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# Essays on Household Health Expenditures, National Health Insurance and Universal Access to Health Care in Ghana

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**ESSAYS ON HOUSEHOLD HEALTH EXPENDITURES, NATIONAL HEALTH INSURANCE AND UNIVERSAL ACCESS TO HEALTH CARE IN GHANA**

A Dissertation Presented

By

EVELYN KWAKYE

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Economics

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# DEDICATION

To my supportive children, Joshua, Joann, Joel and Akosomo.

# ABSTRACT

ESSAYS ON HOUSEHOLD HEALTH EXPENDITURES, NATIONAL HEALTH
INSURANCE AND UNIVERSAL ACCESS TO HEALTH CARE IN GHANA

FEBRUARY 2016

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Access to quality health services is essential for maintaining a healthy population and economic development hence the growing global consensus that universal health coverage is necessary. Ghana attempts to expand access by making basic health services free at the point of delivery through its National Health Insurance Scheme (NHIS). Prior studies indicate NHIS increases demand for health services, but questions remain about its impact on out of pocket payments, quality of services, and the financial viability of the program. Hence, this dissertation analyzes the financial risk in health care seeking, the effect of NHIS on out of pocket payments and access to quality health care, and the financial viability of NHIS compared with the outcomes of Rwanda's community-based health insurance programs with similar objectives but different approaches. The empirical analyses use data from the Ghana Living Standards Survey conducted in 2005-2006 covering 37,212 individuals in 8,868 households, data from the 2008 Ghana Demographic and Health Survey V covering 9919 respondents aged 15-49 years, and data logging from

other sources. The methods include two-stage multivariate regression modelling and maximum likelihood estimations. The study finds health expenditures respond strongly to need and weakly to income, the poor are more likely than the rich to pay of pocket for health care, and catastrophic out of pocket payments occur in all income groups and significantly among the poor. The need for uninsured services and ability to pay significantly determine of out of pocket payments by the insured. These findings imply that NHIS expands access to desired health services for the better-offs but does not eliminate catastrophic out of pocket payments, especially for the poor. Attitude of health worker, rather than the technical effectiveness of services, significantly predicts dissatisfaction with quality. The Rwandan model is more equitable than NHIS, but NHIS spends ten times more per capita. Drawing from Ghana's and Rwanda's experience, effective strategies for national health insurance programs must include i) practical means-testing in setting insurance premiums to improve equity, ii) mandatory enrollments by whole households as a strategy for financial sustainability, and iii) client-based performance-evaluation in provider reimbursements to improve client satisfaction.

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CBHI            Community-based health insurance scheme

DHS             Demographic and Health Survey

EICV            Enquête Intégrale sur les Conditions de Vie de Ménages, Rwanda

GDHS            Ghana Demographic and health Surveys

GHS             Ghana Health Service

GLSS            Ghana Living Standard Survey

MOH             Ministry of Health, Ghana

MOH-R           Ministry of Health, Rwanda

NHIA            National Health Insurance Authority

NHIF            National Health Insurance Levy

NHIS            National Health Insurance

NSIR            National Institute of Statistics of Rwanda

ODA             Overseas Development Assistance

RHNIP           Rwanda National Health Insurance Policy

SSNIT           Social Security and National Insurance Trust, Ghana

UHC             Universal Health Coverage

WHO             World Health Organization

# CHAPTER 1

# INTRODUCTION

## 1.1    Health and health insurance

The general consensus that health is a fundamental human right that should not be denied anyone based on socioeconomic status, race or creed has been demonstrated by ratification of the right to health - Article 25 of the Universal Declaration of Human Rights (United Nations 1948). The right to health is fundamental to a person's capabilities to achieve economic freedom (Sen 2009). Health has implications for development at local and global levels through its direct effect on human capital and entrepreneurship (Sachs 2001). The World Health Organization has defined health as "a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity" (WHO 1948, Huber et al 2011).  Alternatively, health is 'ability to adapt and to self manage' in the absence of complete well-being (Huber et al 2011). In addition, health is influenced by complex interactions of nature, environmental factors and resource endowment, with varying degrees of control by citizens and health system planners over these factors (Roemer 1991, WHO 2000, WHO 2011). Specifically, the impact of ill-health is important from an economic point of view because of linkages between health and economic performance. Maintaining and promoting health commands resources and high health expenditures can plunge households into poverty, possibly having inter-generational repercussions (McIntyre and Thiède 2003). The repercussions are especially relevant to developing countries because of the higher poverty rates coupled with inadequate social security and safety nets. Moreover, while households in developing countries make as much, if not more, out of pocket payments on health care as advanced countries

(Brugiavinni and Pace 2010) they have worse health outcomes (see Table A1 in Appendix A). The growing burden of chronic diseases adds to the economic challenges that infectious diseases like malaria already present. Indirect costs such as the value of time lost in seeking treatment and caring for the ill add on to the direct costs of treatment. The catastrophic cost of ill health is better appreciated if one takes into account the opportunity costs involved such as losses in labor productivity (McIntyre et al 2006).

In the absence of adequate safety nets growing health needs increase the probability for the non-poor to fall into poverty, the poor to stay trapped in poverty and for health needs to worsen. Inequalities worsen in the event of growing health needs for those unable to gain access to effective healthcare, be it the result of financial barriers (non affordability of health care and healthy life styles) or physical barriers (inadequate human resources and infrastructure). The result is increased vulnerabilities to the vicious cycle of poverty and worse health outcomes, potentially eroding achievements in economic development such as reduction in mortality rates and poverty. The linkages between health and poverty have been well acknowledged, and meeting the health needs of people is both a factor and an outcome of development. Consequently, a progressive health system would emphasize financing mechanisms that ensure that vulnerable households are protected from the financial risk of the prevention and management of ill-health. Several country case studies suggest that catastrophic health spending occurs with out of pocket payments exceeding 2.5-40 percent of household discretionary income (Xu et al 2003, O'Donnell et al 2007, Wagstaff and Van Doorslaer 2008, Okunade at al 2010, Xu et al 2011). [Catastrophic health spending refers to the scenario where a household must reduce its basic expenditure over a period of time in order to cope with health costs]. Similarly, evidence from a cross section

of sixty-eight advanced and low income countries suggests that the share of private spending (including out of pocket payments) should be at most 15 percent of the total health care spending in an economy to minimize the chances of household catastrophic expenditures (Xu et al 2003).

Household health care expenditure is a subject that needs more investigation particularly in Ghana where out of pocket payments comprised 39.19 percent of the overall expenditures on health regardless of improved trends in recent decades (see Figure 2-1 and Table A2 in Appendix A). In some estimations households use borrowed funds from outside sources to finance up to 80 percent of their medical expenditures (deGraft-Aikins 2007, Ofori-Adjei 2007, Tagoe 2010). Similarly, calculations based on data from the Ghana Living Standards Measurement Survey in 2005/2006 indicate that for 96 percent of the individuals who reported any health care expenditure, majority of health care payments were made out of pocket. For these individuals, the average health care payments in the two weeks preceding interview was $7. In contrast, a minority (4%) for whom government, insurance or private employer pays most health care expenditures reported an average of $16 over the same period. Although these numbers say little about ability to pay or intensity in the consumption of health care services, it is safe to assume that if health care expenditures are a necessity, inequalities in access to health care would only worsen in the absence of protection against the financial risk of seeking care. An investigation of the relative influence of ability to pay and the needs for health services would shed light on the role of out of pocket payments and the incidence of catastrophic spending by households in Ghana. Such information is useful in making recommendations for effective health reforms that may protect households against the financial risks of seeking health care.

However, we have no knowledge of a study that calculates or estimates the incidence of catastrophic payments for health care by households in Ghana, and this study attempts to fill some of these gaps in knowledge.

Reducing the financial costs associated with seeking essential health care is a value concept that has for the most part been embraced in Ghana even though implementation of appropriate policies has proven difficult. Shortly after Ghana attained independence from British colonial rule in 1957 the Nkrumah government was convinced that 'health before wealth' was necessary for development and so committed to the public provision of free health care for all (Wahab 2011). However, political turmoil and resulting changes in government, coupled with dwindling public revenues began to undermine public capacity to provide free quality health care. Public financing took a turn for the worst in the late 1970's as global economic crises and commodity price shocks resulted in mounting balance of payments deficits and increasing public debt. Ghana's Economic Recovery Program and the World Bank prescribed Structural Adjustment Programs (SAP) adopted in 1983 introduced significant reductions in public spending and cost recovery in public services provision. Public expenditures on health had been reduced to 1.3 percent of GDP by 1997 (Agyeman-Konadu 2000). A controversial reform was the institutionalization of hospital user fees (popularly known as 'cash and carry') in 1985 (Hospital Fee Regulation Law, LI1313) that is still currently in effect (Nyonator and Kutzin 1999, Osei-Akoto 2003, Agyepong and Nagai 2011). Households had to cope with the increasing burden of out of pocket payments for the full cost of medicines and supplies and an additional mark up for overhead costs of the public health facilities (Biritwum 1994). In some estimates, for example, out of pocket payments for drugs constitute about 60% of the cost of malaria

treatment (Asenso-Okyere et al 1998) in addition to the fact that malaria is the leading cause of morbidity and mortality in Ghana.

Although the Bamako Initiative adopted in 1987 by Sub Sahara African countries may be credited for reforms that brought emphasis on primary health care and health sector decentralization, it clearly was not enough (Chabot 1988). The institutional support for health facility user fees by this same Initiative was a contradiction in policy for it took health care away from communities that could not afford it rather than make more revenues available for better health care provision as had been promised (Biritwum 1994, Nyonator and Kutzin 1999). Patients have been detained in hospitals until they could settle bills. Patients needing urgent care have been left to their demise for lack of payment for health services and individuals are known to delay seeking health care or do so too late due to lack of funds (Adu-Oppong et al 2010, Agyepong and Nagai 2011). The Millennium Development Goals agenda has generated some attention to the improvement of health outcomes but out of pocket payments continue to be a major constraint on access to health care (McIntyre and Thiède 2003).

Given this background, Ghana has once again adopted policy to pursue the goal of making basic health services free at the point of service, this time through a National Health Insurance Scheme (NHIS) which was established in 2003. Ghana's National Health Insurance Act (Republic of Ghana 2003), renewed in the National Health Insurance Act of 2012, has three specific objectives: (i) to eliminate financial barriers to access health care (ii) to improve equity in access to health care, and (iii) to guarantee a basic package of health care for all residents regardless of ability to pay. Similarly, there is a growing global consensus that universal health coverage, broadly defined as "all people receiving the

quality health services they need without being exposed to financial hardship" is the vehicle to accelerate poverty reduction and the attendant benefits in socioeconomic development, hence the global development agenda (post 2015 Millenium Development Goals) to attain health for all by the year 2030 (World Bank 2014, World Health Organization and World Bank 2015). In effect, Ghana's goal is not simply ambitious, it is laudable. However, evidence-based policy implementation is critical to success and for this reason it is important to examine out of pocket health expenditures particularly among the insured to measure the impact that the NHIS has had on extending access to care without compromising quality.

The NHIS has attracted attention as an innovative approach to health care financing for the reason that it combines community-based health insurance practices with some social health insurance (SHI) practices common to the advanced country context (Jehu-Appiah et al 2011, NHIA 2012, Kusi et al 2014). Most advanced countries that have attained access to health care for all (universal health care) have done so through third party prepaid arrangements (whether by government as a single payer as practised in Canada and France, or direct public provision of health care such as in the UK, or by social health insurance through government mandated contributions by employer and, or employee to pools of fund such as in Germany). In most cases attaining universal health care has been possible because of the important role of public financing. Populous middle income countries as Brazil, India and Mexico have some basic health care package for all citizens through active public spending. Vietnam, a low income country, has expanded access to health care through its public supplemental health insurance program that has reached 68% of the population (WHO and World Bank 2015).

By several accounts, Ghana and Rwanda are the two Sub-Sahara African countries considered to have achieved what may be described as an intermediate stage of development in universal health coverage with a handful of others, including Nigeria, Kenya and Mali in the early stages of reform (Dhillon et al 2012, Lagomarsino et al 2012, Dixon et al 2014). Rwanda's National Health Insurance Policy (Republic of Rwanda 2010) has the objective to expand access to health for all regardless of ability to pay. Rwanda has a two-sector approach: social health insurance and community-based insurance (Mutuelles de Santé schemes). Rwanda's Mutuelle de Santé (hence Mutuelle) has received acclaim for the reason that majority of the population is enrolled.

In effect Ghana and Rwanda have similar policies but not so similar approaches toward universal coverage. Impact studies have been conducted in both countries but we have no knowledge of an existing study that focuses on comparing the relative progress of the two countries. Arguably countries are different and so are the policy contexts, but common indicators could make comparisons feasible and useful. Both countries attempt national health insurance coverage by organizing at the district level. Rwanda began an expansion of community based health insurance from a pilot phase in three districts around the time Ghana began implementing the NHIS in 2005. Ghana similarly began implementation with a handful of pre-existing community-based schemes. By the end of 2006, voluntary enrollments had increased to reach seventy-six percent of the Rwandan population and by 2010 at least ninety percent of Rwandans had some form of health insurance (Republic of Rwanda 2011). By 2006 15 percent of the Ghanaian population had some form of health insurance coverage (GSS 2008); by 2010 about 33 percent were enrolled in the NHIS (NHIA 2011). In Rwanda an additional 15 percent of the population

are covered by health insurance arrangements outside the district-based schemes (Republic of Rwanda 2011). The faster expansion of population coverage in Rwanda has generated interest in what the critical factors to Rwanda's higher enrollments would be, how comparable the benefits and costs of insurance could be, and how cost effective and sustainable the programs could be. A comparative analysis of the Ghanaian and the Rwandan models holds potential to contribute to the knowledge base on appropriate strategies to attain universal care. Such information is useful to developing countries and the Sub Saharan African context in particular. As more countries are moving toward universal health coverage some gaps in the literature have been identified such as the need for a common set of comparable indicators by which countries may assess their progress (Lagomarsino et al 2012). Hence, a comparative analysis is useful in contributing to the set of tools for developing indicators, and by which countries may develop and evaluate evidence-based policy on universal health coverage, the implementation strategies, or the outcomes.

## 1.2   Goal and objectives of the study

This study aims to investigate the financial risk potential in health expenditures of households in Ghana and to measure the progress of NHIS in reducing financial barriers to accessing quality health care and the consequent potential for universal health coverage. Universal access to health care is a desirable but challenging goal to both advanced and developing countries because of the scale of resources, the social or the political consensus that must be in place. Therefore, compelling evidence about the outcomes is useful in aiding consensus-building. In addition, universal health coverage is a moving target because circumstances change and countries must adapt effectively. Evidence on progress

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and outcomes become important for meeting policy goals in an efficient way. An increasing number of studies have been carried out to assess the impact of Ghana's NHIS, often in local or community settings. Some gaps in knowledge still exist on issues like the determinants of household health care expenditures, how the allocation of out of pocket expenditures may be changing in the context of NHIS (impact on financial risks), what effect the NHIS has on quality of health services received in the context of health care being accessible, what progress Ghana has made toward attaining universal health coverage and how feasible the NHIS could reach that goal. This study therefore attempts to fill some of these gaps.

This study undertakes three specific tasks with the objective to generate evidence to arrive at conclusions that fulfill the goal of the study. The first task is to analyze household health care expenditures to produce measures of catastrophic health care payments and key factors that determine which households pay for health care out of pocket and by how much they spend. This analysis is based on information from a national survey of household living conditions in 2005/2006, a period that coincides with the first year of NHIS implementation. The second task is to identify the key determinants of who has health insurance in Ghana, and among the insured, what factors influence the decision to make out of pocket payments and what factors influence perceptions about the quality of health services received. The empirical analysis uses data from the 2008 Ghana Demographic and Health Survey (DHS-V). The third task is to measure the progress that Ghana has made with its approach to universal health coverage and the feasibility of sustaining the NHIS, by comparing with Rwanda along a common set of indicators. The analysis involves systematic literature reviews of published, peer-reviewed empirical

studies (econometric estimates of the determinants of health insurance coverage and outcomes in health care utilization and financial risk protection), and extensive reviews and logging of information contained in country reports, news journals and other sources.

## 1.3    Overview of the three essays

Given the range of objectives, this study is organized into three essays on different but interrelated themes. The objective of the first essay is to analyze the health care costs of households in Ghana using data from living standards measurement surveys. The key predictors and the determinants of household health care expenditures are estimated. Further analysis is made to identify which households face potentially catastrophic health care spending. The empirical analysis specifically seeks to find out whether (i) income has a comparable influence as health needs in the household's selection into health care expenditures (ii) the amount of health care expenditures reflect household income and welfare and (iii) what proportion of households and which type of household is more likely to experience catastrophic health spending.

The results indicate that in a two-week recall period, at least two-thirds of households participate in health care expenditures regardless of illness status. With regards to cost components, medication is the most patronized and hospitalization is the most expensive, which is to be expected. Catastrophic health expenditures increase with severity of morbidity as measured by hospitalization and the poorest households are the most affected. The coefficients on the predictors of household health care spending suggest that illness is the strongest determinant of the probability to spend followed by the presence of young children (under age 5), while income has a positive but relatively weak influence on the decision to spend, after controlling for household size and other characteristics.

Interestingly, households in the bottom quintiles of welfare are more likely to spend than households in the upper quintiles two quintiles when health needs and other factors have been taken into account. After households have made the decision to spend, morbidity and its severity are the strongest factors of the amount of expenditures. Income measures are significant but the results indicate that health expenditures have a low degree of responsiveness to income, hence low income elasticity, and health expenditures behave as a necessity. Other household characteristics such as education of the household head, geographical residence and religion are statistically significant determinants of the level of health care expenditures. In sum, health care expenditures are nondiscretionary for households in Ghana and morbidity is the strongest factor for the decision to spend, whereas affordability is an important determinant of the amount of expenditures. Households in the bottom quintiles of welfare have a higher likelihood to spend and are consequently the most vulnerable to catastrophic expenditures. The implication for policy is to effectively target poor households with free health care or health insurance coverage to reduce the financial risk of seeking health care. The chances of catastrophic health care expenditures could be significantly reduced if Ghana NHIS effectively targets households in the two bottom quintiles of welfare.

The objective of the second essay is to estimate the predictors of household selection into health insurance with emphasis on regional variations, and to examine the incidence of out of pocket payments and perceptions about the quality of health services among the group of insured individuals. The analysis uses data from the fifth round of the Ghana Demographic and Health Surveys conducted in 2008. The empirical analysis specifically investigates: (i) key determinants of health insurance, and how these differ

across administrative regions in Ghana, (ii) the determinants of out of pocket payments for the insured, especially exploring the role of the need for uncovered services, ability to pay, and satisfaction with quality, and (iii) perceptions about quality of services received by the insured. The results show that community of residence, ability to pay and gender are the key predictors of the likelihood that an individual or household would be insured. Specifically, poorer regions, rural communities and females have a higher probability of being insured and so are households in higher wealth brackets. When insured individuals have to make out of pocket payments the need for service not covered by insurance is the driving factor, but the two upper wealth brackets have significantly higher probability of paying out of pocket. The implication is that insurance improves access to health care but it does not eliminate catastrophic out of pocket payments especially for the poor in the event of critical need of services that are not insured. Alternatively, insurance expands the feasible set of desired health services for wealthier households. Bad attitude of health workers has a significant negative effect on perceived quality of care, more so than the adequacy of information or communication about the treatment process. Hence the results suggest that insured clients may be content with technical quality of the treatment process. The results imply that improving perceived quality of health services may be less of a technical issue. This suggests therefore that a behavioural approach such as a rebranding of customer services and the training health workers to approach clients with a positive attitude is an effective strategy to improve access to health care.

In the third essay Ghana's and Rwanda's approaches to universal access to health care are compared with emphasis on what factors explain differences in outcomes and financial sustainability. The study specifically seeks to compare (i) outcomes in population

coverage, access to health services, financial risk protection, (ii) the institutional factors and program design features and how these explain differences in outcomes, and (iii) the key challenges to financial sustainability of the programs. The analysis is based on information from peer-reviewed publications, published and unpublished reports by governments and development partners. The evidence suggests that common critical factor in the design of universal health coverage policies and the models adopted in Rwanda and in Ghana is the predominance of political commitment to protecting households from financial risk of seeking health care. Rwanda's insurance system includes a mandatory feature through the requirement of enrollment by whole household units and household contributions to insurance premiums are determined by ability to pay. The program design corroborates the evidence in the empirical literature that suggests that disadvantaged groups are excluded from Ghana's NHIS to a greater extent than in Rwanda (e.g., Binagwaho et al  2010, Dhillon et al 2012, Lu et al 2012, Dixon et al 2014b, Kusi et al 2015) as illustrated in Table 4-3 with details in Table D1 and Table D2 in Appendix D. NHIS enrollments have been strongly associated with a higher socioeconomic status: higher wealth brackets, formal employment and higher education. The Rwandan model is an integrated approach to poverty reduction which benefits from a high level of political commitment.  On the contrary political branding of Ghana's NHIS overshadows its relevance as development strategy given the public perception of political motivation in NHIS as a tool to gain political votes.  In addition, Rwanda has inbuilt performance evaluation and monitoring with a client-based component which helps to reduce principal-agent problems. Ghana lacks an integrated client-based evaluation component but rather emphasizes provider focused evaluations such as clinic audits. These measures have not

proven to be adequate to deter considerable fraud in provider claims. Institutional accountability is the critical factor for financial sustainability both in Ghana and Rwanda. The implication for policy is that Ghana NHIS should incorporate a mandatory component which is essential to the successful expansion in coverage to levels commensurate with universal coverage. Also, Ghana could improve equity in coverage by determining household contributions according to ability to pay, and even though this proves to be a difficult challenge in Ghana, the search for a means-tested approach to premium contributions must continue.

## 1.4  Relevance of the study

In Ghana, as in most developing countries, studies on health expenditures have often addressed issues related to national health accounts, aid effectiveness, and health financing reforms and poverty reduction but fewer studies have focused on household health expenditures. Where household expenditures are concerned the studies often focus on specific services such as the demand for maternal health services or the cost of specific diseases such as malaria. Studying the structure and determinants of health expenditures by households in Ghana contributes to knowledge about the key risks and financial barriers to accessing health care.  The results from this study are useful for effectively targeting households most at risk, improving the design of benefit packages given the relevant weight of health services in out of pocket payments. The study provides a baseline by which to measure progress in reducing financial barriers to health care since the establishment of Ghana NHIS.

While a number of studies indicate that health care utilization rates increase with implementation of the NHIS, the quality of care and out of pocket payments have not been

studied as much (Makinen et al 2011; Brugiavini et al 2011; Gaddah M 2010). Increased utilization of health care services is not a sufficient indicator of access to quality health care. Examining overall quality from the client's perspective sheds more light on how health services and consequently NHIS benefits have been perceived. The narrower focus on the group of insured individuals gives an insightful perspective to the problems (such as perceived quality of health services or equity gaps) that persist even after financial barriers to health care are eliminated in the context of NHIS. Similar to Ghana, most impact studies on Rwanda's approach to health insurance have focused on particular districts, regions or schemes, or have addressed specific issues such as enrollment, health care utilization and out of pocket payments. The innovation in this study is the cross-country comparison of effectiveness in community-based approach to reducing financial risks in health care. The set of comparative indicators developed may be relevant for other country case studies, too. Overall the findings from this study can help policy makers improve access to health care and the health of people in Ghana and Rwanda, as well as in Africa and the developing world. This dissertation is organized as follows: After this introductory chapter, chapters two, three and four are essays one, two and three, respectively. The final chapter summarizes the findings from the study and provides policy recommendations and suggestions for further research.

**CHAPTER 2**

**HOUSEHOLD HEALTH CARE EXPENDITURES DETERMINANTS: EVIDENCE FROM THE GHANA LIVING STANDARDS SURVEY V**

**2.1    Introduction**

Countries may finance health with a combination of out of pocket expenditures, general taxation and mandatory social insurance but the relative importance of the funding sources varies.  Musgrave, Carrin and Zeramindi (2002) have, for example, observed an inverse relationship between out of pocket expenditures and country income even when a large proportion of the variation could not be explained.  While countries in the Organization for Economic Cooperation and Development (OECD) tend to rely heavily on public financing through fiscal allocations or mandatory payroll taxes, for middle income and low income economies out of pocket payments are the most significant. In African countries development assistance and donor funds comprise between 3% and 40% of total health spending and 7% on average while out of pocket expenditures make up to 80 percent of total health spending (World Bank 2007).

Ghana's case is not an exception despite the reforms in establishing some semblance of a social health insurance program over the past decade. According to national health accounts estimates, private spending comprised 51 percent of total health care spending for the period of 2000-2009 (World Health Organization 2002, World Bank 2009 and World Health Organization 2011). Out of pocket payments have averaged 78.4 percent of private health spending from 2006 to 2009 and by 2013 the share stood at 91.85% (World Bank World Development Indicators). The share of out of pocket payments may have improved alongside the expansion in health insurance coverage through the National Health Insurance Scheme since 2005 as may be seen in Figure 2-1. Yet the trend has

reversed since 2011 and in 2013 out of pocket payments comprised 39.19 percent of the total expenditures on health. Moreover, households finance medical expenditures by up to 80% with borrowed funds from sources outside the household (deGraft-Aikins 2007, Ofori-Adjei 2007, Tagoe 2010). In some cases, the long process of acquiring funds to finance health care leads to seeking intervention too late (Kruk et al 2009; Adu-Oppong et al 2010). One may question whether out of pocket health expenditures include also overconsumption of health services and not only necessary services. In other words, to what extent is the relative size of health expenditures a reflection of consumption levels and wealth endowments? O, to what extent are they a reflection of catastrophic spending? One thing is certain, however, that when health expenditures are a necessity, out of pocket payments increase the likelihood that households would incur catastrophic costs, even for those that have ability to cope in the long run.

Figure 2-1: Share of out of pocket payments in the total health expenditures in Ghana
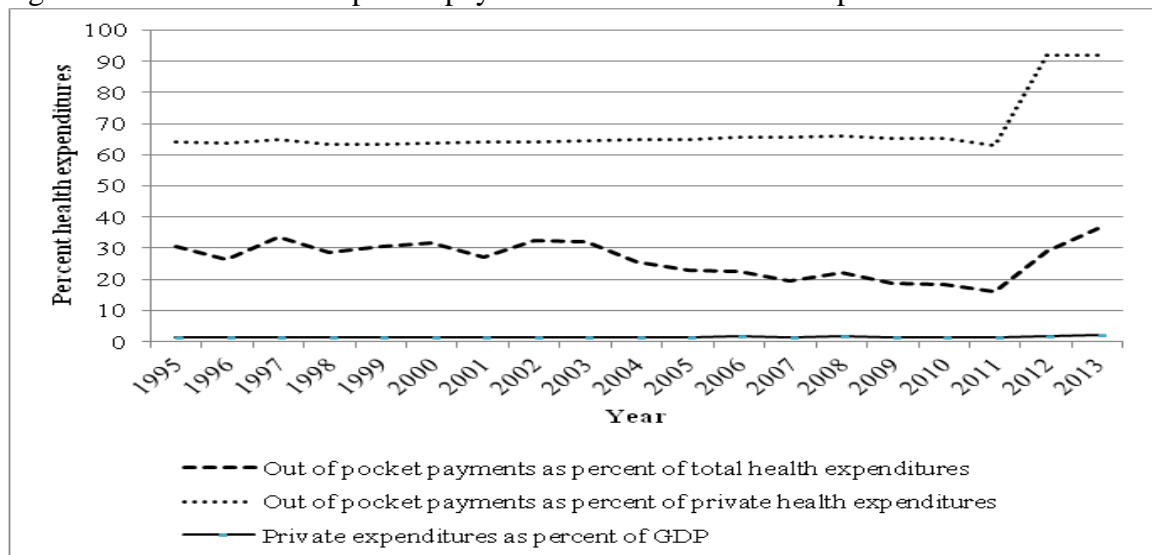


Source: World Bank World Development Indicators databank.

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Out of pocket payments for health care include not only payment for health services, purchase of drugs and medical supplies but also payments for related travel, special foods and fitness programs, and costs may be curative or preventive, direct or indirect, financial or economic (Diehr et al 1999, Folland, Goodman and Stano 2000, Rice and Unruh 2009). The cost of health care includes opportunity costs such as the value of time used in seeking care or time lost due to ill health, hence economic costs (Berman, Kendall and Bhattacharyya 1994, Diehr et al 1999, O'Donnell et al 2007). Similarly, the cost of ill-health may include quality of life measures such as dissatisfaction from pain, disability and ostracism (Berman et al 1994, McIntyre and Thiède 2003, deGraft-Aikins 2005). Counting all these costs, one easily appreciates that health shocks could be catastrophic for households that have a limited ability to cope. Health shocks occur when an illness episode causes changes in quality of life, intra household resource allocation, labor productivity, household structure and others. Health shocks may be temporary or permanent depending not only on the intensity of the illness (morbidity, disability or mortality) but also on the coping strategies available to households. Ample evidence in developing countries show that coping strategies often include selling off assets such as animals, farmlands or tools, cutting down on food spending, taking children out of school and sending children off to work (Asenso-Okyere et al 1998, Kruk et al 2009; Adu-Oppong et al 2010). An extensive literature review of household health expenditures in low and middle income countries show that health care financing strategies place emphasis on out of pocket payments at the point of service and these strategies impoverish households (McIntyre et al 2006).

In spite of the expansion in health insurance coverage in the recent decade, one might suspect the catastrophic potential of out of pocket health care expenditures for households in Ghana may be unaffected. The National Health Insurance Scheme (NHIS) excludes coverage of the cost-intensive treatments associated with chronic illnesses such as in most cancers, renal dialysis and HIV/AIDS anti retroviral therapy. Moreover, most households that want health insurance coverage are unable to afford it and the NHIS has of yet to succeed in incorporating needs-based targeting of insurance subsidies (Joint NGO 2008, Apoya et al 2011, Gobah and Zhang 2011, Jehu-Appiah 2011, Witter and Garshong 2011). An analysis of out of pocket expenditures to shed light on the factors that influence the likelihood that households experience catastrophic spending has potential to yield information that could improve identification of critical needs and effective implementation of health reforms (Gaddah and Munro 2011, Aryeetey et al 2011).

In addition, Ghana is undergoing epidemiological transition whereby chronic non-communicable diseases such as cardiovascular disorders and cancers are becoming prevalent. Hypertension, diabetes and stroke rank in the top ten leading causes of morbidity and mortality, especially among adult females and in some cases the leading causes of maternal mortality (Ministry of Health, Ghana 2009, and Ministry of Health 2011). The national prevalence of diabetes and hypertension is estimated at 28% or more as most cases are suspected to be undiagnosed or under-reported (Hill and Douptcheva 2011, deGraft-Aikins 2007). These problems are in addition to pervasive infectious and parasitic diseases hence the double burden of communicable and non-communicable diseases characteristic of developing countries, or a triple burden if one takes into account physical injuries resulting from accidents and violence (Russel 2004, Rossier et al, 2011). Non-

communicable disease interventions would emphasize preventive approaches such as life-style and nutrition changes (a direct link to household living standards) and the associated cost outlays, whereas Ghana's health system is better acclimatized to acute treatment interventions (deGraft-Aikins 2007, Hill and Douptcheva 2011, Tagoe and Dake 2011). Data from living standards measurement surveys confirm the fact that inpatient services drive extreme out of pocket payments for health care by households irrespective of poverty status (Ghana Statistical Service 2008).

Table 2-1: Summary statistics on health care expenditures by individuals in Ghana

| Who is responsible for the greatest proportion of the expenses | Head of household | Other individual | Employer, government or health insurance |
|---|---|---|---|
| Observations | 31,207 (85.67 %) | 3820 (10.38%) | 1399 (3.98%) |
| | In nominal 2006 US$ | | |
| Mean payments | 6.0 | 7.7 | 16.4 |
| Std Dev of mean | 17.9 | 28.3 | 178.8 |
| Median | 2.0 | 2.0 | 2.4 |
| 75th percentile | 5.3 | 5.9 | 6.7 |
| 99th percentile | 67.3 | 84.0 | 82.7 |
| Maximum | 872.0 | 476.7 | 3,520.0 |
| Total | 423,255.8 (96.21%) | 10,284.2 (2.34%) | 6,385.1 (1.45%) |

Source: Calculations based on data from the Ghana Living Standards Survey 2005/2006 .
Note: US $1 = old cedi ₵7,500 (2006 nominal exchange rate).

Additionally, in 96 percent of cases where health expenditures are made, a household head, a member of household or other individual is responsible for majority of the payments as demonstrated in Table 2-1. One may also observe that for individuals whom government, insurance or private employer pays the majority of expenditures, reported expenditures are on average more than twice that of individuals for whom household head (₵45,236) or other individual (₵53,037) bore the majority of expenditures. Similarly, individuals who report very high expenditures as well indicate sponsorship by

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government or employer, or health insurance coverage. Inadequate or nonexistent social safety nets coupled with strategies that are heavily dependent on household savings implies that health shocks would have greater consequences for households that are disadvantaged. The predominance of out of pocket payments for health care in Ghana gives impetus to investigating the impact on households. An important aspect of such an investigation is a study of the structure and the determinants of health expenditures and the variation across different socioeconomic levels. A case in point is Akazili,, Aikins and Binka's (2007) finding that the cost of care in treating a malaria case in Ghana is on average 1% of income for higher income households but 34% for poor households. Alternately, policy reforms for example in maternal and child health at the forefront of health care challenges in Ghana may emphasize price subsidies and increased awareness in the use of skilled services. Yet, if an investigation into the structure and determinants of the cost of health care indicate for instance that travel costs or time costs are the most significant deterrent to seeking timely care such information becomes critical for policy focus and a more effective allocation of cost subsidies. Similarly, an analysis of household health expenditures provides an assessment of the catastrophic potential of health shocks on individuals and households in particular to determine which households are more at risk.

### 2.1.1 The research goal, questions and hypotheses

Studies on household health expenditures with emphasis on variations within or across demographic and socioeconomic groups have potential to improve information about the nature of out of pocket expenditures, how they may be irrelevant, welfare improving or catastrophic, and the policy interventions that may be efficient even as Ghana pursues reforms toward social health insurance. The relevance of household health

expenditures analysis notwithstanding, empirical studies of such nature are sparse in the case of Ghana as in Sub-Sahara Africa in general given the challenges of inadequate databases on household health expenditures. The goal of this study is to fill some of the knowledge gap by identifying the key determinants of health care expenditures and the incidence of catastrophic health care expenditures in households in Ghana. In explaining the key determinants of health care spending in a predominantly out of pocket payments system, the level of health needs and the role of income or ability to pay is critical, especially where impoverishing or catastrophic out of pocket payments are concerned. Myriad factors, whether exogenously or endogenously determined of income, could influence the decision to spend and the amount of health care expenditures. The challenge in this analysis is to identify some key income versus non-income determinants of household health expenditures.

Specifically, this study seeks to answer the following:

i. Does income have a comparable influence as health needs in the household's selection into health care expenditures?

ii. Does the amount of health care expenditures reflect household income and welfare?

iii. What proportion of households and which type of household is more likely to experience catastrophic health spending?

One may question if out of pocket health expenditures reflect demand for necessary health care given relative prices and intensity of use of services, or whether they are a reflection of household consumption levels and wealth endowments. When relative prices are accounted for (as the expenditures data employed in this study is considered to have)

one may consider that if household health care expenditures are made out of necessity, unaffordable out of pocket payments plunge households in poverty or transitory poverty even when households have ability to cope over a longer term. Hence this study assumes the following, that is, the hypotheses are:

i. Morbidity is the strongest influence in the decision to spend on health care

ii. Household income has a weak correlation with amount of health expenditures because health care behaves as a necessity.

iii. Households with greater health needs are the most likely to fall into catastrophic health spending irrespective of income status.

In a health system where households make health care expenditures out of pocket at the point of service it is expected that the incidence of catastrophic expenditures would be negatively correlated with ability to pay (measured in proportion to consumption expenditures) for a given level of health need. Households with higher perceived needs (measured in terms of reported illness or injury episodes) would have a higher probability to seek health care than households with lower perceived needs all things being equal. Hence health needs should be the strongest influence in the decision to spend in a system of out of pocket payments at the point of service delivery.

A lack of statistically significant evidence showing health care expenditures vary with income would mean health care is income inelastic for households in Ghana, hence health expenditures are non discretionary or health care is a necessary good, which is the usual finding in other countries (Wagstaff et al 2007, Wagstaff et al 2009, Okinade et al 2011, Xu et al 2011). The negative implications are greater for households with higher

health risks or with smaller financial protection in the context of an out of pocket payments system.

Alternatively, a statistically significant positive coefficient on income would mean that health care demand behaves as a normal good. In the context of an out of pocket payments system the implications include: (i) entrenchment of inequity in access to health care based on ability to pay rather than level of need especially if the level of need is higher for less resourced households (ii) if health care expenditures are discretionary then the possibility of overconsumption by better resourced households for a given level of health need. The stronger the positive relationship, the greater the implication that health care is a luxury. A statistically negative relationship with income in the results would be an anomaly because there is no theoretical explanation against health care being a normal good.

Beside health needs and household income measures, other factors expected to be of significant influence in the decision to spend and by how much to spend include health provider and access to health services (estimated by distance to facility conditional on consultation with a provider, rural or urban location), access to information and social networks (estimated by education, religious status). Higher educated households are in general expected to have better access to information and studies have found a statistically significant relationship exists between educations and health care demand although the sign is not assumed apriori. Better access to, or better use of health information could imply better health outcomes (Grossman 1976, Anderson 1995, Cutler and Lleras-Muney 2006), hence lower needs and therefore a lower demand for health care. At the same time, it could imply better participation in health care market and hence higher demand for health care.

The key findings from the empirical analysis are that incidence of illness has a strongest influence on the decision to seek care while taking into account income and other household characteristics. The decision to spend is influenced positively by household income given the statistically significant though small coefficient. Interestingly wealthier households have a lower probability to indicate health expenditures than poorer households even after controlling for differences in health needs. When households have made the decision to spend, illness and the severity of it (as measured by hospitalizations) are strong determinants of the level of expenditures much more than income is, after taking into account household size and other factors. Though income indicators are significant, the degree of responsiveness to health expenditures is low given the small coefficient of elasticity ranging between 0.03 and 0.08. In comparison household income as measured by the ratio of food to total household expenditures shows a significant but negative elasticity coefficient of -0.36. The evidence therefore suggests that health expenditures are nondiscretionary and poorer households who are the most likely to make them are most vulnerable to catastrophic out of pocket payments. Findings from the analysis of the incidence of catastrophic health care payments buttress this conclusion because illness and hospitalizations are statistically significant factors in the chances of catastrophic payments but the two bottom quintiles have higher probabilities than the upper quintiles. Health expenditures vary significantly with the number of years of school of head of household but there is no difference in impact on the decision to spend by the education status of households. The implication is that education may have a weak influence on health outcomes but has importance in terms of the socioeconomic influence on ability to pay. Old age has an interesting influence: having senior members (age 60 or more) in the

household significantly reduces the likelihood of spending and has no influence on the amount of spending. In contrast, the presence of young children strongly predicts health spending and has a positive influence on the amount of spending. Locality of residence, gender, religion and other household control variables have important influence as might be seen in the detailed discussions that follow.

## 2.1.2    Source of data

This study uses information from household living standards measurement surveys to estimate health costs in terms of health care expenditures and productivity losses. Living standard measurement surveys have been conducted in Ghana in several waves over the period 1984-2006. Most of the empirical analysis in this study is based data from the fifth round of the Ghana Living Standard Surveys (GLSS5, 2005-06). The Ghana Living Standard Surveys are the most comprehensive, nationally representative household surveys in Ghana. The surveys have been administered by the Ghana Statistical Service with assistance from the World Bank. The GLSS5 survey was conducted from September 1, 2005 through August 31 2006. Details of the sample size are shown in Table 2-2.

Table 2-2: The Ghana Living Standards Survey 2005/2006 Sample

|  | Percent of sample | Sample (N=37,128) | Percent female |
| --- | --- | --- | --- |
| Minors (0-14 years) | 40.3 | 14,985 | 49.0 |
| Working age (15-59 yrs) | 52.9 | 19,637 | 52.8 |
| Elderly (60 years or more) | 6.8 | 2,506 | 54.3 |
| Household members | 100.0 | 37,128 | 51.3 |
| Head of household | 23.3 | 8,687 | 28.0 |

Source: Calculations based on GLSS5 data, Ghana Statistical Service, 2008.

This survey collected information from over 8680 households and 37128 individuals in 148 communities (enumeration areas). A multistage stratified sampling method was used to select households; each household had an equal chance of being selected. For sampling purposes, the country was divided into three ecological zones: Coastal in the south, Forest in the middle and Savannah in the north. The ecological zones for GLSS5 were divided into enumeration zones based on the GLSS4 (1998-99) stratification. A random selection of the enumeration zones was made with a probability of being included directly proportional to the population size. Hence the numbers selected differed per administrative region and ecological zone based on the population size represented. At the final stage of sampling a fixed number of households were randomly selected from each enumeration zone. The GLSS4 used similar methods to collect information on 26411 individuals in 5998 households.

Topics covered in GLSS include demographic characteristics, education, health, employment and time use, income, nutrition, food expenditures, non-food expenditures, subsistence production, housing conditions, household enterprise, migration and income transfers, credits, assets and savings. The health component captures information on the incidence of illness and injury, the range of health care provider choices available in Ghana, payments made for pharmaceuticals, health practitioner consulting fees, the length of time spent in seeking care, the distance travelled and cost of travel, payments for health insurance and the amount of benefits received, immunizations, fertility and reproductive health. Information is collected on all household members including children. The GLSS is not longitudinal in nature since respondents are not followed in subsequent surveys.

Consequently, any discussion of trend is based on observations of different population samples at different periods in time.

This study makes a critical assumption that insurance coverage for households in Ghana is insignificant hence majority of reported health expenditures are made out of pocket. This is a reasonable assumption given that just about 7% of respondents were covered by any health insurance according to the GLSS5 data. The National Health Insurance was in the very early stages of implementation at the time of the survey from September 2005 to August 2006. Most importantly less than 4% of the sample indicated that government, employer or insurance pays for the greatest portions of health expenses.

### 2.1.3  Outline of the study

The theoretic framework, data and empirical analyses and discussion of the results that confirm or refute our assumptions about health care expenditures by households in Ghana are discussed in the sections that follow. A detailed description of the theoretic framework on which this study is based is presented in section two. Section three presents a description of the empirical models for the data analysis and section four discusses the data and the results. Section five provides a summary of the work, the important conclusions and the policy implications.

### 2.2  Theoretic framework

This section provides a background to the determinants of health care expenditures by looking at the theoretical framework for health care demand and some observations in the empirical literature. Thus the discussion provides some reasons for the theoretical approach and the empirical methods adopted in this study.

