may not be meaningful.

In Ordinary Least Square (OLS) regressions, it is common to provide a measure of how well the model fits the data, such as R^2 . Unfortunately, no direct equivalent to R^2 exists for logit models. A wide range of pseudo- R^2 measures have been proposed. However, these measures have different formulae and will take different values for the same model. Often, goodness-of-fit measures are implicitly or explicitly based on comparison with a model that contains only a constant as explanatory variable.

A first goodness-of-fit measure, Maximum likelihood pseudo- R^2 is defined as;

$$\text{Pseudo}R^2 = \frac{1}{1 + 2(\text{Log}L_1 - \text{Log}L_0)/N}$$

$\log l_1$ = Maximum likelihood value of the model with regressors; $\log l_0$ = Maximum value of the log likelihood function when all parameters, except the intercept, are set to zero and N = Number of observations.

McFadden (1974) suggested an alternative measure;

$$\text{McFadden } R^2 = 1 - \frac{\log L_1}{\log L_0}$$

A high pseudo- R^2 implies that the model is of good fit and vice versa. It must be noted that a low R^2 does not always mean that the model is not of good fit. According to McFadden (1974) R^2 value between 0.2 and 0.4 represent a good fit of the model. The Maximum likelihood pseudo- R^2 was used to explain the fitness of the model and this requirement was considered in our analysis.

Testing of Hypotheses and Joint Significance

The Z-statistics and p-values were used to test the hypotheses. It must be noted that the 'z' and the p-values for the exponentiated coefficient are similar as those of the unexponentiated coefficients.

The Likelihood Ratio (LR) test, which is analogous to the F-test in linear regression models, is widely used for testing the overall significance of the explanatory variables. The likelihood ratio statistic is given by:

$$-2[\ln(L_r) - \ln(L_u)] \sim \chi^2$$

Where: $\ln(L_r)$ = Restricted log-likelihood, $\ln(L_u)$ = Unrestricted log-likelihood and χ^2 = Chi-squared.

With regard to this test, if the null hypothesis is true then asymptotically twice the difference between the unrestricted and restricted log-likelihood follow a X^2 (chi-squared) distribution with degrees of freedom equal to the number of restrictions (Pindyck and Rubinfeld, 1981). The LR test was used in this study in testing for joint significance.

Determinants of Enrolment in Health Insurance

To estimate the determinants of participation in a mutual health organization, we follow an approach applied by Weinberger and Jütting (2000). In that approach participation in a local organization is depended on the rational choice of an individual weighting costs and benefits of membership. There are two options with regard to individuals decision to participate in a mutual i.e. either an individual participates or otherwise. Therefore, our equation would have a binary dependent variable; hence we could use either a Logit or Probit model. It is assumed that participation of a household (p) in a mutual health insurance scheme depend on the current income of the household (Y), characteristics of the household head (H): age, sex, education, occupation; household characteristics (Z): marital status, household size, health status, wealth; community characteristics (C): place of residence, α , β , γ , and δ are vector of coefficients and u measures unobserved factors which influence the demand for health insurance and is assumed to be independent and identically distributed (i.i.d) across households in our sample.

The following equation describes our model:

$$P_i = f(Y_i, Z_i, H_i, C_i, \mu_i)$$

In order to estimate the probability of participation we use a binary logit model:

$$P_i^* = \alpha Y_i + \beta Z_i + \gamma H_i + \delta C_i + \mu_i$$

$P_i = 1$ if $P_i^* > 0$, meaning the household i is member of the insurance scheme

$P_i = 0$ otherwise.

Our model can be specified as follows;

$$\begin{aligned} Pr(y=1) = & \alpha_0 + \beta_1 Sex + \beta_2 age + \beta_3 mar + \beta_4 lit + \beta_5 educ + \beta_6 emp_farm + \\ & \beta_7 emp_gov + \beta_8 emp_tra + \beta_9 emp_art + \beta_{10} HH_size + \beta_{11} sahs + \beta_{12} Sex_h \\ & + \beta_{13} inc + \beta_{14} dist + \beta_{15} urban + \beta_{16} wealth + \mu_i \end{aligned}$$

Where $Pr(y=1)$ is the probability that an individual is a member of NHIS; Sex is a dummy variable for male sex of respondent; Age is the age of respondent; Mar is a dummy variable for respondent who are married; lit is literacy dummy; $Educ$ is education level of respondent; emp_farm represent dummy for respondents who are engage in farming/fishing; emp_gov represent dummy for respondents who are government sector; emp_tra represent dummy for respondents who are traders; emp_art represent dummy for respondents who are artisans; HH_size is the household size; $sahs$ is self assessed health status; Sex_H is a dummy variable for male sex of the head of household; inc is income; $dist$ is the distance to a nearby health facility; $urban$ is a dummy for respondents who resides in an urban area; $Wealth$ is household wealth; and μ_i is the error term. The expected signs of the coefficients are: $\beta_1 < 0$; $\beta_2 > 0$; $\beta_3 > 0$; $\beta_4 > 0$; $\beta_5 > 0$; $\beta_6 < 0$; $\beta_7 > 0$; $\beta_8 < 0$; $\beta_9 < 0$; $\beta_{10} < 0$; $\beta_{11} < 0$; $\beta_{12} < 0$; $\beta_{13} > 0$; $\beta_{14} < 0$; $\beta_{15} > 0$; $\beta_{16} > 0$.

A parsimonious model was employed in our analysis. At individual level we specified the following:

$$Pr (y=1) = \alpha_0 + \beta_1 Sex + \beta_2 age + \beta_3 lit + \beta_4 inc + \beta_5 wealth + \mu_i$$

At household level we specified the following:

$$Pr (y=1) = \alpha_0 + \beta_1 Sex_H + \beta_2 age + \beta_3 educ + \beta_4 inc + \beta_5 wealth + \mu_i$$

A priori Expectation of Determinants of Enrolment

As stated earlier females are seen to be more careful about the health condition of themselves and members of their household and possibly more likely enrol than males. Also, as the main health caregivers in the family, women may be more likely to internalize the costs and consequences associated with health care than men. Hence, we expect sex (male) variable to have a negative coefficient with enrolment.

Because of other financial obligations and greater concerns about their personal health, the older a person is the more likely they are to be risk averse. As a result we expect age to have positive coefficient with enrolment in health insurance.

Education plays an important role in developing a person's mindset. Individuals with higher levels of education are typically more risk averse than those with lower levels. This means individuals with higher education are more likely to purchase health insurance. Therefore, positive coefficient with enrolment in health insurance is expected for this variable. Similarly, we expect literate

individuals to join the scheme than illiterate individuals; therefore, literate dummy should have a positive coefficient.

Income is a strong predictor of insurance status. This so because as individual's income rises, so does their demand for normal goods. Additionally, individuals with higher incomes are more likely to have a lower risk tolerance. We expect income to have a positive coefficient with enrolment in health insurance.

Another strong predictor of insurance status is wealth. Wealthy individuals or households are more likely to have a lower risk tolerance especially with regard to their health. In addition, wealthier households/individuals are more likely to demand more normal goods. Therefore, we expect the wealth variable to have positive coefficient with enrolment in health insurance.

Brief Background of the Study Area

Mfantseman Municipality has Saltpond as its district capital. Mfantseman Municipality is located along the Atlantic coastline of the Central Region of Ghana. The district has a total land size of 612 square kilometres. The district is bounded to the West and Northwest by Abura-Asebu-Kwamankese District, to the North by Ajumako-Enyan-Essiam District and Assin South District, to the East by Gomoa District and to the South by the Atlantic Ocean.

The Mfantseman Municipality with its proximity to the Atlantic Ocean has mild temperatures, which range between 24°C and 28°C. It has a relative humidity of about 70%. The district experience double maxima rainfall with peak

in May to June and October. Annual total of rainfall, range between 90cm in the Coastal Savannah areas and between 110cm and 160cm in the interior close to the margin of the forest zone. The period December to February and July to early September are much drier than the rest of the year.

The vegetation of Mfantseman Municipality consists of dense scrub tangle and grass, which grow to an average height of 4.5m. It is believed that the district was once forested, but has been systematically destroyed through centuries of bad environmental practices such as bush fires and deforestation among others. However, pockets of relatively dense forest can be found around fetish groves and isolated areas.

These physical characteristics have combined effectively to offer opportunities in agriculture to the people. The proximity to the sea has made fishing a major activity along the coastal towns and villages notable among which are Biriwa, Saltpound, Otum, Abandze and Kormantse. More so, the effective interactions among climate, soils, and rivers/streams have made farming possible especially in the inland areas. Among the crops cultivated are cocoa, oil palm, pineapples, oranges, plantain, cocoyam, and coconut. Also significant are the exploitation of kaolin for building, ceramic material, tale, granite and silica. These led to the establishment of the now defunct Saltpound Ceramic Factory. Again, the district has oil deposits, which are being explored off the coast of Saltpound.

According to the 2000 Population and Housing Census, the district has a total population of 152,264 comprising 69,670 males and 82,594 females. The district population constitutes almost 7% of the region's population of 1,593,823.

The annual population growth rate is estimated as 2.8%. Almost 50% of the population lives in areas classified as urban. The district capital has a population of 16,212 approximately 10.6% of the district population. The most densely populated town is Mankessim with population of 25,481. This accounts for about 16.7% of the district population and is also an important commercial centre.

According to the 2000 Population and Housing Census, 95.5% of the people in the district are Akans, majority of them were Fantes. However, there are other ethnic minorities namely Ewes (1.8%), Grusis (0.9%), and other tribes. Also, their religious affiliation were as follows; Catholic 12.7 %, Protestant 23.2%, Pentecost 21.8%, other Christian 22.5%, Islam 10.6%, Traditional 1.2%, No religion 7.2% and others 0.7%. Moreover, 47.7% of the people are not literate.

2000 Population and Housing Census shows that there a wide gap between primary and junior secondary school enrolment, on one hand, and between the junior secondary school and senior secondary school level on the other. The enrolment rates were as follows; primary 70.1%, junior secondary school 67.6% and senior secondary school 15.8%. It can be observed that primary school enrolment is higher than junior secondary school. This may be due to the fact that the district has fewer junior secondary school facilities than primary or many children drop out after primary school. However, the gap is much wider between the junior secondary school and senior secondary school.

Farming and fishing constitutes the main economic activities of the district, employing about three-quarters of the total workforce. Farming is done in

almost all parts of the district especially in the inland areas while fishing is done along the coast. Trading as an important economic activity is carried out virtually in every area in the district with Mankessim as the focal point. Other significant trading centres are Yamoransa, Essuehyia, Saltpound Anomabo, and Otuum. The processing of sugarcane into local gin is carried out at Egyaa. Cassava is processed at Taabosom whilst palm oil at Akobina, Odumanu and Towoboase. Also, dairy product can be obtained at Wankam.

Source, Type and characteristics of the Data

Cross-sectional primary quantitative data was used for this study. A household survey was carried out within the Mfantseman Municipality to solicit cross-sectional information on households. The broad types of questions posed to respondents addressed informal and formal care seeking, health care expenditures, insurance status, and household characteristics. Data collected include individual, household and community characteristics. Among these are age, sex, education, employment status, marital status, household size, health status, religion, wealth, household expenditure, place of residence, distance to health service provider, availability of health service provider and health insurance status.

The Population

The study population consists of all household in the Mfantseman Municipality. The 2000 Population and Housing Census (Ghana Statistical Service, 2000) defines household as a group of persons who live together in the

same house or compound, share the same house-keeping arrangements and are catered for as one unit. The work adapts this definition. According to the 2000 Population and Housing Census (Ghana Statistical Service, 2000) head of household is any person in the household recognized as such by other household members. She/he is the person responsible for the upkeep and maintenance of the household. The minimum age of the head of household is taken to be 25+ years.

Mfantseman Municipality was selected as the study area because it is estimated that at least 60% of the total population are poor and as a result cannot afford certain necessities like food, shelter, education, health care services etc (Ghana Ministry of Local Government, 1999). It is therefore worth examined whether the introduction of the mutual health insurance scheme in the district has improved health care utilization.

Sample Size Determination and Sampling Design

The sample size was determined based on the formula below;

$$n \geq \frac{16(p)(1-p)}{0.01}$$

Where: p = proportion of people that use health facilities; $1 - p$ = proportion of people that do not use health facilities; n = sample size.

According to the District Health Management Team, almost 40% of the people in the study area utilized health facilities in 2007. Therefore, using the equation for the estimation, the sample size came to 384. The sample size was equally divided into insured and uninsured households for a comparative analysis, as the primary focus of this study was to assess the effects of NHIS membership

on utilization of health services and expenditure. The method includes selecting a sample of households who are members of NHIS as cases and households who are not members of the scheme as the comparison group (control group).

The sample was generated using cluster sampling procedure. The study area was divided into clusters. These clusters were constructed based on major economic activities in the study area namely fishing, farming, commerce, and small scale processing activities. Table 4 shows the various clusters.

Table 4: Clusters and their Towns or Villages

Cluster	Name of Town or Village
Fishing Communities Cluster	Biriwa, Anomabo, Otuam, Abandze, Kormantse.
Farming Communities Cluster	Dominase, Baifikrom, Kyeako, Nsanfo, Ekumfi, Ankaful, Ewoyaa, Immune, Akraman.
Commercial Communities Cluster	Mankessim, Yamoransa, Essuehyia, Saltpound.
Small Scale Processing Communities Cluster	Egyaa No 1, 2&3, Akobima, Odumanu, Taabosom, Towoboase, Wankam.

Source: Survey Data, 2008

There are 26 towns and villages in our clusters. One town or village was selected randomly from each cluster giving us 4 towns and villages. These

randomly selected towns and villages constitute our target population. They are Biriwa, Baifikrom, Mankessim, and Egyaa.

Selection of Respondents

Table 5: Selected Towns/Villages and Households

Name of cluster		Name of Towns/Villages	Households Selected
Fishing Cluster	Communities	Biriwa	77
Farming Cluster	Communities	Baifikrom	28
Commercial Communities Cluster		Mankessim	253
Small Scale Processing Communities Cluster		Egyaa	26
Total			384

Source: Survey Data, 2008.

The selection of the number of households was based on the principle that many households were selected from communities with larger population and vice-versa. This is so because a close look at the 2000 Population and Housing Census shows that towns/villages with higher population turn to have more households. Hence, households to be included in the sample were selected proportionately to the total number of people in a given locality. We calculated

the total number of households to be drawn from the selected towns/villages based on the 2000 Population and Housing Census figures. Table 5 shows the number of households drawn from each town or village.

With the help of the Ghana Statistical Service, enumeration areas (EAs) in these communities were used. We randomly selected the EAs and listed the entire household mainly the names of household heads and their members. A multistage sampling procedure was used to select respondents. First, a Systematic Sampling Method was used to select households. Here, households with their locations were serially numbered and the random function on the scientific calculator was used to select the random start. Finally, a Simple Random Sampling Technique with the help of random function on the scientific calculator was used to select one household member who was 18 years or above.

Research Instrument Design

The main instrument used to collect the data from the respondents was an interview. The survey instrument was divided into eight sections: the individual characteristics, health insurance data, health status and outpatient care utilization (four-week reference period), and head of household characteristics. Others include household expenditure, household wealth, community characteristics and other related issues.

Pre-Testing of Research Instrument

The research instrument was pre-tested. This was done to determine the time span, financial requirement, and feasibility of the data gathering exercise. Also, this test was needed as it could reveal unanticipated problems with question wording, instructions to skip questions, etc. It helped us to see if the interviewees understand your questions and could give useful answers. The pre-test was carried out at Anomabo and Ekurabadze all of Mfantseman Municipality in the month of April, 2008. We believed that these areas had characteristic similar to the potential study population in many respects.

After the pre-test, the research instrument was revised appropriately.

Training of Field Assistants

The researcher himself oversaw the training of five field assistants, which took place on the week of July 2008. The research assistants were trained to understand the objectives of the survey. Again, they were trained on the best interview techniques and how to record responses. They were then taught how to introduce survey to respondents, and the meaning of each question. Field assistants were also trained in the household survey instrument.

Selections of these assistants were based on their previous experience, knowledge of the local language, and their ability to understand and write in the English language.

Data Collection Procedure

After various modifications have been made to the survey instrument after the pre-test, the researcher and the field assistants administered the instrument in the selected communities. In order to elicit the right responses, the questions were explained in the local language to the respondents. The researcher worked closely with the field assistants to ensure that responses were from right sources (respondents). Data collection took place in August 2008.

Problems Encountered in the Data Collection

The main problem encountered during the data collection exercise was that some respondents were unwilling to assist. Some respondents were not willing to give the names of other households who were not at the house during the listing of household heads. Some respondent said that they will only provide information on condition that they were given some money. Others retorted that “similar exercises have been done in the past and we have not seen any improvement in our lives”. Despite the above mentioned problems data collection went on smoothly. This became possible because we explained to the respondents that information we are seeking were for academic purpose.

Limitation of the Data

A major limitation of the data was recall bias which is usually pronounced with household survey. Often the ability to recall information on health care services and payments is presumed to be better for patients who had just received health care treatment, as opposed to household respondents who were asked to

recall information on services received and payments made in the last 4 weeks prior to the interview.

Description and Measurement of Variables

Household: Household in this work is defined as a person or persons, who live together in the same house or compound, share the same house-keeping arrangements and are catered for as one unit (Ghana Statistical Service, 2000). Here, the emphasis is on living in the same place and having common provision for food and necessities for living, irrespective of size and relationship.

Head of Household: This is defined as any person in the household recognized as such by other household members. She/he is the person responsible for the upkeep and maintenance of the household (Ghana Statistical Service, 2000). Household headship was defined as a dummy; therefore we assigned the value 1 for male head and 0 otherwise.

Sex: Male or female. A dummy variable was used to capture sex. If the head of household/individual is male we assigned the value 1 and 0 otherwise.

Age: In this study, age was taken in years.

Household Size: Household size was defined as the number of persons residing in the same compound answerable to the same head and pooling resources of common provision like food and shelter.

Literacy: Literacy is measured by the ability to read and write a simple statement in any language with understanding. This is defined as a dummy; therefore we assigned the value 1 for literate and 0 otherwise.

Education: Education was measured by last educational level attained; no education, primary, junior secondary/middle, and secondary/ vocational/technical, post secondary, tertiary. This variable was measured on a six-point scale from '0' for no education at all to '5' as the highest level of education that is tertiary.

Employment: The employment variable used in this study is measure with a dummy variable. A 1 represents individuals/ household heads who are employed, while a 0 represents unemployed.

Occupation: Current occupation was captured by dummies namely farming/fishing, government sector employee, traders/business, artisan and others. Here, others became the reference category.

Self-Assessed Health Status (SAHS): SAHS was used as a proxy for health status. Here the individuals self report about their health status. The question eliciting information on SAHS is formulated as follows: 'In general, would you say that your health is very good, good, or poor?' Only one category was chosen. These responses were assigned numerical values according to the following scale: very good = 3, good = 2 and poor = 1.

Type of Illness: The type of illness was captured by dummies namely malaria, aches and pains, respiratory, diarrhoea, injury/accident and others. Here, others became the reference category.

Severity of Illness: Severity of illness was measured on a scale from 1 to 3; 1= not serious, 2= serious and 3= very serious.

Income: One of the most important variables to be looked at in our study is income. But, estimating income of households in developing countries is very difficult as most people are reluctant to disclose their income. As a result, income is generally measured by expenditure (Jütting, 2001). To measure expenditure of households we adopt the approach used by Ghana Statistical Service. They group household expenditure into different components namely food and beverages, alcohol and tobacco, clothing and footwear, housing and utilities, household goods, operations and services, medical care and health expenses, transport and communication, recreation and education, and miscellaneous goods and services (Ghana Statistical Service, 1992). In this study, data were collected on these variables and aggregated to give household expenditure.

Wealth: Wealth is measured by an asset-based wealth index, created by using key housing characteristics (such as type of flooring, cooking fuel, or potable water source etc) and household assets (such as ownership of telephone, radio, TV, mobile phone, sewing machine or car etc). We assigned the value 1 if the household has any of these items and otherwise 0. The aggregate scores represent the wealth of the household.

Summary

The chapter has considered three main issues: First, the problem of “endogeneity” which one encounter when modelling the effects of health

insurance on health care demand (utilization). Secondly, the various procedures used to test for the presence of “endogeneity” namely Hausman test and Durbin-Wu-Hausman test. Thirdly, method used to correct “endogeneity” problem.

The two-part model developed as part of the Rand Health Insurance Experiment in the United States (Manning et al., 1987) was adopted in analyzing the effects of health insurance on outpatient utilization and expenditure. Given the dichotomous nature of our dependent variable in the case of probability of visiting a modern health care provider when ill, a logit regression model was specified. Besides, a linear model was specified for the incurred level of out-of-pocket expenditures, conditioning on positive use of health care services.

Interview was the main research instrument used to collect data from 386 individual household members. The next chapter analyzed the data collected.

CHAPTER FIVE

PRESENTATION AND DISCUSSION OF RESULTS

Introduction

The purpose of this chapter is to present and discuss the empirical findings of our study. The chapter is divided into six sections; we start with the general characteristics of the respondents, followed by test for endogeneity of the insurance variable, determinants of outpatient utilization and total out-of-pocket expenditure, determinants of enrolment and a brief discussion of the results.

Background of Respondents

This section attempts to give a brief description on the background of the individual respondents in the survey. Recall that 384 respondents were randomly selected of which half are members of NHIS while the other half are non-members.

Table 6: Sex of Respondents

Sex:	Frequency	Percentage (%)
Female	234	61
Male	150	39
Total	384	100

Source: Survey Data, 2008.

Table 6 gives the sex composition of the respondents. In all 234 females constituting 61% of the total respondents were randomly selected. This represents almost two-third of the total sample. However, 39% of the respondents were males.

Table 7: Age of Respondents

Age Range (Years):	Frequency	Percentage (%)
Below 20	24	6
20-29	126	33
30-39	88	23
40-49	79	20
50-59	34	9
60 and above	33	9
Total	384	100

Source: Survey Data, 2008.

Table 7 shows the age distribution of the respondents. It was observed that 9% of the respondents were above 59 years and 6% were below 18 years. Also,

33% of them fell between the ages of 20 and 29 years while 23% were between the ages of 30 and 39 years. But 20% of the respondents were between the ages of 40 and 49 years whereas 9% were between ages of 50 and 59 year. In general it was observed that 62% were between the ages of 18 and 39 years, hence data set was dominated by the youth.

Table 8 indicates the marital status of the respondents. Majority of the individuals sampled reported to be married – 60%. 28% reported to be single while 1% of them were separated. About 6% of them were divorced while the remaining 5% were widowed.

Table 8: Marital Status of Respondents

Marital Status:	Frequency	Percentage (%)
Married	229	60
Single	107	28
Separated	4	1
Divorced	24	6
Widowed	20	5
Total	384	100

Source: Survey Data, 2008.

Table 9: Literacy of Respondents

Are You Literate?	Frequency	Percentage (%)
No	119	31

Yes	265	69
Total	384	100

Source: Survey Data, 2008.

Respondents were asked whether they could read or write in any language. This was to solicit their literacy level. As it turn out 69% of them were literate whereas 31% were not. This is shown in table 9.

The level of education of respondents is presented in table 10. It was observed that out of 384 individuals interviewed 23% had no formal education, 10% had primary education. However, majority of the respondents that is 39% had either junior secondary school or middle school education. Of all the levels of education, the post secondary level had the lowest number of 1%. The percentage of those who had tertiary education was 8%.