### 2.2.1 On the demand for health care

The traditional economics approach to health views the demand for health care as derived from an underlying demand for health (Grossman 1972, Wagstaff 1986a) and that health care is but one component of the factors that influence health. Grossman's (1972) seminal work on a theory of demand for health and health care postulates that individuals consume health care as an input in the production of health subject to a budget constraint. The basic premises of the theory are that: health is desirable hence a good but not necessarily the ultimate; at the margin, health is determined by the consumption of 'health inputs' and inputs include, but are not exclusive to, health care; health care and other commodities consumed have positive costs; the consumer has limited resources hence a budget constraint is taken into account (Wagstaff 1986b)

The approach is to treat the household as a decision-making unit whose decision is based on an interconnected, inter-temporal utility model (Becker 1965, Grossman 1972, Becker 1976, Pollak 2002); this presents some caveats. The household is expected to choose behaviors such as healthy lifestyles, preventive and curative care, in a way that will maximize total utility from health with respect to available resources. The interconnection of individual utility functions is an added complication. Other household members' perceptions of a member's health need and its severity, the prices and opportunity costs facing the household but not just the individual's own perception and purchasing power potentially influence decisions about when and how much to demand. It is simplistic to assume that individual choices are coordinated to maximize the welfare of everyone. This may be the special case where the interconnected utility functions of all members are identical and conflicts of interest are absent regardless of unequal power or control over resources. Ideally conflict of interests, unequal control and choice over resources should

be accounted for. For instance, cultural norms that influence the relative value placed on the life of an adult or child, or of males versus females, may be significant influences on the level of household resources devoted to health of each member, and depending on the choice set and who makes final decisions, total utility may not be maximized. While these challenges are acknowledged in this study observations of household dynamics such as the conflicts of interest and resource control and the implications for health demand and consequently health expenditures determinants are not adequately captured given data limitations. The paternalistic state where the household head makes decisions in the interest of all members is assumed for this study.

Much of the literature based on the traditional model of demand for health (Grossman 1972) and therefore health care considers the consumer as the sole decision maker of when and how much to consume. A more complex view of health care demand is taken by those that incorporate principal agent models and take into account, for example, the role of the health care provider in the decision process, the associated information asymmetries and conflicts of interest (Zweifel, 1981; Polheimer and Ulrich; 1995; Nguyen 2011).

Based on the theory of demand and optimization the determinants of health expenditures would include income, relative prices, consumer tastes and preferences (Grossman 1972, Wagstaff 1986a&b; Pohlmeier and Ulrich 1995). Households would make expenditures to the level where the marginal rate of substitution between health (consequently health care) and other consumption goods equal the ratio of their prices. Expect less demand for health care if consumers derive little satisfaction or the efficacy is below expectation. Given that the health production function is an increasing function of

health care consumption, better-informed consumers would supposedly be more efficient at transforming health care inputs into health (outcomes) hence education plays key role in health care behaviors (Grossman 1976, Anderson 1995, Cutler and Lleras-Muney 2006). Aging would have an increasing impact in health care demand in that a faster depreciation of one's stock of health (health status) may imply more health care consumption to maintain desired health status. Relative increases in the price of health care might imply less demand, all things equal. Income has an increasing effect on health care demand, all things being equal. However, empirical evidence suggests that while higher income is linked to better health status, health care is income inelastic (Getzen 2000; Okunade et al 2010). Health care may behave as a basic necessity; alternately health care demand may be induced by the decision of the provider especially where consumers face information asymmetry and uncertainty about treatment outcomes. Health care demand (consequently health care expenditures in a predominantly out of pocket payments system) determinants may follow predictions of the (Grossman's 1972) health demand model under stringent conditions. Koç (2002) illustrates, for example, that Grossman's (1972) demand model would explain income inelasticity only if one imposed a restriction that health care and other consumption goods are complements rather than substitutes, in utility.

Aside the theory of demand, the Anderson and Newman model on health care use (Anderson 1995) has opened up much discussion about the factors that determine household health care utilization (consequently health expenditures in an out of pocket payments system in this study). The model categorizes environment, population characteristics, health behavior, and health outcomes as four major determinants of health care use. This model incorporates a dynamic and recursive nature through feedback effects

among the factors to further impact health care use and outcomes. Environment describes the health care system and external environment of the family unit or individual. Population characteristics imply predisposing factors, enabling resources and need. Health behavior implies personal health practices and the use of health services. Outcomes describe perceived health status, evaluated health status and consumer satisfaction that results from health care use.

With respect to health care expenditures, the central theme is that an individual's (or household unit's) access to and use of health services is considered to be a function of their predisposing, enabling and need factors.

Predisposing factors imply the socio-cultural characteristics that exist prior to illness: social structure (education, occupation, social networks, etc); health beliefs (knowledge and attitudes toward health care); demographic (age and gender).

Enabling factors imply the logistics of obtaining care: personal or family (income, health insurance, travel, knowledge of the health care system); community (availability of health personnel and facilities, waiting times).

Need factors imply the most immediate cause of health service utilization: perceived or evaluated. Perceived need implies how the household views their own health, experience illness and pain, or judges their problems to be sufficient enough to seek help. Evaluated need implies a professional judgment about one's health status and the need for medical care. According to Anderson (1995) perception of need determines care-seeking while evaluated need determines the kind and amount of treatment to be provided. In other words, this framework accommodates decisions about health expenditures as different

processes: the individual is the central decision-maker in whether or not to seek, but the care provider is the central decision maker of how much care is required.

Summing up from the theory of demand for health and health care, and from Anderson's (1995) Model of health care utilization, the theoretical determinants of household health care expenditures may be categorized as follows: perceived needs, sociodemographic characteristics, economic resources and environmental factors. It may be observed that much of the empirical literature on health care utilization or expenditures have included one or more measures in all four categories (Wagstaff and van Doorslaer 2003, Xu et al 2003, O'Donnell et al 2007, Sen et al 2009, Okunade et al 2010).

## 2.2.2 Empirical evidence in the literature

Household expenditures research have been propagated following Ernst Engel's (1857 as cited in Anker 2011) empirical work in which he formulated a law that implies the share of food diminishes as income increases. Accordingly, household expenditures research often relates income as a core determinant of expenditures whether on food, housing, sundries and consequently health expenditures. Most empirical studies on the determinants of health care expenditures have drawn on household surveys or family budget data of developed countries and have relied on self-reported current (transitory) income as the core determinant. As Okunade (2010) points out, the theoretically correct concept of income, however, should be permanent or long run income (according to Friedman's (1957) income hypothesis) which gives a better estimate of the household resource constraint. Permanent income is especially important in the developing country context because households draw on assets and savings in the event of health shocks especially where safety nets are lacking. However, transitory income has been the most

widely used in health expenditures research in both developing and advanced country contexts due to the inadequacies of the data in capturing permanent income.

Empirical findings suggest that income level (whether transitory or permanent) is a significant determinant of out of pocket expenditures. Van Doorslaer et al (2007) estimate the magnitude and the distribution of OOP expenditures for health care for fourteen countries that make up 81% of Asia's population and discover that the better offs are the most likely to spend a large fraction of total household resources on health. The authors considered this as a reflection of the situation where the poorest of the poor are unable to divert resources from basic needs to finance health care. Alternately some poor households receive health care subsidies and would therefore appear to spend less on health care. Mukherjee, Haddad and Narayana (2011) find similar results after analyzing per capita expenditures on health care consumption from 543 households in Kottathara Panchayat, India. The authors conclude that lower caste households have higher health care needs but spend lower on health care even when the health care needs and other influential confounders had been taken into account.

Empirical evidence suggest also that household health expenditures are highly income inelastic in comparison to findings based on macroeconomic data in which health expenditures are more responsive to national income (Getzen 2000). Okunade et al (2010) find that while income and assets are significant determinants of out of pocket payments by households in Thailand, payments behave as a technical necessity across income quintiles and household sizes (Okunade et al 2010).

To the extent that health care is considered a basic need one would expect that the level of need would be a core determinant of demand (consequently expenditures) ceteris

paribus. Closeness to death by a household member (the aged) for example has been shown to correlate positively with health care expenditures by households (Okunade et al 2010). In a similar argument health expenditures are expected to be influenced by education in the sense that more education would imply better information and self perception of health needs and consequently the use of health care, ceteris paribus. Nketiah et al (2009) find, for example, that education level of mothers corresponds positively with health care seeking for children.

Health expenditures may be categorized in different ways: according to the different types of care such as curative or preventive, allopathic or homeopathic, ambulatory or inpatient; according to the method of financing such as copayments, facility user fees or full coverage; or according to level of aggregation such as such as national, market, household or individual (McIntyre and Thiede 2003; Folland, Goodman and Stano 2004; Rice and Unruh 2009). These classifications are not mutually exclusive and may overlap regardless of the focus of analysis. Health expenditures data commonly exhibit the following features: highly skewed due to a few patients incurring disproportionately high costs relative to the majority and point masses (lumpiness) at lower costs due to many zeros and low expenditures (Deihr et al 1999; Grisworld et al 2004; Stanton and Rutherford 2005). In the GLSS% for example a grand total of ₵553,594,564.25 were made in payments over the two weeks preceding interview. Of this amount a total of ₵145,901,600 (26.4%) were made by the top 1% spenders alone whereas the bottom 75% spenders made ₵102,477,816 (18.5%). Hence the top quartile of health care spenders made more than 80% of the total health care expenditures. Similar wide variations occur elsewhere; for instance, in the Unites States, 5% of the top health care spenders made 49% of the total

health care expenditures in 2002 but the lower 50% took up only 3% (Stanton 2004). The United States is among the top per capita health care expenditures in the world (Stanton and Rutherford 2006) and may not be directly compared to Ghana. The relevance of these statistics is to emphasize the wide variations characteristic of health care payments, and how such distributions present challenges in making generalizations and comparisons among the population.

Arguably a sizable portion of health expenditures tend to be nondiscretionary and incurred based on a perceived (critical) need for care; a person injured or lying unconscious from an auto accident or cardiac arrest would most unlikely ask the ambulance operators for a list of prices to make rational choices, so to speak. Not surprisingly nondiscretionary expenditures also tend to involve intensive care, hence costly. On the other hand, while a group of the population may have a low need of health care and demand less (for example younger people generally of better health status than the aged), another group may constantly need and demand larger amounts of care due, for example, to chronic illness. Then also perceived needs do not necessarily result in health care demand for reasons such as affordability, preferences and inequities in access. For similar reasons it is possible for persons with lower perceived needs to have higher demand for health care. These and any number of reasons could explain wide variations in health expenditures.

Given large standard deviations and very large variances the difference in sample means, for example, is inefficient and sensitive to sample sizes especially when the sample sizes are different (Deihre et al 1999, Grisworld et al, 2004) and the median may be a better measure of central tendency. The non normality of the distribution alludes to the challenges of applying statistical models that have underlying assumptions of normality and zero

expected errors; these challenges are further discussed in the section on empirical modeling. Our analysis would nonetheless use the standard measures of central tendency but with caution to the interpretation of means, medians and other statistics used in studies of this nature. Expenditure categorizations and within and between group comparisons would include sufficient controls to the extent permitted by the available data.

The empirical analysis of household health care expenditures in this study is based on the hypothesis that health needs, income and education are core determinants of health care expenditures by households in Ghana, ceteris paribus. The relative significance of household demographics, access to health care and location is as well examined. The study is based on data from the fifth wave of the Ghana Living Standards Measurement Survey (GLSS5) conducted from September 1st, 2005 to August 31st, 2006.

## 2.3 Modelling the determinants of health care expenditures

Given the theoretical framework, the empirical analysis of household health care expenditures in this study is based on the hypothesis that health needs, income and access to information are core determinants of health care expenditures by households in Ghana, ceteris paribus. The relative significance of household demographics, access to health care and location is as well examined. However, peculiar features of health expenditures and the underlying data generation process create challenges for statistical analysis. The skewed (right-tailed) distribution of health care expenditures, possible interdependence between health care expenditures and explanatory variables and possible heterogeneity in the error structure may render ordinary least squares (OLS) estimator biased or inefficient (Su et al 2006, Nketiah-Amponsah et al 2009, Mackinen et al 2011, Escobar et al 2011).

Health expenditures data tend to be highly skewed as is characteristic of highly selective expenditures as on tobacco and ostentatious goods to name a few. The usual observation is a large number of zeros (especially in the developing country context where the added challenges of data such as inadequate survey response rates or incomplete data). Furthermore, very high expenditures occur in a small proportion of households such as for critical but expensive health care or even selective, sophisticated expensive procedures that may be demanded by the wealthy. For instance, in 33% of the total 8686 households the GLSS5 have on record zero health expenditures in the two weeks preceding interview, the remaining 67% have an average of ₵85,305(US $11.4) but the average for the top ten health care spending households averaging ₵5.96 million (US $795). Similarly, per individual, the 27% for whom health care expenditures exceed zero have an average of US$7.4 with the top ten expenditures averaging US $790.

The other challenge is the identification problem. Unobservable and unidentified characteristics of households and individuals may make OLS estimator biased and coefficients very large due to low variances in the explanatory variables. For instance, households that have members who recently experienced an illness or injury, chronically ill or closer to death, or have very young children are more likely to make non-zero expenditures (Okunade et al 2010). Such common characteristics may not be observed or identified and controlled for. Also, perceptions about illness or health needs are likely to influence the decision to demand health care and therefore health expenditures and at the same time the choice of health care provider and therefore the decision to seek care may be determined by the cost involved, in other words the health expenditure budget. Similarly, unobserved community, household and individual characteristics that influence

health behaviors and perceptions of illness may also be influential in provider choice and the level of health expenditures (Nketiah-Amponsah et al 2009, Mackinen et al 2011, Escobar et al 2011). The challenge is to identify an appropriate instrument variable whose impact on the variable of interest is solely through its impact on the endogenous regressors.

One approach to counteract the identification problem is a two stage decision modeling where the first stage concerns the decision to spend or not and the second concerns the level of spending (Tobin 1958, Heckman 1979, Sigelman and Zeng 1999, Bellemare and Barret 2006, Powers 2007). This approach suggests a probit binary model at the first stage and a Tobin truncated model where the zero observations are dropped in a second stage. Tobin's probit (Tobit) was developed in a seminal study (Tobin 1958) to address limited dependent variables, the situations in which the variable of interest is observed only if it takes on a positive value, the classical example being household expenditures on durable goods where a sizeable number had no expenditures on durable goods.

The standard Tobit may be specified as follows:

$$y_i^* = X_i \mathbf{b} + e_i \qquad \text{2-1}$$

$$y_i = y_i^* \text{ if } y_i^* > 0 \qquad \text{2-2}$$

$$y_i = 0 \text{ if } y_i^* = 0 \qquad \text{2-3}$$

$$e_i \sim N(0, \sigma^2) \qquad \text{2-4}$$

where for the $i$th household $y_i^*$ is some unobserved latent variable describing desired expenditures on health and $y_i$ is the actual observed expenditures on health, and the assumption that $y_i^*$ does not exist if no health care expenditure is observed. Xi is a vector of independent variables and $\mathbf{b}$ is a vector of coefficients, $e_i$ is assumed to be

normally distributed errors hence $e_i \sim N(0, \sigma)$, and $y_i \sim N(X_i b, \sigma)$ is also normally distributed. The probability that $y_i^*$ is positive, as well as the probability that $y_i^*$ is zero must be solved. Following Powers (2007) these probabilities can be jointly expressed as follows:

$$L = \prod_{y* \leq 0}\left[1 - \Phi\left(\frac{X\beta}{\sigma}\right)\right]\prod_{y*>0}\frac{1}{\sigma}\emptyset\left[\frac{Y-X\beta}{\sigma}\right] \qquad\qquad 2\text{-}5$$

where $\Phi(.)$ and $\emptyset(.)$ respectively represent the cumulative standardized normal distribution function and the standardized normal density function. Due to the many zeros observed in health care expenditures data the OLS estimator for $y_i = Xib$ would be biased downward given that $E(y|y^* > 0) = X\beta + E(\varepsilon|\varepsilon > -X\beta)$ where the last term in the equation is not necessarily zero. Based on the assumption that the error terms have a normal distribution, $E(y|y^* > 0) = X\beta + \sigma\lambda\left(\frac{X\beta}{\sigma}\right)$ and $\lambda(.) = \frac{\phi(.)}{\Phi(.)}$. The standard Tobit model however assumes that zero expenditure necessarily corresponds to a decision of nonparticipation in health care demand (Sigelman 1999, Powers 2007, StataCorp 2011). Yet zero expenditure may be a recording error, or represent households with subsidized health care or any number of reasons. Another problem of the standard Tobit is that the choice to participate in health care demand and the decision about how much to spend are determined by the same vector of parameters ($\beta$). This implies, for example, that the sign of the marginal effect of a given determinant (of health care expenditures) would necessarily be similar for the probability of making positive expenditures, and the expected amount of expenditures (conditional on positive expenditures being observed).

Heckman's (1979) sample selection model is an adjustment to the Tobit to overcome the sample selection bias. This explicitly models the correlation between the probability of an outcome and the level of the outcome (Manning et al 1987). The assumption for household decision-making about expenditures is that households first decide whether to spend or not, and next decide how much to spend. Hence $y_i^*$ is a two stage decision-making process where in the first stage it is a binary decision and the second stage is governed by different set of factors ($X_2$). The error terms in both stages are assumed to be correlated hence the errors are dependent.

First stage decision whether to spend (selection equation):

$$d_i^* = X_{1i}\mathbf{b} + u_i \tag{2-6}$$

$$d_i = 0 \text{ if } d_i^* \leq 0 \tag{2-7}$$

$$d_i = 1 \text{ if } d_i^* > 0 \tag{2-8}$$

$$u_i \sim N(0, 1)$$

Second stage decision about how much to spend (primary equation):

$$y_i^* = X_{2i}\mathbf{b} + \varepsilon_i \tag{2-9}$$

$$y_i = y_i^* \text{ if } y_i^* > 0 \tag{2-10}$$

$$y_i = 0 \text{ if } y_i^* = 0 \tag{2-11}$$

$$\varepsilon_i \sim N(0, \sigma^2) \tag{2-12}$$

and

$$corr\ (u_i\ \varepsilon_i) = \rho \neq 0 \tag{2-13}$$

where $d_i{}^*$ is a binary indicator which equal 1 if health care expenditures are observed and zero otherwise and the other variables are as described. Probit or logit regression estimation for the first stage, with standard OLS[1] (ordinary least squares) regression for the second stage is possible. Probit is preferred because it produces estimates for marginal effects. Alternately, full information maximum likelihood estimation methods (e.g. single-step Heckman model in STATA) involving pooled regressions yield consistent, asymptotically efficient estimates for all parameters on condition that the model is correctly specified (Manning et al 1987, StataCorp 2011).

### 2.3.1 Specification of the empirical models

The two-stage probit and OLS, as well as a (single-step) full information maximum likelihood Heckman selection model are estimated for the purposes of comparison. The probit model is specified as follows:

$$\text{prob}(d_i) = \text{prob}(\alpha + \partial I_i + \beta H_i + \delta X_i + \phi S_i + \gamma Z_i + e_i > 0) \qquad \text{2-14}$$

where for the *i*th household:

$d_i$ is a dummy variable that is equal to 1 if health expenditures are observed and 0 otherwise.

$I_i$ is a vector of income related variables: household income, food expenditures, quintile of welfare

$H_i$ is a vector of household characteristics: age, gender, education, religion and size of household.

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[1] OLS results may be biased if $corr\,(\,u_{\,i}\,\varepsilon_i\,) = \rho \neq 0$ holds.

$X_i$ is a vector of household health need indicators: incidence of illness or injury, hospitalizations, number of days incapacitated due to illness or injury.

$S_i$ is a vector of indicators for household access to healthcare: health practitioner consultations, distance to health facility (time travelled), government-, employer-, or private insurance coverage.

$Z_i$ is a vector of community variables: district health profile (disease burden, health care provision), ecological zone, rural urban location.

$e_i$ are normally distributed errors.

The second stage is an estimation of the primary equation that determines the levels or amount of health care expenditures. The variables include a subset of variables in the selection (probability) model, with additional indicators of household income and socioeconomic status. The model is as follows:

$$y_i = \alpha + \beta H_i + \partial I_i + \delta X_i + \phi S_i + \gamma Z_i + u_i \qquad \text{2-15}$$

where for the $i$th household $y_i$ is the total amount of household health care expenditures which is the sum of payments for medicines and medical supplies, consulting fees, travel and inpatient services for all household members, and $u_i$ are normally distributed errors. Definitions of the remaining vectors are as previously described. Specifically, equation 2-16 is the estimated selection equation and the definitions for the variables are as described in Table 2-3:

$$\text{prob}(d_i) =$$

$(\alpha + \partial_1 logincomec_i + \partial_2 quintile_i + \partial_3 drelpays_i + \partial_4 dgovpays_i + b_1 dummy\_ill_i +$

$$\text{b}_2 propipd_i + \text{d}_1 dh\_sch_i + \text{d}_2 gendhead_i + \text{d}_3 dh\_religion_i + \text{d}_4 propd5_i +$$

$$\text{d}_5 propd60_i + \phi_1 loc2_i + e_i > 0) \hspace{3cm} \text{2-16}$$

Table 2-3: Definition of vectors and variables

| **I** is a vector of income and affordability related variables selected from: | |
|---|---|
| lgincomec | log of household income |
| lgfexpendc | log of household food expenditures |
| foodshare | the share of food in total household expenditures |
| quintile | an indicator variable for quintile of welfare |
| dgovpays | an indicator variable for government-, employer-, or health insurance as the main financier of household health expenditures |
| drelpays | an indicator variable for an individual other than household head as the major financial of health care expenditures |
| **H**$_i$ is a vector of household health need indicators selected from: | |
| propill | proportion of members ill or injured |
| propipd | proportion of members hospitalized |
| **X**$_i$ is a vector of household characteristics selected from: | |
| age | years in age of head of household |
| ageheadsq | the square of *age* |
| gender | binary variable indicator for gender of head |
| educhh | number of the years of school attendance by household head |
| dh_sch | binary variable indicating if household head has ever attended school |
| dh_religion | indicator variable of religion of household |
| hhsize | the number of household members |
| **S**$_i$ indicates access to health facility | |
| dtravelt | binary indicator variable for length of time to health facility exceeding the average |
| **Z** is a vector of community variables selected from: | |
| loc5 | indicator variable of the locality of household's community of residence in terms of five rural, urban and ecological regions |
| loc2 | binary indicator variable as for rural or urban locality of residence |
| $e_i$ are assumed to be normally distributed errors | |

Similarly, equation 2-17 is the specific estimated second stage decision (primary)

equation for the determinants of the level of health care expenditures:

$$lgheh_i = \alpha + \partial_1 logincomec_i + \partial_2 drelpays_i + \partial_3 dgovpays_i + \text{b}_1 propill_i +$$

$$\text{b}_2 propipd_i + \text{d}_1 educhh_i + \text{d}_2 gendhead_i + \text{d}_3 hhsize_i + \text{d}_4 propd5_i +$$

$$\phi_1 loc5_i + \gamma_1 dtravelt_i + e_i \hspace{3cm} \text{2-17}$$

where for the *i*th household *lgheh* is the log of total household health care expenditures and the other variables are as described in Table 2-3. Here, slight variations to the model, specifically with respect to the income measure variables, are estimated for the purposes of comparison and robust results. Hence *lgfexpendc*, quintile and *foodshare* respectively replace *lgincomec* in the different iterations of the model. In the developing country context, consumption expenditures are more reliable than reported income given the challenges of inadequate employment data records, and the likelihood of recall and measurement errors.

The choice of explanatory variables to include is arbitrary but one may not include the same set of regressors in each stage because of difficulty in correctly identifying the selection parameters (Jones 1992; Yen et al 1996, Newman et al 2003, Okunade et al 2010, Nguyen et al 2011). However, it is useful to have some assumptions about the sample selection criteria and what variables are most likely to be the sample selectors. Technically, sample selectors are confirmed if they are statistically strong and positive in the decision equation but are statistically weak in the primary equation. In this study, household age indicators (age of head, proportion under age five, and proportion over age 60) are chosen apriori as sample selection indicators for two reasons. First, while very young age and very old age are expected to be associated with higher level of health need, the cost of health care is assumed to be influenced by the severity of illness and the health care provider rather than the age of patient. Second, the head of household being the primary financier of health care for majority of respondents implies that the head's preferences dominate the decision to spend after controlling for the influence of income and other factors. Age of the household head is an indicator of experience (wisdom of age) and the likelihood of having

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household dependents (by default). Household head being the primary financier of health care demand implies that as far as the head is concerned, the ability to pay, hence socioeconomic status (rather than the age of the head) is the important determinant of amount of expenditures.

Though price is theoretically a core determinant of demand price is it not explicitly modelled in this study. The GLSS expenditures data has been adjusted for general price differentials across regions and so we may assume relative prices for health care are insignificant in the data as used. In this predominantly out of pocket health care payments health system one may consider observed expenditures as a reflection of the level of demand for health care hence the empirical analysis in this study views observed household health care expenditures as an approximation of the demand for health care. Also, the GLSS does not collect data on the quality or quantity of the health services demanded; quality differences and intensity of use are not controlled in this study. Given the skewed distribution of expenditures and income date in levels (see tables and histogram in appendix) log transformations are preferred. The normality assumption required for OLS to be best linear unbiased estimator (BLUE) assures that the p-values for tests of significance will be valid.

### 2.3.2 Choice of explanatory variables

The explanatory variables cover household health needs, socioeconomic, demographic and community characteristics. The demographic and socioeconomic variables adopted are assumed to be a crude measure of preferences underpinning the decision-making about health care demand, the income variables a measure of ability to pay and community variables as indicators of the environment as it affects access to health

care (Grossman 1972, Wagstaff 1986, Anderson 1999, Okunade et al 2010, Nguyen et al 2011). Specifically, the explanatory variables for the first stage (probit) analysis are:

### 2.3.2.1 Morbidity

If health care is considered a basic need, or is critical in the case of illness or injury then the occurrence of illness or injury is expected to be a significant influence on the likelihood that households demand care. Hence *propill* is the proportion of the household members that were reported ill or injured; *propipd* is the proportion of members that had had one or more overnight stays at a health care facility and may indicate a critical level of health needs. Being ill or injured is likely to influence the household to seek care, while the amount of expenditures may be most likely to be influenced by the care provider who decides the treatment. Hence *propipd* (overnight admissions) is here assumed to capture more of the treatment effect and would have a greater influence on health expenditures than *propill*, while *propill* would have a greater influence on the probability of health care expenditures.

### 2.3.2.2 Income measures

The variable *incomec* is the log of the weighted total nominal household income as reported in the GLSS. Similarly, *fexpendc* is the log of the weighted total nominal (including imputed) household expenditures on food as reported in the GLSS. The variable *foodshare* is the share of food in total household expenditures. The food expenditure indicators would each be alternated with *incomec* (to compare results) in the sense that income aggregates are suspected to be more prone to recording errors than expenditures aggregates. The income data in the GLSS5 has a sizable number of negative observations and it not clear whether these are a measure of net debt holdings of the household or a

recording error. Alternately, household expenditures data are recorded for each household and include imputed values for household production and non-purchased items and expenditures on remittances. The GLSS5 data shows a more complete record for food expenditures unlike reported income. Therefore, food expenditures as a ratio of total household expenditures (hence consumption expenditures) is the preferred measure of household capacity to pay for health care. Food share is treated as an income measure to estimate health care expenditures. One would expect that the higher the food share (*foodshare*) the less affordable health care expenditures would be and vice versa, all things being equal. Alternately, the amount of food expenditures (*fexpendc* is the log of the weighted total nominal and imputed household expenditures on food) is used as a measure of consumption expenditures and hence income. However, using amount of food expenditures rather than the share in total expenditures presents more challenges for interpreting the results: a higher level of food expenditures may correspond with higher income, higher household size, relative prices or any number of reasons. Hence it is not certain apriori how to interpret the relationship with health care expenditures. However, the evidence from the literature suggests that the responsiveness of the food expenditures to health care expenditures is low hence the coefficient on the level of food expenditures (*fexpendc*) is expected to be small, hence inelastic. Thus health expenditures behave as a necessity. A positive coefficient suggests that expenditures on health care complement food and do not necessarily displace food expenditures.

Household welfare status as estimated by household consumption and poverty is another income measure, an indicator of the likelihood and ability to purchase health care. The GLSS5 data reports quintiles of welfare (welfare is measured as the real total

household expenditures adjusted for household size by the consumption equivalence scale and the poverty line). An indicator, *quintile,* is a dummy variable for household quintile and takes on the value 1 for the lowest and the reference group against which the other (successively higher numbered) quintiles are compared. It is expected that *quintile* captures the poverty level of household and relative affordability of health care. All things being equal one would expect quintiles to correlate positively with amount of health care expenditures. On the contrary the welfare indicators may be of little significance in the decision to spend if health care behaves as a necessity and therefore quintile could be expected to be insignificant as a predictor of health care expenditures.

Who pays for the 'greatest proportion' of health care expenses of a household member may have significance for total household health care expenditures. The dummy variable *drelpays* takes the value 1 for households that had at least one member for whom an individual other than the household head paid the greatest portion of expenses and zero otherwise. The dummy variable *dgovpays* is 1 in the case of one or more members for whom government, insurance or employer covers the greatest proportion of expenses, and zero otherwise. The results are compared to the reference case of households where the head of household is the financier of the 'greatest proportion' of health care expenses for at least one member. It is expected that the coefficient on *dgovpays* would have a negative sign, and prove statistically significant as a determinant of the amount of expenditures.

### 2.3.2.3 Education

The head of household is expected to have significant influence on household health care expenditures especially as majority of respondents to the GLSS5 indicated that the head pays 'the greatest proportion' of their health care expenses. The level of education

of household head, *educhh*, is measured as the total years of schooling. Education, as a measure of access to health care information (literacy), is here considered a core determinant of health care demand. Alternately access to information may be considered to influence behaviors that lead to favorable health outcomes. On the one hand better information would be expected to vary positively with likelihood to demand care in the sense of a higher awareness of health care needs. On the other hand, health outcomes may be more favorable hence lower incidence of health needs. The sign of education in the probability to demand care is not a priori decided, though it is expected to be positive in the amount of health care use and consequently expenditures given the assumption of higher awareness in the event of health needs. A confounding factor of years of schooling is the probable influence on earnings potential and consequently purchasing power. Higher education may imply higher purchasing power and therefore years of schooling is expected also to be a positive influence on the actual amount of expenditures. However, in the developing country context as in Ghana, years of schooling may not strongly correlate with earnings given unemployment rates and the prevalence of informal employment and underemployment. For instance, based on the GLSS5 data, similar ratios for employed (53%) versus unemployed (47%) occur for household heads who had never been to school and those that had some years of schooling: 53% of heads who had had some university education had not worked for pay in the two weeks preceding interview.

### 2.3.2.4  Age as sample selection indicator

The indicator *agehead* represents the age in years of the head and *ageheadsq* is the age square to capture any non-linearity in the influence of age. Age is chosen as a selection variable in the sense that the head being a predominant health care financier (in terms of

frequency) is more likely to choose to demand care the older she is, with the likelihood of more dependents, more years of wisdom, experience and employment, hence income and savings, ceteris paribus. In addition, older age may imply depreciating health and higher probability of health care use. Similarly, other indicators of household needs are representations of the very young or very old: *propd5* is the proportion of household members that are four years or less in age; *propd60* is the proportion aged 60 or more. It is expected that infants, toddlers and members closer to death would, in all things being equal, have a greater risk of illness or injury, or use of health care (preventive or curative) than the general population because of lower immunity. The age distribution of household would expectedly influence probability of demand while not directly determining affordability and use levels (consequently variations in amount of expenditures) assuming that quantity, quality and nominal price of health care is not age discriminatory. Median age would have served a similar purpose but it correlates significantly with other regressors like household size, while *agehead, propd5* and *propd60* all correlate strongly with median age and much less with household size.

### 2.3.2.5   Community indicators

Analysis is carried out to measure the likelihood of expenditures with respect to geographic location. A dummy variable, *loc5*, indicates rural or urban locality among the three ecological zones (Coastal, Forest and Savannah) in Ghana, each spanning a number of administrative regions.  For example, the Forest zone holds a significant proportion of total population, and would have a higher burden of malaria especially given the physical geography more conducive to mosquitoes. It is expected that urban localities would have a higher likelihood of health expenditures than rural localities. Given rural-urban patterns

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in distribution of economic infrastructure such as higher tier health infrastructure and transportation networks in favor of urban localities, one would expect urban to have greater geographic access to conventional health care. Chronic illness such as heart diseases and hypertension (also associated with nutrition and sedentary lifestyles characteristic of urban) are easier diagnosed with greater access to skilled care and so the probability of using health care more often is expected to be greater in urban localities. In addition, higher unit cost for higher tier health care may result in higher expenditure outlays by urban households. As far as transportation costs, mean tests do not indicate statistically significant differences across rural and urban localities. The dummy variable, *loc5*, indicates which locality the household belongs to in reference to the omitted reference group, Greater Accra Metropolitan Area (GAMA); *lo5* takes the value 2 for other urban areas, the value 3 for rural Coastal, the value 4 for rural Forest and the value 5 for rural Savannah. Accra is relatively better resourced given the largest tertiary health care institution, as well as the largest concentration of health care providers and facilities. Hence households would have better physical access to care and may spend relatively more than other localities, all things being equal.

Also access to health care (crudely measured by the length of time spent travelling to health facility or provider) is measured by a dummy *dtravel* which indicates whether the average amount of total time travelled by all household members that sought care is greater than the average amount of time for those that visited a health facility or provider. It is expected that this variable would also capture difficulty in accessing desired health care such as trekking longer hours from rural remote locations to access better quality or

advanced care; or transportation difficulties, whether inner city or remote locations, increasing the cost of reaching otherwise available health providers.

### 2.3.2.6  Other variables acting as control

Socio-demographic characteristics could be important predictors of health expenditures, by reflecting constraints, needs or tastes of the household. One may expect that expenditures increase with household size and therefore health expenditures would tend to be higher for bigger households. Similarly, more members may imply a higher probability of ill or injured individuals all things being equal. Another variable included is *hhsize* which measures the number of household members. Expect household size to be a significant influence on the probability and as well as the actual amount of expenditures. Gender of the head may reflect different probabilities of seeking care and consequently demanding health care. Therefore, *gendhead*[2] is a dummy variable that takes on the value 1 if household head is male and zero otherwise. Gender may reflect differences in economic capabilities where male heads generally have higher incomes and a consequently greater ability to pay. While male heads may have more earnings and consequently higher purchasing power, female heads may be more likely to seek health care, as primary care givers of the family. Hence being male is expected to be less significant than the case of females in the likelihood of positive expenditures while as a determinant of the actual amount of health care expenditures, being male is expected to be more significant.

Religion may also have an influence in the Ghanaian context given beliefs and practices about health; *dh_religion* is a dummy variable that indicates the religious status

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[2] Omitted group is the households with the head being female

of the head of household with Christian as the reference group, compared to traditional African religion, Muslim and atheist.  One may expect a higher probability in orthodox Christianity associated with 'Western' religion which has had a significant history (missionary health posts and 'Western' medicine) in the development of conventional health system in Ghana. Use of conventional (allopathic) care is more likely captured in the health expenditures data compared to homeopathic care and spiritualist interventions and a lower likelihood of conventional market-based care more associated with other religions. Alternately religion may reflect geographical distribution of the population, with corresponding differences in patterns alongside infrastructural development such as in better resourced urban localities tend to be more Christian, rural localities likely tend to be more traditional, and northern localities tend to be more Muslim and have predominantly rural localities. These patterns are similarly exhibited in urban enclaves of migrants from the north and rural localities. In other words, religion is expected also to capture the different socio-cultural factors that influence differences in conventional health demand and consequently health expenditures.

An important observation is that preferences and spending on spiritual healing (Christian or otherwise) and other non-conventional or homeopathic health services might not be explicitly identified as market-based and therefore not captured in reported health expenditures but their influence could be important especially in analyzing catastrophic spending. Admittedly the religious status indicator does not adequately capture some of these influences that may be important in determining household health expenditures in the Ghanaian context.  Household preferences for homeopathic versus allopathic care,

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including the role of religion would be an interesting study on its own and admittedly outside the scope of this study.

Similarly, one would expect coping strategies for health care and consequent health expenditures (especially with implications for catastrophic spending) to be of some significance and differentiated alongside sociocultural, economic and other practices (for example, mutual help groups be it in microfinance, emergency savings, quid pro quo physical care and emotional support groups as in women movement organizations in local communities, churches or trades). Also, socio-cultural practices as in home care for the sick (as may be captured by the time use patterns of household members) that complement or substitute health care expenditures and the consequent health outcomes would be important determinants of health spending. While coping strategies are important to the discussion about household health expenditures, this area of research is considered for further study and is not addressed in this study given the limit of the data and the scope of the study.

## 2.4 Data and stylized facts

This study is based on data from the fifth wave of the Ghana Living Standards Measurement Survey (GLSS5) conducted from September 1st, 2005 to August 31st, 2006. This section is a description of the components of household health care expenditures and their relative sizes in the household budget. Typically, four categories of reported expenditures on health care are available in the GLSS: (a) consulting fees (b) travel costs, (c) overnight stays hence inpatient services (d) medicines and supplies. For Each household that is surveyed provides information about incidence of illness or injury, health care seeking and related expenditures in the two weeks preceding the interview. For each

household member information indicates the number of days one had been ill or injured and for how many days one had stopped usual activities due to illness or injury. Information also indicates whether an individual had consulted a health practitioner, who was consulted (e.g., doctor, nurse, chemical seller, traditional healer), for what reason (e.g., illness, injury, follow-up, check-up, prenatal), where consultation took place (e.g., hospital, clinic, pharmacy, chemical store, consultant's home) and whether the facility was public or private-owned irrespective of whether the individual reported an illness or injury (Appendix B provide further details). For each household member visiting practitioner information is available on how much was paid in consulting fees and how much was paid for travel to and from the provider or health facility, the distance and length of time travelled as well as the length of time spent in consultation. Also, the amount of expenditures on medicines or medical supplies for each household member irrespective of illness, injury or provider consultation is reported. Consequently, the total health care expenditures per household is an aggregation of the health expenditures reported for each member of household irrespective of illness status or health facility visit.

### 2.4.1 Patterns in morbidity, care-seeking and payments

The patterns in self-reported health status and health care-seeking indicates closing gaps over the years in successive rounds of the living standard surveys, in terms of the different household welfare quintiles (household welfare as reported in the GLSS data is calculated as total household expenditures weighted by a consumption equivalence scale and poverty threshold). As may be seen in Table 2-4 and Table 2-5 the gaps in health care seeking have improved in the GLSS5 where the proportion of the ill or injured in the lowest quintile seeking care (57.5%) is less than four percentage points lower than the proportion

form the highest quintile (60.8%) whereas the difference has been twenty-one percentage points in 1991/92 and nineteen percentage points in 1998/99. The worst performances in reported health status and health seeking rates in 1998/99 might be partly explained by cumulative effect of challenges in the health sector reforms and public health care delivery stemming from reforms in cost recovery measures and declining public provisioning that accompanied economic reforms and structural adjustment programs. Though the data are cross sectional rather than longitudinal and though measurement errors might vary for the different survey rounds such that comparability may not be precise it is reasonable to suggest that wide disparities in health care provider contacts across different income groups may be a factor of smaller significance in health care expenditures analysis with the GLSS5 (than the case is for the earlier rounds of GLSS).

The gaps in the rates of self-reported illness or injury in the two weeks preceding interview has similarly reduced between quintiles. Here is it observed that rates of illness and injury are higher for higher quintiles and vice versa hence and as rates have reduced for the highest income group (27.7% in 1991/92, 31.1% in 198/99, 20.2% in 2005/06) smaller changes in the rates have occurred for lowest quintile (17% in 1991/92, 22.6% in 1998/99, 18.7% in 2005/06). On the contrary, with respect to incapacitation due to illness or injury the lowest quintile is the most affected: 61.7% of those reporting an illness or injury had had to stop usual activities compared to 59.6% on average in 2005/06 (see Table 2-5). The number of days incapacitated has similar averages and variations across income groups. It is reasonable to assume that on average small disparities occur in morbidity rates and health care provider contact rates across income quintiles and this is an important

condition to consider in this study where ability to pay for health care is a key factor of investigation.

Table 2-4: Illness and care-seeking by quintile of welfare, 1991-2006

| Household welfare Quintile | GLSS3 1991/92 | | | GLSS4 1998/99 | | | GLSS5 2005/06 | | |
|---|---|---|---|---|---|---|---|---|---|
| | Number of individuals | Percent reporting illness or injury | Percent of ill or injured seeking care | Number of individuals | Percent reporting illness or injury | Percent of ill or injured seeking care | Number of individuals | Percent reporting illness or injury | Percent of ill or injured seeking care |
| 1 | 4,038 | 17.0% | 40.6% | 5,115 | 22.6% | 35.4% | 9,798 | 18.7% | 57.5% |
| 2 | 4,036 | 19.2% | 42.6% | 5,103 | 24.6% | 37.6% | 7,070 | 19.4% | 60.2% |
| 3 | 4,014 | 21.6% | 46.0% | 5,126 | 25.4% | 40.2% | 6,289 | 21.5% | 60.9% |
| 4 | 4,035 | 24.3% | 49.5% | 5,113 | 27.2% | 46.3% | 6,247 | 20.6% | 60.1% |
| 5 | 4,037 | 27.7% | 61.5% | 5,124 | 31.1% | 54.4% | 7,025 | 20.2% | 60.8% |
| All | 20,160 | 21.9% | 49.3% | 25,581 | 26.2% | 43.5% | 36,429 | 19.9% | 59.7% |

Source: Calculations based on data from the Ghana Living Standards Survey, various rounds.

Table 2-5: Indicators of health risk by quintile of welfare, 2005/2006

| Household welfare quintile | Individuals who stopped usual activities as a result of illness or injury in the two weeks preceding interview (% of the ill or injured) | Average number of days had to stop usual activities | Standard Deviation | Percent of individuals hospitalized in past year as a result of illness or injury |
|---|---|---|---|---|
| 1 | 61.7% | 5.0 | 3.6 | 4.6% |
| 2 | 59.4% | 5.4 | 3.9 | 4.7% |
| 3 | 57.4% | 5.5 | 3.9 | 4.8% |
| 4 | 59.3% | 5.6 | 4.0 | 5.6% |
| 5 | 59.7% | 5.6 | 3.9 | 5.3% |
| All | 59.6% | 5.4 | 3.8 | 5.0% |

Source: Calculations based on data from the Ghana Living Standards Survey V, 2005/06.

The reported total health care expenditures by individuals over the two weeks preceding interview ranged between ₵0 and ₵26,400,000[3] for the 36,249 (of 37212) individuals for whom data was obtained for the health questionnaire in GLSS5. One quickly observes that the data exhibits characteristics typical of health expenditures: highly skewed due to a few patients incurring disproportionately high costs relative to the majority and point masses (lumpiness) at lower costs due to many zeros and low expenditures (Deihr et al 1999; Grisworld et al 2004; Stanton and Rutherford 2005).

Of the total sample less than 27% made any health care payments in the two weeks preceding the interview. Skewness measures at 129.2 compared to the benchmark of 0 for a normal distribution and the kurtosis is 21064.3 compared to the benchmark of 3 for a normal distribution (StataCorp 2011 and Stata 2013). While skewness improves when the data is truncated at greater than zero health care expenditures health care payments are still not normally distributed. The average total is ₵47,023.77 and the median is at ₵13,850, a large standard deviation of ₵298,085.6 and a very large variance. A similar distribution occurs where the individual expenditures are aggregated into household units (hence household health care expenditures). Sixty percent (5218 of 8687) of households have at least a member for whom a positive (nonzero) expenditure is recorded.

Four categories of health care related expenditures based on the GLSS5 data are: payments for consultation, payments for travel to and from a health facility or provider, payments for overnight admissions at a facility and payments for medicines and medical supplies. Payments for medicines and medical supplies form the largest proportion of total

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[3] The Ghana Statistical Service stipulates the exchange rate for GLSS5 (2005-06) as ₵7500 to US $1.

health care expenditures as shown in Table 2-6. This may imply that medicines are relatively costly, or perhaps, they are used more intensively. Alternately the size may imply a popularity of self-prescribed medication whether as an alternative or a complement to health practitioner consultations. Spending on medicines and medical supplies is at least 89% of the health care budget of households that reported no incidence of illness or injury and 66% for the households that had an illness or injury episode. In either case rural households spent relatively more in proportion on medicines. The average payment by individuals per expenditure category indicates, however, that inpatient services (referring to persons that made one or more overnight stays at a health facility) are the costliest expenditure category which is not surprising. The average is higher if one excludes overnight stays for who zero health care payments were reported. Individuals who reported making payments for hospitalizations also reported ₵193,838 on average on medicines and those reporting zero payments for overnight stays still spent ₵40,642 on medicines. Associating medicines and medical supplies with facility visits and inpatients in particular is to be expected as theoretically speaking health care providers play key role in the demand for health care or demand or health care may be supplier-induced (Zweifel, 1981; Polheimer and Ulrich; 1995; Nguyen 2011). Persons that visited a facility or practitioner but had no overnight stays (outpatients) paid more on average (₵51,089) than non-visiting persons (those that reported no provider or facility visit) which made the least payment (₵ 21,149) on average for medicines and medical supplies.

Table 2-6: Distribution of household health care expenditures

| Service category, location and illness status | Households reporting no illness | | Households reporting an illness | |
|---|---|---|---|---|
| | Mean | Std Dev | Mean | Std Dev |
| | Urban households | | | |
| Total payments (₵) | 61,622.2 | 183,609.2 | 136,566.5 | 726,232.8 |
| | Percent of total health care expenditures | | | |
| Consulting | 5 | 2 | 7 | 1 |
| Inpatient | 1 | 1 | 21 | 9 |
| Medicine | 89 | 4 | 66 | 8 |
| Travel | 5 | 2 | 6 | 1 |
| | Rural households | | | |
| Total payments (₵) | 28,548.8 | 84,330.57 | 89,446.63 | 185,253.2 |
| | Percent of total health care expenditures | | | |
| Consulting | 4 | 1 | 10 | 1 |
| Inpatient | 0 | 0 | 11 | 2 |
| Medicine | 93 | 2 | 72 | 2 |
| Travel | 2 | 1 | 7 | 1 |

Source: Calculations based on GLSS5 data..

When expenditure categories are summarized by location or locality interesting patterns emerge. The mean, median and percentile distributions show that payments for medicines and supplies are consistently higher in urban locations while average inpatient payments are higher in rural locations (. To better compare household health expenditures across localities the total expenditures are deflated into 1999 Accra prices as some measure to account for medical cost inflation and price differentials. Greater Accra Metropolitan Area (GAMA) made the highest per capita expenditures for each category of service and exceeds all averages for the total sample while rural Savannah reported the least expenditures in each category. These patterns may be due to price differences or intensity in use of services or a combination of both. Urban residents are better resourced with secondary and tertiary health care facilities.

Table 2-7: Health care payments by type of patient and expenditure category

| Variable | Sample size | Mean (old ₵) | Std. Dev. | Maximum |
|---|---|---|---|---|
| Persons reporting one or more overnight stays (inpatients) | | | | |
| Consult | 236 | 21,718.2 | 109,700.3 | 1,500,000.0 |
| Transport | 244 | 20,099.2 | 43,826.1 | 500,000.0 |
| Inpatient | 233 | 296,502.2 | 1,633,308.0 | 23,600,000.0 |
| Medicine | 189 | 138,739.5 | 259,143.7 | 2,500,000.0 |
| Inpatients reporting nonzero payments for overnight stays | | | | |
| Consult | 144 | 22,274.3 | 64,800.5 | 700,000.0 |
| Transport | 151 | 20,455.6 | 34,033.8 | 300,000.0 |
| Inpatient | 140 | 493,464.3 | 2,086,783.0 | 23,600,000.0 |
| Medicine | 121 | 193,868.3 | 303,934.5 | 2,500,000.0 |
| Inpatients reporting zero payments for overnight stays | | | | |
| Consult | 92 | 20,847.8 | 156,452.4 | 1,500,000.0 |
| Transport | 93 | 19,520.4 | 56,428.1 | 500,000.0 |
| Inpatient | 93 | - | - | - |
| Medicine | 68 | 40,642.7 | 87,926.2 | 432,000.0 |
| Persons that visited facility or provider but no overnight stays (outpatients) | | | | |
| Consult | 4,361 | 7,563.0 | 25,508.7 | 500,000.0 |
| Transport | 4,437 | 5,482.7 | 20,355.4 | 800,000.0 |
| Medicine | 3,880 | 51,088.9 | 120,115.5 | 3,000,000.0 |
| Persons that did not visit a facility or provider (non-visiting) | | | | |
| Medicine | 5,438 | 21,149.4 | 52,455.7 | 900,000.0 |

Source: Calculations based on GLSS5 data.
Note: An exchange rate of US$ 1 = ₵7,500 in 2006 prices.


Not surprisingly inpatient services where they occur drive extreme health expenditures regardless of rural-urban location or poverty status. Expectedly health shocks would have greater consequences for households that are less capable of coping. More than 60% of hospital stays were three or more nights. The extreme expenditures may therefore not be considered a recording error. But are observed higher health expenditures a good reflection of ability to pay? Or are they instead a better reflection of intensity of use of service or access to care? And do expenditures reflect household consumption levels and

wealth endowments? These questions are of legitimate concern and further analysis using multivariate regression models are attempted to provide some answers.

### 2.4.2 Summary statistics of regression variables

The information in Table 2-8 and Table 2-9 give summary statistics of the outcome and predictor variables for the regression models. About two-thirds of households made some health care expenditure. On average ₵106,100 was spent by these households. A small number of households (0.54%) reported making consultations with health care provider or visits to a facility, and some reported overnight admissions yet had zero health expenditures. This subset of households compared to households that made some health expenditure, has statistically significant higher coverage by government, insurance or employer and lower responsibility for expenses by the head at the 1% level. The education of the head is statistically significantly lower at the 10% level based on the Student t test statistic. Otherwise all other variables have no statistically significant differences of means among these two groups. The means for food expenditure, income, household size, propd5, male head as well as urban location are significantly higher for households that made some expenditure compared to those that made no expenditure. On the other hand, the households that reported no expenditure had significantly lower proportion of 60 or more year olds. These differences are all at the 1% level of significance, based on the Student's t test statistic. The means for food expenditure, income, household size, propd5, male head as well as urban location are significantly higher for households that made some expenditure compared to those that made no expenditure. On the other hand, the households that reported no expenditure had significantly lower proportion of 60 or more

year olds. These differences are all at the 1% level of significance, based on the Student's

t test statistic.

Table 2-8: Summary statistics of household income and health care expenditures

| By household | All | | Nonzero reported health care spending | | Zero health care expenditure reporting households | | Zero reported health care spenders who consulted provider | |
|---|---|---|---|---|---|---|---|---|
| Household Sample | 8687 | | 5218 | | 3469 | | 44 | |
| | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| | In US$ (nominal) | | | | | | | |
| Health care expenditures in two-weeks | 13 | 40.0 | 13.3 | 53 | - | - | - | - |
| Total income (annual) | 1,573 | 2,853 | 1,747 | 2,933 | 1,293 | 2,707 | 1,333 | 1,667 |
| Food expenditures (annual) | 1,253 | 947 | 1,373 | 987 | 1,067 | 840 | 1,240 | 813 |

Source: Calculations based on GLSS5 data.
Note: The exchange rate for GLSS5 monetary values is US$1 to 7500 old cedis…

Table 2-9: Summary statistics of household indicators

| | All households | | Nonzero health care expenditure households | | Zero health care expenditure households | | Zero health care expenditure but consulted provider | |
|---|---|---|---|---|---|---|---|---|
| Sample of households | 8687 | | 5218 | | 3469 | | 44 | |
| | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| Household size | 4.2 | 2.8 | 5.0 | 2.9 | 3.0 | 2.3 | 4.8 | 3.4 |
| Proportion ill | 0.28 | 0.28 | 0.32 | 0.01 | 0.02 | 0.11 | 0.32 | 0.33 |
| Proportion inpatient | 0.01 | 0.05 | 0.01 | 0.06 | 0 | 0 | 0.02 | 0.8 |
| Proportion of households by who pays the greatest portion of healthcare | | | | | | | | |
| Household head | 0.9 | | 0.9 | | 0.9 | | 0.8 | |
| relative | 0.2 | | 0.3 | | 0.1 | | 0.2 | |
| Government/employe | 0.7 | | 0.1 | | 0.1 | | 0.4 | |
| Proportion of household members who are very young or aged | | | | | | | | |
| Proportion <5 years | 0.11 | 0.15 | 0.12 | 0.12 | 0.08 | 0.15 | 0.10 | 0.20 |
| Proportion >59 years | 0.09 | 0.23 | 0.07 | 0.07 | 0.12 | 0.28 | 0.07 | 0.20 |
| Characteristics of head of household | | | | | | | | |
| Gender of the head (male) | 0.7 | | 0.7 | | 0.7 | | 0.7 | |
| Years of schooling | 4.1 | 4.5 | 4.1 | 4.5 | 4.0 | 4.5 | 3.2 | 4.5 |
| Age in years | 45.4 | 15.6 | 46.1 | 14.7 | 44.3 | 16.8 | 45.1 | 15.9 |
| Age squared | 2300.6 | 1592.7 | 2337.9 | 1512.9 | 2244.4 | 1704.5 | 2281.2 | 1653.7 |
| Proportion of households by locality of residence | | | | | | | | |
| Greater Accra§ | 0.1 | | 0.1 | | 0.1 | | 0.1 | |
| Other Urban | 0.3 | | 0.3 | | 0.3 | | 0.3 | |
| Rural Coastal | 0.1 | | 0.1 | | 0.1 | | 0.1 | |
| Rural Forest | 0.3 | | 0.3 | | 0.2 | | 0.1 | |
| Rural Savannah | 0.2 | | 0.2 | | 0.3 | | 0.4 | |
| Proportion of households that exceed the average travel time of 2.37hour | | | | | | | | |
| Travel time >2.37-hr | 0.1 | | 0.15 | | 0.0 | | 0.2 | |

Source: Calculations based on GLSS5 data.
§ Greater Accra Metropolitan Area (GAMA), Ghana's capital, is the base group.

## 2.5 Results and discussion

The empirical analysis in this study is an investigation into the key factors that influence a household's decision to spend on health care and by how much they, with the expectation to generate information about the likelihood of catastrophic health spending by Ghanaian households. Statistical regression analyses are carried out with the objective to identify key determinants of health care expenditures by examining the relative

significance of health needs and ability to pay while also accounting for several factors that may influence health care utilization such as the demographic, socio-cultural and community characteristics of households.

## 2.5.1   The predictors and the determinants of household health care expenditures

A probit model and an OLS model are first estimated to determine the statistically significant predictors of health expenditures and the statistically significant determinants of the amount of expenditures respectively. Next, the full information maximum likelihood (FIML, single-step) Heckman selection model is estimated. A robust standard error version of the FIML model is estimated.  Two other robust FIML models are estimated by replacing the log of food expenditures with the log of income, and again with the share of food in total household expenditures for the purpose of comparison. Results from these estimations are summarized in Table 2-10 and Table 2-11.

The different versions of the health care expenditures model regression produce similar results from the regression as demonstrated in Table 2-10and Table 2-11. The Heckman full information maximum likelihood (FIML) models each show a statistically significant Wald (chi square) test statistic therefore rejecting the null hypothesis that the selection (probit) equation and the primary (expenditures) equation are independent. The estimate of rho is statistically significant in each case suggesting a significant correlation between selection decision equation and health care expenditures equation. The coefficient on Lambda is also significant and negative in all cases. These results imply that some (unobservable) factors that increase the likelihood that health care expenditures would be made also cause a decrease in the amount of overall household health care expenditures and vice versa.

Table 2-10: Predictors of household decision to spend on health care

| Income measure used in the primary model | I | II | III | IV | V | VI | VII | VIII |
|---|---|---|---|---|---|---|---|---|
| | Probit model | Heckman FIML selection models Coefficients | | | | Predicted change in probability | 95% confidence interval | |
| | | Log of income | Log of food | quintile | food share | Log of income | | |
| log of income | 0.092*** | 0.085*** | 0.088*** | 0.088*** | 0.088*** | 0.02 | 0.01 | 0.02 |
| | (0.02) | (0.02) | (0.02) | (0.02) | (0.02) | | | |
| Welfare indicator (reference group is households in the lowest quintile) | | | | | | | | |
| 2nd quintile | -0.076 | -0.066 | -0.071 | -0.073 | -0.064 | -0.02 | -0.04 | 0.01 |
| | (0.07) | (0.07) | (0.07) | (0.07) | (0.07) | | | |
| 3rd quintile | -0.135** | -0.106 | -0.113* | -0.123* | -0.104 | -0.03 | -0.05 | 0.00 |
| | (0.07) | (0.07) | (0.07) | (0.07) | (0.07) | | | |
| 4th quintile | -0.130* | -0.111* | -0.120* | -0.125* | -0.109 | -0.03 | -0.05 | 0.00 |
| | (0.07) | (0.07) | (0.07) | (0.07) | (0.07) | | | |
| 5th quintile | -0.274*** | -0.254*** | -0.266*** | -0.260*** | -0.252*** | -0.06 | -0.08 | -0.03 |
| | (0.07) | (0.07) | (0.07) | (0.07) | (0.07) | | | |
| Illness indicator (reference group is households reporting no illness) | | | | | | | | |
| illness in household | 2.356*** | 2.366*** | 2.363*** | 2.364*** | 2.363*** | 0.47 | 0.45 | 0.48 |
| | (0.06) | (0.06) | (0.06) | (0.06) | (0.06) | | | |
| Education indicator (base group has head 'never' been to school) | | | | | | | | |
| head ever been to school | -0.008 | 0.020 | 0.018 | 0.019 | 0.019 | 0.00 | -0.03 | 0.03 |
| | (0.08) | (0.07) | (0.07) | (0.07) | (0.07) | | | |
| gender indicator (reference group has female head ) | | | | | | | | |
| male head | 0.041 | 0.042 | 0.041 | 0.040 | 0.041 | 0.01 | -0.01 | 0.02 |
| | (0.04) | (0.04) | (0.04) | (0.04) | (0.04) | | | |
| indicator for locality of residence | | | | | | | | |

| | I | II | III | IV | V | VI | VII | VIII |
|---|---|---|---|---|---|---|---|---|
| | Probit model | Heckman FIML selection models Coefficients | | | | Predicted change in probability | 95% confidence interval | |
| Income measure used in the primary model (reference group is urban households) | | Log of income | Log of food | quintile | food share | Log of income | | |
| *rural* | -0.034 (0.04) | -0.032 (0.04) | -0.034 (0.04) | -0.032 (0.04) | -0.031 (0.04) | -0.01 | -0.02 | 0.01 |
| Indicators for who pays majority of health care expenses[§] | | | | | | | | |
| *relative pays* | 0.189*** (0.05) | 0.178*** (0.05) | 0.178*** (0.05) | 0.178*** (0.05) | 0.178*** (0.05) | 0.04 | 0.02 | 0.06 |
| *government/employer/insurance pays* | 0.019 (0.07) | 0.025 (0.08) | 0.025 (0.08) | 0.025 (0.08) | 0.025 (0.08) | 0.00 | -0.02 | 0.03 |
| religion indicator (base group has Christian head) | | | | | | | | |
| *traditionalist* | -0.152*** (0.06) | -0.154*** (0.06) | -0.155*** (0.06) | -0.154*** (0.06) | -0.152** (0.06) | -0.03 | -0.05 | -0.01 |
| *moslem* | -0.129*** (0.05) | -0.133*** (0.05) | -0.133*** (0.05) | -0.133*** (0.05) | -0.132*** (0.05) | -0.03 | -0.05 | 0.00 |
| *other* | -0.014 (0.07) | -0.041 (0.07) | -0.041 (0.07) | -0.040 (0.07) | -0.038 (0.07) | 0.00 | -0.03 | 0.03 |
| *age in years of head* | 0.036*** (0.01) | 0.037*** (0.01) | 0.036*** (0.01) | 0.037*** (0.01) | 0.037*** (0.01) | 0.01 | 0.00 | 0.01 |
| *age in years squared* | -0.000*** (0.00) | -0.000*** (0.00) | -0.000*** (0.00) | -0.000*** (0.00) | -0.000*** (0.00) | 0.00 | 0.00 | 0.00 |
| *proportion under 5years* | 0.693*** (0.13) | 0.667*** (0.13) | 0.663*** (0.13) | 0.666*** (0.13) | 0.666*** (0.13) | 0.14 | 0.09 | 0.19 |
| *proportion older than 59years* | -0.305*** | -0.315*** | -0.308*** | -0.312*** | -0.313*** | -0.06 | -0.10 | -0.02 |

| | I | II | III | IV | V | VI | VII | VIII |
|---|---|---|---|---|---|---|---|---|
| | Probit model | Heckman FIML selection models Coefficients | | | | Predicted change in probability | 95% confidence interval | |
| Income measure used in the primary model | | Log of income | Log of food | quintile | food share | Log of income | | |
| | (0.11) | (0.10) | (0.10) | (0.10) | (0.10) | | | |
| _cons | -2.936*** | -2.878*** | -2.903*** | -2.919*** | -2.926*** | | | |
| | (0.28) | (0.27) | (0.27) | (0.27) | (0.27) | | | |
| N | 8271 | 8271 | 8271 | 8271 | 8271 | | | |

Source: Calculations based on data from the Ghana Living Standards Survey V.
Note: Binary dependent variable dheh=1 if total reported health care expenditure by household is greater than zero; dheh=0 if health care expenditures are zero.
§Households for whom the head pays majority of expenses is the base group that has been omitted.
Standard errors are in parenthesis.
* p < 0.1, ** p < 0.05, *** p < 0.01.

Table 2-11: Determinants of household health care expenditures in Ghana

| | I | II | III | IV | V |
|---|---|---|---|---|---|
| | OLS | Heckman FIML | | | |
| Income measure in the primary model | Log of income | Log of income | Log of food | Quintile | Food share |
| *log of income* | 0.046*** | 0.033** | | | |
| | (0.02) | (0.02) | | | |
| Indicators for who pays majority of health care expenses§ | | | | | |
| *relative pays* | 0.089** | 0.064 | 0.065 | 0.065 | 0.059 |
| | (0.04) | (0.04) | (0.04) | (0.04) | (0.04) |
| *government pays* | -0.118* | -0.129* | -0.128* | -0.130* | -0.127* |
| | (0.07) | (0.07) | (0.07) | (0.07) | (0.07) |

| Income measure in the primary model | I | II | III | IV | V |
|---|---|---|---|---|---|
| | OLS | Heckman FIML | | | |
| | Log of income | Log of income | Log of food | Quintile | Food share |
| *proportion ill* | 1.290*** | 0.799*** | 0.802*** | 0.788*** | 0.788*** |
| | (0.07) | (0.09) | (0.09) | (0.09) | (0.09) |
| *proportion hospitalized* | 4.005*** | 4.044*** | 4.042*** | 4.057*** | 4.065*** |
| | (0.29) | (0.46) | (0.46) | (0.46) | (0.46) |
| *household size* | 0.142*** | 0.116*** | 0.113*** | 0.122*** | 0.117*** |
| | (0.01) | (0.01) | (0.01) | (0.01) | (0.01) |
| *years in school of head* | 0.019*** | 0.019*** | 0.019*** | 0.019*** | 0.019*** |
| | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) |
| *gender of the head (base is female)* | | | | | |
| *male head* | 0.062 | 0.057 | 0.060 | 0.070 | 0.067 |
| | (0.04) | (0.04) | (0.04) | (0.04) | (0.04) |
| *indicator of residence (base group is Accra)* | | | | | |
| *Other urban* | -0.680*** | -0.713*** | -0.708*** | -0.721*** | -0.696*** |
| | (0.07) | (0.07) | (0.07) | (0.07) | (0.07) |
| *rural coastal* | -0.597*** | -0.618*** | -0.618*** | -0.633*** | -0.569*** |
| | (0.08) | (0.08) | (0.08) | (0.08) | (0.09) |
| *rural forest* | -0.588*** | -0.622*** | -0.612*** | -0.637*** | -0.589*** |
| | (0.07) | (0.07) | (0.07) | (0.07) | (0.07) |
| *rural savannah* | -1.284*** | -1.313*** | -1.287*** | -1.308*** | -1.269*** |
| | (0.07) | (0.08) | (0.08) | (0.08) | (0.08) |
| *indicator for travel time (base group travelled less than average of 2.37 hr)* | | | | | |
| *traveltime ≥2.37 hr* | 1.217*** | 1.190*** | 1.184*** | 1.187*** | 1.184*** |
| | (0.05) | (0.04) | (0.04) | (0.04) | (0.04) |

| Income measure in the primary model | I<br>OLS<br>Log of income | II<br>Heckman FIML<br>Log of income | III<br><br>Log of food | IV<br><br>Quintile | V<br><br>Food share |
|---|---|---|---|---|---|
| *proportion of members under age 5 years* | 0.345*** | 0.216* | 0.219* | 0.200 | 0.223* |
| | (0.12) | (0.12) | (0.12) | (0.12) | (0.12) |
| *log of food expenditures* | | | 0.077** | | |
| | | | (0.03) | | |
| quintile of welfare (base is lowest quintile) | | | | . | |
| *2nd quintile* | | | | 0.066 | |
| | | | | (0.06) | |
| *3rd quintile* | | | | 0.146** | |
| | | | | (0.06) | |
| *4rd quintile* | | | | 0.130** | |
| | | | | (0.07) | |
| *5th quintile* | | | | 0.071 | |
| | | | | (0.07) | |
| *foodshare* | | | | | -0.361*** |
| | | | | | (0.13) |
| _cons | | 9.596*** | 8.899*** | 10.011*** | 10.288*** |
| | | (0.27) | (0.48) | (0.12) | (0.12) |
| N | 5052 | 8271 | 8271 | 8271 | 8271 |

Source: Calculations based on data from the Ghana Living Standards Survey V.

Note: Dependent variable is the log of total health care expenditures by household.

§Households for whom the head pays majority of expenses is the base group that has been omitted.

Standard errors are in parentheses.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

As the results in Table 2-11 indicate the OLS model (which ignores the risk of selection into health care participation) tends to overstate the impact of the explanatory variables on the overall amount of health care expenditures. The evidence leads to the conclusion that Heckman FIML is a robust option to the ordinary least squares in modeling household health care expenditures with the GLSS5 data.

### 2.5.1.1 Age of household members as sample selection variable

As indicators of the health expenditures sample selection, age of household head and the proportion of members age under five or the proportion age sixty and above perform as a sample (households that fall into the group of health care spenders) selector. An important expectation of a sample selector is that it significant in the decision equation but not significant in the primary (expenditures estimation) model. The coefficient on the age of the head is statistically significant and suggests a year older in age results in a percentage point change in the probability that a household would spend on health care, holding all other variables constant. The coefficient on age squared is zero implying a lack of evidence to suggest non linearity in the impact of age of the head. The proportion of household members under age 5 similarly has a positive influence on the chances of health care expenditures. A unit change in the ratio would increase the probability by 0.14. On the contrary the proportion age 60 and over reduces the chances of health care expenditures in the sense that when all variables are held constant at their means, a unit increase in this proportion reduces the chance of health care spending by 0.07. It is worth noting that persons over age 59 are relatively fewer in proportion compared to persons under age 5. The median age of the whole sample of 8687 households is 25.6 years, or smaller at 22.4 years for households that reported (greater than zero) expenditures. As shown in the

proportion of children under 5 (or seniors above age 59) is 0.12 (0.07 for seniors) for health spending households but 0.08 (0.12 for seniors) in non health care spending households. Even among households that indicated consulting a health care provider but reported zero health spending, the proportion of children under age 5 exceeds proportion over age 59. In addition, age of the head of household as well as the proportion over age 59 turn out to be statistically insignificant determinants of the amount of health care expenditures if included in the primary equation (not shown in tables). In contrast proportion under 5 turn out as statistically significant with a coefficient of 0.216 meaning a unit increase in the proportion leads to a 21.6% increase in health care spending all things being equal. These observations lead to the conclusion that the presence of the very young in the household is a strong predictor of both the likelihood and a higher amount of health care expenditures whereas the importance of an older head of household in predicting health care expenditures is the influence in the likelihood of being a parent or guardian of young children. The negative effect of the very old is likely a reflection of smaller proportions of the very young and consequently a smaller chance of health spending.

### 2.5.1.2 Morbidity as the strongest effect on health care expenditures

As expected household members ill or hospitalized at any time in the two weeks preceding interview significantly increased the likelihood that health expenditure would be made. The strongest average marginal effect (predicted change in probability) occurs in the case of households that reported an illness or injury episode (*dummy_ill* =1) as shown in Table 2-10. For such households the chances of health expenditures increase by 0.47 (with a 95% confidence interval of 0.45-0.48), assuming all other variables are held constant. Similarly, morbidity has an increasing effect on the amount of health care expenditures as

shown in Table 2-11: regardless of which income measure is used a unit change in proportion of household members who are ill (*propill*) or hospitalized (*propipd*) respectively leads to about 80 % or 404% increase in the amount of health care expenditures, all things being equal. These results suggest that illness has a significant impact on the decision to seek care but treatment or the health care provider (as reflected in proportion hospitalized) has the stronger influence on the level of health expenditures after the household has made the decision to seek care. It is obvious that hospitalization would have a significant impact on amount of expenditures given that it is relatively the costliest component of health care expenditures as shown in Table 2-7 and similarly in empirical studies elsewhere (Van Doorslaer 2007, Wagstaff and van Doorslaer 2008). Moreover, among expenditure categories, medicines are the most recurring and the greatest proportion of health spending regardless of locality or health care seeking behavior, and the strongest correlation (0.7) is between medicines and inpatient services (see Table 2-6 and Appendix B). Considering that over 93% of cases that visited a provider did so for the reason of illness or injury () rather than for prenatal services, follow up or check up, the GLSS data portrays a fact that for households in Ghana, health care expenditures are synonymous with curative services even though the GLSS does not survey direct costs on preventive services. In other words, the evidence indicates that household health care expenditures are in fulfillment of critical health care needs. Given the critical role of health care expenditures, for a given level of health care needs, variations in ability to pay (income measures) has significant implications for access to critical health care. Further analysis of the responsiveness of household ability to pay (income measures) to health care expenditures follows.

**2.5.1.3 Health care expenditures as a necessity**

The household income measures (log of income, log of food expenditures, quintiles of welfare and the share of food in total expenditures) are alternated to compare the robustness of the responsiveness of the level of health care expenditures to ability to pay. In predicting the decision to spend, however, the log of income as well as quintile (as a measure of inequality) is considered important. As previously explained, food expenditures (the most significant component of total household expenditures) may be a better measure of household consumption than income, but food expenditures are correlated with welfare (expenditure) quintiles, hence food expenditures are avoided as a co-regressor with quintile in order to minimize the problem of collinearity. Overall, the degree of responsiveness of health expenditures to the income measures is small and the evidence suggests also that food expenditures complement health care rather than displace health care given the positive coefficients. This meets the initial assumption that food and health are basic needs and complement each other. The results confirm also that among households in Ghana higher income households likely to afford larger food budgets are as likely to afford higher health care budgets all things being equal, similar to findings for households in fourteen countries in Asia (Wagstaff and van Doorslaer 2003). These conclusions about income measures are supported by the findings as follows.

In the simple probit model as well as the robust Heckman full information maximum likelihood models, the evidence point to income being significant in the decision to spend (see Table 2-10). Specifically, in the FIML with log of income as the measure of ability to pay, a percentage increase in income increases the probability of health care spending by 0.02 (with a 95% confidence interval of 0.01-0.02) while holding all other variables constant. The coefficient on log of income is significant also in the amount of

expenditures conditional on positive expenditures (see Table 2-11): a one percent increase in income results in a 0.03% increase in health care expenditures. This observation implies that health care is a normal good but is income inelastic for households in Ghana given that the coefficient which also measures income elasticity is less than. Similarly, food expenditures turn out to be statistically significant as a determinant of the amount of health care spending. The coefficient on log of food expenditures (*lgfexpendc*) is positive, at 0.08. Using the ratio of food expenditures to total household expenditures (*foodshare*) as the measure of income similarly produces a significant but negative coefficient of -0.36 (see Table 2-11). The negative sign is to be expected as health care expenditures are defined in the non-food expenditures component of total household expenditures. However, the statistically significant negative influence on amount of health care spending reveals another dimension of the responsiveness of food expenditures meaning while food expenditures are increasing in health care spending it may not be concluded as welfare improving in the sense that higher food shares signals lower ability to afford health care expenditures or vice versa. Alternately the results may lead to the conclusion that low income households are likely to have larger food shares according to Engel's law (1857 as cited in Anker 2011) would have lower disposable incomes, therefore spend lower amounts on health care. What the results do not show is whether health care or food expenditures are more income inelastic, in other words, at which threshold of critical (curative) health care health care expenditures needs do displace food expenditures. What is evident is that among households in Ghana, food share is a good indicator of ability to afford health care and households with higher shares are the most likely vulnerable to health shocks.

Interestingly a household being in the upper quintiles of welfare would have a lower probability of spending on health care compared to the lowest quintile as shown in Table 2-10. The difference is more pronounced for the upper quintile of welfare: the predicted probability is 0.06 lower (in the FIML model with log of income in the primary equation). The probability is 0.03 lower for the fourth quintile in reference to the lowest quintile. Looking at the results in Table 2-10, the evidence indicates no difference in probability for the lowest and second quintile (as well as the third quintile in the simple probit model or the FIML model where log of income or food share is the income measure). With respect to the amount of expenditures, there is no statistically significant difference between the amount of health care expenditures by a household in the lowest quintile and a household of similar characteristics in the highest. The same observation could be made between the lowest and second lowest quintile, but a similar household in the third or fourth quintile respectively has spent 15% or 13% more on health care expenditures than the lowest quintile, all things held constant. This observation is consistent with the probability results indicating a statistically strong decrease in the chances of health care spending by the highest quintile in comparison to the lowest quintile (see Table 2-10). But what may explain this observation? One explanation would be that the incidence of illness and injury, therefore critical health care needs, may be lower for higher quintiles. The summary statistics in Table 2-4 show that higher quintiles have higher rates of self-reported illness or injury and consultations with health care provider. As could be seen in Table 2-5 there are similar rates of health risk as measured by hospitalizations in past twelve months. A plausible explanation would be that households in the upper quintile have significantly higher government or employer support than the case is for the lowest quintile. While this

difference is not directly observed in the regression results, summary statistics indicate that 3% of households in the lowest quintile had such support compared to 9%, 8.4% and 7% of households in the third, fourth and fifth quintile respectively as demonstrated in Appendix B.

Who pays the greatest proportion of health care expenditures has influence on both the probability of expenditures and the level of expenditures. The probability is higher (0.04 more) when an individual other than the household head, employer, government or insurance is the financier of the greatest majority of health care expenditures, assuming all other variables are held constant. As one would expect, however, the level of health care expenditures is smaller only in the case where government/employer/insurance is the financier of the greatest proportion of the expenses. Evidently government, insurance or employer coverage has significant impact on the expenditures burden on households. This observation suggests household out of pocket health care expenditures burden would improve in the context of the National Health Insurance Scheme in Ghana. Hence an analysis of subsequent survey data (following the GLSS5) should expectedly indicate a larger coefficient on the government /insurance/employer indicator variable in confirmation.

### 2.5.1.4 Education as a socioeconomic indicator but not a deciding factor

The evidence may support the theory that education is a key determinant of health care demand through its influence on ability to access or use information. Years of schooling of the household head is of statistically weak influence in the likelihood of a household demanding health care but a strong determinant of the level of demand once the decision is made. There is no difference in the chances of health care spending whether

household head has ever been to school or not (*dh_sch*). Concerning the amount of expenditures, however, the number of years of schooling has an increasing effect. The results are the same regardless of which multi-stage model or income measure is used (see Table 2-11). Each additional year of schooling increases the predicted average health care expenditures of the household by 1.9% when all other variables are held constant. One explanation could be education does increase enabling factors of the household such as in having better networks or knowledge about the health care system to gain easier access in the event of need. Alternately higher educated households tend to use health care more intensely, or use higher tier care, which might then correspond to higher expenditures. Households may have peculiar characteristics in years of schooling affecting health care demand: for instance better access to information and opportunities to seek timely care, or to adopt healthy lifestyles, or to produce health care within the household or a combination of these reasons. This is plausible because the data indicates that the average proportion of members that reported illness or injury was 0.54 in the case of household head having no formal education, but 0.11 for households whose head had some formal education. In contrast, one may not conclude (in the case of households in Ghana) that the influence of education is a reflection of differences in ability to pay. This is because the years of schooling do not strongly correlate with the income indicators, and this condition in itself is an advantage in minimizing collinearity between the regressors. Moreover, as previously indicated, there are similar ratios for employed (53%) versus unemployed (47%) household heads who had never been to school and those that had some years of schooling. For example, 53% of heads who had had some university education had not worked for income in the two weeks preceding interview.

**2.5.1.5 Travel time and residence as important indicators**

While information on time travelled to visit a health care facility or provider would involve a subset of health care users and therefore reflect a higher likelihood and amount of expenditures, the time factor may also be considered as an indicator of the differences in the ease of access to health facility or provider of choice. Even considering transportation costs alone, one may still expect health care to be costlier the longer the time travelled therefore households that have a longer than the average 2.37-hour travel time are associated with more expensive care. The simple probit regression results meet this expectation: time travelled exceeding the average perfectly predicts success, hence dropped from the selection equation. In all versions of the health expenditures equation as shown in Table 2-11 time travelled exceeding the average has strong statistical significance. In the robust log of income measure equation for instance, the average health care expenditure of a household that collectively has a higher than average time travelled is 119% more than the case of an otherwise comparable household. There is no evidence to suggest that the average time travelled significantly varies across locality of residence based on a Wilks' lambda F-test F value of 2.53 (upper and lower degrees of freedom 4 and 8682 respectively) which fails to reject the null hypothesis that the average time travelled is equal among all five localities at 5% level of significance. A similar test fails to reject the hypothesis that average time travelled varies across quintile groups, based on an F value of 3.85. The implication then is, for whatever reason time travelled may be longer than average, the data does not indicate a pattern that varies by locality of residence or the income status of a household. In that case the influence of proximity to health care (in terms of time needed to reach provider) on household health care expenditures could be assumed to be similar across localities for otherwise comparable households that visited a health care provider.

What the analysis shows is that, with other variables held constant, health expenditures are significantly higher for households that spent longer than average time travelling to consult a provider and this observation may not necessarily be a rural or urban, rich or poor household phenomenon. However, locality of residence has significant effect on the level of household health care expenditures as further discussed.

Being in an urban locality does not improve the chance of household spending on health care: as shown in Table 2-10 the difference in predicted probability is not significant and results are the same regardless of which model is used. However, once the decision is made to spend on health care, the amount of expenditures is significantly lower for all localities compared to Accra. As shown in Table 2-11 the greatest difference occurs with the rural Savannah zone where average expenditures are 131% less than that of an otherwise comparable household (results from the robust FIML with log of income measure).

### 2.5.1.6 Influence of the social and demographic characteristics of the household

The size of household is a significant determinant of the amount of expenditures with: one additional member increases average household health care expenditures by 12% holding other variables constant. The coefficient on gender of the head of household is not statistically: holding all other variables constant, there is neither a significant difference in the likelihood nor the amount of health care expenditures between male headed and female headed households. However, a test on the equality of means indicates households for whom health care expenditure have been reported have a significantly higher proportion of male heads than households that have zero health care expenditures. On the contrary there is lack of evidence to suggest a difference between the gender proportion (of household

heads) of non-paying households (visited a health care provider but reported zero health care expenditures) and that of households that reported health care expenditures. While previous studies have indicated that being female is associated with a higher likelihood of seeking health care (Nketiah et al 2009, Burgiavinni and Pace 2011) the analysis here does not indicate a difference in expenditures. The explanation may be that such studies had more focus on child health and had more equal proportion of males and females in the sample. The analysis in this study is not specific to a type of health care or a subset of the population but to the household in general, and the influence of gender is gauged in terms of the household head, in which group females are a small (20%) minority. What the results show is that, when the set of socioeconomic and demographic and community indicators used in this study are taken into account, the gender of the head of household makes no difference in household health care expenditures in Ghana.

Religion has the expected influence; holding all other variables constant, a traditionalist or Muslim household is less likely than a Christian household to spend on health care. Religion could be a reflection of lifestyle choices or social networks that influence the decision to use formal health care in Ghana. Private non-profit (quasi public) health facilities form the second largest provider of health care in Ghana (see table in appendix) and these facilities have strong religious affiliations or originated as missionary posts. Religion may also be reflecting patterns in geographic distribution of health care and therefore access to care, and may be reflecting poverty distribution as well. Observe that Christian is the majority in southern regions (74% Christian household heads) which also have a higher concentration of health care facilities, northern regions are dominantly

Moslem (32%) and Traditionalist (42%) and have also higher concentrations of rural (82.67% versus 51.53% southern) or poor (61.29% versus 14.63% southern) households.

## 2.6    Incidence of catastrophic health care expenditures

In this section, estimates of the proportion of households that potentially face catastrophic expenditures are calculated in terms of ability to pay for the reported health care expenditures measured in terms of household consumption expenditures. A further analysis is made to describe the key determinants of catastrophic payments and their incidence across location and income groups.  Analysis of the determinants of household health care expenditures suggest they are responsive to health needs but less to income measures except in terms of relative income as estimated by the share of food expenditures. Some of the variations in household health care expenditures may be due to relative prices or intensity in the use of services although these factors are not directly observable in the data and have not been analyzed in this study. While it is not explicit which of intensity in use of services or price differentials is the stronger factor in expenditure levels, this distinction is fortunately of little relevance in regards to investigating observed health care expenditures and their implications for household ability to cope. Ability to pay is essentially an assessment of the catastrophic potential of health shocks on households particularly when health insurance or safety nets are weak. One would agree that to the extent that health expenditures are nondiscretionary the potential exists to plunge households in at least transitory poverty even for those that have ability to cope over time. Further analysis of the data is done to compare the relative ability to pay for the reported health care expenditures in terms of total household consumption expenditures.

In the literature catastrophic health spending describes the scenario where a household must reduce its basic expenditure over a period of time in order to cope with health costs. The threshold is set as a share of total income (or consumption expenditures where income data is less accurate such as in the developing country context). This is based on the assumption that households should have some minimum consumption level and therefore health expenditures that potentially reduce this consumption level are catastrophic in the sense that they plunge households into poverty or make existing poverty worse. The threshold is somehow arbitrary since no standard has as yet been developed in the literature for setting the catastrophic threshold. Some have labelled 10% or more of consumption expenditures as catastrophic (Wagstaff and van Doorslaer 2003), others have suggested 40% is conservative enough (Xu et al 2003) while others have varied thresholds from 25% to 40% for theoretical analysis (Wagstaff and Van Doorslaer 2008). Alternatively, a cross sectional study of over 68 advanced and low income countries suggests that economies would have to have 15% or lower share of private spending in total health care spending to reduce chances of catastrophic health spending by households (Xu et al 2003). Catastrophic health spending may be synonymous with household vulnerability to economic shocks. Vulnerability to shocks has several dimensions: (1) ability to cope with shocks when they happen; (2) exposure to shocks (e.g. poor households may be exposed to more shocks than rich ones); and (3) frequency and magnitude of shocks. Ability to cope may be estimated as the ability to pay for the cost of health care while exposure to shocks looks at the likelihood of tipping over into poverty or going deeper into poverty and the frequency and magnitude of shock would include a combination of the illness incidence and the recovery rate from the costs involved. This

study focuses on the ability to cope with health shocks in terms of the proportion of health care expenditures in total household consumption expenditures, in other words disposable income. Expenditures data are preferred since they tend to be more reliable than income data in the developing country context (Xu et al 2003).

However, the reported health care expenditures cover the two week preceding interview. The measures of ability to pay are similarly scaled to the two week (adult equivalence scale weighted) consumption expenditures of the household. The noted caveat is that health care expenditures are more random than consumption expenditures and that a smoothed out consumption expenditures (over two weeks) are theoretically not comparable with health expenditures that randomly occur over the same period. The emphasis here is that these expenditures are hypothetical estimates of what a household could afford in health care assuming resources were fixed in the short term, given the real risk of a health shock. Also, in respect of ability to pay and therefore out of pocket payments at the point of service, the cases where government, employer or insurance is responsible for the greatest proportion of household health care expenditures are excluded from the estimate of total household health care spending for want of a correct weight.

Incidence of catastrophic health expenditures is estimated as a headcount of households who fall below a calculated threshold (Wagstaff and Van Doorslaer 2008, Xu et al 2011). The household is the focus of analysis in this study therefore household expenditures are simply an aggregate of reported health care expenditures for each member. As noted by Wagstaff and Van Doorslaer (2008) this approach obscures the distribution of catastrophic payments experienced by individual members. This study makes a simplifying assumption that income transfers are made across household members

to absorb health expenditures. This assumption may pass in the context of the Ghanaian household if one assumes that as in meal sharing and lodging financial bonds are as strong in health care spending although member composition typically extends beyond the nuclear family. Another caveat in this study is that over the long term health expenditures coping mechanisms may be different than the short term; the household may liquidate or build wealth to cover health expenditures, or deplete resources and worsen ability to cope, for a given health shock. As such a snapshot (as in cross section data) ignores long term ability to cope but at least, transitory hardship is assumed by catastrophic measures in this study.

Following Wagstaff and van Doorslaer (2008), two measures of ability to cope are adopted for this study. First, the ratio of health care to total household consumption expenditures. Second is the ratio of health care to total non-food expenditures. The total household consumption expenditure estimates are gross of total health care payments, hence prepayment expenditures. Two thresholds are chosen for the purpose of comparison: 25% and 35% of total household consumption expenditures gross of health care payments is used as a measure for catastrophe. As a measure of ability to pay, 65% and 85% of total consumption expenditures gross of health care expenditures but net of food expenditures (as proxy for capacity to pay income) are compared. Although the thresholds are arbitrary the choice was informed by the average share of food and non-food in total consumption expenditures as illustrated in see Table 2-12. Unlike health care expenditures food expenditures show a normal distribution; the distributions are similar across quintiles of welfare or localities. Given the average food share of 60% and 57% for GLSS4 and GLSS5 respectively, a share of 35% for health expenditures would imply more than half the equivalent of subsistence expenditures and almost all nonfood expenditures. A similar

reasoning governed the choice of 85% of non-food expenditures as the ability to pay measure. The lower thresholds are chosen for comparative analysis.