Table 10: level of Education of the Respondents

Level of Education:	Frequency	Percentage (%)
None	89	23
Primary	38	10
JSS/Middle School	149	39
SSS/Secondary School	60	16
Vocation/Technical	11	3
Post Secondary	5	1
Tertiary	32	8
Total	384	100

Source: Survey Data, 2008.

Table 11 shows the current occupation of respondents. It was observed that majority of the respondents that is 35% were traders. This means that many of our respondents were engaged in commercial activities. This was not surprising because Mankessim, a town which is noted for its commercial activities contributed 253 to our sample. Also, 22% were unemployed whereas 13% were either into farming or fishing. Government sector employees had the least percentage of 9% were artisan while 10% of them were into other occupation.

Table 11: Current Occupation of Respondents

Occupation:	Frequency	Percentage (%)
Unemployed	83	22
Farming/Fishing	51	13
Gov't Sector Employee	35	9
Trader/Business	132	35
Artisan	43	11
Others	40	10
Total	384	100

Source: Survey Data, 2008.

Table 12 indicates the annual household expenditure of the respondents. It revealed that out of 384 individuals, 7% of them had an annual household

expenditure below ₵1000, 27% had an annual household expenditure between ₵1000 to ₵1999. However, majority of the respondents comes from households whose annual household expenditure ranges between ₵2000 to ₵2999 while a least of 1% of the respondents had an annual household expenditure above ₵6000. 8% and 2% of households had ₵4000 to ₵4999 and ₵5000 to ₵5999 expenditure respectively.

Table 12: Household Expenditure (Annual)

Expenditure Range (cedi):	Frequency	Percentage (%)
Below 1000	28	7
1000-1999	103	27
2000-2999	137	36
3000-3999	73	19
4000-4999	30	8
5000-5999	8	2
6000 and Above	5	1
Total	384	100

Source: Survey Data, 2008.

During the recall period of four weeks prior to the survey, 130 representing 34% of the randomly interviewed individuals reported having had at least one spell of illness. Table 13 shows the burden of disease for individuals who reported having had at least one spell of illness. For recent illness,

malaria/fever was the predominant afflictions cited by 49% of respondents. This was immediately followed by aches and pains with 25%. However, respiratory problems, diarrhoea, and injury were cited with much less frequency.

Table 13: Distribution of Illness/Injury

Type of Illness:	Frequency	Percentage (%)
Malaria/Fever	63	49
Aches and Pains	33	25
Respiratory	9	7
Diarrhoea	4	3
Injury/Accident	3	2
Others	18	14
Total	130	100

Source: Survey Data, 2008.

For individuals who reported having had at least one spell of illness in the last four weeks, 36% perceived their illness as not serious, 45% of them see their illness as serious and 19% perceived their illness as very serious. Table 14 indicates individual self perception of their illness.

Table 14: Severity of Sickness/Injury

Severity of Illness:	Frequency	Percentage (%)
Not Serious	47	36
Serious	58	45
Very Serious	25	19
Total	130	100

Source: Survey Data, 2008.

Tables 15 and 16 show informal and formal health care seeking behaviour of respondents particularly individuals who reported having had at least one spell of illness. Out of 130 individuals, 62% visited informal provider for health care need while almost 59% visited a modern health care.

Table 15: Respondents Who Seek Care from Informal Provider

Seek Care from Informal Provider?	Frequency	Percentage (%)
No	49	38
Yes	81	62
Total	130	100

Source: Survey Data, 2008.

Table 16: Respondents Who Seek Care from Modern Health Care Provider

Seek Care from Modern Health Provider?	Frequency	Percentage (%)
No	54	41
Yes	76	59
Total	130	100

Source: Survey Data, 2008.

Test for Normality and Endogeneity

Test for normality was conducted for two main variables namely income and out-of-pocket payments which according to the literature are likely to be non-

normality. As it turns out these variables had a normal distribution (see appendix C).

Furthermore, our models which estimated the determinants of outpatient utilization and total out-of-pocket expenditure have been subjected to a number of specification and diagnostic tests. In particular, the possible endogeneity of health insurance in models (1) and (2) (see chapter four) has been tested by using the Durbin-Wu-Hausman (DWH) test. The insurance variable (*mnhis*) would be endogenous in model (1) if $Cov(mnhis, \varepsilon)$ differs from 0, where $mnhis \in X$ in (1) and (2). This would render the coefficient of *mnhis* biased and inconsistent.

The test was performed as follows. First, we regressed *mnhis* on all other exogenous variables, including the selected Instrumental Variable (in this case, government sector employee). We obtain the reduced form residual terms that is *new_residual_values*. We Included *new_residual_values* in model (1) – the model that estimates the probability of utilizing outpatient care – and formally tested if the coefficient for *new_residual_values* was statistically significant from zero ($H_0: \beta_{\text{new_residual_values}} = 0$). Failure to reject the null hypothesis would suggest that *mnhis* is exogenous in (1). The test indicated that health insurance is not endogenous in model (1) as shown by the p-value [$\chi^2(1) = 0.71, \text{Prob} > \chi^2 = 0.3995$].

Similar test was conducted in order to show that health insurance is not endogenous in model (2) – the model that estimates the out-of-pocket expenditure. Here too the result indicates that health insurance is not endogenous in model (2) as shown by the p-value [$F(1, 58) = 0.15, \text{Prob} > F = 0.6993$]. These results are presented in appendix C.

Estimating the Effects of Health Insurance

Our primary variable of interest is membership in NHIS. We hypothesized that after controlling for individual and household characteristics, members of a health insurance scheme have better access and lower financial burden of health care than non-members. This means that NHIS membership has a positive coefficient for outpatient care and a negative coefficient for the effect on out-of-pocket expenditure. Besides membership, the other variable of key interest is income, as we want to determine the extent to which demand for outpatient utilization and out of pocket expenditure is due to income level and paying ability. Former studies have shown that the demand for health care is influenced by the ability to pay (e.g., Gertler and Van der Gaag, 1990).

As control variables, we included individual characteristics such as age, sex, education, household size, severity of illness, type of illness and self assessed health status. Age and sex capture the differences in the need for health care and the latter serves as a proxy for an individual's health status. Household characteristics are included and aim to control for health preferences due to factors such as income. See appendix B for descriptive statistics.

Determinants of Outpatient Utilization: Empirical Results

The logit regression yielded very significant results during the first and second round of estimation. It must be noted that the first round of estimation generated the z-values for deciding the acceptance or rejection of a particular variable. In the second round, the marginal effects were generated to determine

the probability of an increase or decrease in utilization with respect to a unit charge in any of the explanatory variables (see appendix D for results). Table 17 shows the logit results after the first round of estimation.

Table 17: Logit Result (Determinants of Outpatient Utilization)

Variable	Coefficient	Z	P> Z
SEX	-.800908	-1.45	0.146
AGE	.0018083	0.12	0.907
HH_SIZE	-.1182	-1.33	0.182
MNHIS	1.128339	2.30	0.021
SOI	.5943328	1.64	0.101
SAHS	-.5280142	-1.33	0.183
MAL_DUMMY	-.8810434	-1.31	0.191
PAIN_DUMMY	-1.465879	-1.93	0.053
RESP_DUMMY	.6726932	0.51	0.611
EMPLOY	-.3790308	-0.54	0.591
SEX_H	-.4970272	-1.00	0.320
INCOME	.0006689	2.31	0.021
CONSTANT	-.0102984	-0.01	0.995
Number of observation = 123		LR chi2 (12) = 41.45	
Prob > chi2 = 0.0000		Pseudo R2 = 0.2457	
Log likelihood = -63.615272			

Source: Author's Field Results Using STATA (2000)

On the whole, the model was highly significant as indicated by the p-value associated with the chi-square (p-value= 0.0000). Also, the explanatory power is quite good. According to McFadden (1974), Pseudo R^2 value between 0.2 and 0.4 represent a good fit of a model. It must be noted that the Pseudo R^2 as reported by STATA is McFadden Pseudo R^2 . Therefore, a Pseudo R^2 value of 0.2457 shows that our model is of good fit.

A critical look at the results above reveals that membership is statistically significant in determining utilization of outpatient care. The hypothesis that “Membership of NHIS” does not influence outpatient utilization is rejected. At 5 percent level of significance, it is accepted that the decision to visit outpatient care is highly influenced by being a member of NHIS. With a z-value of 2.30 we accept that membership affect utilization of outpatient care. Added to this, membership has the expected positive sign. This means that members of NHIS are more likely to utilize outpatient care than non-members. This result reinforce the finding that insured members have a positive effect on the utilization of health services such as in Chenq and Chianq (1997); Waters (1999); Jütting (2002) and Jowett et al., (2003).

With respect to other explanatory variables, we found that income had the expected sign. At 5% level of significance, income had a strong positive influence on utilization of outpatient care. This is in line with common economic understanding that with rising income, the demand for health care increases due to higher opportunity costs. Also, it shows that despite membership in a scheme, the level of income still matters to a great extent for the demand for health care.

Severity of illness has positive effect on utilization and this was achieved at a marginal significant level of 10%. This means that the more individuals perceive their illness as severe the more likely they would visit a modern health provider.

One of the notable findings of this study was the inclusion of dummies for the type of illness which the individual suffered. As it turns out diarrhoea and injury dummies predicts success perfectly. This means that in this study all individuals who reported as suffering from diarrhoea and injury utilized health care. Also, individual who suffered aches and pains decreased their utilization of outpatient care in relative to other diseases and this was at 5% level of significant. Possible reasons for this result are that individuals who suffered from aches and pains may not perceive their illness as severe or preferred using informal care. However, malaria sufferers were less likely to utilized outpatient care, but this was statistically insignificant. Individuals who had respiratory diseases were more likely to visit outpatient department, however, this was statistically insignificant.

Determinants of Total Out-of-Pocket Expenditure: Empirical Results

Table 18 shows a linear regression result for out-of pocket payment. The model was highly significant as indicated by the p-value associated with the F (p-value=0.0002). Also, the explanatory power is quite good as indicated by the R-squared value of 0.4588 and an adjusted R-squared value of 0.3345. For instance, the R-squared value of 0.4588 means that our model explain almost 46% of total variation in out-of pocket payment.

Table 18: Regression Result (Determinants of Out-of-Pocket Expenditure)

Variable	Coefficient	T	P> T
SEX	1.315622	0.37	0.712
AGE	-.0622177	-0.73	0.470
HH_SIZE	.8901213	1.34	0.185
MNHIS	-8.495314	-2.47	0.016
SOI	3.148011	1.44	0.155
SAHS	5.523246	2.57	0.012
MAL_DUMMY	-5.06572	-1.24	0.219
PAIN_DUMMY	-10.04168	-2.11	0.039
RESP_DUMMY	-8.524188	-1.60	0.114
DIAR_DUMMY	-10.7167	-1.50	0.140
INJ_DUMMY	7.92031	0.95	0.345
EMPLOY	2.241439	0.50	0.618
SEX_H	-6.951116	-2.13	0.037
INCOME	-.0023709	-1.52	0.132
CONSTANT	10.64987	1.00	0.321
Number of observation =76		F (14, 61) = 3.69	
Prob > F = 0.0002		R-squared = 0.4588	
Adj R-squared = 0.3345		Root MSE = 11.167	

Source: Author's Field Results Using STATA (2000)

The result shows that at 1% significant level, it is accepted that membership influences out-of-pocket payments. With t-value of -2.47 we accept

that membership of NHIS affects out-of-pocket payments. It is interesting to note that membership has the expected negative coefficient with out-of-pocket payment. This means that members of NHIS pay less when using outpatient care. This is an impressive finding and is an indication that the health insurance scheme seems to achieve its objective of providing protection against the financial risks associated with illness. This finding is consistent with results reported by Chenq and Chianq (1997), Tu-Bin et al (2005) and Ekman, 2007.