Table 2-12: Household food and non-food expenditures ratios

|  | 1998-99 (GLSS4) | | | 2005-06 (GLSS5) | | |
|  | Food | Housing | Other | Food | Housing | Other |
| --- | --- | --- | --- | --- | --- | --- |
| Mean | 0.60 | 0.03 | 0.37 | 0.57 | 0.03 | 0.35 |
| Median | 0.62 | 0.02 | 0.54 | 0.58 | 0.02 | 0.34 |
| SD | 0.14 | 0.02 | 0.14 | 0.16 | 0.03 | 0.14 |

Source: Calculations based on data from the fourth and fifth rounds of the Ghana Living Standards Surveys.

One may consider also that information on indirect costs such as loss of labor income, cost of special foods and lifestyle changes due to health care seeking are not provided in the survey therefore these thresholds could be an underestimation of catastrophic health costs. A measure for the extent to which catastrophic expenditures overshoot the threshold is also derived, hence a measure of the excess gap (Wagstaff and van Doorslaer 2008). The catastrophic overshoot, $O_i$, is measured as the distance by which household $i$ exceeds the threshold. Suppose $S_i$ represents the expenditures share for household $i$ and $T$ represents the catastrophic threshold. Then catastrophic overshoot for household $i$, is as follows:

$$O_i = S_i - T > 0, and\ zero\ otherwise \qquad\qquad 2\text{-}18$$

This is a measure of the catastrophic payment gap (analogous to the poverty gap in the poverty literature). This gap is summed up and divided over all households that demanded health care, hence to get the mean excess gap, $G_e$, as follows:

$$G_e = \frac{1}{N}\sum_{i=1}^{N} O_i = \mu_o \qquad \text{2-19}$$

where $\mu_o$ is the mean of the overshoot, hence the overall mean catastrophic gap.

Incidence of catastrophic health expenditures is calculated as the proportion of the population that fall above the threshold. The catastrophic head count, $C_h$, of the population is as follows:

$$C_h = \frac{1}{N}\sum_{i=1}^{N} E_i = u_e \qquad \text{2-20}$$

where $E_i = 1$ if $S_i > 0$, and 0 otherwise and $u_e$ is the average of $E_i$ across the sample.

The average catastrophic gap among only the households with a positive gap, the mean positive gap $G_H$ is therefore:

$$G_H = \frac{\frac{1}{N}\sum_{i=1}^{N} O_i}{\frac{1}{N}\sum_{i=1}^{N} E_i} = \frac{\mu_o}{u_e} \qquad \text{2-21}$$

### 2.6.1  Patterns in the incidence of catastrophic household health spending in Ghana

Results of the catastrophic measures for both GLSS4 (1998-99) and GLSS5 (2005-06) are presented in : Table 2-15 and Table 2-16. A higher threshold results a lower incidence, mean excess gap and mean positive gap across each quintile of welfare but incidence remains concentrated among the lowest welfare quintiles even when the threshold is raised. Incidence consistently increases with a decrease in welfare status; the

highest quintile has the lowest incidence on average while the worse offs consistently show the highest rate of incidence for each year at every threshold level.

The mean catastrophic headcount is lower in 2005-06 (16.69%) than in 1998-99 (18.31%) at the threshold of 25% share of total expenditures. Overall, the incidence increases for 2005-06 at the threshold of 35%. However, the reduction in incidence is due to the lower headcount in the top three quintiles of welfare while incidence rates worsen in the two lowest quintiles. In 2005-06 28.9% health care expenditures of some 28.9% of households in the lowest quintile exceeded 25% of their two-week equivalent total expenditures gross of food; for some 22.72% of households, health expenditures exceeded 35%. At the threshold of 65% and again 85% of non-food expenditures the incidence of catastrophic health expenditures is higher in 2005-06 compared to 1998-88 for all quintiles of welfare. Again lower quintiles are the worse off with as many as 32% of households spending more than 65% the equivalent of two-week non-food expenditures on health care alone. Even at the higher threshold of 85% more than 24% of the lowest quintile is affected. Generally, the incidence rates are higher in terms of non-food expenditures than in terms of total expenditures, and differences in incidence rates between quintiles are smaller. The incidence rates are dismal if one considers the share of non-food expenditures. While health expenditures may be a smaller proportion of household total expenditures for higher welfare quintiles, in terms of the capacity to pay, a greater proportion do fall short. In 2005-06 the average food expenditures share is relatively lower (55%) than in 1998-99 (60%) yet 65% to 85% of non food expenditures are not enough to cover health expenditures for a greater proportion of households. Relative demand for health care may have increased, perhaps because health care is more accessible, or that the need or desire

for health care has increased. Alternately the relative prices of health care have increased hence a greater share of the household non-food budget.

The extent to which households exceed the catastrophic thresholds is observed in the gap measures. Not surprisingly the overshoot of expenditures above the threshold is steeper among poorer households. Mean positive gap estimates indicate that households that exceeded the 25% threshold did so to the extent of 147% (over the threshold) of two-week equivalent non-food expenditures in 2005-06. The mean positive gap increases from 1998-99 to 2005-06 at both 65% and 85% thresholds and for every quintile except for the poorest quintile. An explanation may be that the poorest are simply not able to afford more health care and can no longer exceed their thresholds any farther.

### 2.6.2    Predicting catastrophic household health spending

What these catastrophic ratios indicate is the real risk for households that are unable to adjust to short term health care expenditures. At the given expenditure shares higher mean positive gaps imply a greater potential for catastrophic expenditures where health care needs or health care demand extend to the longer term. One would agree that such factors as recurring morbidity (as in chronic illness) and the intensity of morbidity (as in hospitalizations) for a given expenditures level would have greater risk for catastrophic expenditures. The following probit model is estimated to relate the incidence of illness (measured by proportion of household members that are ill), income and location to the probability for catastrophic payments:

$$prob(cata_i) = prob(\alpha + \beta loc2_i + \delta daysill_i + \gamma income_i + e_i > 0) \qquad \text{2-22}$$

where for the *i*th household: $cata_i$ is a categorical variable which takes on value 1 if the share of total health expenditures exceeded a threshold of 25% of total expenditures gross of food and 0 otherwise, $loc2_i$ is a categorical variable for location of household and equals 1 if rural and 0 if urban, $daysill_i$ is the number of ill days of all household members that reported illness or injury, $income_i$ is the household total nominal income reported, and $e_i$ are normally distributed errors.

The results are presented in Table 2-13. Being in a rural locality increases the probability that a household has catastrophic health expenditures by 0.024 over the case of the urban household when all other factors are held constant. The size of household income is of no significance to the probability of making catastrophic health expenditures. As expected illness has an impact on the incidence of catastrophic payments. A unit increase in the total number of ill person days in the household increases the probability of catastrophic expenditures by 0.009.

Table 2-13: Probability of catastrophic household health care expenditures, GLSS5

|  | Estimated coefficient | Predicted increase in the probability | p-value |
|---|---|---|---|
| *loc2* (base group is urban) | 0.107** | 0.024 | 0.018 |
| *daysill* | 0.041*** | 0.009 | 0 |
| *income* | 0.000 | 0.000 | 0 |
| constant | -1.370*** |  | 0 |

Source: Calculations based on GLSS5 data.
Note: Dependent binary indicator variable = 1 if household catastrophic health expenditures.
N = 5, 249.
**p<0.05 ***p<0.01.

A second model is estimated to control for differences in welfare or poverty status and consequently location given that rural locations have greater proportions of households

in the lower welfare quintiles and vice versa for urban locations. This model looks at the intensity of morbidity and the share of food expenditures as determinants of the probability of a household making catastrophic expenditures. The probit model is as follows:

$$prob(cata_i) = prob(\alpha + \beta ipdays_i + \delta foodexp_i + e_i > 0) \qquad \text{2-23}$$

where for household $i$:$cata_i$ is a binary variable which takes on value 1 if the share of total health expenditures exceeded a threshold of 25% of total expenditures gross of food and zero otherwise, $ipdays_i$ measures the total number of inpatient days reported for all affected household members, and $foodexp_i$ is the share of food in total household expenditures. Separate estimations are here made for each quintile of welfare as a way to account for differences in income; Table 2-14 contains the results. The probability that a household incurs catastrophic health expenditures increases in the number of days of hospitalizations, holding all other factors fixed. The predicted increase is greatest at 0.116 for the worst of households and decreases successively for the better offs up to a low of 0.020 for the highest quintile group, all statistically significant at the 1% level. The share of food is not statistically significant at the 5% level for quintiles two, three and four although the coefficient on food has a negative sign for quintile two as it is for quintile 1. At the 1% level of significance the probability that a household in the lowest quintile of welfare would make catastrophic health expenditures decreases with the share of food in total expenditures whereas the probability increases for households in the highest quintile, at the five percent significance level. A possible explanation is that the poorest households have had to shift expenditures from food to health even in the short term. The better offs

on the other hand appear to be able to meet both catastrophic health expenditures and food expenditures. In other words, the two types of expenditures are not substitutes or do not compete against each other. Clearly the poorest households experience more challenges in meeting both their food and health care needs. For the middle households spending on food is not related to catastrophic expenditures.

Once could conclude therefore that household health care expenditures are nondiscretionary and regressive. Possibly, health care subsidies are not effectively being targeted to households with the least capacity to pay. The relatively low levels and mean differences of consulting fees observed across different locations (akin to welfare quintiles) and type of health service is an example of such evidence that uniform subsidies may have been applied in the case of consulting fees. The incidence of hospitalization and the consequent higher health care payments, on the other hand, have significant influence in the likelihood that a household makes catastrophic expenditures regardless of their welfare status. An effective approach to reducing catastrophic health expenditures would involve better coverage for hospital facilities, especially on medicines and supplies. Even in the present era of implementing a National Health Insurance Scheme towards attaining universal access in Ghana, the implementation, logistical as well as quality of care challenges, out of pocket payments especially on medicines and supplies have been little reduced. Policies that would reduce the risk for catastrophic expenditures necessarily have to be discriminatory in targeting the types of health care and households with the least capacity to pay out of pocket.

Table 2-14: Likelihood of catastrophic health spending, by welfare quintile

| | Quintile 1 | | Quintile 2 | | Quintile 3 | | Quintile 4 | | Quintile 5 | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Predicted increase in probability | p-value | Predicted increase in probability | p-value | Predicted increase in probability | p-value | Predicted increase in probability | p-value | Predicted increase in probability | p-value |
| ipdays | 0.116*** | 0.000 | 0.070*** | 0.000 | 0.051*** | 0.000 | 0.050*** | 0.000 | 0.020*** | 0.000 |
| Food share | -0.319*** | 0.002 | -0.096 | 0.264 | 0.20 | 0.795 | 0.031 | 0.639 | 0.080** | 0.043 |
| N | | 986 | | 978 | | 981 | | 1064 | | 1240 |
| Pseudo $R^2$ | | 0.068 | | 0.064 | | 0.048 | | 0.057 | | 0.066 |
| Log likelihood | | -552.360 | | -464.920 | | -402.870 | | -394.330 | | -287.110 |

Source: Calculations based on GLSS5 data.

**P<0.05  ***P<0.01.

Table 2-15: Incidence of catastrophic health expenditures in percent of total household expenditures

| Threshold level (% total household expenditures) | 1998/1999 GLSS4 | | | | | | 2005/2006 GLSS5 | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Incidence | | Excess gap | | Mean positive gap | | Incidence | | Excess gap | | Mean positive gap | |
| | 25 | 35 | 25 | 35 | 25 | 35 | 25 | 35 | 25 | 35 | 25 | 35 |
| Welfare quintiles | Percent of households exceeding the threshold | | Health care spending in excess of the threshold (%) | | | | Percent of households exceeding the threshold | | Health care spending in excess of the threshold (%) | | | |
| 1 | 28.35 | 20.70 | 19.02 | 16.58 | 67.09 | 80.12 | 28.90 | 22.72 | 17.84 | 15.28 | 61.73 | 67.24 |
| 2 | 18.64 | 14.53 | 7.62 | 6.03 | 40.88 | 41.52 | 20.55 | 14.11 | 8.91 | 7.19 | 43.33 | 50.95 |
| 3 | 19.71 | 13.10 | 9.79 | 8.19 | 49.69 | 62.57 | 15.49 | 10.81 | 8.24 | 6.94 | 53.17 | 64.27 |
| 4 | 16.29 | 11.18 | 5.94 | 4.57 | 36.46 | 40.92 | 13.35 | 7.89 | 4.57 | 3.53 | 34.27 | 44.77 |
| 5 | 14.06 | 8.50 | 5.19 | 4.11 | 36.93 | 48.39 | 6.77 | 4.35 | 2.67 | 2.10 | 39.37 | 48.21 |
| All | 18.31 | 12.57 | 8.54 | 7.03 | 46.63 | 55.92 | 16.46 | 11.55 | 8.11 | 6.72 | 49.27 | 58.20 |

Source: Calculations based on data from GLSS4 and GLSS5.

Table 2-16: Incidence of catastrophic health care spending in percent of non-food expenditures

| | 1998-99 (GLSS4) | | | | | | 2005-06 (GLSS5) | | | | | |
| | Incidence | | Excess gap | | Mean positive gap | | Incidence | | Excess gap | | Mean positive gap | |
| Threshold level (% non-food expenditures) | 65 | 85 | 65 | 85 | 65 | 85 | 65 | 85 | 65 | 85 | 65 | 85 |
| Welfare quintile | Percent of households exceeding threshold | | Health care expenditures in excess of the threshold (%) | | | | Percent of households exceeding threshold | | Health care spending in excess of the threshold (%) | | | |
| 1 | 30.63 | 24.95 | 17.84 | 15.28 | 198.30 | 232.39 | 32.00 | 24.87 | 63.46 | 57.80 | 184.34 | 203.99 |
| 2 | 20.55 | 16.36 | 8.91 | 7.19 | 112.62 | 123.50 | 22.59 | 17.38 | 25.44 | 21.46 | 139.90 | 153.33 |
| 3 | 16.62 | 13.05 | 8.24 | 6.94 | 157.82 | 181.59 | 20.77 | 16.01 | 32.78 | 29.06 | 133.81 | 148.52 |
| 4 | 12.69 | 9.12 | 4.57 | 3.53 | 119.52 | 132.28 | 17.72 | 13.67 | 21.18 | 18.09 | 103.45 | 119.72 |
| 5 | 6.45 | 4.67 | 2.67 | 2.10 | 115.70 | 130.72 | 14.06 | 10.56 | 16.27 | 13.81 | 130.05 | 157.28 |
| All | 16.78 | 13.12 | 8.11 | 6.72 | 142.79 | 163.00 | 19.93 | 15.31 | 28.46 | 24.95 | 147.55 | 166.14 |

Source: Calculations based on data from GLSS4 and GLSS5.

## 2.7    Conclusion

Results from the empirical analysis indicate that morbidity and the severity of it are significant determinants of the likelihood and as well the amount of household health care expenditures.  Health care behaves as a necessity given the low degree of responsiveness of total household health care expenditures to total household income in a two-week period. The results suggest that health care and consumption expenditures do not behave as substitutes. However, consumption (food) expenditures are more responsive than total income, indicating that affordability is important. It is noteworthy that health care is responsive to ability to pay given the positive sign on the coefficient of the income measures. This is buttressed by the observation that food share responds negatively to health care expenditures. Therefore, the initial assumption that income status is a significant determinant of amount of out of pocket health care expenditures is substantiated by the empirical analysis.

The small but positive elasticity of health care spending with respect to food expenditures indicates that health care expenditures by households in Ghana are nondiscretionary and that health expenditures and food expenditures do not behave as substitutes. Health expenditures being nondiscretionary is supported also by the statistically stronger impact of health needs and the relatively weak impact of household characteristics as education and gender of head of household on the probability of health care expenditures. Years of schooling have a positive effect on health care expenditures, and so does being a male head correspond to a higher amount of expenditures than the case of the female headed household. Hence while health care is non discretionary the extent of

demand (as measured by the volume of expenditures) is driven by socioeconomic status of households.

The non discretionary nature of health care expenditures is also supported by the fact that the likelihood and amount of expenditures do not vary with welfare quintile with exception of the middle quintiles that have higher expenditures than the lowest quintile. Health care needs are indeed a strong determinant of both the likelihood and the amount of expenditures, with the amount of expenditures more responsive to the severity of need and provider influence (as measured in the proportion of inpatient days). Moreover, the ease of access to health care facility or provider as measured by the time travelled indicates that household health care expenditures are significantly more the longer (than average) the time travelled. This observation does emphasize the role that health care provider influences amount of expenditures given that time travelled as well reflects households that sought care from a provider or facility. The strong significance of time travelled as a determinant of both probability and amount of expenditures indicates also that households that have longer travel times are most likely to be the farther from health care but in greater need of it.

Locality is important and suggests, yet again in support, that while health care needs may be nondiscretionary, access to care is a strong determinant of the amount of expenditures: being in a locality outside Greater Accra has no difference in the probability of making expenditures (except in the case of relatively significant lower probability in the rural Savannah which is arguably the least resourced compared to Accra) whereas all localities outside Accra show significant lower amounts of expenditures. Accra having a higher concentration of the nation's health infrastructure and resources is arguably different

in structure of health care supply and consequently demand and may not be directly compared to other localities. A similar argument may be made in comparing health expenditures in rural and urban localities without direct controls for differences in health care supply, a caveat in this study. Nonetheless this empirical exercise has been useful by highlighting the non discretionary nature of health expenditures and the relative significance of household characteristics in determining variations in household health expenditures in Ghana. Results from the robust full information maximum likelihood (Heckman selection) procedures suggest that the decision processes that influence the level of health expenditures the household makes are not necessarily the same as those that influence the decision to spend but a strong correlation exists between the two types of decisions.

This study suggests that Ghana has to adopt policy strategies that improve targeting of health care to households with critical health care needs. Moreover, these efforts would be most effective if accompanied by effective education programs that increase access to quality health care and health behaviors. The health care system theme of improving equity in health care through equal access for all would be most effective if emphasis is laid on effective targeting of quality health care to those in critical need while also improving universal health care provision at the basic level of health care.  In the same vein, reducing regional resource gaps and poverty gaps has strong potential to improve health care needs of citizens and the associated benefits that may feed back into equity in economic growth and consequently real progress in development.

This study has several limitations. The study falls short of analyzing the supply-side issues that would provide more insight into what drives household health care demand

and the resulting impact on health expenditures. Also the absence of panel data means the results lack the time trend that is essential in differentiating random shocks and predicted behaviors regarding health expenditures. Survey data from secondary sources means a lack of control on data generating processes; it is not possible to reduce biases due to unknown factors that are significant but not accounted for.

This study suggests a follow up that would empirically investigate the interrelationships between education status, health seeking behavior, access to health care and poverty to throw light on the direction of impact on health care expenditures and poverty status in Ghana. In particular, more recent data may throw light on the impact that universal access policies, notably the National Health Insurance Scheme in Ghana, may have had on reducing the potential for emphasis on the role that education may be playing and to focus attention on the linkages to health care behaviors, accessibility and expenditures, and poverty.

**CHAPTER 3**

**INCIDENCE OF OUT OF POCKET PAYMENTS AND PERCEPTIONS
ABOUT QUALITY OF HEALTH SERVICES BY THE INSURED:
EVIDENCE FROM THE GHANA DEMOGRAPHIC AND HEALTH SURVEY
V**

**3.1  Introduction**

In September 2003 the parliament of Ghana passed the National Health Insurance

Act (Act 650) into law and by this Act the National Health Insurance Scheme was

established and its implementation fully began in 2005. The goal of the NHIS is to ensure

equity in access to health care of acceptable quality for all residents in Ghana without the

necessity to pay out of pocket at the point of service. The New Patriotic Party government

in power from 2000 to 2008 had promised in its pre-election manifesto to abolish out of

pocket payment for health care at the point of service, popularly known as 'cash-and-carry'

in Ghana. Out of pocket payment is a subject that most Ghanaians care about so much as

to make it a winning manifesto of the New Patriotic Party, the first democratically elected

new government in decades (H. Wahab 2008). Indeed, the issue of 'cash and carry' has

featured prominently in manifestos of political parties of both incumbent and succeeding

governments (Agyepong 2010). Political commitment may be considered as the key

element in sustaining the NHIS even as the Scheme faces logistical, financial, actuarial and

systemic challenges but it has not been abandoned by succeeding governments.

Eliminating 'cash-and-carry' is the means to achieve the ultimate goal of equity in access

to quality care as stated in the government's white paper on universal access to health care

(Republic of Ghana Ministry of Health MOH 2004). The stated objectives are equity, risk

equalization, cross-subsidization, quality of care, solidarity, efficiency, community or

subscriber ownership, partnership, reinsurance and sustainability (MOH 2004).  Indeed, the political objective to eliminate cash and carry has evolved into a higher objective to attain universal access to health care. Consequently, the NHIS has been described as the means to "attain equity in access to health care in an efficient way and to foster solidarity which is critical in attaining universal access to health care" (MOH 2004 p4).

### 3.1.1    The National Health Insurance Scheme in context

The Health Insurance Act (2003) stipulates three distinct health insurance schemes that may be operated in Ghana: District Mutual Health Insurance Schemes (DMHIS) that collectively make up the NHIS, private mutual schemes and private commercial schemes. By law membership in a scheme is mandatory although citizens are free to choose any number of schemes to join, but in practice this law is not enforced and health insurance subscriptions have been voluntary. As of December 2010, 8,163,714 people representing 38.4% of the population were active members of the DMHIS (NHA 2010). Senior citizens age seventy and above, children below age eighteen, individuals who contribute to the Social Security and National Insurance Trust (SSNIT) pension scheme, retirees receiving pension from the SSNIT scheme and individuals identified as indigent are exempt from paying annual insurance premiums.  About 31.8% of NHIS members pay premiums in addition to the 4.7% of members who are SSNIT contributors.  Therefore, fewer than half the members make direct contributions to the scheme. Also, the distribution of NHIS membership across the ten administrative regions Table 3-1 indicates that lower income regions such as the Upper West and Upper East have higher enrollment rates than higher income regions such as the Greater Accra. To the best of our knowledge no study has empirically identified the reasons for the regional differences in enrollments. With the

relevant data, some reasons that may be put forward for empirical testing may include the emphasis of NHIS on the poor hence targeting of NHIS to regions with higher poverty rates; the higher tendency of at-risk (higher morbidity and lower income) groups to self-select into insurance scheme; perceived quality of services from private health care providers outside the NHIS; the prevalence of informal employment in urbanized regions.

The slow growth in membership and in particular, the retention of premium paying enrollees is a major problem facing the Scheme. As of 2010 cumulative enrollments had reached 64% of the population and yet 34% were active membership (National Health Insurance Authority 2010; Apoya and Marriot 2011; Jehu-Appiah et al 2011). The National Health Insurance Authority has singled out re-enrollment barriers as a problem in critical need of research (Duku, Fenenga, Alhassan and Nketiah-Amponsah 2012; SEND-Ghana). Certainly several other conditions such as efficiency in administration, reduction in perverse incentives to service providers, and the control of moral hazard behavior by beneficiaries are necessary for the successful operation of an insurance scheme. Evidence suggests the NHIS faces problems in all these areas, too (see for instance NHA 2010; Apoya and Marriott 2011; Jehu-Appiah et al 2011; Carapinha, Ross-Dengene, Desta and Wagner 2011; Gobbah and Zhang 2011; Yilma, van Kempen and de Hoop 2012). Another critical factor for sustaining any health insurance scheme is the provision of benefits of acceptable quality, especially quality as perceived by client. Patient satisfaction is very much a dimension of health care outcome and may influence health care utilization, consequently the survival of the health care organization or program (Maxwell 1984) and by association, the health insurance scheme. Nevertheless, some evidence suggests that patient dissatisfaction is a potential threat to the survival of the NHIS. Findings from

several case studies in selected districts suggest that dissatisfaction with health care tends to be worse for NHIS members due to complaints of unequal treatment and discrimination by providers favoring clients paying out of pocket (SEND Ghana 2010, R. A. Atinga 2012, Dalinjong and Laar 2012). Health care providers have been known to consider NHIS beneficiaries as 'opportunistic', receiving 'free' care and deserving blame for the increased workloads.

Another challenge that NHIS faces is that the larger population in the private and especially informal sectors is yet to be adequately tapped into the NHIS. Achieving such an expansion in membership could expectedly improve financial sustainability. Presently, the revenue generated from premium payments and payroll taxes is obtained from a small membership base. Expansion in the client base is particularly desirable to minimize the adverse selection problem and attain objectives of the NHIS while assuring its sustainability. However, the necessary conditions that may assure an adequate client base include patient satisfaction whereby the perceived quality of services is an important input. Alternatively, improvements in out of pocket payments would be unrealized without the necessary emphasis on quality, and perceived quality for that matter. Regardless of the fact that free health services at the point of service improves accessibility to available health care, better resourced households and individuals may price out individuals who may not afford better quality uninsured services. In other words, elimination of 'cash-and-carry' (as the main objective of the NHIS) at the cost of quality is not a sustainable approach to minimizing gaps in access to necessary health care.

Table 3-1: Regional distribution of Ghana NHIS subscribers

| Region | Active members | Percent of population |
|--------|----------------|----------------------|
| Western | 947,976 | 41% |
| Central | 492,717 | 23% |
| Greater Accra | 961,455 | 25% |
| Volta | 581,305 | 28% |
| Eastern | 930,343 | 23% |
| Ashanti | 1,585,097 | 34% |
| Brong Ahafo | 1,014,554 | 44% |
| Northern | 771,335 | 31% |
| Upper East | 517,867 | 50% |
| Upper West | 361,065 | 53% |
| National | 8,163,714 | 34% |

Source: National Health Insurance Authority, 2010.

While a number of empirical studies about the impact of NHIS have been carried out, to our knowledge, few have focused on out of pocket payments and the quality of health care. The evidence suggests a positive effect on health care seeking and utilization rates by the insured (Sulzbach, Garshong and Banahene 2005, Health Systems 20/20 Project 2009, Brugiavinni and Pace 2011, Gobah and Zhang 2011, Ngoyen, Rajkotia and Wang 2011, Dalinjong and Laar 2012). For instance, enrollment in a district health insurance scheme is a good predictor of affordability of hospital care in Ghana (Sulzbach et al 2005) and insured women are more likely to receive prenatal care, have a skilled professional attend birth, or have a lower likelihood infant deaths (Mensah, Oppong and Bobbi-Barimah 2010; Brugiavinni and Pace 2011). Other studies have found on the contrary that patterns in maternal care seeking are largely unchanged while insured women are more likely to have a caesarean delivery (Sulzbach 2005, Health Systems 20/20 Project 2009). In some cases, the average out of pocket expenses by NHIS insured patients were 20% in proportion to the amount paid by the uninsured (Sulzbach et al 2005, Health Systems 20/20 Project and GHS 2009). Other findings suggest that while insured people

still make out of pocket expenses on drugs and services that are not covered by insurance and on health care from informal sources, they still spend less in comparison to the uninsured (Nguyen et al 2010). Others suggest, on the contrary, a weak effect of NHIS on out of pocket payments (Brugiavini and Pace 2011). In some cases, the evidence suggests that non affordability of premiums is a deterrent to enrollment but that NHIS beneficiaries are less likely to be satisfied with quality than the general client population (Mensah et al 2010, Jehu-Appiah et al 2011).

### 3.1.2   Research goal, questions and hypotheses

While a number of studies about the NHIS have focused on enrollments in relation to health care utilization rates, there is more to be learned about the value of out of pocket expenses as well as the quality of care received by the insured (Witter and Garshong 2009, Apoya and Marriot 2011, Gobah and Zhang 2011, Makinen et al 2011). NHIS aims to reduce equity gaps in access to quality health services but utilization rates are not necessarily indicative of bridging gaps in access to quality care. In addition, most of the studies have been based on a few districts in selected regions, usually carried out as case studies. The need for nationwide assessments has been well acknowledged especially because national study samples are scarce (NHA 2010, Duku et al 2013). Regional comparisons would be relevant, at least, to provide to provide some explanations for the significant disparities in enrollment rates across regions increasing and retaining enrollment is an important challenge for the NHIS. The aim of this study is to examine the occurrence of out of pocket payments for services, and the sources of dissatisfaction with quality of health services by groups of the insured population based on a nationally survey data. This study in addition examines the significance of regional variations in

socioeconomic and sociodemographic characteristics that influence the likelihood of health insurance coverage and thereby infer about the significant factors that determine differences across regions. National surveys specific to evaluating the impact of health insurance are needed however the financing and logistical challenges involved are beyond the scope of this study. Therefore, this study relies on the fifth round of the Ghana Demographic and Health Surveys in 2008 which make it possible to include regional comparisons.

The following are the specific questions to be answered in this study:

(i) What are the key determinants of health insurance, and how do these differ across administrative regions in Ghana?

(ii) Do out of pocket payments by the insured depend on need for uncovered services, ability to pay, or dissatisfaction with quality?

(iii) What are key determinants of dissatisfaction with quality of health services among insured individuals?

From the outset this study assumes that health insurance provides a broader access to a range of health services than in the absence of health insurance consequently health insurance is desirable. Given this assumption, ability to pay or affordability is expected to be significant determinant in the likelihood of being insured, all things being equal. In addition, access and use of information about health insurance and benefits are expected to be significant determinants of insurance coverage. On regional differences, the assumption is that regional differences in household socioeconomic and socio-demographic factors belie region-specific differences in the administration and delivery of health insurance benefits (such as management of insurance schemes and the availability of health care

provider networks) as the significant determinants of differences in insurance coverage observed across administrative regions. If the evidence shows otherwise insignificant influence of socioeconomic and socio-demographic factors in the likelihood of insurance coverage, and minimal differences in these factors across regions then one may conclude that significant regional differences in health insurance coverage are largely a systemic problem that is independent of health insurance.

This study also assumes that by providing access to a broader range of health services, insurance implies a better choice set, hence quality in health care than in the absence of health insurance. Also, based on the underlying assumption that health insurance provides a broader access to a range of health services, ability to pay is expected to be a significant determinant of out of pocket payments but the need for services not covered by insurance is expected to be the most significant determinant of out of pocket payments among the group of insured individuals. Alternately, one may not assume a priori that dissatisfaction with health services is the more significant determinant of out of pocket payment in the context of health insurance. Similarly, the assumption that insurance provides access to a broader range of health services would imply a higher chance of access to quality than in the absence of health insurance, all things being equal. Hence ability to pay, as well as the incidence of out of pocket payments are both expected to be significant determinants in the likelihood of perceiving better quality care than otherwise comparable individuals.

Explaining differences in perceptions (a subjective concept) about quality across different socio-cultural groups of the population is outside the scope of this study. However, categorizing quality measures into human factors versus non human is useful for

identifying the sources of dissatisfaction, as this has implications for approaches towards improving sustainability of the National Health Insurance Scheme and consequently universal access to health care.

The key results in this study are that community of residence, ability to pay and gender are the key predictors of the likelihood that an individual or household would be insured: poorer regions, rural communities and females have a higher probability of being insured and so are households in higher wealth brackets. When insured individuals have to make out of pocket payments the need for service not covered by insurance is the driving factor. Wealthier households have significantly higher probability of paying out of pocket. The implication is that NHIS expands the set of attainable desired health services for wealthy households but does not eliminate catastrophic out of pocket payments, especially for the poor in the event of critical need of services that are not insured. Attitude of health workers has a significantly negative effect on perceived quality of care, more so than the adequacy of information or communication about the treatment process. The implication for policy is that improving perceived quality of health services may be less of a technical issue than a behavioural approach. A revamping of customer services and training health workers to approach clients with a favorable demeanor is an effective strategy to improve access to health care.

### 3.1.3   Source of data

The fifth round of the Ghana Demographic and Health Surveys (DHS) is the main source of data for empirical analysis in this study.  The DHS is a survey series conducted in over 80 countries. These surveys are sponsored by the United States Agency for International Development in partnership with the domestic government agencies in the

relevant countries. The American based ORC Macro Group provides the technical assistance and training for the local implementing agencies in all stages from survey design to data management. The core topics include maternal and child health, nutrition and mortality but for each survey additional modules and country-specific questions cover topics such as occupation, wealth, gender violence, access to mass media, malaria, health-seeking behavior and health expenditures. To date, Ghana has had five waves of the DHS with the first conducted in 1988 and subsequent ones at five year intervals. These surveys are not cross sectional in nature therefore the data may not be constructed as a panel. As of year 2014, the fifth round of the standard survey conducted in 2008 is the most recent that has been published. Multistage stratified sampling method was used to select households for each round of survey; the DHS is considered nationally representative. The DHS Program granted permission to use the data (*http://dhsprogram.com/data/*) and provided electronic access to the relevant databases.

### 3.1.4   Outline of the study

The second section presents a review of selected theoretical and empirical literature on client perceived quality of health care and on the value of health insurance and out of pocket payments. The section thus provides a framework for the empirical analysis carried out in this chapter. Section three provides details about the empirical models used for the data analysis. The data and the results from the empirical analysis are discussed in section four. Section five concludes the chapter with a summary of the key findings from the study and the implications for policy.

## 3.2 Theoretic framework

Before delving into the analysis of the data some background literature is presented to provide the theoretic framework and empirical evidence that supports the analysis, the discussion of results leading to the conclusions and the economic and policy implications from this study. This section proceeds with a review of selected literature on client-perceived quality in health care, the value of health insurance and out of pocket payments.

### 3.2.1 Client-perceived quality of health services

Perceptions about the quality of a service play a key role in client satisfaction and consequently influence demand. Likewise, the perceptions about the quality of benefits, hence health services received, would directly or indirectly influence the demand for health insurance and out of pocket payments for health care. But what constitutes quality from the perspective of the client in regards to health care? Do health care consumers look for the same things when making assessments about quality, in the same way health care providers would? This section presents a review of some of the literature on client perceptions pertaining to quality of health care especially in the developing country context.

It may be taken for granted that patient satisfaction is important as a dimension of the outcome from the health care delivery process (Maxwell 1984). This observation holds even if quality of care and satisfaction in the developing country context is not as well researched as in the developed country context (Abiola 2010, Newhouse et al 1998). The literature on health care quality (often in the advanced country context) often distinguishes between clinical quality and service quality (Baker et al 2008). This distinction is based on the idea that patients are better at predicting service quality than clinical quality as patients

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do not typically have the technical knowledge about clinical processes (Gronros 1984, Bowers et al1994, Devebakan 2005). Empirical work is generally based on Parasuraman et al's (1985) SERVQUAL framework for measuring organizational service quality, or some version of it. The SERVQUAL framework describes a list of indicators for evaluating client satisfaction: reliability, responsiveness, customization, courtesy, competence and access, security, tangibles, communication and understanding of the customer. A basic list includes responsiveness, assurance, empathy, tangibles and reliability (Parasuraman et al 1988). Empirical researchers modify or augment this SERVQUAL framework to reflect case specific quality variables. While SERVQUAL provides a good starting point as a framework for research on the quality of health care a specific set of quality measure or design is not advocated in the research literature. The common practice is to tailor the quality measures to the peculiarities of the health care system, the health care delivery process and the population concerned. Edvardson et al (1994) for instance find that patient perception of quality is better predicted by the care provider's experience, knowledge, commitment, trustworthiness and empathy, and his control over critical situations as important factors in assessing service quality. Gross et al (2006) identify health care accessibility, structure, atmosphere and interpersonal relations as determinants of quality of services perceived by care recipients. Hassin et al (2001) identify interpersonal relationship as critical and especially finds that communication, responsiveness, courtesy, cost of services and cleanliness are significant predictors of perceived quality of service. Rose et al (2004) measure quality in terms of physical, psychological and social needs of the care seekers, and Baker et al (2008) suggest accessibility, amenities and interpersonal relations as important determinants of quality.

In the case of Ghana, empirical findings portray that client perception about health care quality borders on the nontechnical aspect of service delivery, and more so on the human dimension. Turkson's (2004) work is one of few studies focused on client perceived quality of health care in Ghana. Researchers interviewed 803 patients, 70% female, and conducted focus group discussions with community representatives in Komenda, a rural district in the Central Region. Almost 90% respondents indicated quality of health services received was high or very high based on the researcher's scale and measurement criteria. Nonetheless the lack of information and inadequate communication in the consultation process by providers was the most cited problem. Patients complained about not being told their diagnosis and having limited discussions about how illness would be managed. Just about 40% respondents were given advice or information about their condition or 43% told about the diagnosis. Specific concerns cited about quality included poor attitude of staff, long waiting times, high cost of services, inadequate staff and unavailability of ambulances.

Yawson et al's (2013) objective, analogous to Turkson's (2004), was to identify the key factors in perceived quality of health care delivery but at the tertiary institutional level and with a relatively urban sample. Questionnaires were administered over several weeks to 655 participants randomly selected from the outpatient department of the largest tertiary facility, the Korle Bu Teaching Hospital in Accra. Focus group discussions were conducted in addition. Although males were well represented (45%) in the sample, the findings were similar to Turkson's (2004): 89% respondents expressed being satisfied or very satisfied with service quality, 86% considered their condition had been adequately explained by health care provider and 87% were positive about being physically examined. Spontaneous recurring complaints included the poor attitude of some health workers,

longer than average expected wait times (one hour was considered an acceptable wait time but 51.9% had experienced longer than an hour's wait), uncomfortable waiting area and the late (compared to the posted) starting time of clinic and the lack of directional signs at the facility.

Overall, these findings suggest that clients' experiences of health care quality as they perceive it, for example, poor the attitude of staff or long wait times may not be very different between rural and urban localities even though the mix of problems may have different weights such as inadequate information being more prominent in rural areas and longer than expected wait times being prominent in urban areas.

ii. The insured individual's perception about quality of health services received

As the analysis in this chapter concerns perceived quality among insured individuals it is interesting to know what role health insurance status may play in client perceptions about the quality of health care received. One study that evaluates perceived quality based on insurance status is Perez, Ang and Vega (2009) which examines the effects of insurance coverage and multiple covariates on perceived quality of care among the Hispanic community in the USA. Access to health care (through health insurance) had a substantial influence on improving perceived quality, especially for persons with chronic diseases, for persons that had a higher utilization of health care, and for persons who had more doctor visits. Patients having better information and being more involved in their health care management were more likely to adhere to treatment procedures and hence have better outcomes. Having health insurance therefore could be associated with a better client perceived quality of care.

In the case of the NHIS some evidence suggests that the quality of care has rather been compromised based on both client and the provider perspectives. In a survey of NHIS clients in two districts in the Upper East region most respondents indicated experiencing verbal abuse, longer waits, being denied physical examinations, and discrimination in favor of uninsured clients (Dalinjong and Laar 2012). In similar case studies of health facilities in all three northern regions, most health facility managers (63%) indicated that the NHIS impacts negatively on the attention given to NHIS clients because of the longer wait times due to cumbersome documentation and a large patient turnout (SEND-Ghana 2010). In some facilities (21%) most NHIS clients are refused inpatient care because of delays in reimbursements. Alternately, Atinga's (2012) survey of NHIS beneficiaries in the context of urban Accra had findings somewhat different in the perceived quality of care. Exit interviews of some 250 NHIS insured patients in public and private NHA accredited facilities included measures of quality categorized as interaction with service provider, provider demeanor, physical infrastructure and waiting time. The results suggest that patient's interaction with health care provider and the attitude of the provider were statistically significant and positive determinants of the perceived overall service quality. However, waiting times had no significant association with patient perception of the quality of care in general.

The evidence therefore supports the conclusion that client-perceived quality is better measured in terms of interpersonal interactions (human dimensions) than the technical aspect of health care provision. The indicators of quality of health services - provider attitude, speed of service and communication in the health care delivery process-

reported in the DHS data are useful for analyzing the determinants of service quality in this study.

### 3.2.2 On the value of health insurance and out of pocket expenses

Nyman (1998, 1999, 2001, 2006) proposes what could previously have been considered a non-conventional view of private health insurance: a redistribution of income since insurance is a contract to transfer income or wealth from those who buy insurance and remain healthy to those who buy insurance and become ill. In this respect health insurance becomes an issue of equity. In contrast, the conventional (neoclassical) approach based on expected utility theory views health insurance as a redistribution of income across health states for the same consumer, thereby transforming an essentially equity issue to one of efficiency. The individual is assumed to know ex ante what utility he derives from an ill state, as well as the utility from a healthy state. The utilities are weighted by the probabilities associated with the different states to determine the total effect of insurance on the individual consumer (Friedman and Savidge 1948, Arrow 1963). Health care demand enters the health insurance demand argument as a financial loss. Health care spending (out of pocket payments) is a loss of income and therefore the marginal utility of income increases with illness. Consequently, the consumer, preferring certainty, would insure against the risk of loss of income.

Nyman's approach on the contrary considers out of pocket expenses, rather than being a disutility, increase in value with health insurance. The conventional theory that people purchase insurance simply to transfer risk of loss of income from one health state to another is inadequate for several reasons (Nyman 1998). Research experiments have shown that people prefer the risk of zero losses than the certainty of a smaller actuarially

equivalent loss that insurance promises (Kahnemn and Tversky 1979, Tversky and Kahneman 1981). Moreover, people are more likely to purchase insurance the lower the premium is in proportion to the value of the coverage. The problem of moral hazard (M. V. Pauly 1968) and adverse selection causes increases in the price of insurance which would consequently reduce the likelihood of purchasing insurance. Another issue Nyman grapples with is that the emphasis on certainty or avoidance of income loss downplays the role that health care demand plays in health insurance (Nyman 1999, 2001). The utility from health care consumption and consequently the demand for health care would vary across states of illness so that the moral hazard problem might not be significant. Healthy individuals are less likely to intensively consume health care simply because it is affordable, while ill persons would consume health care as a life-saving event which without the income transfers (from healthy to ill persons through insurance) may not have been possible. In this regard the welfare gain from health insurance is not only from the avoidance of loss. Hence the desire for a full range of health care could explain why people buy health insurance. Insurance makes it possible to afford access to an otherwise unaffordable full range of services people desire given the value they place on their health (Nyman 1999, 2001, 2006).

### 3.2.2.1  Implications of affordable full range of services in the context of NHIS

If the theoretical basis for the value of health insurance is believed to be the access to a desired full range of health care that would be otherwise unaffordable (Nyman 1999, 2001, 2006) considering the value on one's health, then one may consider also that out of pocket expenditures by the insured, compared to the uninsured, may be welfare improving and not necessarily a disutility. The assumption here is that insurance at least guarantees

some basic package of health care at a lower cost than available to the uninsured ('basic'
is understandably case specific). In the case of the NHIS, benefits include full coverage of
provider consulting, and a basic drugs list for a purported ninety percent of the disease
burden in Ghana (NHIA 2010, see also Table D4, Table D5 and Table D6 in Appendix D).
NHIS has a uniform policy in the sense that all policy holders are entitled to a similar
package of benefits regardless of the amount paid in premiums. In practice differences are
expected in the availability and the quality of health services to the extent that differences
persist across health care districts and providers.   In the context of universal access such
as the NHIS aims for the value of health insurance, out of pocket expenses may be drawn
out in the following hypothetical model:


$$full\ range\ of\ health\ services\ desired = insured\ services + OOP +$$
$$unattained \hspace{6cm} \text{3-1}$$


where the *full range of health services desired* by households or individuals is a
simple aggregate of insurance benefits (*insured services*), services obtained through out of
pocket expenses (*OOP*) and unaffordable or affordable but technically unavailable care
(*unattained*) services. Uninsured but desired health services are obtained through OOP
and otherwise unattainable. The quality of health services enters the argument as follows:
The full range of desired services is defined over quality of life years and behaves as a
normal good. Assume *insured services* are a function of quality of care and *OOP* is a
function of the quality of insured services and affordability (budget net of premium
payment). Assume also that the full range of services desired is weighted by needs versus
wants with higher weight attached to needs. Needs may be measured by an objective or

subjective ranking of health state, or by some expressed needs of respondents in surveys. Assuming that a universal health care plan guarantees some standard basic package of care to all insured, the relative weight of insured services and OOP services in the full range basket is affected by the quality of service. Differences in access to health care may be modeled as such. If quality of insured services worsens and quality is neither affordable through OOP (assuming better quality is available through OOP) then unattainable care is increased.

This simple hypothetical model would imply that without due emphasis on quality of care in the context of a universal access to care such as the NHIS aims for, equity gaps worsen. In the context of NHIS the model predicts that OOP would be welfare improving for insured households with ability to afford a broader range of services conditional on a guaranteed acceptable quality of the basic package of health care (assuming the stipulated zero copayments and deductibles are actually in effect). Moreover, the subsidies for the poor to afford premiums would lead to equity gains in access to quality health care. Subpar quality of insured services might be associated with worsening inequities because the better offs are subsidized to afford better quality care while poorer households may be priced out of quality health care.

Alternately targeting the quality of service to the level of needs has greater potential to bridge equity gaps. Improving the quality of the insured minimum package of health care for all implies that health services paid for out of pocket expands the attainable range of desired health care while also bridging equity gaps being the goal of universal access.

### 3.2.2.2 Empirical evidence

The Health Care Fund for the Poor in Vietnam has similar ambitions as the NHIS to make health care accessible for all. The program has been extended to cover the general population with mandatory membership based on a sliding scale of household poverty levels. Evidence suggests that the likelihood of seeking insurance benefits varies inversely with income and education of the members of Vietnam's Health Care Fund (Sepehri, Sarma and Serieux 2009). In addition, respondents perceive the insured services as inferior quality. In fact, households that voluntarily sign up for health insurance are less likely to use their card when seeking outpatient care compared to low income households that are mandatorily insured (by default). Voluntary members are more likely to use insurance cared when seeking inpatient care. Evidently accessing otherwise unaffordable (inpatient) health care is the stronger motive for voluntary insurance.

In the case of NHIS some evidence shows that 29% enrollees prioritize financial security, 60% prioritize costs (affordability of health care) as the major reason for enrolling and 60% express satisfaction with the scheme according to Mensah et al (2011). In contrast majority of uninsured (90%) individuals cite non affordability of insurance premium as the main reason for not enrolling. Although satisfaction with the management of the insurance scheme is mediocre it is apparent that taking out insurance is desired for the main reason of affording (a wider range of) health care. Similarly, Jehu-Appiah et al (2011) observe that although uninsured respondents have a more negative perception about NHIS benefits, non-affordability of the insurance premium is the most cited reason for not enrolling.

With respect to the determinants of health insurance the empirical literature suggests that the characteristics of individuals and their households (families) are important. One would expect that an individual presented with the choice of health

insurance would be influenced by the cost (premium and copayments) versus the expected benefits given a budget constraint (income, wealth or other measures of ability to pay) and preferences. In the literature preferences are approximated by a combination of socio-cultural, socioeconomic, socio-demographic and environmental factors. Hence, common indicators used to predict health insurance status include age, gender, occupation, family size, ethnicity and community of residence. In the empirical evidence on Sub-Saharan Africa, the household socioeconomic and demographic characteristics commonly identified as strong predictors of health insurance demand include older age, higher education, female gender, formal employment and wealth (Sulzbach et al 2005, Duku et al 2012, Kimani et al 2012). Being in a marital union and access to credit are other important predictors. Place of residence is also important but to a lesser extent (Kirigia et al 2005, Duku et al 2012, Kimani et al 2012). In Kenya, female, gender individuals in a marital union, formal sector employees and members of a credit union are the most likely to be insured (Kimani et al 2012). In South Africa, higher income, being female, post-secondary education, being in a marital union, safe environment, older age and smoking are strong predictors of insurance status (Kirigia et al 2005). In India income, education, health risk, awareness about insurance benefits and organizational effectiveness of insurance operators are some key determinants of health insurance demand (Vellakal 2013).

Surmising from the literature, the theoretical framework that guides analysis in this study is that out of pocket payments augment health insurance. The NHIS, branded as a program to implement universal access to health care, in effect provides access to a wider range of desired health care. The benefit of universal access is on the condition that the quality (quality as gauged from the perspective of the client) of the guaranteed package of

insured services is satisfactory. Also quality from the perspective of the client is more human centered than technical. These theoretical underpinnings would therefore guide the discussion of results from the econometric analysis of the key factors that determine insurance coverage, OOP expenses and the perceptions of the quality of health care received in the context of the NHIS in Ghana. The next section presents the econometric models and variables, and the rationale for choosing these models and variables for the empirical analysis.

## 3.3    Empirical models and variables

The questions of interest in the empirical estimations are: what determines insurance status, the incidence of out of pocket payments and the perceived quality of health services received by the insured and each of these are determined in a separate model. The explanatory variables include indicators of socio-demographic, socioeconomic, environment and community characteristics of the relevant sample of individuals.

### 3.3.1    Determining the likelihood of health insurance coverage

In order to identify the key determinants of health insurance and the differences across administrative regions, a multivariate probit regression analysis is used to show the direction and the strength of influence of several socioeconomic, demographic and environment indicators to determine the significant predictors of health insurance enrollment. Descriptive bivariate analyses are then used to examine the strength of association between these predictors of health insurance enrollment on one hand, and the administrative regions on the other hand.

### 3.3.2 Probit model and variables to predict health insurance status

Probit regression analysis is the preferred method to determine the impact of selected indicators on the likelihood of being insured. This multivariate analysis involves maximum likelihood estimation of the following model:

$$\text{prob}(d_i) = \text{prob}(\alpha + \beta I_i + \delta X_i + \gamma Z_i + e_i > 0) \qquad \text{3-2}$$

where for the $i$th individual $d_i$ is a binary variable indicator that equals 1 if individual i has health insurance, and 0 otherwise. The letter $I_i$ represents a vector of categorical variables that indicate ability to pay or affordability and the socioeconomic status of the individual. Similarly, $X_i$ is a vector of variables acting as indicators for socio-demographic characteristics of individuals that influence the choice of health insurance. Also, $Z_i$ would be a set of indicators for the community and location of residence, and $e_i$ are normally distributed errors. Specifically, the following model is estimated:

$$\text{prob}\,(d_i) = \text{prob}(\alpha + b_1 quintile_i + b_2 occupation_i + b_3 educlevel_i + b_4 media\_access_i + d_1 gend_i + d_2 agegp_i + d_3 married_i + d_4 yes\_chn_i + d_5 relnhead_i + d_6 agehead_i + d_7 ageheadsq_i + d_8 tobacco_i + s_1 loc2_i + s_2 region_i + e_i > 0) \qquad \text{3-3}$$

where quintile describes the quintile of wealth an individual's household falls in: quintile equals 1 if lowest quintile which acts as the base group, 2 if 2nd quintile, 3 if 3rd, 4 if 4th and 5 if highest quintile. Also, *occupation* describes sector of employment and equals 1 if technical or professional, 2 if sales, 3 if services, 4 if agricultural, 5 if manual,

6 if other, and 0 for the base group 'does not work'. The indicator variable educlevel equals 1 if the highest level attained is primary, 2 if secondary, 3 if post secondary and 0 for reference group of individuals who describe themselves as 'never been to school'. The indicator *media_access* describes the level of exposure an individual has to the news media: equals 1 if respondent watches television, listens to radio or reads news journal less than once a week, 2 if at least once a week, 3 if almost every day and 0 for the reference group 'not at all'. The gender indicator, *gend*, equals 1 for female and 0 for male respondent. The indicator *agegp* equals 1 if age group 19-24 years, 2 if 25-29, 3 if 30-34, 4 if 35-39, 5 if 40-44, 6 if 45-49, 9 if unknown and 0 for the base group of teens aged 15-19. The indicator variable married equals 1 if respondent is married and living with spouse or 2 if living with common law partner, 3 if widowed, 4 if divorced, 5 if does not live with partner, and 0 for the base group of individuals who describe themselves as 'never married'. The indicator *yes_chn* equals 1 if the respondent has a son or daughter living at home and 0 otherwise, and *agehead* is a continuous variable that measures age in years of the respondent's head of household while *agesq*, the square of *agehead* is used to capture any nonlinear effects that may arise from age. The indicator *tobacco* equals 1 if the respondent uses tobacco and 0 otherwise. *relnhead* describes relationship to head of household and is equal to 1 if the respondent is the head, 2 if spouse, 3 if son or daughter; 4 if other relative, and 5 if not a relative of head of household. The *loc2* equal 1 if community of residence is urban, 2 if rural. The indicator *region* describes the administrative region in which the respondent resides: equals 1 if Western, which is also the base group, 2 if Central, 3 if Greater Accra, 4 if Volta, 5 if Eastern, 6 if Ashanti, 7 if Brong Ahafo, 8 if Northern, 9 if Upper East and 10 if Upper West. The term $e_i$ represents normally distributed errors. This ordering of the

regions follows the pattern reported in survey data but in no particular order other than regions being ordered geographically from south to north.

Several reasons for choosing this set of explanatory variables need mention. First, the descriptive statistics show that almost all (97%) insured respondents were enrolled in the NHIS and ninety percent of all insured respondents paid for premiums out of pocket. A small percentage had premiums paid for by government, employer or SSNIT (see Table C2 in Appendix C). Therefore, ability to afford insurance premium is expected to account for a significant proportion of enrolments. One's wealth status (*quintile*) and employment status (*occupation*) are the indicators of ability to pay. Second, evidence suggests the organizational effectiveness and outreach campaigns of health insurance organizations has influence on enrollments patterns (Mensah et al 2010; Jehu-Appiah et al 2011; Vellakal 2013). We expect access to information about insurance to be an important determinant. Therefore, information about a respondent's frequency of listening to radio, watching television or reading news journals is used as an indicator of access to information. Although we do not have an indicator for insurance administrator effectiveness, access to media is useful for making inferences about the effect the publicity about health insurance could have on the likelihood of enrollment when the other factors such as ability to pay are taken into account. Arguably, one's exposure to the news media is not a direct indicator of the effectiveness of insurance operators' advertising, marketing or management strategies to attracting clients. Access to news media is an instrument to gauge a respondent's potential exposure to social marketing, campaigns or public information about NHIS including enrollment procedures, the benefits package and NHIS-accredited health care

providers. In a similar vein, education level acts as an indicator of literacy and ease of access to information.

Again on the issue of the reach of health insurance organizations in attracting clients, locality would be expected to have an influence on the probability of health insurance. One would expect rural residents to be more likely to have health insurance in the regions such as in Brong Ahafo, Upper East and Upper West that have had mutual health insurance schemes in several communities in operation in the decade or earlier before NHIS. Location is important also as an indicator of the economic and health infrastructure including network of providers, health delivery facilities and transportation systems that characterize a respondent's environment. In this respect one may expect the likelihood of being insured to be higher for urban residents in closer proximity to established health care provider networks.

Another indicator considered as key in determining the probability of health insurance enrollment is the health status of beneficiaries and the level of need by those taking out insurance. In the absence of data that directly measure ex ante health state of respondents, age would be used as a proxy for health status in this study with older respondents (approaching the average life expectancy of 57 years) considered as having lower health state while controlling for who finances the insurance purchase. In addition, tobacco use is a crude indicator of a respondent's healthy lifestyle behavior. The level of an individual's aversion to ill health may influence the behavior towards healthy lifestyle and similarly the decision to secure access to health care. The assumption is that if there is a market for insurance it is likely that a household with a low tolerance for health risk would purchase insurance, all things being equal. Use of tobacco is a crude measure of an

individual's healthy lifestyle behaviors and consequently health risk aversion. The remaining variables, used as control factors include gender and household demographics such as marital status, relationship to head of household, age of household head, and having a son or daughter at home (used as a crude measure of dependency given the age cohort of 15-49 as the respondents).

### 3.3.3    Contingency tables for analysis of regional differences

Bivariate analysis using contingency tables is straightforward and involves Pearson chi-square ($\chi^2$) tests of the association between each of the categorical predictor variables (of health insurance status) and the administrative regions, as displayed in contingency tables (see Table C3 in Appendix C). The independent variables include measures of income, healthy lifestyle choices, location, and access to information, type of occupation, family status and gender. The objective is to measure the importance of each of the independent categorical variables in the regional variations of health insurance status. The Pearson $\chi2$ test statistic (following Maxwell (1971)) test is as follows:

$$\chi2 = \sum_{i=1}^{r} 1 \sum_{j=1}^{c} \left( \left( O_{ij} - E_{ij} \right) \frac{1}{E_{ij}} \right)^2 \qquad\qquad \text{3-4}$$

where $O_{ij}$ is the observed frequency for the $i$th row and $j$th column in a contingency table, $E_{ij}$ is the expected frequency and is summed over r number of rows and c number of columns and compared to a critical chi square value at a level of significance $\alpha=0.01$ with degrees of freedom=(r-1) *(c-1). In the case of household wealth for example, the null ($H_o$) and alternate ($H_a$) hypotheses are as follows:

H$_o$: An individual's region of residence is independent of household wealth status.

H$_a$: An individual's region of residence is dependent on household wealth.


The DHS data for this study meets the necessary assumptions for minimizing bias in the Pearson χ2 test statistic: random sampling, nonzero observations, a large sample size and mutually exclusive categories (Maxwell 1971, Plackett 1983, Ruxton and Neuhäuser 2010). A statistically significant result implies that the frequency ratios reported for each cross tabulation of administrative regions and the independent categorical variable in question should not be passed off as random though this result says nothing about causation or the sign of the relationship. Another note of caution is that the Pearson $χ^2$ test is sensitive to sample size so the larger the sample size the more likely to reject the null even when the association between the two variables is weak. For this reason, a further test is necessary to estimate the strength of the association between region of residence and the independent categorical variable in question, hence the Cramer's V test statistic computed as described in Ruxton and Neuhäuser (2010):


$$V = \sqrt{\left(\frac{χ2}{n(k-1)}\right)} \qquad\qquad 3\text{-}5$$


where χ2 is the calculated chi square value as described in equation 3-4, n is the sample size and k is the lowest of number of rows or columns. Cramer's V provides useful information about the strength of association but not about the direction of the relationship. Cramer's V is useful also as a guide to select relevant variables for multivariate analysis

(Duku et al 2013). Hence in this study, calculated Cramer's V statistic has been useful information to make inferences about socioeconomic and sociodemographic factors that influence observed regional variations in health insurance coverage in Ghana. Further details about calculated test statistics and the importance of regional differences in explanatory and dependent variables are shown in the contingency tables in appendix C.

### 3.3.4 Probit models for predicting out of pocket payments

The multivariate probit analysis method used in estimating the likelihood of health insurance coverage is again the approach to identify the key predictors of out of pocket payments by insured individuals. The probit model for estimating the predictors of out of pocket payments takes the following form:

$$\text{prob}(y_i) = \text{prob}(\alpha + \beta H_i + \partial I_i + \delta X_i + \gamma Z_i + e_i > 0) \qquad \text{3-6}$$

where for the $i$th individual $y_i$ is a binary variable which equals 1 if insured individual i has to make out of pocket payments, and 0 otherwise. $H_i$ is a set of indicators about the perception of the quality of health services, and need for services not covered by insurance. $I_i$ is a set of indicators of the ability to pay, and the socioeconomic status of the individual, $X_i$ is a set of indicators for sociodemographic and household characteristics, $Z_i$ is a set of indicators for respondent's community and location of residence and $e_i$ are normally distributed errors. The estimated model is as follows:

$$\text{prob}(y_i) = \text{prob}\Big(\alpha + \alpha + \ b1\ needsvs + b2\ dsvsqlty + b3nhisqlty +$$

$$\partial_1 wealth_i + \partial_2 occupation_i + \partial_3 who_{paid_i} + \partial_4 educlevel_i + d_1 gend_i + d_2 yes_{chn_i} +$$

$$d_3 relnhead_i + d_4 age_i + d_5 agesq_i + s_1 loc2_i + s_2 region_i \ + e_i > 0\Big) \qquad \text{3-7}$$

where *needsvs* equals 1 if the respondent indicated a need for services not covered by insurance, and 0 otherwise. The indicator *dnhisqlty* equals 1 if NHIS cardholders are erceived to receive similar services as others, 2 if worse quality than others and 0 if better, with 'better' as the base category. The indicator *dsvsquality* equals 1 if respondent considered the service quality as not good at the most recent treatment at a clinic or hospital, and 0 otherwise. The indicator *quintile* describes the quintile of wealth the respondent's household falls within which equals 1 if lowest quintile (the base group), 2 if the 2nd quintile, 3 if 3rd, 4 if 4th and 5 if highest quintile. The indicator *occupation* describes sector of employment and equals 1 if technical or professional, 2 if sales, 3 if services, 4 if agricultural, 5 if manual, 6 if other, and 0 for base group 'does not work'. Additionally, *educlevel* equals 1 if the highest level attained is primary, 2 if secondary, 3 if post secondary and 0 for reference group 'never been to school'. Gender is indicated by ge*nd* and equals 1 for female and 0 for the base group of males. The indicator *yes_chn* equals 1 if a respondent has a son or daughter living at home and 0 otherwise. Also, *age* is a continuous variable that measures age in years, and *agesq* is the square of *age. The* indicator *relnhead* describes relationship to head of household and is equal to 1 if the respondent is the head, 2 if spouse, 3 if son or daughter, 4 if other relative and 5 if not a relative of household head. The indicator *loc2* equals 1 if urban and 2 if rural and *region* equals 1 if administrative region is Western, as well the base group; 2 if Central, 3 if Greater

Accra, 4 if Volta, 5 if Eastern, 6 if Ashanti, 7 if Brong Ahafor, 8 if Northern, 9 if Upper East and 10 if Upper West.

With regards to out of pocket payment for health services among the insured, it is expected that need of services not covered by insurance would be a key predictor of the likelihood. Service quality is expected to be a key determinant in the likelihood of out of pocket payment by the insured. More so, we expect that health insurance has value as an expansion in the attainable set of health services an individual desire. In other words, out of pocket payments would be considered as welfare enhancing rather than a loss of income. We could interpret a strong effect of need for services not insured as an indication of affordability of a wider set of health services. If in addition, quality of health services is insignificant as a predictor of out of pocket payments, this observation would strengthen the argument that health insurance improves affordability of one's desired or full range set of health services argument. Alternately, it is expected that persons with insurance coverage who make out of pocket expenses would be more likely to have been disgruntled about health services received. Therefore, indicators of the user-perceived quality of health services received during a respondents most recent visit to a facility, as well as the opinion about the relative quality of services received by NHIS cardholders versus non-NHIS card holders are included as key predictors of the incidence of out of pocket payments. The ability to pay is expected also as a significant predictor of out of pocket payments for health services by the insured. Affordability as measured by wealth status (quintile), occupation and who pays for insurance premium are expected to be significant predictors of the incidence of out of pocket spending by insured persons.

Gender is expected to be a significant predictor of out of pocket payment. It is expected that females would be less likely than males to spend out of pocket assuming that such services as maternal and child health typically demanded by females are more likely to be covered or subsidized at most facilities. Moreover, males are expected to be higher income earners and hence have higher affordability of uncovered services. The predominance of male heads of households is expected to be associated with the higher likelihood of the male as the incidence of out of pocket spending. Marital status, age, locality and region are included as the control variables.

An important consideration for out of pocket payments by the insured concerns the specification of the model to take into account the likely problem of omitted variables. One may consider that factors that influence an individual's selection into health insurance would be likely also to influence out of pocket payments and when the confounding factors are not accounted for, regression estimates could be biased. For this reason, the probit model is augmented with the Heckman probit approach whereby out of pocket payments are predicted conditional on the factors that determine whether an individual is insured or not. The simple approach we adopt is to estimate out of pocket payments by the full information (Heckman probit) maximum likelihood estimation techniques using the probit model for predicting health insurance enrolment as the selection equation. Both simple probit and Heckman probit regressions are included in the results for the purpose of comparison.

### 3.3.5  Multinomial logistic models for estimating predictors of perceived quality

This section describes the methods used to estimate the likelihood that insured individuals have unfavorable perception about health services received. Two opinion polls

about the quality of services are modeled:  first is an individual's perception about quality of service received at a most recent treatment at a hospital or clinic, if good or bad, and if bad the main reason for the dissatisfaction. Second is the perception about quality received by NHIS card holders compared to others, if better, same or worse.

The multinomial logistic regression model is suitable for determining the statistical significance of predictors in both cases of the ordered responses about relative NHIS quality and the unordered responses about quality of service at the most recent treatment at clinic or hospital. The multinomial logistic model described in this study is based on information in Jones (2000), Green (2011) and StataCorp (2011a). In this multinomial logistic regression approach a set of multinomial response indicators $(Y_{ij})$ is defined to determine which alternative in a set[4] of j=1,2, …, k response categories is chosen by the ith individual, for i=1, …, n (Jones 2000).  For example, for j=2 (long wait time), $y_{i2} = 1$ if individual i chose indicator 2, but zero otherwise. To simplify calculations one of the k response categories in j is chosen as a reference group or baseline by which to calculate the log odds for the other categories relative to the base line. The log odds are assumed to be a linear function of a set of covariates (indicator variables for education, gender, locality, wealth quintile, out of pocket payment and others) associated with the *i*th individual. Also, $p_{ij} = p(Y_{ij}=1)$ describes the probability that individual i falls into category j of perceived quality. The probability in turn depends on vector $(\mathbf{x}_i)$ of covariates associated with the ith individual or group. Therefore, $p_{ij}/p_{ik}$ (odds ratio) describes the odds that an individual i

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[4] In this case the set j describes perception about quality of service received where good=1, long wait times=2, staff not polite=3, inadequate information =4 and other reason=5.

falls in the jth category of perceived quality rather than the base line category (j=k). The multinomial logistic regression model then relates the logs odds as a linear function of the **x**i covariates as follows:

$$\log\left(\frac{P_{ij}}{P_{ik}}\right) = \beta_{0j} + \mathbf{x}_i\beta_j + \varepsilon_{ij} \qquad\qquad 3\text{-}8$$

where $\beta_o$ is a constant and $\beta_j$ is a vector of regression coefficients for j= 1, 2, ..., k-1 and j=k is the reference category. Maximum likelihood methods are used to estimate the model. The probability distribution of the responses and the multinomial (k-1) equations are analogous to the binomial case of a logistic regression model. A separate probit regression is run for each of the k-1 equations. The odds ratios (also referred to as relative risk ratios) rather than the log odds are the estimates of interest and exponentiation of the linear equations return coefficients as relative risk ratios for a unit change in the predictor variable (StataCorp 2011). An odds ratio greater than 1 implies that the expected risk of staying in an outcome category is higher than the risk of staying in the base line category for subjects who are in the (associated higher level of the dummy) predictor variable. An odds ratio that is less than 1 describes the opposite.

### 3.3.5.1 Variables to predict perceived quality of health services received by the insured

In the Ghana DHS-V (2008), the selected respondents that had health insurance coverage were asked to rate the quality of services received during the most recent treatment at a clinic or hospital, and if quality was not good, responses indicated the most important source of dissatisfaction. Hence the indicator *svsqlty* equals 1 for the base group

of respondents that perceive 'good' quality of health services, equals 2 for the group that indicate the source of dissatisfaction is long wait times, equals 3 for respondents who indicate 'staff not polite', 4 if 'did not receive enough information about treatment', and 5 if due to 'other' reason. The following are the independent variables to predict individual i's choice of quality rating j: *oopd* takes on the value 1 if the respondent had made out of pocket expenditures and 0 if otherwise, which represents the base group. Also, *quintile* indicates the quintile of wealth the respondent's household belongs to, with 1 being the lowest and 5 being the highest, and the lowest as the reference group. Similarly, *nhisqlty* equals 1 if the respondent perceives that NHIS cardholders receive better quality of service than non-cardholders, 2 if similar quality, 3 if worse quality and 4 if 'not sure' or 'cannot tell'. The indicator *loc2* equals 1 if the respondent lives in an urban community and 2 if rural, with urban as the reference group. The indicator *gend* takes on the value 1 if the individual is male and 2 if female, with males as the reference group. The indicator *yes_chn* equals 2 if the respondent lives with his or her child in same household and 1 if otherwise. Similarly, *educlevel* describes the highest level of education attained and takes on the value 1 if 'never' attended school (the base group), 1 if primary education, 2 if secondary and 3 if post-secondary.

The data does not specify that a respondent's most recent treatment at a clinic or hospital occurred at a time the individual had insurance coverage but this observation does not detract from the usefulness of the information contained in the opinions about the quality of health services. Arguably, OOP for health services would raise the threshold for expectations about quality received. One may consider that the value of health insurance stems from the gains in welfare through expansion in the feasible set of desired health

services as J. Nyman postulates (1999, 2001, 2006). In that case OOP by insured individuals would imply an expanded feasible set of desired health services (equation 3-1). If OOP turns out to be a significant predictor of favorably perceived quality, such an observation would be evidence that individuals value health insurance as a strategy to expand the feasible set of desired health services and not merely as a hedging against loss of income from health shocks. Alternately, if OOP significantly predicts unfavorably perceived quality, it would confirm that insurance expands the feasible set of desired quality. In other words, finding that OOP significantly predicts perceived quality (positively or negatively) implies the value of insurance being in the expansion in the feasible set of desired range of health services. A statistically significant correlation between OOP and quality would confirm the predictions of the model laid out in equation 3-1 in the sense that NHIS is welfare-improving.

Based on evidence in the literature such as in Turkson (2004), Atinga (2012) and Yawson et al (2013), the overall perception about quality being good or bad may not differ by rural or urban residence but rural dwellers might be more likely to complain about inadequate information while urban might more likely complain about long wait times. Results which portray residence as a significant predictor of perceived quality would demonstrate the compositional differences in perceived quality for rural and urban residence.

Educational attainment, gender and respondent living with son and, or daughter at home are included as a control for differences in access to information and health care utilization rates. Due to data limitations it is not possible to control for supply-side factors that may have direct influence on perceived quality such as the type of health facility in

question, the type of provider, the case mix or type of services received, as well as clinical indicators of quality such as the health practitioner's adherence to clinical guidelines for consultation, diagnosis or treatment procedures. Similar indicators of technical quality include the cleanliness in practice to minimize infection, availability of drugs and medical supplies. This limitation notwithstanding the information available allows a satisfactory analysis of perceived quality from the client's perspective along the human dimensions of service quality. The model to predict perceived quality of health services involves maximum likelihood methods to estimate the following equations:

$$\log\left(\frac{p_{ij}}{p_{i1}}\right) = b_{0j} + b_{1ij}oop_i + b_{2ij}nhisqlty_i + b_{3ij}quintile_i + b_{4ij}educlevel_i +$$

$$b_{5ij}gend_i + b_{6ij}yes_{chn_i} + b_{7ij}loc2_i + e_{ij} \qquad\qquad 3\text{-}9$$

Where the b's are the estimated coefficients and all other variables are as described. Indicator j takes the value 1 if respondent perceives health service quality as good, 2 if not good due to long wait times, 3 if not good due to impolite staff, 4 if not good due to inadequate information about treatment and 5 if not good due to 'other' reason.

### 3.3.5.2 Variables to predict the relative quality of services to NHIS card holders and non-NHIS-cardholder

Further analysis is made to describe perceptions about the relative quality of services received by NHIS card holders compared to non-holders. Respondents were asked to rank the quality received by NHIS card holders as better, same or worse than non-NHIS. The responses are modeled as a discrete ordered multinomial outcome dependent variable, $y_i$, which indicates NHIS cardholder quality as: better = 1, same = 2, or worse = 3. Ordered regression forms like ordered logistic or ordered probit models are common for data with

underlying ordering of preferences and would be a natural choice to obtain results that reflect the underlying ranking of the quality received by the insured relative to others. However, the proportionality of odds across response categories, the assumption that must hold in order to apply ordered logistic or ordered probit regressions, does not hold for the set of data being used based on results from the Brant test for the proportionality of odds. An alternative could be the robust general ordered logistic model but this approach is limited to binary variables not easily applied to higher order categorical variables as predictors (such as wealth at five different levels or service quality at four different levels). Nonetheless the results from the general ordered logistic regression and the ordered logistic regression are not very different from the multinomial regression results other than a few predictor variables failing to meet the proportionality assumption. Those few variables that fail the Brant test are ones that have inconsistent outcomes across the different models. The multinomial regression form is therefore the preferred method to determine significant predictors of the relative quality but that implies doing away with the ranking of outcomes. A similar set of predictor variables used for modeling the perceived quality of services received during the most recent treatment at a hospital or clinic (see equation 3-9) works for modeling the comparisons between the quality received by NHIS card holders versus non-NHIS cardholders. This set is augmented with an additional categorical variable which indicates whether the respondent needed services not covered by health insurance. The equations to be estimated in this case are similar to equation 3-9 and take the following form:

$$\log\left(\frac{p_{ij}}{p_{i1}}\right) = b_{0j} + b_{1ij}oop_i + b_{2ij}svsqlty_i + b_{3ij}quintile_i + b_{4ij}educlevel_i +$$

$$b_{5ij}gend_i + b_{6ij}yes_{chn_i} + b_{7ij}loc2_i + b_{8ij}needsv_i + e_{ij} \hspace{2cm} \text{3-10}$$

where *b*'s are the estimated coefficients and all other variables as previously described, j takes the value 1 if NHIS quality is perceived better, 2 if same, 3 if worse and 4 if the respondent does not know or is not sure, *needsvs* equals 1 if respondent had need of services not covered by insurance, and 0 otherwise. NHIS being favorably perceived would infer some welfare gains from expanding the feasible set of desired health services. The alternative would be an indication that quality is an important factor in the successful expansion of voluntary enrollments in the NHIS. This would have implications for attaining high enrollment rates that correspond to universal coverage while also improving the sustainability of a national program on health insurance. Either way, we expect the need for health services not covered by insurance to significantly predict a difference between quality of NHIS benefits and the alternatives. If need for services not covered by insurance turns out insignificant as a predictor of relative quality (regardless if better or worse), one may infer that health service quality is not an important source of the value in health insurance in Ghana.

## 3.4    Data and results from the analysis

The fifth round of the Ghana Demographic and Health Surveys conducted in 2008 is the main source of data for both descriptive and econometric analysis in this study. The survey was administered to a sample of 9484 individuals in the age range of fifteen and forty-nine years and a response rate of 96%. However, relevant survey modules on out of pocket payments and perceived quality of health care was filtered through and administered

only to respondents that had indicated having some insurance coverage at the time of interview. The narrower focus on insured individuals is relevant in extending the discussion to the potential outcomes of NHIS as a policy to attain universal access to quality health care. The problem is the limitation of the data in designing a control group to enable comparisons with the uninsured to make stronger inferences about the impact of NHIS on out of pocket payments and perceived quality of care. Also, OOP is not measured in absolute therefore not estimated. It is the incidence of OOP that is modeled in this study. The age group of 15-49 is appropriate for this study on the grounds that these are fewer exemptions from premium payments (children and the aged) and the sample reflects a high proportion of voluntary participation in NHIS, hence enabling inferences about health insurance demand. In addition, the sample as defined represents the majority of the economically active and sexually reproductive population with implications for health insurance demand.

### 3.4.1 Summary statistics of variables

The information in Table 3-2 shows the percent distribution of the sample with respect to the key variables involved in the econometric analysis. Further information on socioeconomic characteristics, demographic characteristics and the regional distribution of the sample is provided in Appendix C. The gender distribution, with 51.8 percent of respondents being female, compares with the general population where females are about 52 percent of the 14 million people in the age group of 15-65 years (GSS, 2012). More than 96 percent of the group of insured respondents had exclusive membership in the NHIS and mutual private insurance arrangements took up 2.86% more.

Table 3-2: Summary statistics on insurance coverage, out of pocket payments and perceptions about quality of health services in Ghana

|  | All | Female | Male |
|---|---|---|---|
| Sample aged 15-49 years selected for interview | 9484 | 4916 | 4568 |
| % total | 100 | 51.83 | 48.17 |
| % insured | 36.84 | 41.70 | 31.61 |
| Of which %: |  |  |  |
| National Health Insurance Scheme (NHIS) | 96.68 | 96.93 | 96.33 |
| Mutual private insurance members | 2.86 | 2.49 | 3.39 |
| Private commercially purchased | 0.09 | 0.10 | 0.07 |
| Employer provided insurance | 0.31 | 0.15 | 0.55 |
| Of the insured: |  |  |  |
| Need to pay out of pocket for drugs and services (%) | 18.18 | 16.15 | 21.05 |
| Do NHIS card holders get better service than others? (%) |  |  |  |
| Better | 50.29 | 46.83 | 55.19 |
| Same | 35.89 | 39.17 | 31.23 |
| Worse | 10.16 | 9.9 | 10.53 |
| Don't Know | 3.66 | 4.1 | 3.05 |
| Did you receive good service last time treated at a clinic or hospital? (%) |  |  |  |
| Yes | 79.97 | 81.61 | 77.63 |
| No, long waiting time | 9.73 | 8.98 | 10.80 |
| No, staff not polite | 1.63 | 1.22 | 2.22 |
| No, inadequate information about illness and treatment | 3.63 | 3.41 | 3.95 |
| Other | 5.04 | 4.78 | 5.40 |

Source: Calculations based on data from the Ghana Demographic and Health Survey V, 2008.

In other words, Ghana's health insurance market as largely non-profit since NHIS comprises District Mutual Health Insurance Schemes. The private for profit insurance market in Ghana is not as much discussed in this work, but the implication of the results for health insurance outcomes would otherwise not differ given that commercial insurance in Ghana is a very small percentage of the market. Alternately the implication of NHIS for the development of the private insurance industry, and the role private insurance in Ghana plays is a good question for prospective research.

The evidence reveals a skewed distribution in the indicator variables on perceived quality in favor of a positive perception: about 80 percent of the insured respondents were

positive[5] about the overall quality of health services. With regards to perception about relative quality received by NHIS versus non-NHIS cardholders, half the respondents perceive NHIS to be better while 10% perceive worse; 35% are neutral. It is likely that the small proportion (3.66 %) of respondents that 'do not know' may have lacked the information to decide rather than simply being neutral. A higher proportion of males than females perceive subpar quality of health services received at their most recent visit; a similar observation holds for NHIS cardholders receive worse services than non-cardholders.

The next section is a presentation of results from the econometric estimations of the impact of gender, location and wealth status (with other control variables) on the likelihood of insurance coverage, and for the insured, the likelihood of paying out of pocket for services, dissatisfaction with services received and the perceived quality received by NHIS-cardholders versus non-cardholders.

### 3.4.2   Who is likely to be insured

The results from estimating equation 3, that is, the coefficients from the probit regression as well as the estimates of the marginal average probabilities (differences in probability from the base for each predictor variables) appear in Table 3-3. The marginal probabilities associated with each level of the predictor variables and the statistical significance attached is determined based on all variables being held constant at their means. The variables with a strong level of statistical significance are deemed the

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[5] This observation compares with other studies in Ghana, e.g., Turkson's (2004) and Yawson's (2013) where respectively 89% and 90% of health care users indicated a general satisfaction with services received.

predictors of health insurance and the relevance of these predictors in turn determined by the relative size of the associated marginal average probability.

### 3.4.2.1  Effect of household wealth and employment

The results confirm that a higher wealth status improves the chances of being insured and that the likelihood increases progressively at each higher wealth quintile as compared to the lowest quintile. For instance, the probability that one has health insurance improves by 0.37 for an individual in the fifth quintile relative to that of the lowest quintile. For an individual in the second quintile of wealth the average marginal probability is much less at 0.09 while holding all other variables constant.

The type of occupation of the individual has some influence on the probability of being insured. An individual in a professional, managerial or technical occupation has a better chance of being insured compared to an individual that is 'not working'. In the case of the former, holding all other explanatory variables constant, the probability of being insured increases by 0.129. Other identified occupations are worse off than persons 'not working'. Persons engaged in agriculture have the worst reduced probability (-0.06), followed by clerical and service occupations (-0.045). Persons in sales or manual trades have also reduced probabilities though not statistically significant. Occupation could be an indication of the significance of affordability in health insurance status. The list of occupations may partly reflect who pays for insurance in the sense that citizens enrolled in the public pension scheme - the Social Security and National Insurance Trust (SSNIT) – which funds NHIS through payroll deductions, are most likely to be enrolled in the NHIS by default. Consequently, individuals in professional, technical and administrative occupations, and in particular, the public sector would most likely be enrolled in NHIS.

Citizens engaged in informal work arrangements such as in agriculture, sales and manual trades, and for whom NHIS enrollment is practically voluntary, the probability of being insured would be expected to differ only slightly from that of those 'not working'. In other words, the formality of one's employment arrangements is a determining factor in the likelihood of health insurance coverage.

### 3.4.2.2    Influence of access to information

The results confirm that accessibility of information influences the likelihood of being insured. Specifically, respondents who frequently listen to radio, watch television or read news are the more likely to be insured. The probability improves by 0.07 for respondents that read, watch or listen almost every day compared to respondents who do so less than once a week, the probability improves also by 0.05 for respondents who do so at least thrice a week (but not almost every day), holding all other explanatory variables constant. The results indicate also that education is statistically significant factor for the likelihood of being insured. The higher the education level attained the higher the average marginal probability:  the probability increases by 0.04 if primary level is the highest attained, 0.12 if secondary level attained and 0.21 if post-secondary level attained, when compared to the group of respondents who have not attained any level of education. Education attainment could be considered as a reflection of one's ease of access to information that is relevant to health insurance demand including where and how to enroll, benefits, and the health care provider networks.

Table 3-3: Predictors of health insurance coverage among 15-49 year olds

| | Likelihood of health insurance coverage | | | |
| --- | --- | --- | --- | --- |
| | Coefficient | SE | Difference in probability from the base level | SE |
| dummy for respondent's household *wealth* quintile; base group is the 1st quintile | | | | |
| 2nd quintile | 0.339*** | 0.05 | 0.093*** | 0.01 |
| 3rd quintile | 0.583*** | 0.06 | 0.169*** | 0.02 |
| 4th quintile | 0.898*** | 0.06 | 0.276*** | 0.02 |
| 5th quintile | 1.168*** | 0.07 | 0.368*** | 0.02 |
| dummy for how often reads, listens or watches news *media*; base group is less than once a week | | | | |
| At least once a week | 0.349 | 0.28 | 0.114 | 0.09 |
| At least thrice a week | 0.154*** | 0.06 | 0.049*** | 0.02 |
| Almost everyday | 0.223** | 0.10 | 0.071** | 0.03 |
| dummy for *locality* of respondent; base group is urban | | | | |
| Rural | 0.134*** | 0.04 | 0.043*** | 0.013 |
| dummy for administrative *region* of respondent; base group is Western | | | | |

| | Likelihood of health insurance coverage | | | |
| --- | --- | --- | --- | --- |
| | | | Difference in probability from the | |
| | Coefficient | SE | base level | SE |
| Central | -0.374*** | 0.08 | -0.106*** | 0.02 |
| Greater Accra | -0.740*** | 0.07 | -0.188*** | 0.02 |
| Volta | -0.139** | 0.07 | -0.041** | 0.02 |
| Eastern | 0.268*** | 0.06 | 0.086*** | 0.02 |
| Ashanti | 0.040 | 0.06 | 0.013 | 0.02 |
| Brong Ahafo | 0.723*** | 0.07 | 0.238*** | 0.02 |
| Northern | 0.518*** | 0.07 | 0.169*** | 0.02 |
| Upper East | 0.851*** | 0.08 | 0.280*** | 0.02 |
| Upper West | 0.851*** | 0.07 | 0.280*** | 0.02 |
| dummy for *age group* in years; base is 15-19 | | | | |
| 20-24 | -0.287*** | 0.05 | -0.093*** | 0.02 |
| 25-29 | -0.285*** | 0.07 | -0.092*** | 0.02 |
| 30-34 | -0.128* | 0.08 | -0.043* | 0.05 |
| 35-39 | -0.168** | 0.10 | -0.055** | 0.03 |
| 40-44 | -0.128 | 0.10 | -0.042 | 0.03 |
| 45-49 | -0.254*** | 0.10 | -0.083*** | 0.03 |
| Unknown | -0.025 | 0.11 | -0.008 | 0.04 |
| dummy for *gender;* base group is male | | | | |
| Female | 0.358*** | 0.04 | 0.116*** | 0.01 |
| Dummy for marital status; base group is 'never married' | | | | |

| | Likelihood of health insurance coverage | | | |
| --- | --- | --- | --- | --- |
| | Coefficient | SE | Difference in probability from the base level | SE |
| Married | 0.217*** | 0.06 | 0.070*** | 0.02 |
| living together | 0.012 | 0.07 | 0.004 | 0.02 |
| Widowed | -0.112 | 0.14 | -0.034 | 0.04 |
| Divorced | 0.053 | 0.11 | 0.017 | 0.04 |
| not living together | -0.101 | 0.10 | -0.031 | 0.03 |
| Dummy for respondent having a child at home; base group has 'none' | | | | |
| Has child at home | 0.124*** | 0.05 | 0.040*** | 0.02 |
| dummy for occupation of respondent; base group is 'not working' | | | | |
| Professional/managerial/tech | 0.375*** | 0.08 | 0.129*** | 0.03 |
| clerical and services | -0.138** | 0.06 | -0.045** | 0.02 |
| Sales | -0.070 | 0.06 | -0.023 | 0.02 |
| Agricultural | -0.184*** | 0.05 | -0.060*** | 0.02 |
| manual | -0.032 | 0.06 | -0.011 | 0.02 |
| Other | 0.127 | 0.11 | 0.043 | 0.04 |
| dummy for highest level of school attended; base group 'never attended school' | | | | |
| Primary | 0.136*** | 0.05 | 0.042*** | 0.02 |
| Secondary | 0.369*** | 0.05 | 0.118*** | 0.02 |
| post secondary | 0.631*** | 0.09 | 0.208*** | 0.03 |
| dummy for relationship to head of household; base group is 'head of household' | | | | |

| | Likelihood of health insurance coverage | | | |
| --- | --- | --- | --- | --- |
| | Coefficient | SE | Difference in probability from the base level | SE |
| Spouse | 0.049 | 0.05 | 0.016 | 0.02 |
| son/daughter | -0.021 | 0.08 | -0.007 | 0.03 |
| other relative | -0.177** | 0.08 | -0.056** | 0.02 |
| not related | -0.315* | 0.17 | -0.097** | 0.05 |
| Age in years of head of household | 0.027*** | 0.01 | 0.009*** | 0.00 |
| Head of household age squared | -0*** | 0.00 | 0.000*** | 0.00 |
| dummy for tobacco use; base group is tobacco users | | | | |
| does not smoke | 0.239*** | 0.08 | 0.075*** | 0.02 |
| _cons | -2.60*** | 0.20 | | |
| N | 8,996.000 | | | |

Source: Calculations based on data from the Ghana Demographic and Health Survey V, 2008.