These results confirm our hypothesis that members of NHIS are more likely to utilize outpatient care and at the same time pay less than non-members. It must be noted that these results are consistent with evidence emerging from the literature, including Jütting (2002), Sulzbach et al. (2005) Diop et al. (2006) and Ekman, 2007.

Determinants of Enrolment in Health Insurance: Individual Level

Even though theoretically and empirically a lot of factors seem to influence enrolment in health insurance, however, as far as this study is concerned sex, age, literacy, education, income and wealth were the main variables of interest.

In the first round of estimation, all the five covariates namely sex (male), age, literacy, income and wealth had the expected signs and they were highly significant. At 5% level of significance, there is enough evidence to accept that the entire variables statistically influence individuals' decision to enrol in health

insurance. Pseudo R^2 also suggests that the model predicts well and fits well. The results of the logit regression are presented in tables 19 and 20.

Table 19: Logit Result (Individual Enrolments in Health Insurance)

Variable	Coefficient	Z	P> Z
SEX	-.6480001	-2.56	0.011
AGE	.0307738	3.77	0.000
LIT	.6545392	2.22	0.026
INCOME	.0004485	3.79	0.000
WEALTH	.1515488	5.31	0.000
CONSTANT	-4.835327	-7.87	0.000
Number of observation = 384		LR chi2 (5) = 113.30	
Prob > chi2 = 0.0000		Log likelihood=-209.51936	
Pseudo R2 = 0.2128			

Source: Author's Field Results Using STATA (2000)

As stated earlier, the sex (male) variable had the expected sign. A negative sign indicates the males are less likely to enrol. A z-value of -2.56 means that male variable significantly influence enrolment in health insurance. The strong negative effect of the sex (male) dummy on enrolment supports earlier findings by the U.S. Census Bureau (2002) and Munkin and Trivedi (2003) which revealed that males are less likely to be insured.

Age had a positive coefficient with enrolment and was highly significant. This suggests that age does have an effect on an individual's mindset. As a person

becomes older, he tends to become more conservative, preferring a fixed level of utility. This result is consistent with evidence emerging from the literature, including U.S. Census Bureau (2002), Munkin and Trivedi (2003) and Sulzbach et al. (2005). Besides, the literacy variable was relatively significant at 5%. This means literate individuals are more likely to enrol.

Income had a strong positive impact on the probability of being a member of the scheme. This was achieved at 1% of significance. This makes sense because people with higher incomes are more likely to purchase some form of health insurance. Again, individuals with higher incomes are much more likely to enrol themselves than individuals with lower incomes.

Again, Likelihood Ratio test suggests that sex (male), age, literacy, income and wealth jointly influence individual's decision to enrol in health insurance

Table 20: Marginal Effects (Individual Enrolments in Health Insurance)

Variable	$\partial y / \partial x$	Z	P> Z
SEX	-.1605262	-2.60	0.009
AGE	.0076919	3.77	0.000
LIT	.1618243	2.27	0.023
INCOME	.0001121	3.80	0.000
WEALTH	.0378797	5.31	0.000

Y = Pr (mnhis) (predict) = .50703702

Source: Author's Field Results Using STATA (2000)

Wealth had a positive coefficient with enrolment and was highly significant. With a z-value of 5.31 ($p=0.00$), the wealth variable was significant at 1%. This means that individuals from wealthy households are more likely to enrol. The marginal effect ~~dy/dx~~ of .0378797 ($z=5.31$) means that as wealth of household increases enrolment in health insurance will increase by 3.8%. This result confirms Jütting's (2002) study.

Determinants of Enrolment in Health Insurance: Household Level

In this section, the analysis of the effects of household characteristics on the probability of household enrolment serves as a basis for the assessment of social inclusion. To determine enrolment at the household level, the insurance status of the household head was used as a proxy for whether or not a household is enrolled in NHIS. The model was highly significant and its explanatory power was quite good as indicated by the p-value associated with chi-square (0.0000) and the Pseudo R^2 (0.2094).

The logit regression results are presented on tables 21 and 22. All the variables that enter the logit regression had a positive sign. Also, the variables had the expected signs with the exception of sex of household head. This means that households headed by males are more likely to enrol than households headed by females, even though this was not significant statistically. This was a significant finding because most of the literature reveals that households headed by females are more likely to enrol in health insurance than male households headed by males.

Table 21: Logit Result (Household Enrolments in Health Insurance)

Variable	Coefficient	Z	P> Z
SEX_H	.0686571	0.25	0.803
AGE_H	.0323294	3.77	0.000
EDUC_H	.2526062	2.43	0.015
INCOME	.0003612	3.21	0.001
WEALTH	.0816927	2.92	0.004
CONSTANT	-4.735248	-7.20	0.000
Number of observation = 384		LR chi2 (6) = 109.78	
Prob > chi2 = 0.0000		Log likelihood = -207.1818	
Pseudo R ² = 0.2094			

Source: Author's Field Results Using STATA (2000)

Table 22: Marginal Effects (Household Enrolments in Health Insurance)

Variable	$\partial y / \partial x$	Z	P> Z
SEX_H	.0167958	0.25	0.802
AGE_H	.0079227	3.78	0.000
EDUC_H	.0619044	2.43	0.015
INCOME	.0000885	3.21	0.001
WEALTH	.0200199	2.92	0.003
Y = Pr (mnhis_h) (predict) = .42973649			

Source: Author's Field Results Using STATA (2000)

The positive sign of the education variable indicates that there is a direct relationship between education and enrolment. With a z-value of 2.43 ($p=0.015$) the education variable was highly significant at 1%. The marginal effect $\frac{\partial y}{\partial x}$ of .0619044 ($z=2.43$) means that an increase in the level of education of the head of household would increase enrolment by 6.2%. This result is consistent with earlier studies such as Sulzbach et al. (2005) and Diop et al. (2006) which reveals that the higher the level of education of heads of household, the more likely they are to enrol than heads of household with lower education.

At the household level as the situation was at individual level, income had a strong positive impact on the probability of being a member of the scheme. This indicates that ability to pay does make a difference in the decision to join the scheme as households with lower income were less likely to join the scheme than households with higher income. Also, age and wealth were highly significant as the case was at the individual level.

Likelihood-ratio test suggests that personal and household characteristics (sex, age, education, employment, income, and wealth) of the household head jointly influence enrolment in NHIS.

Discussion of Results

The study found that insured respondents were more likely to seek outpatient care than 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 modern health care

facility. This implies that health insurance increased outpatient utilization and it enable patients to seek care on time thus avoiding complications associated with illness.

However, about 40% of the population in the municipality has not enrolled with NHIS and continues to report dismal health care utilization patterns. Although the large majority of non-members interviewed, nearly 95%, said they would like to become members in the future, 65% of them cited financial difficulty as the main reason for not joining the scheme. This raised concerns about how successful the scheme is in improving equity of access to care.

A major objective for the introduction of the NHIS was to achieve equitable and universal access to health care in Ghana through the removal of financial barriers imposed by user fees. The regression results on the probability of seeking modern health care provider when ill found that income was a significant factor in the outcome of interest, supporting the notion that those with more financial resources have better access to and increased ability to pay for health care services.

Besides, there was a significant difference in out-of-pocket payments between insured and uninsured respondents. Insured respondents paid on average GH¢3.52 compared to GH¢16.03 for uninsured respondents. Hence, uninsured patients paid nearly 5 times the amount that the insured patients paid for outpatient care. Membership of NHIS has been shown to be particularly effective in protecting members from health care expenditures. Therefore, if families could

be convinced to enrol in the NHIS, the cost that would be saved in terms of health care expenditure is likely to be significant.

Summary

The chapter presented and discussed the results of the study. Estimations were done using STATA and SPSS statistical packages. Various diagnostic tests were carried out which include test for normality and test for endogeneity.

Results indicated that insured respondents were more likely than uninsured to utilize outpatient care and also pay less at the same time. With regard to enrolment in health insurance age, sex (male), literacy, income and wealth predicted enrolment at the individual level. Moreover, personal and household characteristics (sex, age, education, employment, income, and wealth) predicted enrolment at household level.

CHAPTER SIX

SUMMARY, CONCLUSIONS AND POLICY IMPLICATIONS

Introduction

This chapter seeks to present a brief summary on the content of the research work undertaken in this thesis and outline the major conclusions that were derived from the empirical results. The next section discusses policy implications, limitations of the study and suggested areas for future research.

Summary

This study began with the observation that the introduction of user fees otherwise known as “Cash and Carry” had decreased access to health care particularly among the poor and the vulnerable. In an attempt to increase access and improve the quality of health care, the government of Ghana passed the National Health Insurance Act 650 (HI Act) in August 2003. The government regards the National Health Insurance Scheme (NHIS) as one of the instruments to achieve the Millennium Development Goals.

The purpose of the study was to analyze the effects of NHIS on outpatient utilization of health care services and expenditure among the people of Mfantseman Municipality. Other objectives were to find out the determinants of enrolment in NHIS and also to come out with policy implications.

For us to achieve our goal, first we reviewed available literature on the topic. The reasons were mainly to arrive at suitable models and also to come out with variables that are likely to be appropriate for the purpose of our study. The two-part model which was developed as part of the Rand Health Insurance Experiment in the United States (Manning et al., 1987) was adopted for the study. Given the dichotomous nature of our dependent variables in the cases of probability of visiting a modern health care provider when ill and probability of enrolment in health insurance, logit regression model was specified. Additionally, a linear model was specified for the incurred level of out-of-pocket expenditures, conditioning on positive use of health care services. It must be noted that a review of the literature on the health sector in Ghana was done.

A household survey was conducted within the Mfantseman Municipality to collect the data. In all, 384 individuals were randomly selected and interviewed. Empirically, there was enough evidence to show that members of NHIS are more likely to utilize outpatient care and pay less at the point of utilizing health care services than non-members. The results were consistent with evidence from the literature notably Jütting (2002); Sulzbach et al., (2005); Diop et al., (2006) and Ekman, (2007).

Through econometric analyses, it was observed that sex, age, literacy, education, income and wealth do have significant effect on enrolment in health insurance.

Conclusions

The results of this study allowed us to draw the following conclusions: firstly, health insurance has helped to eliminate financial barriers to utilization of health care for the insured members whereas the uninsured members continue to report significantly worse utilization of care. In addition to improved utilization, faster utilization of care for the insured patients has contributed to a shift in demand for care from the traditional to the modern health sector and has improved the efficient use of limited medical resources such as drugs and staff in the various health facilities.

Additionally, the results suggest that membership of NHIS has a strong protective effect on the level of out-of-pocket expenditures for outpatient care. This means that there is a significant difference between levels of outpatient out-of-pocket expenditures for members and non-members.

Furthermore, we find evidence that NHIS is an effective tool for increasing utilization of modern health care services particularly outpatient care and that NHIS membership can protect households from the potentially catastrophic health care expenditures. Although, data collected for this study was quite extensive, it is too early to conclude that better utilization of care due to NHIS membership has caused members' health to improve. However, findings from different sources suggest that conclusion (Liu, 2002).

Moreover, this study adds to the growing body of literature on the effects of health insurance on health care utilization particularly outpatient care and expenditures. It is hoped that future studies will learn from and build upon this

work to create a better understanding of the role and effects of NHIS in improving health in Ghana.

Again, the approach used to assess social inclusion in health insurance organization in this study is to investigate the effects of personal and household characteristics on enrolment. This approach is consistent with the emerging literature on the impact of community-based health insurance (Jakab et al., 2001 and Ekman, 2004).

Besides, the results suggest that there is a consistent evidence of association between economic status of the individual/household and the likelihood of enrolment of the individual/household. Individuals from households with higher incomes or higher wealth are much more likely to enrol in the scheme than individuals from households with lower incomes or lower wealth.

In furtherance of these, the results emerging from our study support findings which suggest that enrolment of the poor in community-based health insurance may depend upon other dimensions of social inclusion, such as participation and community ownership. Additionally, the structure of the benefits packages and the contractual relations that the district mutual health insurance organizations have with health care providers may influence a variety of costs of accessing health services and may therefore influence the poor's decision to enrol in health insurance.

Lastly, household characteristics contribute to the likelihood of enrolment in health insurance. For instance, higher level of education of the head of household was generally associated with higher likelihood of enrolment.

Policy Implications

A handful of policy suggestions can be extrapolated from the results of this study. First, an important policy implication of this study is that it is critical to move away from resource mobilization instruments that are based on point-of-service payments (i.e. “Cash and Carry”). Public education should be embarked upon to encourage families to enrol, as the scheme has immediate direct and indirect impact on poverty. The direct impact would be by preventing impoverishment due to catastrophic health expenditures. The indirect impact would be by ensuring access to health and thereby improving health, thus allowing the individual to take advantage of economic and social opportunities.

Organizations/institutions such as the Ghana Information Service, National Commission on Civic Education (NCCE), the media particularly, the local FM stations and Ghana Broadcasting Corporation (GBC) should educate the general public on the benefits of the scheme. Also, the Public Relation Departments of the various schemes in the districts should intensify their education and sensitization programmes especially in the rural areas.

Participation in health insurance schemes is not cost-free and requires a minimum level of income which the most disadvantaged often do not have at their disposal. Therefore, donors and policy makers should be aware that it may be very difficult, if not impossible, to reach the poorest part of the population when promoting enrolment. In order to reach the poorest members of the society, the cost of participation would have to be reduced or the government would have to

subsidize their premiums. This targeted demand-side subsidy would contribute to welfare gain if they benefit the indigents.

Even though the act that established the NHIS made provision for the indigents or the very poor to be exempted from paying premium, it has become increasingly difficult if not impossible to identify them. Chiefs, opinion leaders, assemblymen or assemblywomen and other concern citizens in the communities should help in identifying the very poor so that they could be exempted from paying premium.

At individual level it was observed that enrolment in health insurance was influenced by literacy. This meant that the more literate a person is the more likely he/she will enrol in health insurance. The implication of this result is that for government to achieve universal health insurance coverage functional literacy class should be promoted.

This study has attempted to capture information related to outpatient utilization and out-of-pocket expenditures after the implementation of the national health insurance in Ghana. It is envisaged that the results of this study in and of themselves will be of service to the government of Ghana as it continues to implement its ambitious policy of providing universal coverage of health care services.

Limitations of the Study

Our study is limited by a number of factors as this is the case with all forms of research work. To begin with, in analyzing the effects of NHIS we

limited our study to outpatient care neglecting other health care services such as inpatient care, prenatal care and delivery care. It must be noted that this was done mainly due to limited time and financial constraints.

Moreover, evidence from our study suggests that NHIS increases the level of outpatient utilization among members than non-members. However, this study failed to examine further whether the scheme had actually improved the health status of members.

Suggestions for Future Research

The findings of this study suggest some areas of future research. First, in order to understand the effects of health insurance on health care in general future research should investigate the effects of health insurance on curative care (outpatient care and inpatient care), and maternity health care (prenatal care and delivery care).

Last but not least, it could be shown that access to health insurance can have a positive impact on the members' economic and social situation. Further investigation should be devoted to discovering the extent to which health insurance, or its lack, affects labour supply and labour productivity and the health status of the insured.

REFERENCES

- Aikins, M. (2003). *Emerging Community Health Insurance Scheme/Mutual Health Organizations in Ghana—Achievement & Challenges*. Accra: Sakva Company limited.
- Aikins, M. (2005). *Jaman South Health Insurance Scheme Brong Ahafo Region, External Evaluation, 2004*. Accra: Uneek Magazine Publication.
- Akin, J., Birdsall, N. and de Ferranti, D. (1987). *Financing Health Services in Developing Countries: An Agenda for Reform*. A World Bank Policy Study, Washington, D.C.: The World Bank.
- Akor, K. J. (2002): *The Effects of User Fees in the Volta Region of Ghana. Health Policy and Planning*, 14, 329-341.
- Asfaw, A. (2003). *Cost of Illness, Demand for Medical Care, and the Prospect of Community Health Insurance Schemes in the Rural Areas of Ethiopia*. Frankfurt: Peter Lang Eds.
- Atim, C. (1998). *Contribution of Mutual Health Organizations to Financing Delivery and Access to Health Care: Synthesis of Research in Nine West and Central African Countries*. Bethesda, MD: Partners for Health Reformplus, Abt Associates Inc.
- Atim, C., Grey, S., and Apoya, P., (2003). *A Survey of Mutual Health Organizations in Ghana*. Bethesda, MD: Partners for Health Reformplus, Abt Associates Inc.

- Atim, C., and Sock M. (2000). *An External Evaluation of the Nkoranza Community Financing Health Insurance Scheme, Ghana*. Bethesda, MD: Partners for Health Reformplus, Abt Associates Inc.
- Bedi, A., and Gaston, N. (1999). Using Variation in Schooling Availability to Estimate Educational Returns for Honduras. *Economics of Education Review*, 18, 107–116.
- Bennett, S., Creese, A., and Monash, R. (1998). Health Insurance Schemes for People outside Formal Sector Employment. ARA Paper No. 16, WHO, Geneva.
- Cameron, A.C., Trivedi, P.K., Milne, F., Piggot, J. (1988). A Microeconomic Model of the Demand for Health Care and Health Insurance in Australia. *The Review of Economic Studies*, 55 (1), 85-106.
- Chen, C.S., Liu, T.C., and Lin, C.J. (2005). The Analysis of Family Income and Out-of-Pocket Medical Expenditure Financial Burden in Taiwan. *Taiwan Bank Quarterly Journal*, 56, 200–229.
- Chenq, S. H., and Chianq, T.L. (1997). The Effect of Universal Health Insurance on Health Care Utilization in Taiwan-Results from a Natural Experiment. *Journal of the American Medical Association*. 278 (2), 89-93.
- Chiappori, P.A and Salanie, B. (2000). Testing for Asymmetric Information in Insurance Markets. *Journal of Political Economy*, 108, 56-78.
- Coleman, B. (1999). The Impact of Group Lending in Northeast Thailand. *Journal of Development Economics*, 60, 105–141.

- Commission on Macroeconomics and Health (2001). *Macroeconomics and Health: Investing in Health for Economic Development. Report of the Commission on Macroeconomics and Health*. Geneva: World Health Organization.
- Criel, B. (1998). *District-Based Health Insurance in Sub-Saharan Africa. Part II: case-studies*. Antwerp: Studies in Health Services Organization and Policy.
- Davidson, R., and MacKinnon, J.G. (2004). *Econometric Theory and Method*. New York: Oxford University Press.
- Diop, F. P., Sulzbach, S and Chankova, S. (2006). *The Impact of Mutual Health Organizations on Social Inclusion, Access to Health Care, and Household Income Protection: Evidence from Ghana, Senegal, and Mali*. Bethesda, MD: The Partners for Health Reformplus Project, Abt Associates Inc.
- Dror, D., and Jacquier, C. (1999). Micro-Insurance: Extending Health Insurance to the Excluded. *International Social Security Review*, 52 (1), 71–98.
- Ekman, B. (2007). The Impact of Health Insurance on Outpatient Utilization and Expenditure: Evidence from one Middle-Income Country Using national Household Survey Data. *Health Research Policy and System*, 5:6. Retrieved January 25, 2008 from <http://www.health-policy-systems.com/content/5/1/6>.
- Feldman, R. and Dowd, B. (1991). A New Estimate of the Welfare Loss of Excess Health Insurance. *American Economic Review*, 81, 297-301.

- Feldstein, M.S. (1973). The Welfare Loss of Excess Health Insurance. *Journal of Political Economy*, 81, 251-280.
- Folland, S., Goodman, A .C., and Stano, M. (2004). *The Economics of Health and Health Care*. Upper Saddle River, NJ: Pearson Prentice Hall.
- Gertler, P. and van der Gaag, J. (1990) *The Willingness to Pay for Medical Care*. The World Bank, Baltimore: Johns Hopkins University Press.
- Ghana Ministry of Health (1997). *Annual Report of Maternal & Child Health and Family Planning, 1997*, Accra: Ministry of Health
- Ghana Ministry of Health (1999). *Medium Health Strategy towards Vision 2020, Revised August, 1999*, Accra: Ministry of Health
- Ghana Ministry of Health (2007). *Programme of Work, the Ghana Health Sector*, Accra: Ministry of Health
- Ghana Ministry of Local Government (1999). *Standard of Living for Communities in Central Region*. Retrieved November 4, 2007 from <http://www.ghanadistricts.com>
- Ghana Statistical Service (1992). *Ghana Living Standard Survey, GLSS2*. Accra: Ghana Statistical Service.
- Ghana Statistical Service (2000). *Ghana Living Standard Survey, GLSS4*. Accra: Ghana Statistical Service.
- Ghana Statistical Service. (2000). *2000 Population and Housing Census*. Accra: Ghana Statistical Service.
- Gilson, D. (1992). *The Lessons of User Fee Experience in Africa*. Washington D.C.: World Bank.

- Graphic Communication Group Ltd. (2007, November 24). Malaria Control is a Collective Responsibility. *The Mirror*, p. 2.
- Graphic Communication Group Ltd. (2008, May 7). NHIS Coverage Rate Exceeded Targets—CEO. *Daily Graphic*, p.15.
- Green, W. H. (2000). *Econometric Analysis*. Upper Saddle River, New Jersey: Prentice-Hill, Inc.
- Griffin, C. (1992). *Health Care in Asia: a Comparative Study of Cost and Financing; World Bank Regional and Sectoral Studies*. Washington, D.C.: World Bank.
- Grossman, M. (1972). On the Concept of Health Capital and the Demand for Health. *Journal of Political Economy*, 80, 223-255
- Hausman, J. A. (1978). Specification Tests in Econometrics. *Econometrica*, 46(6), 1251-1271.
- Holzmann, R., and Jorgensen, S. (2000). Social Risk Management: A New Conceptual Framework for Social Protection, And Beyond. *Social Protection Discussion Paper No. 0006*. Washington, DC: The World Bank.
- Indiana Family and Social Services Administration (2000). *The Indiana Health Insurance Study*. Retrieved January 25, 2008 from <http://www.state.in.us/fssa/programs/chip/insurance/study.html>
- Jakab, M., Preker, A. S., Krishnan, C., Schneider, P., Diop, F., Jütting, J., Gumber, A., Ranson, K., and Supakankunti, S. (2001). Social inclusion and financial protection through community financing: Initial results from

five household surveys. *Health, Nutrition and Population Discussion Paper*, Washington, D.C.: World Bank.

Jowett, M, Contoyannis P, and Vinh, N.D (2003). The Impact of Public Voluntary Health Insurance on Private Health Expenditure in Vietnam. *Social Science and Medicine*, 56, 333-342.

Jütting, J. (2001). The Impact of Health Insurance on the Access to Health Care and Financial Protection in Rural Areas of Developing Countries: The Example of Senegal. Retrieved 22 September 2007 from <http://www.zef.de>

Jütting, J. (2002). *The Impact of Community-Based Health Financing on Financial Protection: Case Study Senegal*. HNP Discussion Paper, World Bank. Washington, D.C.: World Bank.

Liu, T.C., Chen, C. S., and Chen, L. M. (2002). The impact of National Health Insurance on Neonatal Care Use and Childhood Vaccination in Taiwan. *Health Policy and Planning*, 17 (4), 384-392

Lund, S. (2003). *Health Insurance Schemes in Northern Ghana: A Case Study of Salamba Women's Health Insurance Scheme*. Accra: Chaiglo Print Services.