Binary dependent variable: *insured*=1 if respondent has health insurance and 0 otherwise.

 *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

### 3.4.2.3 Influence of region of residence

When the Western region is the basis for comparison the pattern that emerges is that the marginal probability increases in magnitude and statistical significance the farther away (to the north) the region. Residents to the north (Upper East, 0.28; Upper West, 0.28; Northern, 0.17) and middle belt (Brong Ahafo, 0.23) of the country have positive average marginal probabilities of high magnitude and strong statistical significance. Comparatively regions lying on the Atlantic coast (Central, Greater Accra, Volta) similar to Western have lower and negative average marginal probabilities: -0.03 for Volta, -0.1 for Central, -0.19 for Greater Accra. Ashanti is the only region that is similar to the Western Region in the likelihood of health insurance. These observations could in part be a reflection of the level poverty in the respective regions relative to Western region (see Ghana poverty headcount and Regional maps in appendix). Table C4 in appendix C gives further details about the regional differences in the important socioeconomic indicators of health insurance. The Cramer's V test shows statistically significant correlation between regions and the predictor variables except in the case of gender. This means the percent distributions in the explanatory variables reflect the strengths and weaknesses, and the differences across regions, though the sign of the correlation is not given. The evidence in Table C4 would suggest that some regions are more alike than different such as the case is with quintile of household wealth, rural-urban location and education level of respondents among the Northern and Upper regions, than the case is in comparison to Western, Ashanti and Eastern.

It becomes obvious that (in comparison to the Western region) regional differences in the likelihood of being insured are in favor of the poorer regions (see maps in appendix B) and may at face value suggest that NHIS is pro-poor. However, if one compares the

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poverty-adjusted distribution of NHIS it becomes obvious that NHIS is not pro-poor. For example, Upper West has more than 50% of population coverage of NHIS, but the poverty rate is 70.7% in 2012/2013 (GSS 2014). Northern region similarly has more than 31% of population covered by insurance whereas the poverty rate is 50.4%. Greater Accra has one of the lowest population coverage (25%) but then poverty rate is 5.6%. In fact, all the other regions except Volta have higher rates of population coverage than poverty. Similarly, as to how equitable NHIS is, especially with regards to access to health services, further information about the regional distribution of realized benefits in access to health care - availability of insured services, quality of services, out of pocket payments - would have to be considered. Comparing enrollment rates with the distribution of the insurance benefits would be a good area for prospective research. The probit results provide evidence that rural residents are more likely to have insurance coverage as indicated by the statistically significant marginal average probability of 0.04 compared to an urban resident. This is another observation that corroborates the patterns in regional distribution since poverty distribution patterns is in tandem with distribution of the rural population.

### 3.4.2.4 Differences by gender

With regards to gender females are more likely to be insured; the marginal probability is 0.12 and it is statistically significant when all other independent variables are held constant. The finding that females are more likely than males to be insured is common in the evidence on Sub-Sahara Africa. This observation has been made in studies in both developing countries and advanced countries (Sulzbach et al 2005, Duku et al 2012, Kimani et al 2012). With regards to NHIS, pregnant women have since July 2008 been exempt from premium payments (NHA 2010). In the case of NHIS, some information

gathered from key informant interviews author conducted in January 2013 provide some explanation about the female effect. For instance, the Onwe District Clinic (Ashanti Region) administrators recount incidents where some households, members who are ineligible for premium subsidies (for example adult males) typically would not enroll for NHIS but still access NHIS benefits by proxy. What happens is, in the event that a non-NHIS cardholder member of the family needs health services, the NHIS eligible household member (usually primary care givers who are also female) would present themselves to the health care provider as the patient (describing symptoms the real patient may have exhibited at home) expecting to obtain a diagnosis and prescription. The medical practitioner not knowing, the presenting 'patient' (NHIS card bearer) receives the treatment plan including NHIS covered prescriptions for the real patient who is at home. Information from author's interviews of physicians in two different health facilities explaining challenges faced with NHIS provided accounts that inadvertently corroborate the complaints about individuals receiving NHIS benefits by proxy. Physicians recounted cases where repeat visits and consequently numerous prescriptions were made within relatively short periods, whereas the patient appeared to show little improvement or had recurring unrelated problems. In these narratives the presenting cases were female.

Another explanation why women are more likely to be insured could be the observation that men tend not find NHIS benefits worth the cost of premium payments, which might be in part a failure in the national effort to effectively communicate to men about NHIS. In an interview with a young man in the waiting area of a health facility while his partner was seeing the physician, the respondent requested to know about the real benefits of NHIS. In his opinion he had heard a lot but learnt little about NHIS. His partner

had often implored him to register them both in the NHIS but he had refused. However, accompanying his pregnant partner to the clinic for the first time and realizing what savings out of pocket he could have made just in the cost of hospital registrations and physician fees piqued his interest in NHIS. He had heard mostly negative reviews about NHIS benefits from passengers on the bus routes he works as a bus conductor. He had often been advised by his clients to avoid NHIS and he had been conflicted because his partner thought otherwise. In an interview with yet another male respondent, himself a patient waiting to see the physician at the health facility, there was indication of a determined choice to not register with the NHIS. The respondent indicated willingness to pay whatever it would cost to have effective treatment. Effective treatment in his opinion would require substantive payments out of pocket and NHIS would be irrelevant. In another interview with a 40-year-old chauffeur, the respondent indicated his distrust of NHIS, that it was more of a political project, designed to siphon benefits to sympathizers of the political party in majority government. In his opinion the NHIS was a good thing depending on who was asked. More interestingly this man indicated he had never registered for and did not plan to register for NHIS because he had never really needed to use the health care benefits. What was garnered from these interviews was that women, especially those visiting health facilities, would tend to be better informed about NHIS and the benefits, and more likely to have received benefits through the tangibly lower out of pocket payments when using accredited health facilities.

### 3.4.2.5 The influence of household composition and age

The evidence from the probit analysis suggests that household composition has significant influence on the likelihood of being insured. Persons living with spouses are

7% more likely to be insured than others who have never been in marital relations. Individuals in other relationship statuses cannot be said to have probabilities that differ from those of persons who have never been in a relationship. With respect to relationship to the head of household, being a spouse or son or daughter means one's probability of being insured is not statistically different from that of the household head. Other relatives such as nephews, in-laws and parents have a lower likelihood of being insured than household head. Persons not related to head of household have the least probability of being insured. Similarly, respondents indicating having a son or daughter living at home are 4% more likely to be insured compared to respondents that do not have son or daughter living at home.

Age groupings indicate that the higher the age group the lower the likelihood of being insured compared to the base group of 15-19 years. One explanation could be that at the time of interview in 2008 NHIS enrollment was free of charge to minors or enrollees' dependents younger than 22 years (). Comparatively the probability is lowest for young adults 20-24 and aged 25-29 with negative marginal probability of 0.093 and 0.092 respectively. The next lower group is middle aged 45-49 with a negative marginal probability of 0.083. Individuals in the age groups 30-34 and 35-39 have lower probabilities, though not as wide on the margin. The age group 40-44 is not statistically different than the teens. The results could imply that individuals who have dependents (as are household heads) who are minors are motivated to take out insurance, and this group mostly fall in the middle ages up to 44. The probit results show also that the older the age of the head of the household the more likely a person in that household would be insured. The marginal effect is an increase in probability by a percentage point for each additional

age in years of the head. The sign on age squared is negative, indicating the existence of nonlinearity in the effect of age: while age has an increasing impact on probability the effect of age diminishes as household head gets older.

### 3.4.2.6 Tobacco use as a measure of health risk aversion

Although a small proportion of respondents use tobacco the evidence suggests that tobacco use is a strong predictor of health insurance status. The results show that the probability of being insured increases by 7% for respondents who do not use tobacco compared to those who use it. This result may be reflecting health risk aversion of the insured or that the insured tend to care more about health status, and therefore less likely to use tobacco. In that case it may be concluded that health risk aversion has some influence on the likelihood that an individual obtains health insurance in Ghana. On the contrary it is not a simple matter of preferences linking tobacco use to health insurance status but rather an underlying phenomenon where people using tobacco tend to be male, adult and of lower wealth status (all fall in less likely category), given the very small proportion of tobacco users.

The probit results have thus far indicated that affordability of insurance is significant in the likelihood of being insured as evidenced by wealth status, type of occupation and region of residence which determines whether the insurance premium is subsidized or not. Also important is the ease of access to insurance market as evidenced by the region and rural residency with longer history of mutual health insurance establishments. Finally, household demographics also matter: teens, persons in marital unions, the immediate family of the household head and older household heads are more likely to be insured. Further investigation is made to ascertain what factors predict the

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likelihood that an insured individual makes out of pocket payments for needed health services. The next section presents econometric results on incidence and predictors of out of pocket payments by insured individuals.

### 3.4.3   Incidence of out of pocket expenses by the insured

Results from the simple probit regression analysis and the Heckman probit model (to account also for the correlation between insurance selection and out of payments) for predictors of out of pocket payments by insured individuals are shown in Table 3-3.

### 3.4.3.1   Influence of the need for services and perception about quality

The need for uninsured services as expected increases the likelihood of out of pocket payments among the group of respondents who have health insurance coverage. Individuals who have a need for services not covered by insurance are on average 12% more likely to make out of pocket payments relative to comparable individuals. Similarly, as expected the perceived quality of services received is a statistically significant predictor of out of pocket payments. The probability increases by 4% in the case of an individual who did not perceive good quality received, as compared to individuals who perceived a good quality at a the most recent visit to a hospital or clinic.

### 3.4.3.2   The effect of affordability

Affordability-related predictor variables (wealth quintile, employment) have average marginal probabilities that are not significantly different from zero when the effect of insurance selection is not taken into account. Wealth differences have a negligible effect on the likelihood of out of pocket payments among the group of insured. When all other covariates are held constant, the probability of out of pocket payments by a household in the highest wealth quintile is not significantly different from that of a household in the

poorest wealth quintile. The results lack evidence of a difference in the probability of out of pocket expenses by individuals in any of the occupation groups, compared to the base group of unemployed individuals. While these covariates increase the likelihood of being insured the average marginal probabilities of out of pocket payment attached to these variables are not statistically different from zero. Hence, a difference in ability to pay has no significant influence on the likelihood that insured individuals make out of pocket payments. In that respect it could be said that health insurance coverage is equity improving in ability to pay for health services in Ghana; the same may not be concluded about access to quality health services.

### 3.4.3.3 Importance of who pays for the insurance premium

Who pays for the insurance premium influences the probability of out of pocket expenses. For an individual whose insurance premium is paid for by a relative or friend, or by the employer, the probability of out of pocket payments for health services decreases by 4% and 8% respectively compared to the case of an individual paying for premium by himself. Therefore, paying for one's own insurance premium is associated with a higher likelihood of out of pocket payments than the case of individuals whose premiums were paid for. This observation could allude to differences in the level of health care coverage among different groups of the insured persons. Employer provided insurance may correspond to employees having access to some institutionalized care that is more comprehensive than the average, even if the insurance policy (NHIS) may specify a universal benefits package.

### 3.4.3.4  Regional differences

One would expect that regions with higher poverty rates have relatively lower incidence of out of pocket expenditures as a result of the combined effect of lower ability to pay and consequently lower demand for uncovered services, and a weaker health infrastructure. In comparison to the Western region insured people in Central and Upper East are less likely to make out of pocket expenses. These two administrative regions are as well the higher poverty distribution in Ghana (GSS 2008).  A resident of the Volta Region is the only case that has a higher (by 15%) probability of making out of pocket payments than a resident in Western Region. Residents of Greater Accra, though less likely to be insured, are no more likely than Western to make out of pocket payments. The regional differences do not all correspond to differences in likelihood of being insured, except in the case of Upper East with a higher likelihood of being insured and smaller likelihood of having to pay for out of pocket, and vice versa for Volta region.

Arguably, supply side issues such as health care provider networks and availability of insured services as well as health care utilization patterns and incidence of health care benefits would be useful for explaining regional variations in out of pocket payments with respect to insurance coverage.  Such an investigation is a prospect for further study.

Table 3-4: Likelihood of out of pocket payments by the insured, Ghana DHS 2008

| | Likelihood of out of pocket payments by the insured | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | Simple probit model (N=3378) | | | | Probit model with sample selection[¤] (N=3245) | | | |
| | Difference in probability[§] | SE | [95% confidence interval] | | Difference in probability[§] | SE | [95% confidence interval] | |
| Has need of services not covered by insurance: base group has not | | | | | | | | |
| Need services not insured | 0.117*** | 0.01 | 0.09 | 0.15 | 0.095*** | 0.02 | 0.05 | 0.14 |
| Perceived quality of service received during most recent visit to a clinic/hospital: base group 'received good service' | | | | | | | | |
| Quality not good | 0.029* | 0.02 | 0.00 | 0.06 | 0.016 | 0.01 | -0.01 | 0.04 |
| Opinion about quality received by NHIS cardholder versus non cardholder: base is 'better' | | | | | | | | |
| Same | 0.034** | 0.01 | 0.01 | 0.06 | 0.027** | 0.01 | 0.00 | 0.05 |
| Worse | 0.078*** | 0.03 | 0.03 | 0.13 | 0.066** | 0.03 | 0.02 | 0.12 |
| do not know/not sure | 0.063 | 0.04 | -0.01 | 0.14 | 0.060* | 0.04 | -0.01 | 0.13 |
| Household wealth: base group is 1st quintile | | | | | | | | |
| 2nd quintile | 0.026 | 0.02 | -0.02 | 0.07 | 0.026 | 0.02 | -0.01 | 0.06 |
| 3rd quintile | 0.003 | 0.02 | -0.04 | 0.05 | 0.021 | 0.02 | -0.02 | 0.06 |
| 4th quintile | 0.029 | 0.03 | -0.02 | 0.08 | 0.050** | 0.02 | 0.01 | 0.09 |
| 5th quintile | 0.049 | 0.03 | -0.01 | 0.11 | 0.079*** | 0.03 | 0.03 | 0.13 |
| Occupation: base group is 'not working' | | | | | | | | |

| | Likelihood of out of pocket payments by the insured | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- |
| | Simple probit model (N=3378) | | | | Probit model with sample selection[¤] (N=3245) | | |
| | Difference in probability[§] | SE | [95% confidence interval] | | Difference in probability[§] | SE | [95% confidence interval] | |
| professional/managerial/tech | 0.013 | 0.03 | -0.04 | 0.07 | 0.019 | 0.02 | -0.03 | 0.07 |
| clerical and services | 0.009 | 0.03 | -0.04 | 0.06 | 0.004 | 0.02 | -0.04 | 0.05 |
| Sales | 0.037 | 0.02 | -0.01 | 0.08 | 0.025 | 0.02 | -0.02 | 0.07 |
| Agricultural | 0.020 | 0.02 | -0.03 | 0.07 | 0.006 | 0.02 | -0.03 | 0.05 |
| manual | 0.012 | 0.02 | -0.04 | 0.06 | 0.011 | 0.02 | -0.03 | 0.05 |
| other | -0.019 | 0.04 | -0.10 | 0.06 | -0.019 | 0.03 | -0.09 | 0.05 |
| Who paid for insurance premium: base group is 'self' relative/friend | -0.031* | 0.02 | -0.07 | 0.00 | -0.029* | 0.02 | -0.06 | 0.00 |
| employer/SSNIT | -0.076*** | 0.02 | -0.12 | -0.03 | -0.059** | 0.02 | -0.10 | -0.02 |
| did not pay | -0.045 | 0.04 | -0.13 | 0.04 | -0.032 | 0.04 | -0.11 | 0.05 |
| Highest level of school attended; base group 'never attended' Primary | -0.012 | 0.02 | -0.06 | 0.03 | -0.001 | 0.02 | -0.03 | 0.03 |
| Secondary | 0.028 | 0.02 | -0.01 | 0.07 | 0.034** | 0.02 | 0.00 | 0.06 |

| | Likelihood of out of pocket payments by the insured | | | | | | | |
| | Simple probit model (N=3378) | | | | Probit model with sample selection[¤] (N=3245) | | | |
| | Difference in probability[§] | SE | [95% confidence interval] | | Difference in probability[§] | SE | [95% confidence interval] | |
| post secondary | 0.071** | 0.04 | 0.00 | 0.14 | 0.081** | 0.03 | 0.02 | 0.14 |
| Gender; base group is male | | | | | | | | |
| Female | -0.028* | 0.02 | -0.06 | 0.00 | -0.008 | 0.02 | -0.04 | 0.03 |
| Relationship to head of household: base group is 'household head' | | | | | | | | |
| Spouse | -0.014 | 0.02 | -0.05 | 0.02 | 0.002 | 0.02 | -0.03 | 0.03 |
| Son/daughter | -0.003 | 0.02 | -0.05 | 0.04 | 0.005 | 0.02 | -0.03 | 0.04 |
| Other relative | 0.044 | 0.03 | -0.02 | 0.11 | 0.035 | 0.03 | -0.02 | 0.09 |
| Not related | -0.100 | 0.06 | -0.22 | 0.02 | -0.077 | 0.05 | -0.18 | 0.02 |
| Age in years | 0.012** | 0.00 | 0.00 | 0.02 | 0.007** | 0.00 | 0.00 | 0.02 |
| Age squared | 0.000** | 0.00 | 0.00 | 0.00 | 0.000 | 0.00 | 0.00 | 0.00 |
| Locality of residence: base group is urban | | | | | | | | |
| Rural | 0.017 | 0.02 | -0.01 | 0.05 | 0.018 | 0.01 | -0.01 | 0.04 |
| Region of residence: base group is Western | | | | | | | | |
| Central | -0.103*** | 0.03 | -0.16 | -0.04 | -0.083*** | 0.03 | -0.14 | -0.03 |

| | Likelihood of out of pocket payments by the insured | | | | | | |
| | Simple probit model (N=3378) | | | | Probit model with sample selection[¤] (N=3245) | | |
| | Difference in probability[§] | SE | [95% confidence interval] | | Difference in probability[§] | SE | [95% confidence interval] | |
| Greater Accra | 0.055 | 0.03 | -0.01 | 0.12 | 0.010 | 0.04 | -0.07 | 0.08 |
| Volta | 0.204*** | 0.04 | 0.13 | 0.28 | 0.149** | 0.05 | 0.05 | 0.25 |
| Eastern | -0.015 | 0.03 | -0.07 | 0.04 | -0.003 | 0.02 | -0.05 | 0.04 |
| Ashanti | -0.038 | 0.03 | -0.09 | 0.02 | -0.030 | 0.02 | -0.07 | 0.01 |
| Brong Ahafo | -0.039 | 0.03 | -0.10 | 0.02 | -0.009 | 0.03 | -0.07 | 0.05 |
| Northern | -0.028 | 0.03 | -0.09 | 0.03 | -0.007 | 0.03 | -0.06 | 0.05 |
| Upper East | -0.112*** | 0.03 | -0.17 | -0.06 | -0.080* | 0.04 | -0.16 | 0.00 |
| Upper West | -0.065** | 0.03 | -0.12 | -0.01 | -0.020 | 0.04 | -0.09 | 0.05 |

Source: Calculations based on data from the Ghana Demographic and Health Survey V 2008.
Note: Binary dependent variable *oopd*=1 if respondent has had to pay out of pocket for services and zero otherwise.
§Marginal effect at factor variable levels is the discrete change in probability from the base.
¤ Full Information Maximum Likelihood Heckman probit model.
*** p<0.01, ** p<0.05, * p<0.1.

### 3.4.3.5 Effect of sociodemographic characteristics of household

Examining socio-demographic characters of the individual shows that differences age and education level have an influence on the probability of out of pocket spending. Controlling for the confounding factors in insurance selection suggests that being female does not reduce the chance of out of pocket expenditures any better than for male. In contrast, an individual with post secondary education has an increase of at least 3 percentage points (8 points for tertiary education) in probability than the reference group that has 'never' attended school. The older a person is the higher the likelihood of making out of pocket expenses; a year increase in age is associated with a 0.7 percentage point increase in probability.

### 3.4.4 Predictors of the perception of quality of health care services

Table 3-5 presents results of the multinomial regression with the perception about the quality of health services as outcome (dependent variable). The outcome variable, *svsquality*, indicates whether a respondent, in their own opinion, received a good service or not, and if not, what the main source of dissatisfaction was. The perception that service received was 'good' is the modal outcome, and the base category against which the relative risk ratios (calculated as the exponents of the coefficients, i.e., $e^{Bi}$) for the other outcomes ('waiting times too long', 'staff impolite', 'did not receive adequate information' and 'other') are estimated. The predictor (independent) variables include household wealth, rural -urban locality, and gender and education level.

Column I in Table 3-5 reports the relative risk of perceiving poor quality due to long waiting times over perceiving good services received. A respondent indicating that NHIS cardholders receive worse quality than non cardholders, or one that have had to pay

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out of pocket for services is more likely to have experienced waiting times being too long. A respondent that had had to pay out of pocket for services tends to be 44% more likely to be dissatisfied due to a long wait than an otherwise comparable respondent. If a respondent indicated NHIS quality was similar to non-card holders, such an individual was twice likely to be dissatisfied due to long waiting times, but if NHIS quality was perceived worse that individual was fifteen times more likely to complain about wait times being too long.

Females as a group are less likely than males to complain about wait times; so do individuals with secondary school level than otherwise comparable respondents. The estimates attached to quintiles of household wealth show that wealth does not predict satisfaction with quality of services, the only exception being the second quintile with a lower likelihood of waiting times being longer than otherwise comparable individuals. Having one's child or children in the household is not a significant predictor of perceived quality. The results would imply that males and individuals having to pay out of pocket and especially those dissatisfied with NHIS are the most likely to be dissatisfied with services received due to long wait times.

With regards to 'staff not polite' the relative risk ratios suggest that the predictors of dissatisfaction with services include again paying out of pocket, unfavorable perception of NHIS cardholder services quality and gender. In this case insured individuals that indicate paying out of pocket for health services are twice likely to be dissatisfied than otherwise comparable individuals. Subpar NHIS quality perceived is the most significant predictor of dissatisfaction due to staff impoliteness.

Table 3-5: Factors predicting perceptions about quality of services received at health facilities: multinomial logistic regression

| Dependent indicator variable for quality of service received last time treated at a clinic or hospital; base group received good service | No, Waiting times too long | | No, Staff not polite | | No, not enough information received | | other | |
|---|---|---|---|---|---|---|---|---|
| | odds ratio | SE | odds ratio | SE | odds ratio | SE | odds ratio | SE |
| **Has to pay out of pocket: base group 'does not'** | | | | | | | | |
| oopd | 1.442** | 0.146 | 2.033** | 0.301 | 2.088*** | 0.215 | 0.983 | 0.225 |
| **Perceived quality of service received by NHIS cardholder versus non cardholder: base group perceives NHIS as 'better'** | | | | | | | | |
| same | 2.581*** | 0.144 | 5.166*** | 0.471 | 1.631* | 0.283 | 1.153 | 0.213 |
| worse | 15.484*** | 0.175 | 62.065*** | 0.464 | 33.741*** | 0.256 | 5.760*** | 0.260 |
| do not know/not sure | 1.539 | 0.481 | 4.656 | 1.092 | 6.231*** | 0.478 | 26.483*** | 0.236 |
| **Household wealth: base group is 1st quintile** | | | | | | | | |
| 2nd quintile | 0.529*** | 0.240 | 2.213 | 0.620 | 0.756 | 0.393 | 0.780 | 0.292 |
| 3rd quintile | 0.752 | 0.228 | 0.654 | 0.753 | 0.954 | 0.380 | 0.695 | 0.312 |
| 4th quintile | 0.830 | 0.230 | 1.354 | 0.654 | 0.922 | 0.383 | 0.574* | 0.331 |
| 5th quintile | 1.020 | 0.251 | 1.872 | 0.686 | 0.568 | 0.432 | 0.792 | 0.348 |
| **Locality of residence: base group is urban** | | | | | | | | |
| rural | 0.969 | 0.159 | 1.043 | 0.353 | 0.727 | 0.243 | 0.699 | 0.227 |
| **Gender: base group is male** | | | | | | | | |
| female | 0.693*** | 0.127 | 0.550** | 0.289 | 0.768 | 0.202 | 0.724* | 0.175 |
| **Has child at home: base group has 'none at home'** | | | | | | | | |
| Child lives at home | 1.202 | 0.129 | 0.669 | 0.292 | 1.147 | 0.205 | 0.869 | 0.178 |
| **Highest level of school attended; base group 'never attended'** | | | | | | | | |
| primary | 0.771 | 0.221 | 0.488 | 0.673 | 0.620 | 0.401 | 1.174 | 0.295 |
| secondary | 0.723 | 0.189 | 0.875 | 0.508 | 1.024 | 0.312 | 0.920 | 0.268 |
| post secondary | 0.713 | 0.267 | 1.529 | 0.596 | 1.212 | 0.422 | 0.843 | 0.395 |

Source: Calculations based on data from the Ghana Demographic and Health Survey V, 2008.
Note: Sample size= 3,494 *** p<0.01, ** p<0.05, * p<0.1

An individual is sixty-two times more likely to be dissatisfied if they perceive NHIS quality to be worse than non-cardholders and five times more likely even if NHIS quality is considered to be similar. Females again are less likely than males to be dissatisfied due to staff impoliteness.

Where the source of dissatisfaction involves communication about the health care process, perception about NHIS quality and having to pay out of pocket are the only statistically significant predictors of dissatisfaction with services received. An individual that perceives that NHIS cardholder receives worse quality than non-NHIS cardholder is thirty-three times more likely to be dissatisfied due to inadequate information received than an otherwise comparable individual. Even in the case of an individual that cannot decide about the relative quality of services received, he is six times more likely to perceive poor quality due to inadequate information received than an otherwise comparable individual. Having to pay out of pocket for services doubles the risk of perceiving inadequate information than not.

For 'other' unidentified reasons for dissatisfaction with health services received at the most recent visit to a hospital or clinic, again pessimism about NHIS quality is a significant predictor of dissatisfaction. Perceiving NHIS quality as subpar or being undecided about the relative quality of NHIS is respectively associated with five times or twenty-six times the risk of being dissatisfied than not. Paying out of pocket on the contrary is associated with a lower risk of being dissatisfied due to 'other' unidentified reason. Hence, not having to pay out of pocket is associated with a higher risk of being dissatisfied but for some 'other' unidentified reason. Females as well as individuals in a higher wealth bracket, the 60th percentile, are less likely to complain because of 'other' reason.

The estimates also suggest that the residence (rural or urban) is not a significant predictor of perceived quality for any identified or unidentified reason among the insured persons in Ghana. Similarly having a child at home is irrelevant and so are differences in wealth and education levels[6].

In summary, these results imply that among the insured individuals, wealth and locality of residence are not significant determinants of the perception of the quality of health services received. Evidently, dissatisfaction with quality of health services received is predicted by having to pay out of pocket and a perception that NHIS cardholders, compared to non-cardholders, receive subpar quality. Additionally, males are more likely than females to be dissatisfied with health services received.

### 3.4.5 Predictors of perceived quality received by NHIS cardholder

The insured respondents ranked also the quality of services received by NHIS card holders in reference to quality received by non-cardholders. Table 3-6 reports multinomial regression estimates of the relative risk that a respondent perceives the quality of services received by NHIS card holders is less than better (compared to quality received by non NHIS cardholders). The variable *nhisqlty* is the outcome variable that indicates whether a respondent believes the relative quality of health services received is better, same, worse, or 'do not know/not sure'. The modal outcome is 'better' and it is the base category against which the relative risk ratios for the other outcomes are estimated in the multinomial regression.

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[6] Except secondary education and the 2nd quintile of wealth are associated with a lower likelihood to complain about waiting times being too long. Also the 4th quintile with has a lower likelihood to be dissatisfied due to some other (unidentified) reasons.

Estimates of relative risk ratios (see Table 3-6) on worse quality given to NHIS cardholder indicate not surprisingly that respondents who experienced dissatisfaction with the quality of services received at most recent visit are the most likely to perceive worse quality of services given to NHIS cardholder. Respondents that experienced staff impoliteness are sixty times likely to indicate NHIS cardholders receive worse services at 1% level of significance, than otherwise comparable individuals would suggest. Respondents who indicate receiving inadequate information about treatment are 33 times more likely to indicate that NHIS cardholders are worse off. Those for whom waiting times were the source of dissatisfaction are 15 times more likely to perceive NHIS as worse quality. Another predicator of NHIS quality being worse is post-secondary education level. One explanation could be that higher education may be related to a better access to health care information and networks and consequently a higher threshold for quality. An alternate explanation could be that higher education corresponds to a higher likelihood of occupations and employment that belong in the SSNIT pension scheme and consequently mandatory payroll deductions towards the NHIS Fund. One may expect that for such individuals the perceived benefits of NHIS, and consequently quality of services, ought to be high enough to offset the disutility of mandatory contributions to NHIS Fund. This may be especially true for individuals that are least concerned about solidarity. Their threshold for quality in NHIS is therefore likely to be higher than average.

Table 3-6: Factors predicting perceptions about quality received by NHIS cardholders compared to others: multinomial regression

| | Same | | Worse | | Do not know/not sure | |
|---|---|---|---|---|---|---|
| | odds ratio | SE | odds ratio | SE | odds ratio | SE |
| Need services not covered by insurance: base group has no such need | | | | | | |
| Need services not insured | 0.662*** | 0.10 | 1.085*** | 0.15 | 0.567*** | 0.298 |
| Perceived quality last treatment at clinic/hospital: base is 'good service' | | | | | | |
| No, waiting times too long | 2.719*** | 0.15 | 15.340*** | 0.18 | 1.652*** | 0.481 |
| No, staff not polite | 5.166*** | 0.47 | 60.465*** | 0.46 | 4.677*** | 1.093 |
| No, did not receive enough information | 1.724*** | 0.28 | 33.562*** | 0.26 | 6.884*** | 0.479 |
| No, other | 1.150*** | 0.21 | 5.819*** | 0.26 | 26.275*** | 0.237 |
| Has had to pay out of pocket for services: base group has not | | | | | | |
| Has paid for services out of pocket | 1.356*** | 0.10 | 1.348*** | 0.16 | 1.475*** | 0.263 |
| Household wealth: base group is 1st quintile | | | | | | |
| 2nd quintile | 1.020*** | 0.14 | 1.074*** | 0.26 | 0.953*** | 0.320 |
| 3rd quintile | 1.363*** | 0.14 | 1.393*** | 0.26 | 0.961*** | 0.344 |
| 4th quintile | 1.410*** | 0.15 | 1.472*** | 0.26 | 0.809*** | 0.375 |
| 5th quintile | 1.398*** | 0.16 | 1.543*** | 0.28 | 0.671*** | 0.410 |
| Locality of residence: base group is urban | | | | | | |
| rural | 0.953*** | 0.10 | 0.893*** | 0.17 | 1.016*** | 0.264 |
| Gender: base group is male | | | | | | |
| female | 1.585*** | 0.08 | 1.487*** | 0.14 | 1.823*** | 0.213 |
| Has child living at home: base group has 'none at home' | | | | | | |
| Child lives at home | 0.999*** | 0.08 | 1.042*** | 0.14 | 0.563*** | 0.213 |
| Highest level of school attended; base group is 'never attended' | | | | | | |
| primary | 1.102*** | 0.14 | 1.473*** | 0.25 | 0.486*** | 0.347 |
| secondary | 1.283*** | 0.12 | 1.197*** | 0.22 | 0.619*** | 0.283 |
| post secondary | 1.437*** | 0.18 | 1.647*** | 0.29 | 0.631*** | 0.483 |

Source: Calculations based on data from the Ghana Demographic and Health Survey V, 2008.
Note: Dependent indicator variable for perceived quality of services received by NHIS card holder compared to non-cardholder; base group perceives NHIS cardholder receives 'better' quality.
N = 3,494.
 *** p<0.01, ** p<0.05, * p<0.1.

Females also are more likely than males to perceive NHIS quality as worse. The women are consistently more likely to suggest NHIS cardholder receives similar quality, or to be unsure about relative quality. In other words, the men are less likely to be undecided about NHIS quality and are more likely to say that NHIS is better. This contrasts with the case of perceived quality of service received at the most recent visit where females were less likely to indicate dissatisfaction about quality received. What may be influencing unfavorable position about NHIS than males? Females are more likely to be insured and less likely to pay out of pocket (as shown in Table 3-3 and Table 3-4 respectively).

One explanation could be that females tend to use health care services more often in their capacity as primary care givers in the household and therefore more likely to have experienced NHIS cardholder benefits. In that case women would more likely hold stronger views about NHIS quality. As such unimpressed females may be more likely to perceive that non-NHIS cardholders must be better off. Moreover, females are more likely to be unsure about relative quality received by NHIS cardholder.

The results indicate also that the need for services not covered by insurance is not a significant predictor of the quality of health services received. The need for services not covered rather decreases the likelihood of considering NHIS quality as similar. In other words, respondents needing services not covered are more likely to consider NHIS quality as better. The implication is that respondents needing services not covered may be more appreciative of NHIS coverage. The summary statistics indicate also that 37 percent the respondents who need services not covered compared to 14 percent of the respondents who did not indicate a need for services covered, have had to pay out of pocket to pay out of pocket. Since 16 percent of females (compared to 25 percent of males) need services not

covered by insurance this may imply that females are more likely to be dissatisfied with NHIS. Respondents who have had to pay out of pocket are more likely to consider quality as similar and more likely to consider NHIS quality as worse than respondents who have not had to pay out of pocket.

When it comes to being unsure about the quality received by NHIS cardholder, paying out of pocket does not make a difference. On the contrary, basic education attainment and secondary level attainment are associated with a lower likelihood of being unsure, as is having children living at home. Respondents who experienced dissatisfaction about quality received at a visit due to inadequate information or other unidentified reason are the most likely to be unsure about NHIS quality. So as it turns out, the group of respondents more likely to be unsure about the relative quality of NHIS services (in Table 3-6 ) are also the ones who tend to be dissatisfied with services received at the most recent visit because of inadequate information and as well the group that tends to be dissatisfied for 'other' unidentified reason. Improving access to information or effective communication about health services may be effective in improving quality of health services especially where NHIS benefits are concerned. The community of residence makes for difference with respect to opinions about the relative quality of NHIS cardholder. Gender is the only factor that consistently differs in opinion about the relative quality of NHIS.

## 3.5    Conclusion

Ghana is pursuing the goal of making basic health care free at the point of service through the National Health Insurance Scheme. The goal in this study was to examine the progress toward universal access to quality health care and the implication of NHIS on out

of pocket payments. The econometric analysis has shown that community of residence, ability to pay or affordability and gender are the key predictors of the likelihood that an individual or household would be insured. The northern regions, rural communities and females have a better chance of being insured but so also are households in higher wealth brackets. When insured individuals have had to make out of pocket payments the need for service not covered by insurance is the driving factor though ability to pay is also significant. This suggests that health insurance improves access to health services by making it more affordable. Alternately, out of pocket payments for the insured improves the feasible set of desired services since nee, quality and ability to pay are key predictors of out of pocket payments. NHIS does not eliminate out of pocket payments and the potential equity gaps in ability to pay even if NHIS improves them. Hence the catastrophic potential of out of pocket payments persists even though such payments might respond stronger to critical needs not included in insurance than to ability to pay for basic package of services. The results from the econometric analysis suggest that the attitude of health workers has a significant effect on perceived quality of care, more so than the adequacy of information or communication about the treatment process. Either information is adequate or clients do not care as much for details so long as they are handled with the dignity they expect. A good attitude of health workers has potential to significantly improve health outcomes, to increase enrollments in NHIS and consequently create a strong subscriber base that would ensure long term sustainability of the Scheme with the attendant gains in welfare.

This study falls short in several areas largely due to limitations of the Ghana Demographic and Health Survey V data in addressing the research questions. One

limitation of this study is the lack of control for heterogeneity in health insurance schemes such as differences in performance (inherited, longer established versus relatively new mutual health insurance schemes), the local economies and the health system within which the schemes operate. This distinction is relevant in evaluating enrollments and outcomes. Another limitation is of absence of control for insurance status when analyzing the need to pay out of pocket and perceptions about quality of health services. The GDHS V survey questionnaire on these topics was administered to insured respondents only.

Other supply-side issues about NHIS that have to be studied include the technical dimensions of quality of health care including clinical procedures and outcomes and accreditation of facilities and providers. Also, information gathered from key informant interviews conducted in the process of this study suggest that NHIS faces critical challenges in the area of provider incentives, processing of benefits claims and reimbursements. However, these issues have been inadequately studied in the literature. The plan for a future research program is to evaluate the relative impact of the pilot phase of capitation reimbursement program compared to the general fee-for-service reimbursement approach on the quality of outcomes, on provider incentives toward quality health care and on efficiency in the use of resources in the context of NHIS. The immediate plan, however, is to extend this study to examine the key attributes of health care workers and health care facilities that produce quality outcomes and whether the NHIS has an effect on these outcomes.

**CHAPTER 4**

**A COMPARATIVE ANALYSIS OF COMMUNITY-BASED HEALTH INSURANCE APPROACHES TO UNIVERSAL HEALTH COVERAGE IN GHANA AND RWANDA**


## 4.1 Introduction

The World Health Organization describes universal health care coverage as the progressive development of a health system including its financing mechanisms into one that ensures that everyone has access to quality, needed health services and where everyone is accorded protection from financial hardships linked to accessing these services (WHO 2011). Accordingly, it is a challenge for a health system and any country for that matter to attain universal health care coverage with regard to reaching social or political consensus and mobilizing the appropriate financing mechanisms that must be in place. By several accounts, Ghana and Rwanda are the only two in Sub-Sahara Africa considered to have achieved an "intermediate stage of development in their [universal] health coverage" (Dixon et al 2014) while a few others like Kenya, Mali and Nigeria are in the early stages of reform (Lagomarsino et al 2012). In 2003 Ghana passed its National Health Insurance Law (Act 650) with the goal to create sustainable financing of quality health care for all, with special emphasis on the poor in Ghana. It is this Law that established the National Health Insurance Scheme (NHIS) specifically to:


"…*secure the provision of basic health care services to persons resident in the country through mutual and private health insurance schemes; to put in place a body to register, license, and regulate health insurance schemes and to accredit and monitor healthcare providers operating under health insurance schemes; to establish a national*

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*health insurance fund that will provide subsidy to licensed district mutual health insurance schemes; to impose a health insurance levy and to provide for related matters*". (Republic of Ghana 2003, p.1)

Following the Law, the District Mutual Health Insurance Schemes (one per administrative district in Ghana) which constitute NHIS, the auxiliary institutions of the National Health Insurance Authority (NHIA), the National Health Insurance Fund (NHIF) and the National Health Insurance Levy (NHIL) were created in quick succession. Presently, 156 DMHIS schemes representing more than 9 million subscribers (34% of the population) and 3,593 health care providers participate in the NHIS.

Rwanda has similarly adopted a National Health Insurance Policy (RNHIP) as a strategy to attain universal access to health care with this expressed goal: *"to provide a national framework for strategies and actions aimed at assuring that all residents of Rwanda can be enrolled in a health insurance plan that provides access to quality health care"* (Ministry of Health, Rwanda 2010 p. 14). The RNHIP expands on previously existing community health insurance (CHI) and social health insurance (SHI) arrangements by including the formulation of a comprehensive framework specifically to strengthen public-private institutions partnerships and to establish a health insurance council to oversee the coordination of activities in the health insurance sector.  The community health insurance schemes, commonly known as Mutuelle de Santé, hence Mutuelle, are often cited as a classic example of mutual health schemes in the developing country context. The majority of citizens are enrolled in a CHI schemes with coverage estimated at more than 85% in 2008 and although enrollments decreased in some years the proportion still stood

at 87% of the population according to the Ministry of Health (hence MOH-R) in Rwanda (MOH-R 2010, MOH-R 2012). Rwanda has some level of social insurance whereby employees in the formal public and private sector have mandatory insurance with contributions of 15% of basic salary, 7.5% of which is contributed by the employer. Also in existence is the Military Medical Insurance (MMI) for personnel and their dependents and it is funded by mandatory contributions of 22.5% of basic salary with 17.5% borne by the government. It is estimated that more than 90% of residents in Rwanda have health insurance (MOH-R 2012, RDHS 2011, EICV 2010). In effect not only do Ghana and Rwanda have in common a legal mandate on universal access to health care, they both have adopted district-level health insurance schemes as the main mechanism through which to attain universal health insurance coverage. Similarly, in both countries policy reforms towards a universal health insurance in recent years have involved efforts to increase centralization of fund management. In a revised Ghana National Health Insurance law (Act 825) enacted in 2012 all the district schemes have been merged to form a nationwide NHIS which every resident of Ghana is now expected by law to belong to. Consequently, all the district fund pools have been merged into on central Fund (NHIF) from which the Authority (NHIA) allocates subsidies to districts to cover operational costs. Effectively NHIS has evolved into a government-run community-level insurance scheme. Rwanda also has, since adoption of RHNIP in 2012, made the Rwandan Social Security Board as the supervisory authority in charge of all Mutuelle schemes but the community ownership is retained. In addition, a national pool of funds has been set up into which the funds mobilized by all Mutuelle schemes are to be collected (MOH-R 2012).

After almost decade in operation NHIS had just about 34% of the national population in membership according to the National Health Insurance Authority (2010). By December of 2012, 8,885,757 people were enrolled in 2012 (NHIA 2012), which amounts to an estimated 40% of the population. Yet a significant proportion of the population are eligible for exemptions from premium payments (the dependent minors of insured adults, pregnant women, the core poor and senior citizens aged seventy or more). What is more, alternative health insurance covers about 5% of the population (Ghana DHS 2008) so that population coverage pales in comparison to Rwanda. Mutuelle has received acclaim for the high rates in population coverage. When the MOH-R began implementing a rollout of Mutuelle in 2006 only three out of thirty districts had been in operation in the pilot phase beginning in 1999. By the end of 2006, voluntary enrollments had increased fast enough to cover 76% of the population (MOH-R 2008). Yet, unlike the NHIS, Mutuelle subscription stipulates insurance copayments and while the health services covered have been described as comprehensive (MOH-R 2012) the benefits package is by comparison smaller than the NHIS that is stipulated to cover 95% of the disease burden in Ghana.