Manning, W. and Marquis, M. (1996). Health Insurance: The Trade Off Between Risk Pooling and Moral Hazard. *Journal of Health Economics*, 15, 609-640.

Manning, W., Newhouse, J., Duan, N., Keeler, E., Leibowitz, A., and Marquis, M. (1987). Health Insurance and the Demand for Medical Care: Evidence

from a Randomised Experiment. *American Economic Review*, 77, 251–277.

McFadden, D. (1974). Conditional Logit Analysis of Qualitative Choice Behaviour. (P. Zarembka, Ed.) *Frontiers in Econometrics*, 105-142.

McIntyre, D. (2007). *Country Case Study: Health Insurance in Ghana*. Cape Town: Health Economics Unit.

Miller, L (1994). Medical Schools Put Women in Curricula. *Wall Street Journal*, p. B1, May 24.

Ministry of Health (2003). *National Health Insurance Policy Framework for Ghana*. Accra: Ministry of Health.

Ministry of Health (2004). *Aligning Exemption Policy and Practice with Poverty Reduction Goals: A Report of the Annual Health Sector Review 2002*. Accra: Ministry of Health.

Morrisson, C. (2002). Health, Education and Poverty Reduction: *OECD Development Centre Policy Brief No. 19*. Paris: OECD Development Centre.

Munkin, M. K. and Trivedi, P. K. (2003). Bayesian Analysis of a Self-Selection Model with Multiple Outcomes Using Simulation-Based Estimation: An Application to the Demand for Healthcare. *Journal of Econometrics*, 197–220.

Nada, P. (1999). A Woman's Participation in Rural Credit Programmes in Bangladesh and their Demand for Formal Health Care: is there a Positive Impact? *Health Economics and Econometrics*, 8, 415–428.

- National Development Planning Commission (2003) *Ghana Poverty Reduction Strategy (2003-2005)*. Retrieved May 5, 2008 from <http://www.ndpc.gov.gh/Publications.html>.
- National Development Planning Commission (2005) *Ghana Poverty Reduction Strategy (GPRS II) (2006-2009)*. Retrieved May 5, 2008 from <http://www.ndpc.gov.gh/Publications.html>.
- Newhouse, J. P. (1978). *The Economics of Medical Care*. Reading, MA: Addison-Wesley.
- Newhouse, J.P. (1993). *Free for all? "Lessons from the RAND Health Insurance Experiment"*. Cambridge, MA: Harvard University Press.
- Norton, E.C., Wang, H, and Ai, C. (2004). Computing Interaction Effects and Standard Errors in Logit and Probit Models. *The Stata Journal*, 4 (2), 103-116.
- Nyonator, F., Awoonor-Williams J.F., Phillips J.F., Jones T.C., and Miller R.A. (2005). *The Ghana Community-Based Health Planning and Services Initiative for Scaling up Service Delivery Innovation*. Technical Report 34. Bethesda, MD: Partners for Health Reformplus, Abt Associates Inc.
- Odwee, J.J.A.O., Okurut, F. N., and Adebua, A. (2006). The Determinants of Health Care Demand in Uganda: The Case Study of Lira District, Northern Uganda. *Research Paper No 155*. Nairobi: African Economic Research Consortium.
- Pauly, M.V. (1968). The Economics of Moral Hazard: Comment. *American Economic Review*, 58, 531-538.

- Perker, A. and Carrin, G. (2004). *Health Financing for Poor People: Resource Mobilization and Risk Sharing*. Washington, D.C.: World Bank.
- Pindyck, R.S., and Rurinfeld, D.L. (1981) *Econometric Models and Economic Forecast*. New York: McGraw-Hill.
- Pohlmeier, W. and Ulrich, V. (1995). An Econometric Model of the Two-Part Decision-Making Process in the Demand for Health Care. *The Journal of Human Resources*, 30 (2), 339-361.
- Rothschild, M., and Stiglitz, J.E. (1976). Equilibrium in Competitive Insurance Markets: An Essay on the Economics of Imperfect Information. *Quarterly Journal of Economics*, 90, 630-649.
- Santos-Silva J.M.C., and Windmeijer, F. (2001). Two-Part Multiple Spell Models For Health Care Demand. *Journal of Econometrics*, 104, 67-89.
- Sarma, S., and Simpson, W. (2006). A Microeconometric Analysis of Canadian Health Utilization. *Health Economics*, 15, 219-239.
- Sepehri, A., Simpson, W., and Sarma, S. (2006). The Influence of Health Insurance on Hospital Admission and Length of Stay--The Case of Vietnam. *Social Science Medicine* 63 (7), 1757-70.
- STATA (2000). A Guide to Using Stata. Indiana University: Scott Long.
- Sulzbach, S., Garshong, B., and Banahene, G. (2005). *Evaluating the Effects of the National Health Insurance Act in Ghana*. Baseline Report. Bethesda, MD: Partners for Health Reform Project, Abt Associates Inc.

- Trivedi, P. (2003). *Patterns of Health Care Use in Vietnam: Analysis of 1998 Vietnam Living Standards Survey Data*. World Bank Discussion Paper, Washington D.C.: World Bank.
- Trujillo, A. J., Portillo, J.E., and Vernon, J.A. (2005). The Impact of Subsidized Health Insurance for the Poor: Evaluating the Colombian Experience Using Propensity Score Matching. *International Journal of Health Care Finance Economics* 5 (3), 211-39.
- Tu-Bin, C., Tsai-Ching L., and Chin-Shyan, C. (2005). *Household Out-of-Pocket Medical Expenditures and National Health Insurance in Taiwan: Income and Regional Inequality*. Retrieved August 10, 2007, from <http://www.biomedical.com//472-6963/5/60>.
- U.S. Census Bureau (2002). *Health Insurance Coverage in the United State*. Retrieved January 28, 2008 from <http://www.census.gov/prod/2003pubs/p60-223.pdf>
- Vera-Hernandez A.M. (1999). Duplicate Coverage and Demand for Health Care- The Care of Catalonia. *Health Economics*, 8, 341-350.
- Wagstaff, A., Lindelowb, M., Junc, G., Lingc, X., and Junchengc, Q. (2007). *Extending Health Insurance to the Rural Population: An Impact Evaluation of China's New Cooperative Medical Scheme*. World Bank Policy Research Working Paper 4150, Washington, D.C.: World Bank.
- Waters, H. (1999). Measuring the Impact of Health Insurance with a Correction for Selection Bias a Case Study of Ecuador. *Health Economics and Econometrics*, 8, 473–483.

- Watkins, K. (1997). Cost Recovery and Equity in the Health Sector: Issues for Developing Countries. *Paper Prepared for WIDEW Project on Provision and Financing of Public Goods in Developing Countries*. Oxfam: United Kingdom and Ireland Policy Department.
- Weinberger, K. and Jütting, J. (2000). The Role of Local Organizations in Risk Management: Some Evidence from Rural Chad. *Quarterly Journal of International Agriculture*, 39 (3), 281-299.
- World Bank (1993). *World Development Report*, New York: Oxford University Press.
- World Bank (2005). *Jordan at a Glance*. Washington, D.C.: World Bank.
- World Health Organization (2000). *The World Health Report 2000: Health Systems: Improving Performance*. Geneva: World Health Organization.
- Yeh, H.J. (1997). Equity in the Out-of-Pocket Expenditures under National Health Insurance. *Working Paper*.
- Yip, W., and Berman, P. (2001). Targeted Health Insurance in a Low Income Country and its Impact on Access and Equity in Access: Egypt's School Health Insurance. *Health Economics*, 10, 207 – 220.
- Zweifel, P., and Breyer, F. (1997). *Health Economics*. Oxford: Oxford University Press.

APPENDICES

APPENDIX A

QUESTIONNAIRE ON UTILIZATION OF CARE

This questionnaire is seeking information on utilization of outpatient care and expenditure. Any information given will be used solely for academic purposes. You are assured of confidentiality of your responses. Please you are kindly requested to give answers to all the questions. Tick [] or write in the space provided as appropriate.

Town/Village House No

Name of Interviewer

Date of Interview.....

Household Identification No

SECTION A: Individual Characteristics

Respondent Name:

A1. Sex: Male [] Female []

A2. How old were you at last birthday?

A3. What is your marital status?

Married [] Single [] Separated [] Divorced [] Widowed []

A4. Can you read and write in any language? YES [] NO []

A5. Have you ever attended school? YES [] NO []

A6. What was the highest class or form completed?

A7. Which of the following describe your level of education?

- (a) None []
- (b) Primary []
- (c) Junior Secondary/Middle School []
- (d) Secondary/Senior Secondary School []
- (e) Vocational/Technical []
- (f) Post Secondary []
- (g) Tertiary []

A8. Please indicate your current occupation. (Tick one box)

- (a) Unemployed []
- (b) Farming/ Fishing []
- (c) Government Sector Employee []
- (d) Trader/Business []
- (e) Artisan []
- (f) Others (specify) []

A9. What is the total number of people in your household?

A10. What is your religion?

- Christian [] Muslim [] Traditional Believer [] Others []

A11. Are you a Social Security and National Insurance Trust (SSNIT) contributor? YES [] NO []

SECTION B: Health Insurance Status

B1. Are you currently a member of the National Health Insurance Scheme?

- YES [] NO [] {IF NO GO TO B5}

B2. If YES to B1, have you ever benefited from the scheme? YES [] NO []

B3. If YES to B2, did you have any difficulty in using the scheme when you went to the health service provider? YES [] NO []

B4. If YES to B3, what was the problem(s)?

.....
.....
.....
.....

B5. If NO to B1, what would you say is your main reason for not being a member of the scheme?

- (a) Too expensive []
- (b) Did not have money during the registration period []
- (c) Health providers provides poor services []
- (d) Seek treatment elsewhere []
- (e) Others []

B6. If NO to B1, will you consider joining the scheme in the future?

YES [] NO []

B7. Do you think the health insurance scheme has made health care better?

YES [] NO []

SECTION C: Health Status and Outpatient Care Utilization

C1. Are you currently a member of the National Health Insurance Scheme?

YES [] NO []

C2. Do you have any disability? YES [] NO []

C3. Do you have any chronic illness (i.e. asthma, cancer, hypertension, or diabetes)? YES [] NO []

C4. In general, would you say your health is very good, good, or poor?

(a) Very good []

(b) Good []

(c) Poor []

C5. Have you fell sick or injured in the last 4 weeks? YES [] NO []

{IF NO GO C19}

C6. What sort of sickness/injury did you suffer?

(a) Malaria/fever []

(b) Aches and pains []

(c) Respiratory []

(d) Diarrhea []

(e) Injury/accident []

(f) Others []

C7. Which of the following describe the severity of the sickness/injury?

(a) Not serious []

(b) Serious []

(c) Very serious []

C8. Did you seek care from informal provider (i.e. chemical seller or herbalist) in the last 4 weeks? YES [] NO []

C9. If “YES” to C8, what was total cost incurred? Amount

C10. Did you seek care from a modern health care provider (i.e. outpatient visit)?

YES [] NO []

C11. What kind of modern health care provider did you visited?

(a) Hospital []

(b) Private/Mission Hospital []

(c) Health Centre []

C12. How many days did it take before you visited a modern health care provider?

DAYS.....

C13. How many times did you consult a modern health care provider?

(a) One visit (if visit) []

(b) Two visits (if one visit) []

(c) Three visits (if one visit) []

(d) Four visits (if one visit) []

(e) Five visits (if one visit) []

C14. What service did you received during the visit to the modern health care provider?

(a) Consultation []

(b) Lab test []

(c) X-ray []

C15. How much did you paid during the visit to the modern health care provider?

Amount

C16. What was transport cost during the visit to the modern health care provider?

Amount

C17. Did you have sufficient cash to pay for the bill? YES [] NO []

C18. If “NO” to C17, how did you managed to pay the bill?