Given the near universal insurance coverage in Rwanda one may infer by this measure that Rwanda has made faster gains towards universal health care which then brings to question what the critical factors to Rwanda's success are. More importantly, do the higher rates of insurance enrollments correspond to depth in coverage and equitable access to health care? Has there been a trade off in expanding coverage and access to quality services? Is speeding up insurance coverage sustainable given domestic resource and resource mobilization capacities? Or does universal health insurance coverage correspond

to a higher aid dependency? What key lessons and what caution should countries following in the stead of Ghana and Rwanda draw from either country's experience? These are valuable lessons that a comparative analysis holds potential for. A scrutiny of the factors that have been critical to the insurance participation rates in Rwanda and Ghana could is relevant as general case study on universal health insurance coverage. In addition, it would be informative to compare these two countries along the dimensions of access to health care as well as sustainable financing to put in context the progress that Ghana has made and to examine the feasibility of attaining universal access to health care given the political economy.

Arguably an attempt to compare policy outcomes across different jurisdictions is fraught with challenges beginning with the concern that they differ in policy contexts and the rate of policy change. The assessment of policy or its impact is a challenge given the multiplicity of variables that affect policy formulations and their outcomes. As one would expect, the difficulties are compounded when different countries are compared. However cross country comparisons may yield benefits in understanding the important factors that contribute to the progress of policy outcomes. Cyr and deLeon (1975) argue in favor of cross country policy comparisons by stating that:

*"...expanding the analytical horizon from one nation to two can easily more than double the difficulties involved. Nevertheless, comparative work also holds considerable promise for both the academician and the policymaker. The opportunities it provides are roughly related to the qualities which make it difficult"*. (Cry and deLeon 1975 p.6)

Wagstaff and Van Doorslaer (2000) have similarly observed that in health policy research cross country comparisons of health is a common approach to evaluating normative questions such as concern equity in health or access to health care. In spite of their differences as far as countries, Ghana and Rwanda have both experienced colonialism and the repercussions on the political, social, cultural and economic institutions. Both attained independence from colonial rule around the same period: Ghana in 1957, Rwanda in 1960. Both are Sub-Saharan, although of different geography and ecology. In both countries mutual insurance schemes are de jure integral to the approach to universal access. Both have begun a policy on health insurance coverage around the same period: with the passage of the NHIL in 2003 and the beginning of NHIS implementation in 2005 in Ghana; with the beginning of CBHI in a pilot phase in 2003 and the national roll out beginning in 2005 in Rwanda. Moreover, both countries have similarly structured national surveys that produce the data bases often used to assess indicators on health outcomes including health insurance demand (Demographic and Health Surveys) and living standards including household health expenditures (Ghana Living Standards Surveys; EICV in Rwanda). Contemporaneous comparisons become more feasible as either country surveys tend to be conducted within a year or two of the other country. For example, the standard DHS in Ghana has occurred in 1993, 1998, 2003, 2008 and 2013 and in Rwanda, in 1992, 2000, 2005, 2010 and 2015. The standard GLSS in Ghana has occurred in 1987/88, 1991/92, 1998/99, 2005/06 and 2011/12 and in Rwanda in 1985, 1993, 1998, 1999, 2000, 2005 and 2011. Even if these countries may be different than alike on a number of fronts the two are leading examples of reformers in universal access in SSA and consequently relevant in the global dialog on universal health care. Lessons on best practices could be extended (with

caution to case-specific factors that are not easily replicable) to other nations. The lessons are especially relevant to several in Sub Sahara Africa such as Nigeria, Kenya, Mali and Senegal that are at different stages of initiating or implementing universal health coverage reforms through national health insurance schemes, sometimes closely following the experiences of Ghana and Rwanda.

### 4.1.1 The research goal, questions and hypotheses

Ghana and Rwanda present interesting cases for comparative analysis given the similar objectives to attain universal access by means of a national health insurance policy but not so similar policy contexts and community-based approaches. More importantly Rwanda is close to attaining a feat that Ghana still struggles with- universal coverage in health insurance. It becomes useful to closely examine what factors and institutional features are critical to progress or to the challenges in adopting and implementing the respective district-based approaches to universal access. It is important to identify what factors may be considered luck or effort, country-specific or replicable. It is important also to identify how financially feasible universal access to health care could be, considering the program design, external resources and domestic resource capacities in either of these less resourced, developing countries.

The goal in this essay is to examine the factors critical to the success and challenges of community-based approaches to national health insurance in the form they are implemented in Ghana and in Rwanda. The health insurance enrollment rate in Rwanda has climbed in spite of a difficult political history and modest economic resources as the country is ranked among the poorest in the world. External aid has been instrumental and leads to the question of the sustainability of universal health coverage. On the other hand

Ghana's experiment with combining funding sources (payroll deductions and general taxation) that are more adaptable to the advanced country context with community-based funding and management of schemes, also presents a question for debate about financial sustainability in a relatively large informal economy and a weak tax system. In either country the policy on national health insurance has universal access to health care as the ultimate objective. Consequently, the existing health insurance arrangements may be considered to have limited potential towards attaining universal access to care if expansion in access to care and the financial risks associated remain unchanged. In other words, the objective in this study is to analyze the impact and financial sustainability of community based insurance models adopted in Rwanda and Ghana as the mechanism to expand access to health care. The following are the specific questions the analysis attempts to answer:

(i) What are the outcomes in population coverage, access to health services and financial risk protection?

(ii) What are differences in institutional factors and program design that explain differences in the outcomes?

(iii) Are the programs financially sustainable? If not, what policy changes are needed to keep them sustainable?

The initial hypotheses are that health insurance programs increase access to health services and the impact on access to health services is independent of the community-based model adopted, but a stronger domestic revenue mobilization capacity improves long term financial sustainability. One may argue that health insurance coverage in the developing country context is not a sufficient condition to guarantee access to quality health care considering that supply-side factors such as the availability of resources, the technical

quality of health care delivery and the efficiency of the health system are necessary. Nevertheless, it is reasonable to assume that subscribers voluntarily enroll in health insurance programs because they expect to minimize financial barriers in accessing needed health care. Continual voluntary enrollments and expansion in insurance coverage then signal that access to health services is expected to have improved than the alternative case of the absence of an insurance program. One other assumption is that, in principle, the program objectives in Ghana and Rwanda are similar with respect to the policy goals for universal coverage, hence observed differences in population insurance coverage may be attributed to factors related to the program design. With regards to financing structure, earmarked taxation, mandatory payroll deductions from the formal sector and stipulated subscription payments by informal sector subscribers are the main sources of funds for Ghana NHIS (National Health Insurance Authority 2010, NHIA 2012). Rwanda Mutuelle has similar financing sources as Ghana but the relative importance differs while external sources are relatively significant than the case of Ghana (Ministry of Health Rwanda 2012, MOH-R 2013).

The evidence in this study suggests that insurance programs improve access to health care and provide financial risk protection as expected. Ghana's NHIS enrollments have been strongly associated with a higher socioeconomic status: higher wealth brackets, formal employment and higher education. In contrast to Ghana, Rwanda's insurance system includes a mandatory feature through the requirement of enrollment by whole household units and household contributions to insurance premiums are determined by ability to pay. This program design corroborates the evidence in the empirical literature showing that disadvantaged groups are excluded from Ghana's NHIS to a greater extent

than in Rwanda (e.g., Binagwaho et al 2010, Dhillon et al 2012, Lu et al 2012, Dixon et al 2014b, Kusi et al 2015) as illustrated in Table 4-3 with further details in Appendix D. The Rwandan model is an integrated approach to poverty reduction which benefits from a high level of political commitment. On the contrary political branding of Ghana's NHIS overshadows its relevance as development strategy. With respect to provider reimbursements, Rwanda has inbuilt performance evaluation and monitoring with a client-based component which helps to reduce principal-agent problems. Ghana lacks an integrated client-based evaluation component but rather emphasizes provider focused evaluations such as clinic audits. However, these measures have proven to be inadequate to deter considerable fraud in provider claims in either country. Contrary to the initial hypotheses about mode of financing and sustainability, institutional accountability is the critical factor for financial sustainability both in Ghana and Rwanda. The implication for policy is that Ghana NHIS should incorporate a mandatory component which is essential to the successful expansion in coverage to levels commensurate with universal coverage. Ghana should improve equity in coverage by determining household contributions according to ability to pay, and even though this proves to be a difficult challenge in Ghana, the search for a means-tested approach to premium contributions must continue. Subsequent sections provide further results and the details of this study.

### 4.1.2 Method of analysis and data sources

The comparison between the Ghanaian and the Rwandan model of national health insurance as a means to achieve universal coverage is based on existing data. An extensive literature review and a logging of information are the main methods used. These include assessments of the evidence about the linkages between participation in the health

insurance schemes and the outcomes in access to and utilization rates of health services, as well as financial risk protection and how strong these linkages are. Majority of the evidence is based on district level household and health facility surveys, and national household surveys and demographic and health surveys. Activities include identifying and categorizing the evidence about the key institutional and program design features that sets the schemes apart. The approach to financial sustainability assessment includes key accounting ratios and descriptive statistics. Financial sustainability of the approach to universal coverage would be assessed with respect to reliability of the sources of funding over the short and the medium term. This exercise would rely on both published and grey literature in country specific public records such as fiscal data, national health accounts and reports. Further details about the methods are discussed in each respective section.

### 4.1.3    Conceptualizing universal access to health care

Universal health care coverage (universal coverage) invokes the values of equity, shared responsibility and quality in health care delivery irrespective of the individual's ability to pay (WHO 2005, Stuckler et al 2010, WHO 2011, Japan-World Bank 2013, Mebratie et al 2014). It involves judgments about the range of services, the intended recipients and expectations about the quality of the defined services. As such universal health care may imply different things to different groups or countries but the common theme is the non-discriminatory access to a defined health benefit for a defined group of the population (Stuckler et al 2010, Mebratie et al 2011, Lagomarsino 2012).   Universal health 'coverage' has often been applied to the low and middle-income country context while universal health 'care' is the term often applied to the high income country setting. This distinction draws attention to the fact that attaining broad coverage of the population

does not necessarily guarantee access to a basic package of health care in the developing country context (Stuckler et al 2010). Drawing on this important distinction, this study conceptualizes *universal access* to health to imply the absence of economic barriers to attaining needed health care. This operational definition precludes connotations of the technical quality or the effectiveness of the defined minimum package of services. In other words, *universal access* in the context of this study assumes away the effectiveness of the defined basic package of health services in meeting the intended health needs of the population. In a similar way this study assumes a distinction between universal *health insurance coverage* and universal access to health care. In other words, we do not assume a high insurance coverage rate would necessarily imply the attainment of a universal health care system. The focus is that community-based health insurance approaches are the tool to expand health insurance coverage and by that, to expand access to a given minimum basic package of health care. In that respect universal health insurance coverage may ultimately lead to universal access to a defined minimum package of health care. The narrower definition is for the purposes of analysis while also acknowledging that assessments about universal coverage requires a holistic analysis of the health system including health services delivery and technical quality of health care and not only the analysis of financial barriers to access.

As one would expect of population dynamics, universal health coverage entails dynamic continuous processes in response to shifting demographics, epidemiological and technological trends and expectations (WHO and World Bank 2015). Assessment of UHC design and implementation can be made by the dimensions in height, depth and breadth of coverage (Stuckler at al 2010). Height is in reference to financial cost sharing so that public

dominance would be commensurate with a greater height in coverage than would be the case with private dominance where services are based on ability to pay. Width refers to the percent of the population covered so that a broader program would cover almost all the population regardless of age, gender, ethnicity, as against targeted groups of the poor or the pregnant or children or veterans and such like. Depth of coverage refers to the extent of services included, whether a basic package of services or some essential medicines, hence the more comprehensive the package, the deeper the coverage. Another differentiating feature of a UHC program is the mobilization of resources or the financing structure. The key mode of financing are prepayments toward pooling risks, either through a national framework of mandatory contributions to (state-managed or privately-managed) social insurance programs, or through contributions to a community-based health insurance (CBHI) with voluntary membership as often apply in the developing country setting. CBHI generally involves greater participation of the target population in the design and management of the insurance scheme (Mebratie et al, 2013) and participation is often voluntary.

Rwanda has adopted a two sector approach to expanding health insurance coverage as an important means to attain universal access to health care (community-based health insurance on one hand and social health insurance on the other) while Ghana combines both. NHIS is largely domestically financed arising from internal political dynamics while overseas development assistance has had a greater role in sustaining Rwanda's CBHI program. The table gives a brief overview of the current structure of the programs while subsequent sections provide details about how this structure has evolved. Subsequent sections provide details also about the differences in outcomes, the peculiar and the

common institutional features of these country models and how these features explain the observed outcomes.

Table 4-1: The general structure of financing and coverage: NHIS versus Mutuelle

|  | Ghana NHIS | Rwanda Mutuelle |
|---|---|---|
| Starting year of nationwide expansion | 2005 | 2006 |
| Breadth of coverage | Eligibility for all citizens.<br><br>35% national population coverage in 2012 | Eligibility for informal sector.<br>76% national population coverage in 2015 |
| Depth of coverage | Defined package of services covering 90% of the national disease profile. | All primary health care services; secondary services with varying levels of coverage |
| Sources of financing | Domestic:<br>5-7% in premium s<br>63-81% in earmarked taxes<br>17-19% in payroll taxes<br><br><br>ODA:<br>< 5% in donations | Domestic:<br>55-66% in premiums<br>2% in levies<br>14% or more in government budget allocations<br>5-6% in copayments<br><br>ODA:<br>11% in The Global Fund |
| Administrative structure | Relatively centralized<br>-District schemes managed by local and government appointees<br>-NHIA is the central implementing agency | Decentralized<br>-District schemes managed by community-appointed representatives<br>-Implementation decisions shared between Ministry of health and scheme managers |
| Provider reimbursement method | Fee-for-service<br>Capitation in select regions | Fee-for-service with inbuilt performance-based evaluation |

Sources: Ministry of Health Rwanda Annual Report in various years, National Health Insurance Authority Annual Report in various years, and author's calculations.

### 4.1.4 Outline of the study

The next section is a brief description of the country background by presenting several indicators of economic development and health system performance. Section three presents a systematic review of the literature on the impact of Mutuelle and NHIS on households with emphasis on the patterns in enrollments, health services utilization and financial protection. Section four builds on the evidence by presenting the differentiating features of Mutuelle and NHIS that may lend themselves to differences in the patterns

observed. Section five analyses the financial sustainability issues for Mutuelle and NHIS. Section six is a summary of the key findings and concluding remarks and prospects for research.

## 4.2    Country background

A brief description of the economies of Ghana and Rwanda is useful to put in context the relative level of economic development and also the health system that Mutuelle and NHIS are founded in. This summary review of some key indicators suggests that the economic status and the development progress achieved in the recent decade vary for Ghana and Rwanda but the need to sustain improvements in access to health services is equally critical. In addition, this background information helps to explain the evidence presented in the study and the implications for universal health care coverage.

### 4.2.1    Structure of economy and poverty

As is common to most SSA and developing countries in general, Rwanda and Ghana have significantly large informal and agrarian sectors although slight transitions have been observed in recent decade. This feature of large informal sector is an important factor in the adoption of community-based health insurance as a policy tool for universal coverage. Informal sectors have limited access to formal financial services and expectedly lower rates of participation in formal insurance markets. Similarly, a limitation in formal employment arrangements limits the reach of social or employer-based health insurance. Accordingly, mutual or community risk pooling arrangements, whether government-sponsored, donor-sponsored or completely autonomous, have become a dominant medium to reach the informal sector with health insurance services.

In Rwanda, subsistence agriculture is the source of livelihood for upwards of 49% of the population with another 9% in farm wage employment. Another 19% are in nonfarm self-employment and 14% in nonfarm wage employment (NSIR 2012). The economy grew at an average of 8.8% in 2011 spurred by the industrial growth resulting from the scale up of construction projects in national infrastructure building. Similarly, in Ghana recent data indicates more than 68% of the employed are in own-account, vulnerable work, hence predominantly informal (Ghana Statistical Service 2014). In recent estimates, 44.3% or employed individuals are directly engaged in agriculture or fishery and 10% are in manufacturing and industry. The services sector has been the leader in growth, unlike the case of Rwanda where industry is the growth leader. Also, Ghana has experienced a faster growth trajectory with rates as high as 15% in 2011 and an average of 6% in the years since 2007 bolstered by revenues from oil and gas production (African Development Bank 2014). Regardless Ghana has been experienced widening budget deficits with an unprecedented deficit of 13% of GDP in 2012 and similar in 2013. What is more, neither the recent growth trajectory nor the deficit correspond to faster growth in health sector resources or improved health outcomes as may be observed below.

Ghana has relatively higher gross national income per capita and lower rates of poverty than Rwanda as demonstrated in Figure 4-1. Although Rwanda is ranked among the poorest countries, evidence from living standards measurement surveys (Integrated Household Living Conditions Surveys or EICV [7]) shows that poverty has declined

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[7] Enquête Intégrale sur les Conditions de Vie des Ménages

significantly in recent years.  For instance, consumption poverty fell from 58.9% in 2000/2001 to 56.7 in 2005/2006 and again to 44.9% in 2010/2011. Extreme poverty declined from 40% in 2000/2001 to 35.8% in 2005/2006 and to 24.1% in 2010/2011. Within this period Rwanda achieved increased agricultural production, slower population growth, increases in non-farm wages and improvements in income transfers which may explain the poverty reduction. While poverty reduction has been significant in all provinces, rural poverty was 48% compared to urban poverty at 22% in 2010/2011 (NSIR 2012). The depth of poverty in the capital, Kigali City, is 16.7% while differences between other provinces tend to be very small ranging from 42% to 52% in 2010/2011.

Rwanda has more than 75 percent of the population living in rural areas compared to 49.8% in Ghana as shown in Figure 4-3.  This predominance of rural population has greater implications for inequities in access to economic infrastructure and its influence on the patterns in poverty distribution. For example, access to electricity for lighting is a low 10.8% for the general population in Rwanda and yet rural-urban inequality is pronounced: 46 percent of urban population have access compared to 4.7 percent of rural population. Using the World Bank estimate of the Gini index as an indicator of overall inequality, Rwanda compares better than Ghana as illustrated in Appendix D. Rwanda's index increased from 28.9 in 1984 to a high of 53.1 in 2006 although declining to 50.8 in 2011, whereas Ghana's index was at a level of 35.5 in 1987 but gained a smaller increase to 42.3 in 2005.

Figure 4-1: Poverty headcount ratio at $1.25 a day (PPP): Ghana and Rwanda
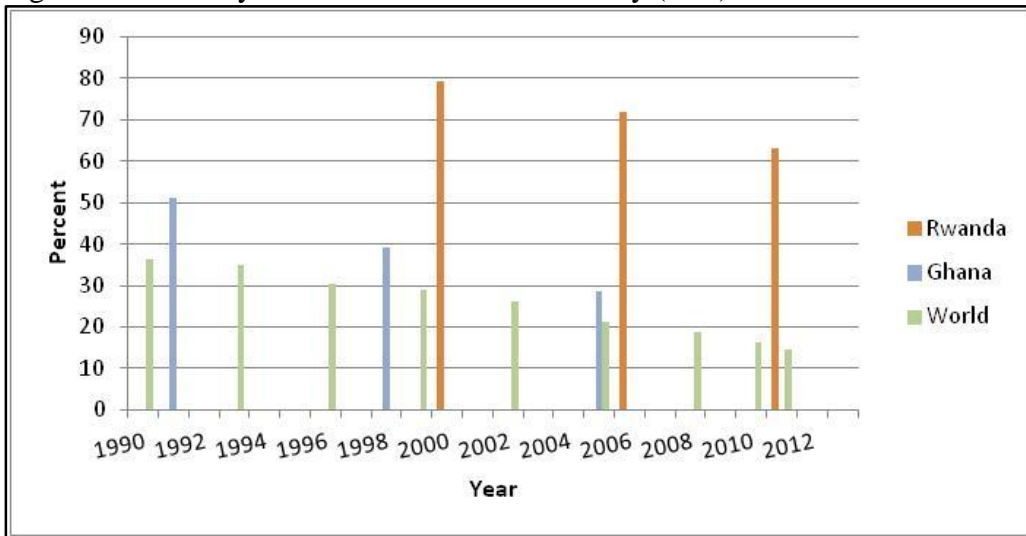


Source: World Bank World Development Indicators database.

Figure 4-2: Gross national income per capita in Ghana and Rwanda (current US $)
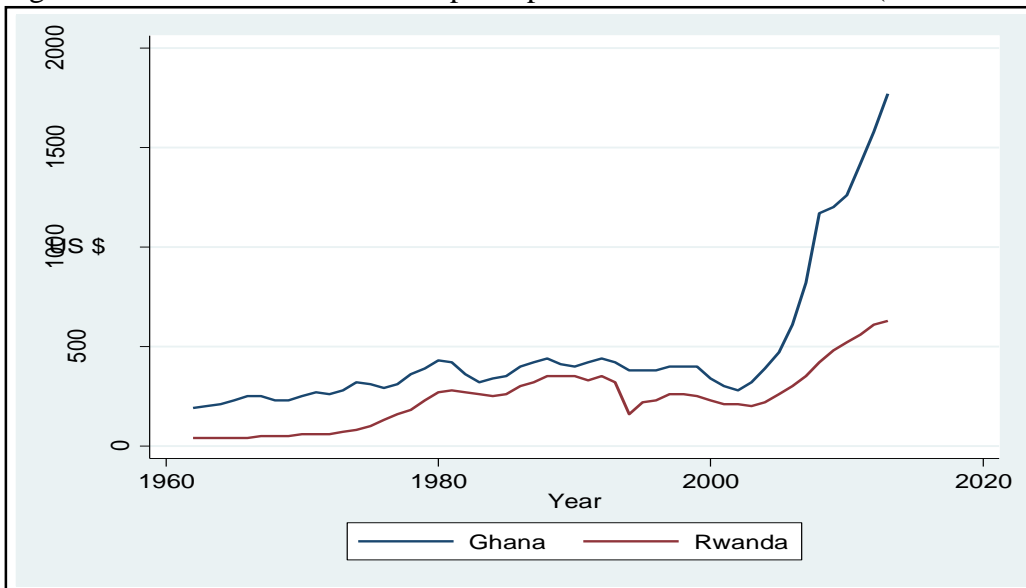


Source: World Bank World Development Indicators database.

Figure 4-3: Population distribution by locality and access to electricity in Ghana and Rwanda (percent of total population)
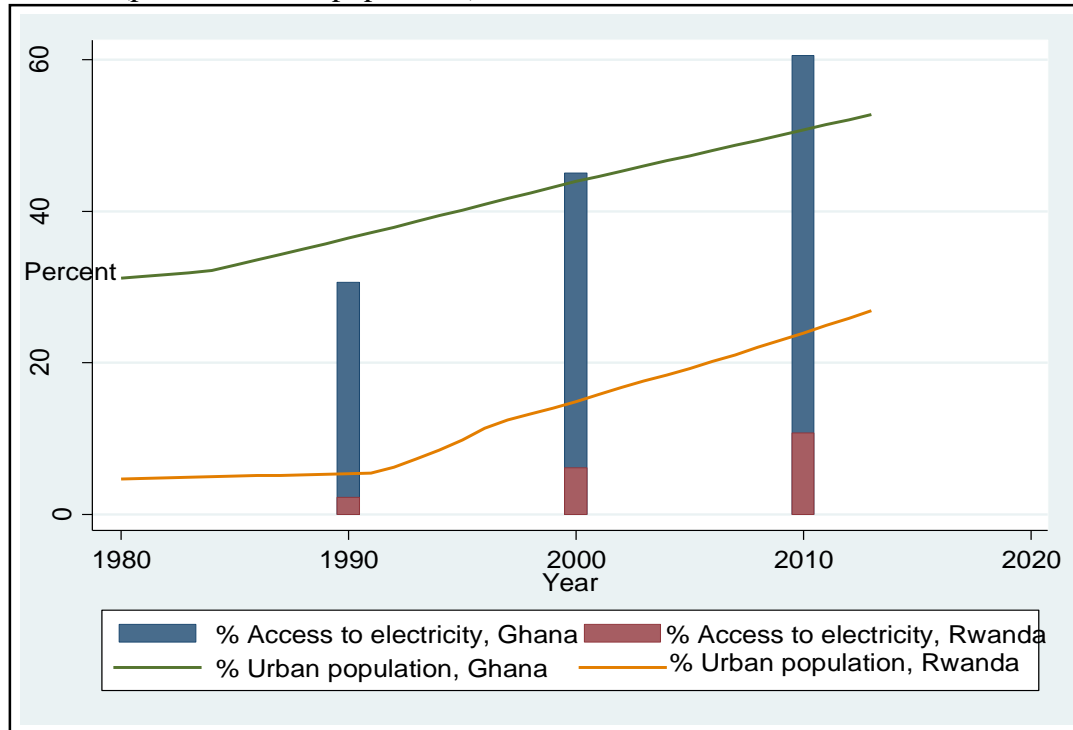


Source: World Bank World Development Indicators database.

### 4.2.2 Health system performance in Rwanda and Ghana

In 2000 the WHO World Health Report ranked Rwanda as one of the weakest health systems in the world. Rwanda had an overall rank of 172 out of 191 countries. Ghana was viewed to have a better health system at a rank of 135. On health level indicators Ghana and Rwanda ranked worse at 158 and 181 respectively. Rwanda performs better however in the indicators of fairness in financial contribution, ranking at 60 compared to 75 for Ghana. The relative importance of the factors that make up the ranking index is as follows: 1. Health Level: 25% 2. Health Distribution: 25% 3. Responsiveness: 12.5% 4. Responsiveness Distribution: 12.5% 5. Financial Fairness: 25%. To put in perspective how Ghana and Rwanda performed one may compare that only four other SSA countries (Seychelles, Senegal, Burkina Faso and Sudan) in the first 134, ranking at 56, 59, 132 and

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134 respectively. Afghanistan, Cambodia and Burma were the only non SSA to rank below Rwanda at 173, 174 and 190 respectively. Although the WHO has since declined to rank health systems one has a point of reference about the relative progress Ghana and Rwanda have made in subsequent years.

Nationwide surveys indicate that Rwanda has made significant gains in maternal and child mortality. The annual maternal mortality rates have reduced from 1071 deaths in 2000 to 487 in 2010 and 69% of deliveries in 2010 were assisted by a skilled worker compared to 39% five years prior. In 2010 90% of children from 12 months to 23 months had received the scheduled vaccinations compared to 76% five years prior. Annual under-five mortality rates declined from 152 deaths in 2005 to 76 in 2010. Rwanda is therefore believed to be on target to achieve the millennium goal for child mortality and maternal mortality by 2015 (NISR 2012). The usual major challenges in health service delivery such inadequate infrastructure and human resources, in particular, midwives and specialist doctors still persist. The average travel time to the nearest health facility is sixty minutes and at least 40% of the population live more than five kilometers away from a health facility (MOHR 2010, NISR 2012). It is easy to compare maternal and child health in both countries given the emphasis these demographics have received in the Millenium Development Goals for the past decade. Recent data (see Figure 4-4Figure 4-4) shows Rwanda has progressed from a weak position to attain better outcomes especially in maternal mortality even though Ghana had considerably better outcomes at the turn of the century.

Figure 4-4: Health outcomes in Ghana and Rwanda
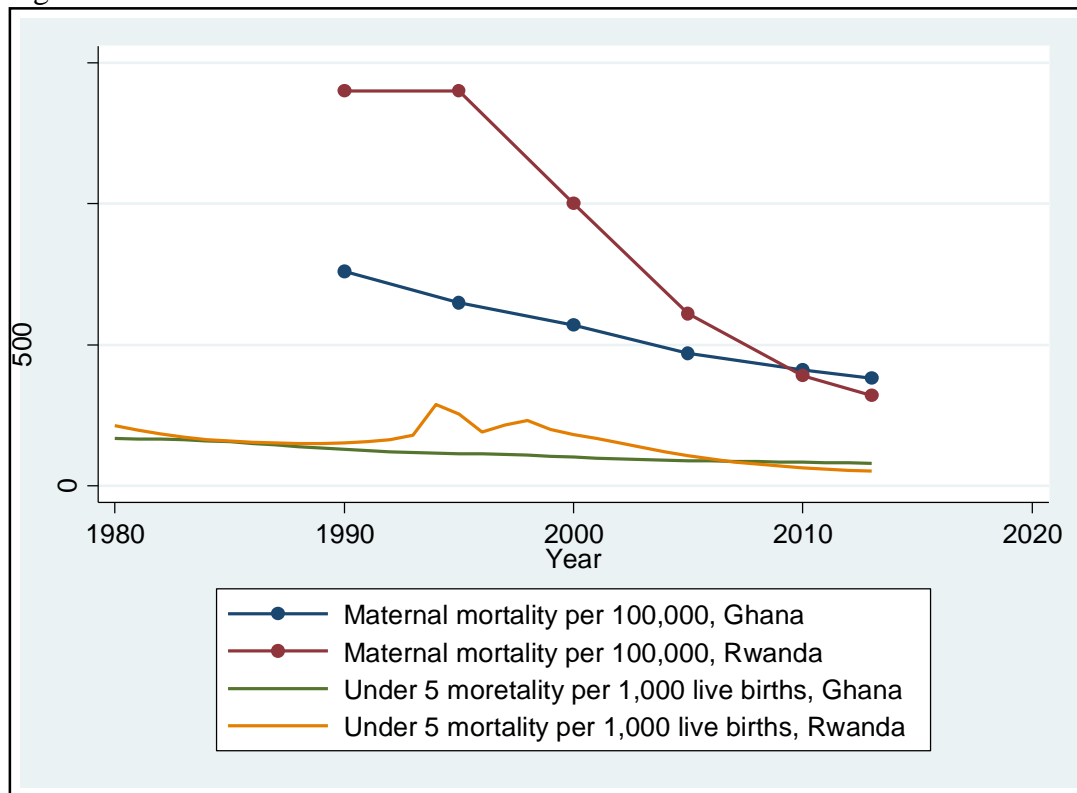


Source: World Bank World Development Indicators database.

Judging by the level of human resources (see Figure 4-5) Ghana has a better resourced health system than Rwanda: physicians per 1,000 populations was 0.056 in 2010 compared to 0.096 in Ghana, which translates to 17857 and 10417 people per doctor in Rwanda and Ghana respectively. Looking back, Rwanda has made some progress in this area considering the average of 0.069 physicians per 1000 of the population in the period 2006-2013 compared to 0.1 in Ghana over the period 2000-20009 according to the country-specific factsheets of health statistics published in WHO databases. Over the same periods the nursing and midwifery personnel per 1000 population was 0.69 and 1 in Rwanda and Ghana respectively.

Figure 4-5: Physicians per one thousand population: Ghana and Rwanda
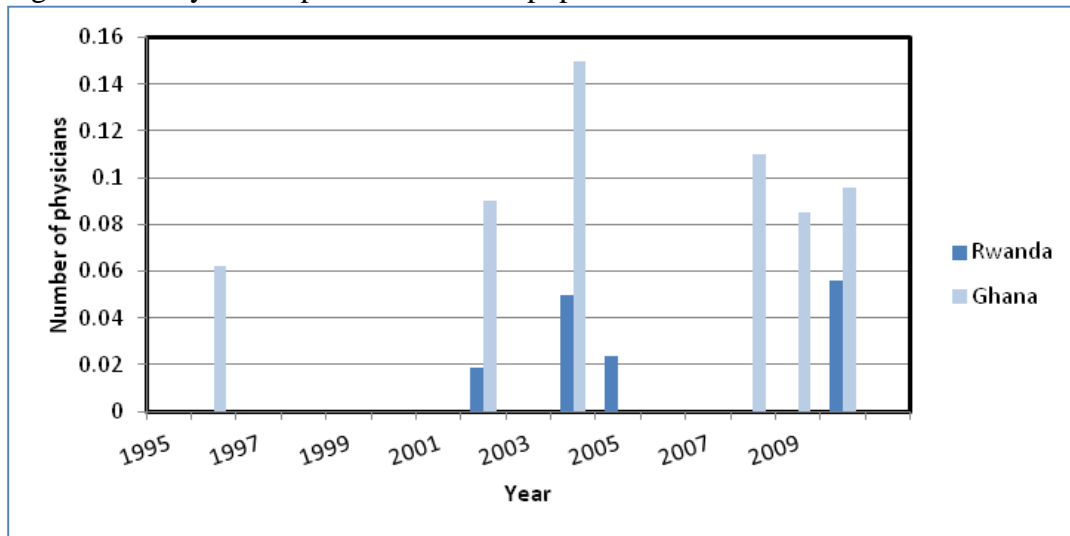


Source: World Bank World Development Indicators database..

Human resources aside, Rwanda has been described as having one of the most efficient public sector administration and consequently an efficient health system in Sub Sahara Africa. In contrast, the public health sector financing in Ghana has been described as in transparent (Abekah-Nkrumah et al 2009). The health system in Ghana was once described as the second most corrupt in the world (World Bank, Africa Development Indicators 2012). Seeing as a significant proportion of health sector financing is channeled through the public sector in Ghana it is easy to appreciate how public sector inefficiencies or mismanagement could have significant constraints on health outcomes in Ghana. On the other hand, a greater share of public health expenditures may have implications for equity since countries that have a stronger public role in the health sector have generally been associated with better equity in health care coverage (Stuckler et al 2010).

### 4.2.3 Patterns in expenditures on health

Domestic sources of health spending are an important indicator of a government's commitment and a critical factor in the sustainability of health programs (Heller 2005, Lu

2010). The WHO (2010) estimates that the minimum per capita expenditure on health services required to provide basic life saving services is $44 per year. The average per capita health expenditures in current US dollars for the period 2010-2014 is estimated at $100 and $77 for Ghana and Rwanda respectively (World Bank 2014). By this measure, both countries would have resources at their disposal to provide a minimum basic package of health care. However, a given level of expenditures does not guarantee the required basic minimum package without taking into account other technical and institutional factors of the economy as well as the socio-cultural and economic barriers households face in gaining access to adequate care.

Some general patterns in the expenditures on health over the past two decades show notable differences between Ghana and Rwanda, the shifting roles of public and private financing channels, and the relative importance of out of pocket expenditures. In Rwanda over 40% of expenditures on health is financed from external with such funds going towards targeted programs (Rwanda 2010). The share of external funding in total health expenditures is believed to be much higher because of significant amounts of work by nonprofits that may not have been fully captured in the national accounts (Rwanda, 2010). Ghana also benefits from external support although the share in total expenditures on health is small compared to Rwanda, as illustrated in Figure 4-7. However, private expenditures are a bigger share in Rwanda as inferred from the relative share of public health expenditures in GDP (see Figure 4-6 and Figure 4-7) but the share of out of pocket expenses including insurance premiums (MOH-R, 2006) in the total expenditures are lower compared to Ghana (see Figure 4-8). With a relatively smaller public share but a larger external share it appears that more of the aid is channeled through the private sector such

as non-profit institutions on behalf of households. That may partly explain the relatively large private share in Rwanda as shown in Figure 6. In effect Rwandan households on do not bear as much of the burden regardless of the relatively large role of private spending.

In as much as both countries have been beneficiaries of external resources, it appears that the Rwandan health system relies heavily on external support. It is a good thing that more resources have become available than Rwanda could mobilize domestically and especially with the high poverty rates. Regardless of the relative size of economy and given the relatively higher gross national income per capita in Ghana, Rwanda's health expenditures per capita are comparable to those in Ghana (see Figure D3 in Appendix D). Rwanda's health sector may be more vulnerable to the availability of external resources than the case may be for Ghana. Not surprisingly, Rwanda has set an ambitious goal to wean itself off aid as has been expressed in the country's economic development plans (Vision 2020) health benefits from the current influx of external support (MOH-R 2012).

Figure 4-6: Expenditures on health as a share of GDP: Ghana versus Rwanda
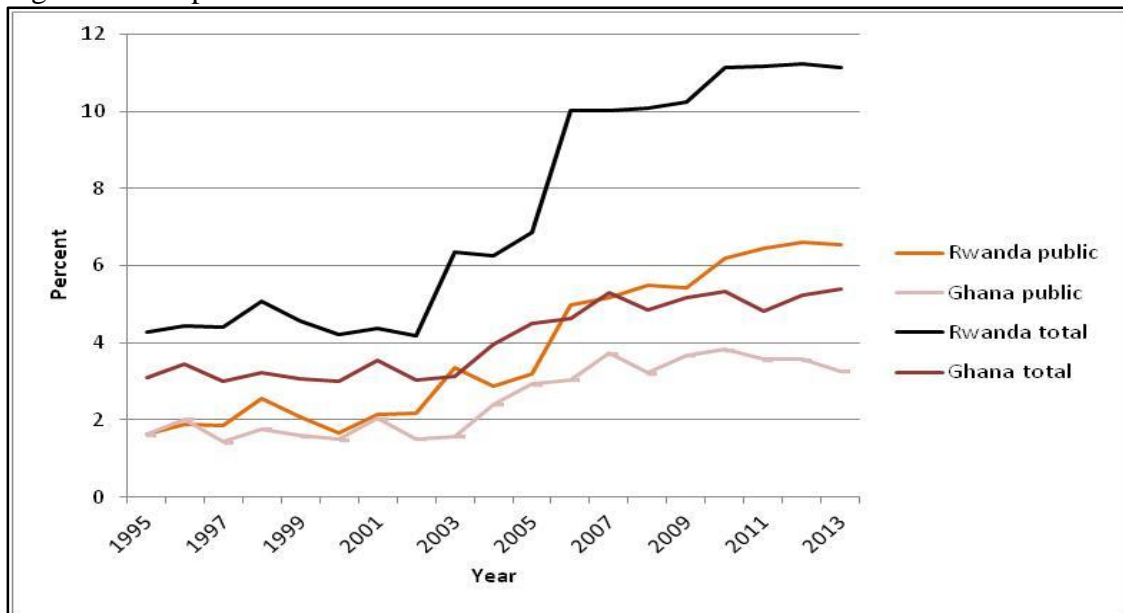


Source: World Bank World Development Indicators databases.

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Figure 4-7: Public health expenditures and external resources as percent of GDP: Ghana versus Rwanda
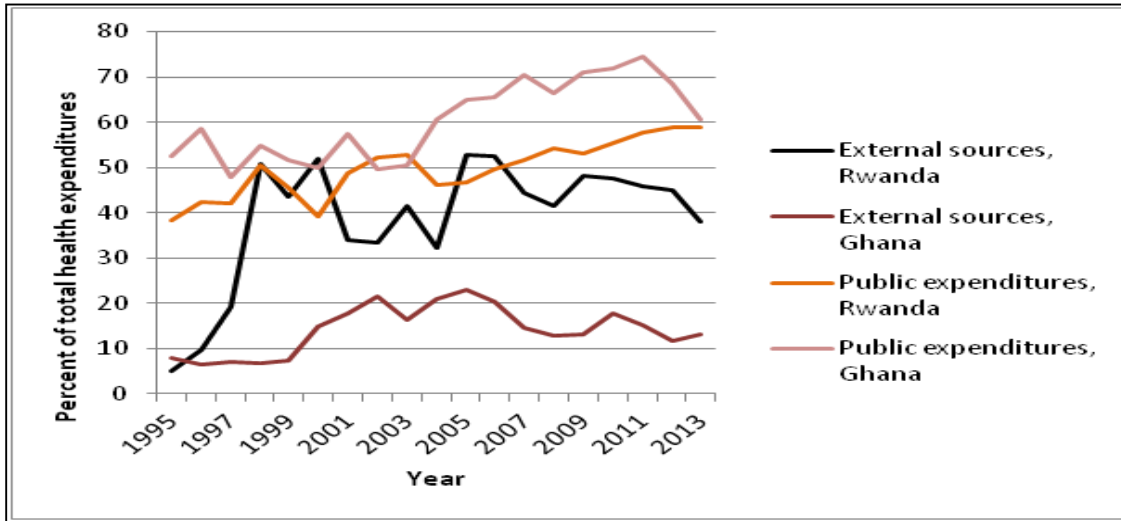


Source: World Bank World Development Indicators database.

Figure 4-8: The share of out of pocket payments in the total health expenditures in Ghana and Rwanda
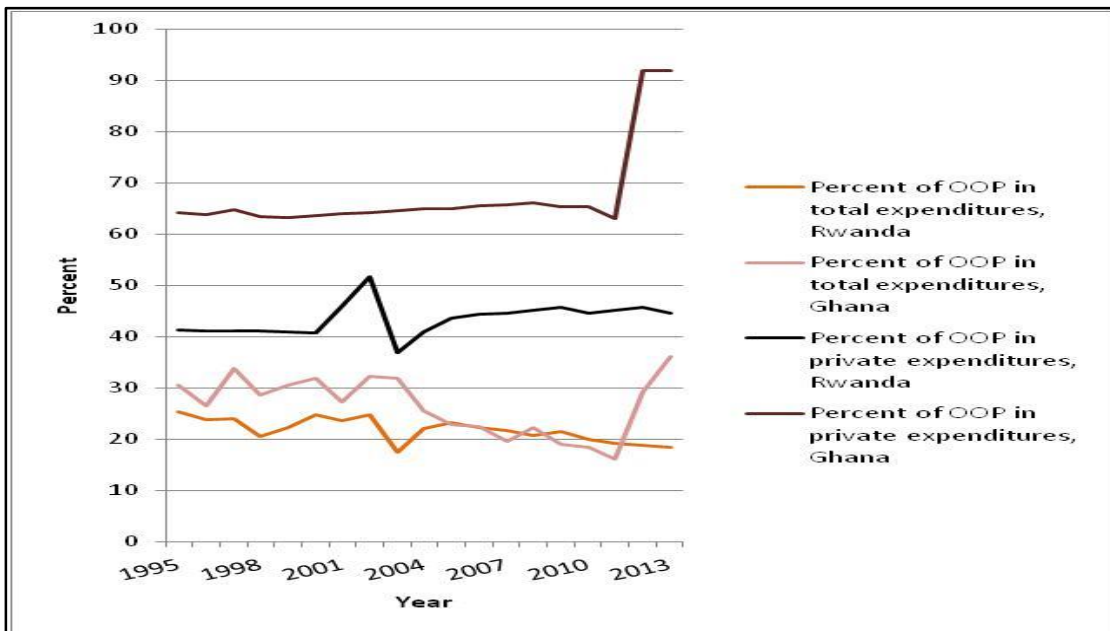


Source: World Bank World Development Indicators database.

These patterns in expenditures suggest that financial sustainability of universal health coverage in Ghana depend to a greater extent on domestic resource mobilization capacity and most sensitive to public sector efficiency. Most likely in Rwanda, the

effectiveness of the non-profit sector at mobilizing and allocating resources efficiently has a greater stake in universal health coverage in Rwanda.

## 4.3 Evidence on the outcomes in health care utilization and financial risk protection of Ghana NHIS and Rwanda Mutuelle

Rwanda has experienced notable changes in health coverage and outcomes in a relatively short period of time. Health insurance coverage jumped from 7% in 2003 to 91% in 2010 (MOHR, 2010) and in the same period outpatient visits per capita increased from 0.31 to 0.95. Under five mortality rates have been halved from 15.2% in 2005 to 7.6% in 2010 (NSIR 2010). Delivery in a health facility by women who had a live birth increased from 28% to 69% in 2010. Significant increases in health spending occurred also within the same period (MOHR 2008, NSIR 2010, R. Dhillon 2011, and World Bank 2011). The NHIS in Ghana has similarly been associated with positive outcomes in maternal and child mortality and an overall improvement in communicable diseases (Ghana NDPC 2008, MOH-G 2012) because of increased utilization of health services. Outpatient visits per capita increased by 0.23 within three years of implementing NHIS compared to increase of 0.15 (MOH-G 2012) in the eight years prior. A detailed and systematic review of the empirical evidence would be useful to identify in specific terms what impact these universal health insurance programs have had, including issues about equity and the potential to achieve universal access to quality health care.