(a) Borrowed money from friends and relatives []

(b) Took money from “susu” collectors []

(c) Sold personal property []

(d) Others []

C19. Are you the head of household? YES [] NO []

COMPLETE SECTION D ONLY IF THE RESPONDENT IS NOT THE HEAD OF HOUSEHOLD

Section D: Head of Household Characteristics

D1. Name of household head

D2. Sex of household head: Male [] Female []

D3. Age of household head.....

D4. Has the head of household ever attended school? YES [] NO []

D5. What was the highest class or form she/he completed?

D6. Which of the following describe his/her level of education? (Tick one box)

(a) None []

(b) Primary []

(c) Junior Secondary/Middle School []

(d) Secondary/Senior Secondary School []

(e) Vocational/Technical []

- (f) Post Secondary []
- (g) Tertiary []

D7. Please indicate the current occupation of household head. (Tick one box)

- (a) Unemployed []
- (b) Farming/ Fishing []
- (c) Government Sector Employee []
- (d) Trader/Business []
- (e) Artisan []
- (f) Others (specify) []

D8. Marital status:

Married [] Single [] Separated [] Divorced [] Widowed []

D9. Are you currently a member of the National Health Insurance Scheme?

YES [] NO []

Section E: Household Expenditure

E1. How much do the household expend on food and beverage daily?

Amount

E2. Please, indicate the total household expenditure on the following items in the

last month;

- (a) Housing (Rent): Amount.....
- (b) Electricity bill: Amount
- (c) Water bill: Amount
- (d) Alcohol: Amount
- (e) Soft drink: Amount

(f) Tobacco: Amount

(g) Mobile phone credit: Amount

(h) Others: Amount

E3. Please, indicate the total household expenditure on the following items in the last 12 months;

(a) Clothing;

(i) Clothing material: Amount

(ii) Tailoring charges: Amount

(iii) Readymade clothing (e.g. Dress, underpants etc): Amount

(b) Footwear;

(i) Shoes: Amount

(ii) Sandals: Amount

(iii) Other foot wears: Amount

(c) Household goods;

(i) Bed sheets, Bed cover, Blanket Curtain, other linens:
Amount

(ii) Mattress, Pillow, Sleeping mats: Amount

(iii) Other soft furnishings: Amount

(d) Appliances (Heating, Cooking, Washing Refrigeration Etc.);

(i) Electric fan: Amount

(ii) Fridge and freezers: Amount

(iii) Gas or electric stoves: Amount

(iv) Electric: iron Amount

- (v) Coal pot and other non-electrical cooking appliances:
Amount
- (vi) Other appliances: Amount
- (e) Communication;
 - (i) Postal charges including stamps and courier services:
Amount
 - (ii) Telegrams, telephones, fax etc: Amount
- (f) Furniture and Fixtures, including Floor Coverings;
 - (i) Bed: Amount
 - (ii) Chair: Amount
 - (iii) Table: Amount
 - (iv) Carpet and other floor covering:
Amount
 - (v) Other furniture and fixtures: Amount
- (g) Recreation, entertainment, education and culture services;
 - (i) Radio, Wireless and Cassette/radio: Amount
 - (ii) T.V. set, video, video camera: Amount
 - (iii) Other (phonogram, C/D players music system): Amount
 - (iv) Sports equipments: Amount
 - (v) Musical instruments: Amount
- (h) Transport;
 - (i) Cars and other motor vehicle: Amount
 - (ii) Motor cycles: Amount

- (iv) Bicycle: Amount
- (v) Tyres: Amount
- (i) Medical care and health expenses;
 - (i) Doctor and out-of-payment consulting fees: Amount
 - (ii) Dentist: Amount
 - (iv) Native Doctors and Spiritual healers: Amount
 - (v) Other practitioners (e.g. drug store charges): Amount
- (j) Education (e.g. transport cost, pocket money etc): Amount
- (k) Miscellaneous goods and services;
 - (i) Jewelers, watches, rings, etc: Amount
 - (ii) Other personal goods (e.g. suitcase, hair brush, etc): Amount

Section F: Household Wealth

F1. Does the household own any of the following items?

INCLUDE ITEMS ONLY IF THEY ARE IN WORKING CONDITION

- (a) Radio/Cassette player YES [] NO []
- (b) Electric iron YES [] NO []
- (c) Fan YES [] NO []
- (d) Stove YES [] NO []
- (e) Refrigerator YES [] NO []
- (f) Television YES [] NO []
- (g) Video deck YES [] NO []
- (h) Stereo system YES [] NO []
- (i) Personal computer YES [] NO []

(j) Car or truck YES [] NO []

(k) Canoe/boat YES [] NO []

(l) Mobile phone YES [] NO []

(m) Land telephone YES [] NO []

(n) Watch or clock YES [] NO []

(o) Bicycle YES [] NO []

(p) Motorcycle YES [] NO []

(q) Sewing machine YES [] NO []

(r) Mattress or bed YES [] NO []

F2. Does the household or a member own any of the following?

(f) An Agricultural land YES [] NO []

(g) A house YES [] NO []

(e) A poultry farm YES [] NO []

(f) A livestock farm of cattle YES [] NO []

(g) A livestock farm of goat/ sheep YES [] NO []

F3. What is the main floor material in the house? Tiles [] Cement [] Others []

F4. What is the main wall material in the house? Tiles [] Cement [] Others []

F5. Is the main roof material in the house zinc/asbestos/aluminum sheets?

YES [] NO []

F6. Does the household have these amenities?

(a) Electricity YES [] NO []

(b) Pipe borne water YES [] NO []

(c) Flush toilet (WC) YES [] NO []

F7. What is the main fuel used for cooking?

- (a) Electricity []
- (b) LPG []
- (c) Charcoal []
- (d) Firewood []
- (e) Others []

Section G: Community Characteristics

G1. Do you have health facility in your community? YES [] NO []

G2. How far is the nearby health facility from your house? Kilometers

Section H: Other Issues

H1. Are you a SSINT contributor? YES [] NO []

H2. Please, if you are to compare yourself with others in your community would you consider yourself as a rich, average or poor person? (Tick one box)

- (a) Rich []
- (b) Average []
- (c) Poor []

H3. Do you currently smoke cigarettes/drink alcohol? YES [] NO []

APPENDIX B

DESCRIPTIVE STATISTICS

Variable	N	Mean	Std. Dev.	Min	Max
Dependent variables					
Outpatient Visit (If ill)*	130	.5846154	.4946946	0	1
Out-of-pocket expenditure	76	8.460526	13.6897	.4	75
Independent variables					
sex*	384	.390625	.488527	0	1
age	384	37.38021	15.38153	18	88
hh_size	384	4.893229	2.659346	1	16
mnhis*	384	.5	.5006523	0	1
soi	130	1.830769	.7275153	1	3
sahs	384	2.273438	.6509464	1	3
mal_dummy *	130	.1640625	.3708154	0	1
pain_dummy*	130	.0859375	.2806374	0	1
resp_dummy *	130	.0234375	.1514858	0	1
diar_dummy*	130	.0104167	.1016616	0	1
inj_dummy*	130	.0078125	.0881573	0	1
employ*	384	.2161458	.4121519	0	1
sex_h*	384	.6692708	.4710895	0	1
inc	384	2562.102	1206.266	360	8964

* = binary indicator variable.

**APPENDIX C
DIAGNOSTIC TESTS**

Skewness/Kurtosis tests for Normality

Variable	Pr (Skewness)	Pr(Kurtosis)	adj chi2(2)	Prob>chi2
inc	0.000	0.000	56.01	0.0000
oop	0.000	0.000	46.31	0.0000

Test for Endogeneity

```
. logit mnhis sex age hh_size educ soi sahs mal_dummy pain_dummy
resp_dummy diar_dummy inj_dummy male_h educ_h employ mar dist inc wealth
emp_gov
```

note: inj_dummy != 0 predicts failure perfectly

inj_dummy dropped and 3 obs not used

Iteration 0: log likelihood = -88.025755

Iteration 1: log likelihood = -63.503143

Iteration 2: log likelihood = -61.534132

Iteration 3: log likelihood = -61.430277

Iteration 4: log likelihood = -61.429796

Iteration 5: log likelihood = -61.429796

Logistic regression	Number of obs =	127
	LR chi2 (18) =	53.19
	Prob > chi2 =	0.0000
Log likelihood = -61.429796	Pseudo R2 =	0.3021

mnhis	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]
sex	-1.850124	.6579801	-2.81	0.005	-3.139741 - .5605064

age		.0491992	.0177701	2.77	0.006	.0143705	.0840279
hh_size		-.0514197	.1013149	-0.51	0.612	-.2499932	.1471537
educ		.2327603	.2252489	1.03	0.301	-.2087194	.6742401
soi		-.6177185	.375965	-1.64	0.100	-1.354596	.1191594
sahs		.4365375	.4161516	1.05	0.294	-.3791047	1.25218
mal_dummy		-.3661148	.7113582	-0.51	0.607	-1.760351	1.028122
pain_dummy		-.6417707	.8097368	-0.79	0.428	-2.228826	.9452844
resp_dummy		-1.385202	1.239769	-1.12	0.264	-3.815105	1.044701
diar_dummy		-.0044144	1.702128	-0.00	0.998	-3.340524	3.331696
sex_h		.0775305	.6600831	0.12	0.906	-1.216209	1.37127
educ_h		-.0836343	.2508969	-0.33	0.739	-.5753832	.4081146
employ		.734889	.8520407	0.86	0.388	-.9350802	2.404858
mar		-.1302204	.6284629	-0.21	0.836	-1.361985	1.101544
dist		.309411	.3687504	0.84	0.401	-.4133265	1.032148
inc		.0008223	.0003013	2.73	0.006	.0002318	.0014127
wealth		.1633476	.0681653	2.40	0.017	.0297461	.296949
emp_gov		1.680149	1.265507	1.33	0.184	-.8001992	4.160497
_cons		-5.749259	1.971059	-2.92	0.004	-9.612464	-1.886054

 . predict new_residual_values, resid

(257 missing values generated)

. logit visit sex age hh_size mnhis soi sahs mal_dummy pain_dummy
 resp_dummy diar_dummy inj_dummy employ sex_h inc new_residual_values

note: diar_dummy != 0 predicts success perfectly

diar_dummy dropped and 4 obs not used

note: inj_dummy dropped due to collinearity

Iteration 0: log likelihood = -84.340188

Iteration 1: log likelihood = -64.681141

Iteration 2: log likelihood = -63.124428

Iteration 3: log likelihood = -63.033186

Iteration 4: log likelihood = -63.032522

Iteration 5: log likelihood = -63.032522

Logistic regression

Number of obs = 123

LR chi2 (13) = 42.62

Prob > chi2 = 0.0001

Log likelihood = -63.032522

Pseudo R2 = 0.2526

```

-----+-----
      visit |      Coef.   Std. Err.   z    P>|z|   [95% Conf. Interval]
-----+-----
      sex |  -0.9715516  .5815159  -1.67  0.095  -2.111302  .1681985
      age |   .008168   .0167278   0.49  0.625  -.024618  .0409539
     hh_size | -0.1186436  .0878912  -1.35  0.177  -0.2909071  .05362
      mnhis |   .3115145   1.00766   0.31  0.757  -1.663462  2.286491
      soi |   .5015441   .3718465   1.35  0.177  -.2272616  1.23035
      sahs |  -0.3963917  .4151925  -0.95  0.340  -1.210154  .4173706
 mal_dummy | -0.9039798  .6786683  -1.33  0.183  -2.234145  .4261855
 pain_dummy | -1.510868   .765496   -1.97  0.048  -3.011212  -.0105233
 resp_dummy |  .6099728   1.326557   0.46  0.646  -1.990031  3.209977
      employ | -0.3641408  .7109914  -0.51  0.609  -1.757658  1.029377
      sex_h | -0.5418365  .5033081  -1.08  0.282  -1.528302  .4446293
      inc |   .0008806  .000365   2.41  0.016  .0001652  .0015959
new_residu~s |  .3703256  .4395223   0.84  0.399  -.4911224  1.231774
      _cons | -0.3462655  1.643189  -0.21  0.833  -3.566858  2.874327
-----+-----

```

. test new_residual_values

(1) new_residual_values = 0

chi2(1) = 0.71

Prob > chi2 = 0.3995

```

. reg oop male sex hh_size mnhis soi sahs mal_dummy pain_dummy
resp_dummy diar_dummy inj_dummy employ sex_h inc new_residual_values

```

```

Source |      SS      df      MS              Number of obs = 73

```

```

-----+-----
      Model | 4528.74982   14 323.48213      F (14, 58) = 2.49
      Residual | 7530.16935   58 129.830506    Prob > F   = 0.0077
-----+-----
      Total | 12058.9192   72 167.484989    R-squared  = 0.3756
                                     Adj R-squared = 0.2248
                                     Root MSE   = 11.394

```

```

-----+-----
      oop |   Coef.   Std. Err.   t   P>|t|   [95% Conf. Interval]
-----+-----
      sex |  1.772307  3.80251   0.47  0.643   -5.839243   9.383857
      age | -.0755208  .091676  -0.82  0.413   -2.590303   .1079887
      hh_size | .8381428  .683003   1.23  0.225   -5.290362   2.205322
      mnhis | -6.002768  7.757216  -0.77  0.442   -21.53052   9.524985
      soi |  3.231373  2.282371   1.42  0.162   -1.337289   7.800035
      sahs |  5.252985  2.386241   2.20  0.032   .4764046   10.02957
      mal_dummy | -5.162013  4.169214  -1.24  0.221   -13.5076   3.183575
      pain_dummy | -10.12496  4.853734  -2.09  0.041   -19.84076  -.4091521
      resp_dummy | -8.578977  5.437087  -1.58  0.120   -19.46249   2.304534
      diar_dummy | -10.6101  7.333189  -1.45  0.153   -25.28907   4.068874
      inj_dummy | (dropped)
      employ |  2.09431  4.594251   0.46  0.650   -7.102082   11.2907
      sex_h | -7.11099  3.337361  -2.13  0.037   -13.79144  -.4305352
      inc | -.0027135  .0021195  -1.28  0.206   -.0069562   .0015292
      new_residu~s | -1.459044  3.759273  -0.39  0.699   -8.984047   6.065959
      _cons | 11.48752  11.20822   1.02  0.310  -10.94817   33.9232

```

```
. test new_residual_values
```

```
(1) new_residual_values = 0
```

```
F (1, 58) = 0.15          Prob > F = 0.6993
```

APPENDIX D
DETERMINANTS OF UTILIZATION

. logit visit sex age hh_size mnhis soi sahs mal_dummy pain_dummy
resp_dummy diar_dummy inj_dummy employ sex_h inc

note: diar_dummy != 0 predicts success perfectly

diar_dummy dropped and 4 obs not used

note: inj_dummy != 0 predicts success perfectly

inj_dummy dropped and 3 obs not used

Iteration 0: log likelihood = -84.340188

Iteration 1: log likelihood = -65.098212

Iteration 2: log likelihood = -63.68705

Iteration 3: log likelihood = -63.615668

Iteration 4: log likelihood = -63.615272

Iteration 5: log likelihood = -63.615272

Logistic regression

Number of obs = 123

LR chi2 (12) = 41.45

Prob > chi2 = 0.0000

Log likelihood = -63.615272

Pseudo R2 = 0.2457

visit	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
sex	-.8009083	.5504711	-1.45	0.146	-1.879812	.2779952
age	.0018083	.0155112	0.12	0.907	-.0285932	.0322098
hh_size	-.1182	.0886267	-1.33	0.182	-.2919052	.0555052
mnhis	1.128339	.490305	2.30	0.021	.1673586	2.089319
soi	.5943328	.3620671	1.64	0.101	-.1153056	1.303971
sahs	-.5280142	.3962204	-1.33	0.183	-1.304592	.2485635
mal_dummy	-.8810434	.6740614	-1.31	0.191	-2.202179	.4400926
pain_dummy	-1.465879	.7586959	-1.93	0.053	-2.952896	.0211376
resp_dummy	.6726932	1.322075	0.51	0.611	-1.918527	3.263913

employ		-.3790308	.7052068	-0.54	0.591	-1.761211	1.003149
sex_h		-.4970272	.4993056	-1.00	0.320	-1.475648	.4815937
inc		.0006689	.0002893	2.31	0.021	.0001018	.0012359
_cons		-.0102984	1.609383	-0.01	0.995	-3.164632	3.144035

 . mfx

Marginal effects after logit

y = Pr(visit) (predict) = .59403505

variable		dy/dx	Std. Err.	z	P> z	[95% C.I.]	X
sex *		-.1954225	.13297	-1.47	0.142	-.45603 .065185	.292683
age		.0004361	.00374	0.12	0.907	-.006892 .007764	39.7642
hh_size		-.0285048	.02146	-1.33	0.184	-.070567 .013557	4.80488
mnhis*		.266034	.11042	2.41	0.016	.049624 .482444	.504065
soi		.1433278	.08737	1.64	0.101	-.027919 .314575	1.78049
sahs		-.1273345	.09544	-1.33	0.182	-.31439 .059721	1.94309
mal_du~y*		-.2090385	.15532	-1.35	0.178	-.513455 .095378	.512195
pain_d~y*		-.3507706	.16734	-2.10	0.036	-.678749 -.022792	.268293
resp_d~y*		.1497602	.2622	0.57	0.568	-.364146 .663666	.073171
employ*		-.0929226	.17491	-0.53	0.595	-.435739 .249894	.178862
sex_h*		-.1180299	.11619	-1.02	0.310	-.345751 .109691	.609756
inc		.0001613	.00007	2.34	0.020	.000026 .000297	2521.66

 (*) dy/dx is for discrete change of dummy variable from 0 to 1

APPENDIX E
DETERMINANTS OF OUT-OF-POCKET PAYMENT

```
. reg oop sex age hh_size mnhis soi sahs mal_dummy pain_dummy resp_dummy
diar_dummy inj_dummy employ sex_h inc
```

Source	SS	df	MS	Number of obs =	76
-----+-----					
Model	6448.22671	14	460.587622	F (14, 61) =	3.69
Residual	7607.35486	61	124.710735	Prob > F =	0.0002
-----+-----					
Total	14055.5816	75	187.407754	R-squared =	0.4588
-----+-----					
				Adj R-squared =	0.3345
				Root MSE =	11.167

oop	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
-----+-----						
sex	1.315622	3.545019	0.37	0.712	-5.773081	8.404325
age	-.0622177	.0855155	-0.73	0.470	-.2332165	.108781
hh_size	.8901213	.6645339	1.34	0.185	-.4386963	2.218939
mnhis	-8.495314	3.436866	-2.47	0.016	-15.36775	-1.622875
soi	3.148011	2.187183	1.44	0.155	-1.225531	7.521554
sahs	5.523246	2.14584	2.57	0.012	1.232373	9.814119
mal_dummy	-5.06572	4.076941	-1.24	0.219	-13.21807	3.086627
pain_dummy	-10.04168	4.754147	-2.11	0.039	-19.54819	-.5351781
resp_dummy	-8.524188	5.320857	-1.60	0.114	-19.1639	2.115523
diar_dummy	-10.7167	7.165058	-1.50	0.140	-25.04412	3.610721
inj_dummy	7.92031	8.314241	0.95	0.345	-8.705043	24.54566
employ	2.241439	4.475361	0.50	0.618	-6.707599	11.19048
sex_h	-6.951116	3.25824	-2.13	0.037	-13.46637	-.4358621
inc	-.0023709	.0015547	-1.52	0.132	-.0054796	.0007379
_cons	10.64987	10.65199	1.00	0.321	-10.6501	31.94983

**APPENDIX F
DESCRIPTIVE STATISTICS FOR ENROLLMENT**

Variable	N	Mean	Std. Dev.	Min	Max
sex	384	.390625	.488527	0	1
age	384	37.38021	15.38153	18	88
lit	384	.6901042	.4630538	0	1
inc	384	2562.102	1206.266	360	8964
wealth	384	15.60938	5.085536	5	27
sex_h	384	.6692708	.4710895	0	1
age_h	384	45.79948	14.45616	25	88
educ_h	384	2.083333	1.640968	0	6

Individual Enrollment in NHIS

. logit mnhis sex age lit inc wealth

Iteration 0: log likelihood = -266.16852
 Iteration 1: log likelihood = -212.23627
 Iteration 2: log likelihood = -209.56787
 Iteration 3: log likelihood = -209.51938
 Iteration 4: log likelihood = -209.51936

Logistic regression

Number of obs = 384
 LR chi2 (5) = 113.30
 Prob > chi2 = 0.0000
 Pseudo R2 = 0.2128

Log likelihood = -209.51936

mnhis	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
sex	-.6480001	.2536088	-2.56	0.011	-1.145064	-.1509359
age	.0307738	.0081732	3.77	0.000	.0147545	.046793
lit	.6545392	.2949409	2.22	0.026	.0764656	1.232613
inc	.0004485	.0001182	3.79	0.000	.0002168	.0006801
wealth	.1515488	.0285458	5.31	0.000	.0956001	.2074976
_cons	-4.835327	.6142157	-7.87	0.000	-6.039168	-3.631487

. mfx

Marginal effects after logit

y = Pr(mnhis) (predict) = .50703702

variable	dy/dx	Std. Err.	z	P> z	[95% C.I.]		X
sex *	-.1605262	.06165	-2.60	0.009	-.28135	-.039702	.390625
age	.0076919	.00204	3.77	0.000	.003688	.011696	37.3802
lit*	.1618243	.07115	2.27	0.023	.022372	.301277	.690104
inc	.0001121	.00003	3.80	0.000	.000054	.00017	2562.1
wealth	.0378797	.00713	5.31	0.000	.023901	.051858	15.6094

(*) dy/dx is for discrete change of dummy variable from 0 to 1

Household Enrollment in NHIS

. logit mnhis_h sex_h age_h educ_h inc wealth

Iteration 0: log likelihood = -262.07059

Iteration 1: log likelihood = -209.87985

Iteration 2: log likelihood = -207.25965

Iteration 3: log likelihood = -207.18199

Iteration 4: log likelihood = -207.1818

Logistic regression	Number of obs =	384
	LR chi2 (6) =	109.78
	Prob > chi2 =	0.0000
Log likelihood = -207.1818	Pseudo R2 =	0.2094

mnhis_h	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
sex_h	.0686571	.274837	0.25	0.803	-.4700136	.6073278
age_h	.0323294	.0085723	3.77	0.000	.015528	.0491308
educ_h	.2526062	.1038179	2.43	0.015	.0491269	.4560855
inc	.0003612	.0001124	3.21	0.001	.0001409	.0005815
wealth	.0816927	.0279877	2.92	0.004	.0268379	.1365476
_cons	-4.735248	.6579967	-7.20	0.000	-6.024898	-3.445598

. mfx

Marginal effects after logit

y = Pr(mnhis_h) (predict) = .42973649

variable	dy/dx	Std. Err.	z	P> z	[95% C.I.]		X
sex_h*	.0167958	.0671	0.25	0.802	-.114716	.148307	.669271
age_h	.0079227	.0021	3.78	0.000	.003811	.012035	45.7995
educ_h	.0619044	.02549	2.43	0.015	.011937	.111871	2.08333
inc	.0000885	.00003	3.21	0.001	.000034	.000143	2562.1
wealth	.0200199	.00685	2.92	0.003	.006604	.033436	15.6094

(*) dy/dx is for discrete change of dummy variable from 0 to 1