This section reviews the existing evidence on the impact of Ghana NHIS and Rwanda Mutuelle on access to health care, financial risk protection and health outcomes. The evidence is discussed with regards to the potential for community health insurance to attain universal health insurance coverage and the ultimate goal of universal access to health care. Furthermore, findings about community-based health insurance schemes

(CBHIS) in developing countries (Mebratie et al 2013) provide an additional point of reference by which to compare the performance of Ghana NHIS and Rwanda Mutuelles. Through a detailed review of CBHI in the developing countries, Mebratie et al (2013) arrive at some conclusions about CBHI characteristics based on CBHI outcomes, origins in formation and governance structure.

With regard to CBHI outcomes Mebratie et al (2013) find that CBHI coverage as share of the target population ranges from 1% to 100% with an unweighted mean of 37.2%. Evidence in 61% of the studies indicates that the "ultra poor" are excluded and even where the poor are well included in membership they tend to use health services less intensively due to reasons such as inability to afford copayments, transportation costs and foregone income. Evidence indicates that households with chronic health conditions more likely to join CBHI. The majority of the studies report increased health care utilization as an outcome of CBHI. The findings differ, however, across the type of health service: CBHI is somewhat more effective at extending access to outpatient services than inpatient services. Not much is discussed about outcomes in quality of health services. On financial protection, some studies looked at out of pocket payments but only half that number included measures of catastrophic spending most of these studies conclude that catastrophic spending has been prevented. The evidence suggests a reduction in OOP ranges between 12%-35% payments.

With these measures in mind this study attempts to assess the performance of Ghana NHIS or Rwanda Mutuelle in equitably improving access to health care (as implied in policy objectives) and more specifically to compare which scheme performs better in each

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measure of equitable coverage, improvement in access to health care or financial risk protection for households.

The approach to the literature review is partially based on the systematic literature review framework for Meta analysis, a statistical technique to combine the findings from two or more independent studies to answer a common question and consequently the validity of the analysis depends on the quality of the systematic review on which is based (Crombie and Davies 2009, Mebratie et al 2012). The literature review in this study does not include technical statistical combinations and sensitivity analysis of findings. The review was adapted to the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) protocol, hence the following guideline:

1. The aim for the study is specifically defined as follows: a review to provide a synthesis of the existing knowledge about the effect of the Ghana National Health Insurance Scheme, and similarly the impact of Rwanda *Mutuelle* Schemes, in four measures of outcomes: household insurance coverage rates, health service use rates, financial risk protection and the state of health (status).

2. The sources of data are as follows: published and unpublished papers over the 20-year period from January 1995-January 2015 as both country schemes had pre-existing schemes in the 1990's and which had formed an integral part of the respective national insurance policies subsequently implemented.

3. Databases: The publications were located through the search of the following five databases (the first four was obtained through the University of Massachusetts Library portal): Econlit, PubMed, Science Direct, SSRN JSTOR, Google Scholar. In addition, reports, background papers, working papers and pamphlets were searched in the WHO

databases and links to sponsoring institutions such as United Nations. Similarly, country-specific databases (e.g. Ministry of Health, National Health Insurance Authority, NDPC) and links to sponsoring institutions and organizations (e.g., USAID, Dfid, DANIDA, JICA, Belgium), and NGO's (e.g., ISODEC) were sourced. Academic, government and non-government research consortiums (eg Joint Learning Network on Universal Health Care) were also important sources.

3. Search criteria: The search was based on the key phrases and iterations of these phrases in this order: Ghana National Health Insurance Scheme *and*: -enrollments, -access to health services, -financial risk protection, -health status. The same was repeated for Rwanda CBHI Mutuelle Schemes. The searches churned out several hundred abstracts of research papers, books, reports, news articles, even also conference programs and outputs and many of these appeared to be remotely related and some not at all related to the objectives in this study. Nonetheless all the search results were routinely compiled electronically using RefWorks, or manually where necessary, and filed into lists of bibliographies for each key phrase search. As expected many of the search results were cross listed in two or more key phrase searches so such papers were kept to the first list in which they appeared.

4. First selection: Given the specific objectives of this study, the titles, introductions and conclusions and in particular the abstracts were skimmed to identify papers that addressed at least one of the four outcome measures (enrollments, access to health care or health care use, financial risk protection, health state). Papers that did not specifically state any of these outcome measures in the objectives, introduction or conclusions were considered to not address them adequately so such papers were dropped. At this stage a

rough count was made of the remaining relevant literature. About 50 papers on Ghana and 40 on Rwanda remained for a second round of selection.

5. Second selection: Studies that did not single out the relevant health insurance schemes in Ghana and Rwanda such as the studies that were generally regional or multiple country level analysis were disregarded for the sake of focus in this study. Similarly studies that did not include any measure of impact at the client or member (i.e., household or individual) level were dropped. About 40 were dropped at this stage.

6. Final selection: The favored studies would ideally lay out specific and clear details about the research methods used to identify, collect and analyze information that adequately addressed clearly defined research objectives and certainly related to at least one of the four measures of impact stipulated in this review.

About methods, the favored papers had to at least comment on, better still control for, the problems of confounding or interdependency or unobserved factors as they relate to insurance uptake, health care use, financial risk protection or health state. With these satisfied about 35 studies remained.

The criterion used to select the final list for detailed review was that studies included statistical or econometric methods in the analysis of information were favored. If methods were largely qualitative in nature, they must include at least some descriptive statistics with tests of statistical significance. This criterion of quantitative analysis was simply to aid in standardization and comparison of the findings. For example, outcome measures of health service use would state the averages for OPD use rates, hospitalization rates or the number of births that had skilled attendants and so on. Additional papers were

found looking through the reference lists of selected studies and these papers were included in the selection.

7. Detailed review: A final list of 15 papers on Ghana and 7 papers on Rwanda were reviewed in greater detail. The papers were carefully scrutinized and a data extraction template (similar to Table D1 and Table D2 in Appendix D) was used to compile the findings. For a group of better quality in methods, the quantitative analysis explicitly stated the attempts made to improve robustness in results with examples such as comparing results from alternative models, the theoretical and statistical support for choice of instrumental variables, appropriate model specification and so on. The studies that commented on robustness are identified by asterisk in the first column.

8. Analysis and results: a summary of the quantitative measures has been compiled to identify overall scheme performance with respect to enrollments, health care utilization and financial risk protection to construct stylized facts about relative performance of Ghana NHIS versus Rwanda Mutuelles. The quantitative measures are summarized in Table 4-4, Table 4-5 and Table -6. The information in Table 4-3 shows the conclusions from the literature review.

Table 4-2: Types of studies reviewed

|  | Ghana | Rwanda |
|---|---|---|
| Number of studies reviewed | 15 | 7 |
| Of which: |  |  |
| Studies providing quantitative measures on enrollment | 12 | 2 |
| Studies measuring impact on health care utilization | 10 | 6 |
| Studies measuring extent of Financial protection | 4 | 4 |
| Studies measuring the changes in health state | 6 | 2 |
| Studies using only district survey data | 13 | 3 |
| Studies using district and nationwide survey data | 1 | 0 |
| Studies using only nationwide survey data | 1 | 4 |

Some general observations about the studies may be noted. The studies are generally of three types: case studies of selected districts and based on primary data, studies based on household demographic and health surveys or general living standards measurement surveys, and a combination of both primary surveys and the secondary data from the national surveys. District studies have mostly been limited to one or two study sites in a region or two and sample size is often less than 500. A rare example of a study (Kusi et al 2015) in this category with a sample size exceeding 2000 covered three districts across three regions representing the three different ecological zones in Ghana but have comparable economies and fairly homogenous populations.

The fifteen papers on NHIS covered seventeen studies and twelve of these studies included explicit measures about insurance enrollment rates of households, individuals or both. Of the 14 NHIS papers that used district surveys 11 were predominantly rural, 1 was a mixture of both and 2 were predominantly urban. But this rural predominance is useful for this study in the sense that the evidence is easier to compare with Rwanda where the district studies have all been based in rural districts but also Rwanda's population is predominantly rural while 48% of the total population in Ghana is rural. Another observation is that a greater proportion of the NHIS studies focus on the districts that have had a longer history of CHI schemes and consequently regions such as Brong Ahafo with the oldest established CHI scheme in addition to the northern and upper regions whose pre-existing CHI schemes were rolled out into NHIS are more represented than the other administrative regions. In particular baseline studies, inter-temporal comparative studies and experimental impact studies (Sulzbach, Dzakpasu, Yilma, Chankova, Akazli) have been based in these predominantly rural regions. In a similar vein the district-based studies

about Mutuelle involve the longer established CHI schemes and as well include pre and post Mutuelle roll out comparisons. These similar features of the studies are useful for the purposes of this study. With this in mind the key findings are compared in the categories of enrollment rates, health care utilization rates, financial protection and health state.

The relative share of the studies per outcome measure reflects the relative importance of impact in the country context. Generally, the studies on Rwanda concentrate on health care utilization rates and financial protection and least on enrollment rates which is to be expected given the near universal enrollment rates. Studies on Ghana NHIS have higher representation enrollment equity and least on financial protection. Also, a smaller number of studies were obtained for Rwanda. All the studies on enrollment conclude that the poor are the least likely to be insured. In most cases households of the highest socioeconomic status (SES) are the most represented in insurance coverage. One of two studies on Rwanda that explicitly stated enrollment rates similarly indicate the poor are least represented. The evidence in all six studies that measured utilization rates strongly support an increase in health care utilization rates as an outcome of CBHI schemes in Rwanda. Health care utilization rates is found to be strongly positive outcome

### 4.3.1 Financial protection, health care utilization and health status

The evidence shows that insured households make lower out of pocket payments for health care. In addition, health care payments as measured in terms of food expenditures are consistently lower, suggesting a better ability to afford the consequent out of pocket payments. The financial impact is strongest in Rwanda.  The evidence consistently shows that health insurance has a significant impact on health care utilization. Again, the evidence in Rwanda indicates a stronger impact in the sense that the quantitative measures show at

least a doubling of use rates compared to before insurance coverage (Kagubare 2011, Saksena 2011, Schneider 2011, Dhillon 2012) while an increase of 7.5% was reported in Ghana in a similar time frame of insurance treatment (Dzakpasu et al 2012). Increased utilization of health services may in theory suggest two things: moral hazard or improved access to needed health care. The latter is more likely the case for Rwanda judging from the improvement in health outcomes. Binagwaho et al (2012) for example find no evidence to suggest that insurance coverage leads to a reduction in preventive measures against ill health. The same results however suggest adverse selection as that the insured have lower health status, yet the insured with health needs are less likely to seek care perhaps due to other costs such as travel.

Table 4-3: Strength of evidence about the impact of insurance schemes

| | Equity in enrollment | | Health care utilization | | Financial protection | | Health state | |
|---|---|---|---|---|---|---|---|---|
| | Studies | Verdict on impact | Studies | Verdict on impact | Studies | Verdict on impact | Studies | The verdict on impact |
| Ghana NHIS | 12 (12) | Strongly negative | 9 (10) | positive | 3 (4) | Positive | 4(6) | Negative |
| Rwanda Mutuelle | 1 (2) | Inconclusive | 6 (6) | Strongly positive | 4 (4) | Strongly positive | 2(2) | Strongly positive |

Note: Number in parenthesis represents total number of studies that reported a quantitative measure of the outcome in question. Number not in parenthesis represents total number of the studies that indicate statistically significant evidence that support verdict.

One study specifically tests for adverse selection in NHIS enrollment (Rajkotia and Frick 2011) concludes that NHIS is able to contain adverse selection although it does not eliminate it. The findings suggest that majority of household medical consumption is not substantially correlated with household enrollment costs and that generally no correlation exists between hospitalization and household enrolment costs. Ghana NHIS targeting has

been effectively towards pregnant women and to some extent children but least toward the poor.

The use rates reported for Ghana are stated as proportional comparisons of insured versus uninsured, rather than a before and after scenario as used for Rwanda. In most cases the proportions of insured are double that of uninsured. However, the evidence on antenatal care use is mixed, ranging between 0-40% margin of difference between insured and uninsured. Five out of seven studies on maternal health indicate that the insured have at least 83% more use rates while and 5 of the 6 studies report differences smaller than 50%. Antenatal service use is similar for both insured and uninsured. One explanation is that a policy on free health care for pregnant women and children under five had been in operation prior to NHIS until 2007. Again a Free Maternal and Child Care component of the NHIS was phased in beginning in 2008. Additionally, nonfinancial factors such as lifestyle and cultural practices leading to a low preference for formal ANC may add to the reasons. The evidence nonetheless shows clearly that insured women are twice likely to experience a skilled birth attendant and more so to experience intensive care such as caesarian births (Sulzbach et al 2005, Chankova et al 2008).

### 4.3.2 Equity in enrollment

Equity in health care is one of the main goals of the NHIS as expressed in the NHI Law of 2003 (Act 625) and again emphasized in an amended NHI Law 2012 (Act 825). Equity concerns differential access based on levels of need (vertical equity) as well as access for all (horizontal equity). Equity in access to health care assures removal of structural inequalities that prevent certain social groups from gaining access to quality health care (O'Donnell et al 2007). Conceptually universal access to health care has the

important feature of horizontal equity by making health care accessible to disadvantaged groups. To the extent that Ghana NHIS and similarly Rwanda Mutuelle reduce catastrophic out of pocket health expenditures, vulnerable households and the poor for that matter, would be protected against financial risks associated with health shocks. Equity in access to health care would improve assuming supply-side systemic problems are also accounted for. However, for a program that is geared toward closing equity gaps or social protection, effective targeting of high needs groups is a necessary condition for success. In other words, equity in enrollment would require that households with greater financial risks and especially the income poor are included in the insurance program.

With respect to Rwanda Mutuelle, although the selected studies do not focus on determinants of enrollments, the evidence suggest that poverty is the strongest determinant of being uninsured particularly in the years before the stratification of premium contributions according to socioeconomic status (Ubudehe system) of households (Saskena et al 2010, Binagwaho et al 2012). In fact, the studies on Rwanda do not report any other socioeconomic determinant to have a statistically significant effect on the likelihood of being insured. On the contrary studies on NHIS show various socioeconomic indicators to be strong determinants of insurance status. Formal education is often reported as a key determinant of insurance status and so is formal occupation strongly associated with the likelihood of being insured (Jehu-Appia et al 2011, Yilma et al 2012, Dixon et al 2014a, Kusi et al 2014).

The studies unanimously show evidence that non enrollment in NHIS is first and foremost a problem of affordability of the cost of insurance. Insurance not wanted or insurance not needed is are other important factors especially for higher welfare quintiles.

Systemic factors like the health system, attributes of insurer, in addition to other unspecified factors are collectively cited by about 21% of households. Inadequate information, institutional rigidities and political branding has declined in importance as a determinant of insurance status and the evidence suggests a high level of awareness about the NHIS and similarly about the benefits of enrollment (Kusi et al 2015, Jehu-Appiah et al (2011, 2012), Kotoh 2013, NDPC 2009).

Households citing affordability as the most important problem are as well the ones with higher expected cost of insurance. Uninsured households are more likely to have lower ability to pay for the cost of insurance as measured in terms of food expenditures. For instance, in one study all 69 percent of households identified as not able to afford insurance were in the lowest two income quintiles (Kusi et al 2015). In contrast the majority of the relatively small proportion of households that cite nonfinancial factors as the most important reason for not being insured often belong in the upper wealth quintiles. The evidence suggests that individuals in the formal sector, or with higher education or in the upper quintiles of welfare are the most represented in the NHIS (Asante and Aikins 2008, Sarpong et al 2010, Jehu-Appiah et al 2011, Kusi et al 2014). While the higher inequity in the NHIS is brought to bear some evidence also suggests that NHIS has been effective at reaching the indigent. Households in lowest quintile of welfare are more likely to be enrolled than households in the second lowest quintile (Jehu-Appiah et al 2011, Dzakpasu et al 2012).

Rural residence and proximity to facility are not significant factors in enrollment in Rwanda Mutuelle. In Ghana, proximity to a health facility increases the odds of being insured yet rural location of residence is inconclusive. There is some evidence to suggest

that even where community-based primary facilities are available residents particularly NHIS members do not use them but go to secondary facilities as their first point of call, citing reasons as better quality of health professionals and availability of medicines (Gobah and Liang 2011).

Some evidence on Ghana suggests adverse selection is a problem for the NHIS. Self-rated health status of the insured is lower than the uninsured. While a larger proportion of partially insured households report that insurance is not needed, the likelihood was also higher that insured individuals had chronic illness or perceived to have fair or poor health (Kusi et al 2015). In terms of demographic groups, older females are the ones that are consistently more likely to be insured.

Studies that focus on a homogenous groups of people such as the aged (Parmer et al 2014) or communities of similar economic profile (Yilma et al 2011), socioeconomic factors, location and demographic variables not surprising appear insignificant. What is significant is an association with a majority group (ethnicity, religion). Consistently, being Christian has been identified as a strong determinant of being insured even in regions where Christianity is not the majority.

Table 4-4: Evidence on the enrollment rates: Ghana NHIS versus Rwanda Mutuelle

| Who is insured | Ghana NHIS | Rwanda Mutuelle | Ghana NHIS | Rwanda Mutuelle | Ghana NHIS | Rwanda Mutuelle |
|---|---|---|---|---|---|---|
| | By demographic group | | By households | | By general population | |
| Difference in the odds of being insured (the odds reported for upper wealth quintiles minus the odds for lower wealth quintile) | | | 2.4 - 4 | NA | | NA |
| Difference in percent insured (the percent coverage of upper wealth quintile less the percent coverage of lower quintile) | Panel study: 11.4-54.3 (pregnant women) | | 14 - 24.4 | | | |
| Insurance coverage rates (% of group) | 72 (age 70+) 65.4 – 91 (pregnant women) 32.8 (under 5 children) | 90 (children under age 5) | 39 (increased to 53 in panel study) 30; 54 | | 33.9; 40; 53; 54; 57; 78; 36.6 | |

Source: Selected literature. See details in Table D1 and Table D2 in Appendix D.

Table 4-5: Evidence on differences in health care utilization rates by groups of insured and uninsured

| | Ghana NHIS | Rwanda Mutuelle | Ghana NHIS | Rwanda Mutuelle | Ghana NHIS | Rwanda Mutuelle |
|---|---|---|---|---|---|---|
| | Demographic groups | | Households | | General population | |
| Differences in odds (odds reported for insured groups minus odds reported for uninsured groups) | 0.4  -outpatient<br>0.83 -inpatient<br>0.53 -prescriptions (women) | 0.3-0.6 for child age<5<br>0.71 facility delivery<br>0.75 for assisted delivery | N/A | | | 2 for health facility use |
| Percentage point difference between insured versus uninsured groups seeking care (percent reported for insured minus percent reported for uninsured) | 50 -skilled birth<br>52 -facility delivery<br>13 -antenatal care<br>41 -post natal care | | | | 65 | |
| Difference in health care use rates for insured compared to use rates reported for uninsured: factor of multiple | 5x for caesarian operation | | | | | 4x |
| Difference in use rates before and after insurance: factor of multiple | | | | | | 1.85 per capita<br>2.68 per day |
| Percentage point difference in use rates before and after insurance (percentage points) | 21.1 (facility delivery) | | | | | |
| Equity gap in use rates before and after insurance (percent use rates for upper quintiles less percent use rates for lower wealth quintiles) | 64.7 declining to 53.8 (facility delivery) | | | | 76 | |
| Difference in proportion of health care benefits going to upper versus lower wealth quintiles | | | | | 0.21 | |

Source: Evidence from selected literature. See Table D1 and Table D2 in Appendix D for details.

Table 4-6: Differences in out of pocket health expenditures by groups of insured and uninsured Ghana and Rwanda

| | Ghana NHIS | Rwanda Mutuelle | Ghana NHIS | Rwanda Mutuelle | Ghana NHIS | Rwanda Mutuelle |
|---|---|---|---|---|---|---|
| | Demographic group | | Households | | General population | |
| Difference in the odds of catastrophic health spending (*uninsured* versus insured) | | NA | | | NA | 4 x |
| Ratio of the *proportion* of *uninsured* versus the proportion of the insured paying out of pocket (OOP) for health services | 3.1 (facility delivery) 78.6 (under 5 children) | | | | | |
| Ratio of the *amount* of OOP by *uninsured* versus amount by insured | 2.5 (facility delivery) 0.35-0.4 (antenatal care) | | 8.3x | | | |
| Ratio of the proportion *uninsured* versus the proportion of insured whose OOP exceed <u>10%</u> of capacity to pay | | | | 2.1 | | |
| Ratio of the proportion *uninsured* versus the proportion of insured whose OOP exceed <u>40%</u> of capacity to pay | | | | 3.9 | | |
| Ratio of the percent increase in poverty headcount as a result of OOP (*uninsured* divided by insured) | | | | 2 | | |

Source: Evidence from selected literature. See Table D1 and D2 in Appendix D for details.

## 4.4 Institutional features of Rwanda Mutuelle and Ghana NHIS

The implementation and the outcomes of policy are invariably influenced by the technical soundness of policy design. In turn policy design is influenced also by the competing interests of stakeholders, with the likelihood that constituencies with stronger influence would dominate policy choices. In effect the political, economic, socio-cultural, demographic and other contexts of an economy have varying degrees of influence on the institutions within which policies such as universal access to health care programs are carried out. In a review of the literature on CBHI, Mebratie et al (2014) observe that the policy debates do not revolve around the relevance of CBHI. The consensus is that CBHI does improve access and financial protection. Rather, policy questions have often focused on scheme characteristics and their effects (Stuckler et al 2010, Mebratie et al 2014) and about the desirable design features that would maximize desirable outcomes. In other words, the literature confirms the differences are in the features. Hence, in comparing the outcomes of the NHIS and the Mutuelle, the institutional framework surrounding these programs and their influence is fundamental.

The purpose in this section is to compare the institutional features of Rwanda's Mutuelle and Ghana's NHIS and how these features relate to observed outcomes and the potential toward attaining universal access to health care. Rwanda's Mutuelle and Ghana's NHIS represent similar policy objectives in the sense of eliminating financial barriers to needed health care and to create universal access to health care for all regardless of ability to pay. While both programs may similarly be described as intended for universal health insurance coverage, they adopt not so similar community-based approaches, have different technical design and operate within different institutional set ups given the differences in countries and policy processes. This analysis highlights also the strategic policy design

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features that have resulted in expected or successful outcomes and to make inferences about the best practices that may be replicable or country specific.

### 4.4.1 Insurance benefits package

The health system in Rwanda fully subsidizes preventive health services for the entire population but the cost of curative services is only partially subsidized. Persons in formal employment and the military have insurance arrangements that cover majority of the cost of curative services. However, majority of the population work outside the formal sector and would consequently be vulnerable to the cost of curative care. Consequently, the Ministry of Health implemented these community-based health insurance schemes, the Mutuelles de Santé, to raise revenues to cover curative health services (Kayonga 2007, MOH-R 2008). The Mutuelles are consequently non-profit, mutual aid schemes to reach the informal and consequently rural sector with affordable care. Communities are organized into risk pools, first at the sector (small community) level, and then collectively forming larger pools at the district level for secondary care, and then even larger pools for tertiary care at the national level. Mutuelle service providers may be public or private non-profit contracted facilities but not private for-profit. Providers are paid by Mutuelles directly, either through monthly capitation rates, on a fee-for-service basis, or by performance-based payments.

The Mutuelle benefits package has two components: a Minimum Package of Activities (MPA) and the Complementary Package of Activities (CPA). MPA covers all the services and drugs at the primary level of care, typically by NGOs or government-run community health centers. CPA cover specialized care organized at the district level through district hospitals and specialists and tertiary care financed at the national level

through a handful of national referral hospitals (NRH) such as the Kigali University Teaching Hospital (CHUK). A list of services provided by the different types of health facilities may be seen in Table D3 in Appendix D. The CPA covers all child health services and childbirth; all inpatient services but selected surgeries at the district and tertiary facilities. Members are required to pay a deductible of RWF 200 at health centers and a coinsurance of 10% of the cost of all services at each visit to a district or referral hospital (MOH-R 2012).

The NHIS similarly specifies a standard package of benefits for all members regardless of geographic location, sex, age or level of risk (see Table D4, Table D5 and Table D6 in Appendix D). According to the National Health Insurance Authority about 95% of diseases in Ghana are covered. Outpatient visits, overnight stays, diagnostic services and treatment are all covered. A comprehensive drugs list is also covered (see details in Table D6 in Appendix D). Beneficiaries are not required to make copayments since the policy does not specifies zero coinsurance and benefit cost deductibles for any covered services, medicines or supplies. In practice, beneficiaries have often been known to pay for covered services either voluntarily or involuntarily. Reasons include supply constraints, quality constraints, discriminatory health worker attitude, or the contracted providers' refusal of NHIS card bearers in protest of delays in reimbursements. The NHIS benefit package excludes cost intensive treatments such as for renal dialysis, most cancers, HIV antiretroviral therapy and organ replacement. Affected households are therefore exposed to catastrophic expenditures regardless of the stipulated generous benefit package of the NHIS. Given epidemiological transitions occurring in Ghana and the increasing share of chronic, non-communicable diseases such as diabetes, hypertension and cancers,

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a sizable proportion of the population would consider NHIS unbeneficial and thus refuse to enroll or renew membership.

Similarly, the Mutuelle similarly has been experiencing enrollment challenges in recent years and supply bottlenecks are partly to blame. Subscription rates have declined to 73% of the population in the fiscal year 2013/2014 down from 91% in 2010 (see Table 4-7). Subscribers have complained about being discriminated against especially in acquiring medicines while the district schemes that have experience sharp declines in enrollments have as well experienced the worst delays in delays in restocking drugs (Nkurunziza 2015).  Regardless of the absence of copayments and a relatively generous benefits package NHIS has experienced slower growth in enrollment rates than the Mutuelle as demonstrated in Table 4-7. A look at the insurance cost structure and the membership requirements provides another insight into the differences in outcomes.

Table 4-7: Percent population enrolled in Rwanda Mutuelle and Ghana NHIS

| Year | Rwanda Mutuelle (%) | Ghana NHIS (%) |
|---|---|---|
| 2003 | 7 | NA |
| 2004 | 2 | NA |
| 2005 | 44 | - |
| 2006 | 73 | 15.2[a] |
| 2007 | 75 | - |
| 2008 | 85 | 38[b] |
| 2009 | 86 | 34.5 |
| 2010 | - | 34 |
| 2011 | 91[c] | 33 |
| 2012 | 90[c] | 35 |
| 2013 | 80.9[c] | - |
| 2014 | 73[c,d] | - |
| 2015 | 76[c,e] | - |

Source: Ministry of Health, Rwanda Annual Reports 2008, 2010, 2011, 2012; Ghana National Health Insurance Authority Annual Reports 2009, 2010, 2011, 2012.
a. Author's calculation based on data from the Ghana living standards survey in 2005/2006.
b. Author's calculation based on data from the standard Ghana Demographic and Health Survey in 2008.
c. These figures are for the fiscal year ended June 30th.
d. By the Ministry of Health, Rwanda as cited in Nkurunziza (2015).
e. By Ministry of Health, Rwanda as cited in Ivan Ngoboka (2015).

### 4.4.2 Insurance costs and subsidies

Membership in the Mutuelle is voluntary but the cost of the insurance varies by household socioeconomic status (SES) based on the national system of socioeconomic ranking commonly referred to as Ubudehe. Each family member pays the stipulated amount for their household SES category. According to government reports (MOH-R 2012) as of 2012 the stipulated amount for individuals in the bottom two socioeconomic categories (CBHI category 1) was RWF 2000 (USD 3.26) and this group consisted of 24.8% of the population. However, indigents in this group were completely covered by a combination of government and donor grants. Individuals in middle income households (CBHI category 2) had to pay RWF 3000 (USD 4.88). This category consisted of 65%.9% of the population. Individuals in the two upper SES categories (CBHI category 3) paid RWF 7000 (11.40) but these were a very small percent of the population (0.04%). However, the SES categorizations have only recently been implemented. Previously each family member had paid a flat rate of 1000 Rwandan francs (the equivalent of about USD 1.63) annually as premium. Unlike Rwanda, Ghana lacks an operational system of socioeconomic classification and the relative capacity of Mutuelle in targeting the poor is one important institutional feature that explains key differences in outcomes. The NHIS ends up with a far greater variation in the cost of insurance while also being less effective in discriminating by ability to pay for the cost of insurance.

In contrast to the Mutuelle, NHIS does not require enrollment by whole household units and this may be one explanation why enrollment rates are much lower compared to the Mutuelle. NHIS Participation rates stood at 34% of the population as of December 2010

(NHIA 2010) whereas in previous years many believed that the NHIS had experience

higher participation rates of up 60% based on reports by the NHIA (2009). These estimates

had been based on an inappropriate methodology that reflected only cumulative

enrollments and not actual enrollment rates (Makinen et al 2011, Brugiavinni and Pace

2011, Apoya and Marriot 2011, NHIA 2010). Hence, according to the NHIA (2010) the

historical information on the real enrollments in prior years is nonexistent. The Ghana

Demographic and Health Surveys conducted in 2008 had provided a basis for comparing

the estimates. In 2008 35.4% of the population (based on a sample of men and women aged

15-49 years) were enrolled in NHIS. In the early years of the NHIS enrollment rates stood

at about 15% based on estimates from the Ghana Living Standards Measurement Surveys

conducted in 2005-2006. The increase in enrollment has been steady but slow and yet about

half of the population is eligible for exemptions from premium payment.

By policy, children under 18 are exempt from premium payments but on condition

that at least one parent or guardian is an active member. Active membership implies the

individual is in good standing having paid all required fees to maintain current enrollment

and eligibility for benefits. The new Law 2012 (Act 825) eliminates the requirement of a

parent's active membership for children. As a matter of fact, since 2010 children under five

have been premium exempt regardless of a parent or guardian's membership status.

Another premium exempt group is senior citizens 70 years and over, retirees on the SSNIT

pension scheme as well as the current contributors to the SSNIT pension scheme who by

default contribute to the National Health Insurance Fund through a 2.5% payroll deduction.

These groups are however required to pay the annual registration and processing fees to

remain active. An annual registration processing fee of about GHS 4 (USD $1, current 2015) is required also of most premium exempt groups to maintain eligibility for benefits.

Individuals identified as extremely poor and pregnant women are exempt from both registration processing fees and premiums. A relatively small group of indigents are identified through the Livelihood Empowerment Against Poverty (LEAP) program. This is a social cash transfer program that began in March 2008 and currently reaches about 70,000 households. Consequently, the insurance costs of LEAP participants are borne by government, grants from the UK's Department for International Development (DFID) and other donors and loan facilities from the World Bank. Similarly, the insurance costs of pregnant women are covered by the Free Maternal and Child Health component to the NHIS that was created in 2008 with a DFID grant of US$10 million. The evidence suggests that this program has outstripped initial projections reaching costs of about USD43 million in the very first year, the excess of which has since been absorbed by the NHIS while the external support has dwindled (Witter et al, 2013). Pregnant mothers regardless of socioeconomic status are eligible. Accordingly, the evidence from the literature indicates equity in coverage among pregnant women while inequities persist among the general population given the general pattern that households in low socioeconomic status are least likely to have insurance.

Despite the policy directive to target the poor, the evidence from the literature suggests that the NHIS fails to effectively reach the poor even though reaching the indigent has been fairly successful (Jehu-Appiah et al 2011, Dzakpasu et al 2012, Kusi et al 2014). The evidence shows that the cost of enrollment is the most cited reason for non-enrollment and increasingly so by households in lower quintiles of welfare. Even for easier identified

premium exempt groups of children and the aged the cost of registration can add up for larger households. It appears that individuals in the formal sector who contribute to the Social Security and National Insurance Trust (SSNIT) pension fund are better identified for premium exemptions, unlike premium exempt groups such as indigents in the informal sector. District schemes have at their discretion to decide which individuals may be deemed indigent to qualify for insurance cost subsidy. Yet the districts lack an effective system of socioeconomic classification by which to identify contributions capabilities of households and to extract surpluses through effective price discrimination and successfully target the needy. This policy feature is arguably the crux of the problem and the reason why NHIS fails in equity. Ghana NHIS and Rwanda Mutuelle have similar aims to expand population health insurance coverage to reduce the financial risks in accessing health care and thereby extend access to affordable health services for all. The NHIS in concept is a rational approach toward making health care accessible for all regardless of ability to pay. In practice institutional design of the NHIS lacks an effective targeting of coverage to disadvantaged groups with limited ability to pay and to participate, whereas these groups are the most likely to value the program. The NHIS has rather the unintended consequence of reducing equity despite the observed improvement in overall access to health care in the sense that health care has become more accessible to households who can afford the cost of insurance.

Unlike the case of Mutuelle in Rwanda where enrollment costs are standardized across all schemes and by household socioeconomic status, NHIS enrollment costs have substantial variation, first by the overall SES of the district scheme and then by demographic or exempt grouping. District schemes, in their failure to categorize

households by SES and price premiums according to ability to pay, resort to charging a flat rate while the amount charged varies on average by the socioeconomic status of the district as a whole. For example, in May 2015, a quick survey of the insurance costs of a handful of schemes for the purpose of this study confirms no standard cost structure across schemes. The cost of enrollment is GHS 28 for a person registering with the Ga East district scheme in Greater Accra compared to GHS 14for a person registering with the Assin district scheme in Ashanti. The stipulated charges are GHS 14 for children aged 5-17, and GHS 24 for a SSNIT contributor. There are additional categories as veterans, military and the police. Other than the zero costs for children under five and persons aged seventy or more, there is no clear cut distinction of placing individuals in categories given the overlaps. A SSNIT contributor may claim the status of informal if premium costs are less and vice versa. For persons who choose to subscribe at the NHIA head office in Accra the charge is a flat rate of GHS 40 in premium and GHS 8 as registration processing fee. The range of prices for all 152 district schemes in Ghana is GHS 0-48 as shown in Table 4-8.

The evidence shown in Table 4-8 indicates a difference of less than $2 in the maximum amount of the cost of insurance for Mutuelle (USD10.2) and NHIS (USD 11.86). The cost of subsidies is similarly covered by government and external sources. In the case of Mutuelle subsidies are allocated on a per household basis based on socioeconomic status but for NHIS the criteria for subsidy allocations are not explicit but are on a per program basis (eg LEAP, MCH). In effect Rwanda Mutuelle has an advantage over NHIS by the institutional feature of a more defined SES classification and targeting of the poor.

Table 4-8: Insurance costs and benefits: NHIS in Ghana versus Mutuelle in Rwanda

| | Ghana NHIS | | Rwanda Mutuelle |
|---|---|---|---|
| Cost of insurance | GHS 0-48 ($ 0-11.86) [a] | | RWF 3000-7000[b] ($4.37-10.2) |
| | Varies by the socioeconomic status of the district. Hence a flat rate which differs by district and then age group. | | Premiums vary by a well-defined socioeconomic status classification applied nationally. |
| | Broken down as: | | Broken down as: |
| | Processing fee | GHS 0-8 | CBHI Category 1 (SES 1&2): RwF 3000 |
| | Premium fee | GHS 0-40 | CBHI Category 2 (SES 3&4): RwF 4500[c] |
| | Card replacement fee | GHS 2-8 | CBHI Category 3 (SES 5&6): RwF 7000 |
| Premium exempt groups | Pregnant mothers, children under age 5, adults 70 years plus, SSNIT contributors, indigents | | N/A |
| Processing fee exempt | Pregnant mothers, indigents | | N/A |
| Insurance cost subsidy and funding source | Indigents (full subsidy): government and donors Pregnant (full subsidy): NHIS and donor support | | CBHI category 1 (partial subsidy of RWF 2000): government and donor support |
| Benefit package | Outpatient services, inpatient services, diagnostic services and drugs for about 95% of diseases | | Minimum package of activities (MPA): all services and drugs at primary care facilities |
| | | | Complementary package of activities (CPA): Inpatient services, diagnostic services, maternal and child services and selected surgeries in secondary and tertiary facilities |
| Exclusions from benefit[b] | Most cancers, HIV ART, organ transplant, etc. | | Eye care |
| deductible | 0 | | RWF 200 at health centers |
| coinsurance | 0% | | 10% after deductible at district/referral facilities |

Source: Ministry of Health, Rwanda Annual Reports 2008, 2010, 2011, 2012; Ghana National Health Insurance Authority Annual Reports 2009, 2010, 2011, 2012; interviews with key informants of selected District Health Insurance Schemes and the National Health Insurance Authority, May 2015.
a. The exchange rates applied are the United Nations operational rates reported for June 1, 2015. The rate for Ghana is GHS 4.1 per US dollar and the rate for Rwanda is RWF 686.5 per dollar.
b. Current rate as at April 2015 as cited in Nkurunziza, 2015.
c. Author's estimation based on information from Ministry of Health Rwanda CBHI Report (2012).

### 4.4.3   Administrative structure and governance

A further look at the policy origin, the political context and socio cultural factors could shed more light on the differences in institutional features but first an overview of the organizational structure of the programs is presented in the section that follows.   The Ghana National Health Insurance Law (Act 625, Republic of Ghana 2003) was established the NHIS. By this law, three distinct health insurance schemes may be operated in Ghana: district mutual health insurance schemes (DMHIS) which collectively make up the NHIS, private mutual schemes and private commercial schemes. By the law, membership in a scheme is mandatory for all residents but residents are free to choose any type or number of schemes to join.  The new National Health Insurance Law 2012 (Act 825) now requires all employers to make insurance enrollment mandatory for employees but employers are not responsible for the cost of insurance. In practice no legal actions, probes or threats have ever been taken against the uninsured so insurance is in practice voluntary. Each DMHIS is governed by a board, and has a management staff to take care of the daily administration. Responsibilities of the board include setting the level of fees to be paid per category of subscribers, identifying the abjectly poor to be exempted from premium payments and negotiating service contracts with providers. At the national level the National Health Insurance Authority (NHIA) oversees the licensure of insurance schemes, accreditation of health care providers, the management of the national Fund and the revision of NHIS policies among other responsibilities. The NHIA, a quasi government agency, was established by the NHI Law of 2003 and entrusted with the regulatory oversight of the health insurance industry. Similarly, policy reforms in recent years include strategies that increase centralization of fund management. In the new NHI Law 2012 (Act 825) all the

DMHIS are merged to form a nationwide NHIS which every resident of Ghana should be part of. Consequently, NHIS has now a central NHI Fund from which NHIA allocates subsidies to districts to cover their operational costs.

Rwanda similarly has three main types of health insurance schemes: *La Rwandaise d'Assurance Maladie* (RAMA) or Rwanda Medical Insurance Scheme (RMIS), the Military Medical Insurance (MMI) scheme and the Community-Based Health Insurance Scheme, i.e., collectively the Mutuelle de Santé, which is organized in all thirty administrative districts in Rwanda. Unlike the case of Ghana, membership is exclusive for the different schemes. Membership in RAMA is restricted to employees in the formal sector and their dependents. Similarly, membership in MMI is mandatory for military personnel and their dependents. Citizens may voluntarily join the CBHI scheme in their district of residence. By several accounts the Mutuelles began in 1999 as a pilot scheme in three districts (Kabgayi, Kabuyer and Byumba) working together with about 52 health centers and the three district hospitals (MOHR 2012, Dhillon et al 2012). Within a year these pilot schemes appeared promising in improving access to health care therefore, beginning in 2005, development partners and the government put structures in place to expand the schemes to all 30 districts in Rwanda. In 2006 a policy and a legal framework for the nationwide CBHI scheme had been developed and the Ministry of Health had the mandate to strengthen these schemes. The legal policy and framework for a National Health Insurance Scheme had been completed in 2010 and the implementation of the policy officially began in 2011.

The government aims to restrict its role to stewardship activities only such as in resource mobilization, capacity building, policy development, monitoring and evaluation

but decentralize policy implementation activities by engaging the communities. Sectors are organized into roughly 50,000 people with at least one health centre, and a Mutuelle managed by community-elected representatives. Districts comprise five sectors on average, and have populations between 250,000 and 500,000 and at least one hospital providing secondary-level services. The Ministry of Health has worked in collaboration with the Ministry of Local Government to provide technical support and regulatory oversight of the Mutuelle. Judging by recent news reports, the transfer of oversight of the Mutuelle to the Rwanda Social Security Board (RSSB) as prescribed in the new CBHI policy (MOH-R 2010, MOH-R 2012) and resulting centralization of key administrative functions is expected in 2015. The RSSB is imminently assuming regulatory oversight of the whole insurance industry in Rwanda. The Mutuelle may thus be approaching less decentralization and in similarity to NHIS but in Rwanda's case, while the RSSB assumes regulatory oversight the community ownership will be retained.

The Mutuelles de Santé are, in contrast to the NHIS, highly decentralized and have benefited from existing community-based organizing structures such as rural cooperatives that have provided majority of the management and administrative services. Rwanda has benefited also from a long history of community-based health insurance associations such as *Muvandimwe de Kibungo* that dated back to the 1960s according to the Joint Learning Network for Universal Health Coverage. Each district Mutuelle has a governing board that manages the pool of funds, negotiates contracts with the health centers and hospitals and manages insurance claims and reimbursements on behalf of clients. Each district in turn is partitioned into several sections of communities where a representative (usually chosen by the community) is stationed. Section managers are the direct liaison with communities and

take on responsibilities such as managing registrations and collecting premiums. Given the new CBHI policy of 2010 several changes have been occurring leading toward a centralized pool of funds and cross subsidization of districts as reflected in recent financial statements (see Tables in Appendix D).

In the literature on community-based health insurance schemes worldwide, it has been observed that where potential beneficiaries have had increasing participation in the design, implementation, management and supervision of schemes, higher participation rates have also been observed (Stuckler et al 2010, Mebratie at al 2014). Government-run CBHI have been described as the situation where a central agency appointed by government is in charge of the setting up, mobilization, management and supervision decisions and less involvement of the community than in private mutual schemes or even provider-based schemes. Given the organizational characteristics of Mutuelle and NHIS, it appears that the Mutuelle have had more community involvement which may explain the higher participation rates than the case of Ghana NHIS.

Figure 4-9: Organizational structure of the Mutuelle de Santé of Rwanda

Health Facilities                    Community Based Health Insurance                    Source of Fund

Provider claims        Provider claims

National risk pool

Finance

-Government

-RAMA

-MMI

Referral hospital

District hospitals

Provider claims

Reimbursements

CBHI district risk pool

Finance

-CBHI sections

-National pooled funds

-Government

Health centers

Finance

CBHI sections

Finance

- Contributions from beneficiaries

-Government

- Partners

Source: Based on Government of Rwanda Ministry of Health, Annual Report: Community-Based Health Insurance Scheme, 2012.

Figure 4-10: Organizational structure of the Ghana National Health Insurance Scheme
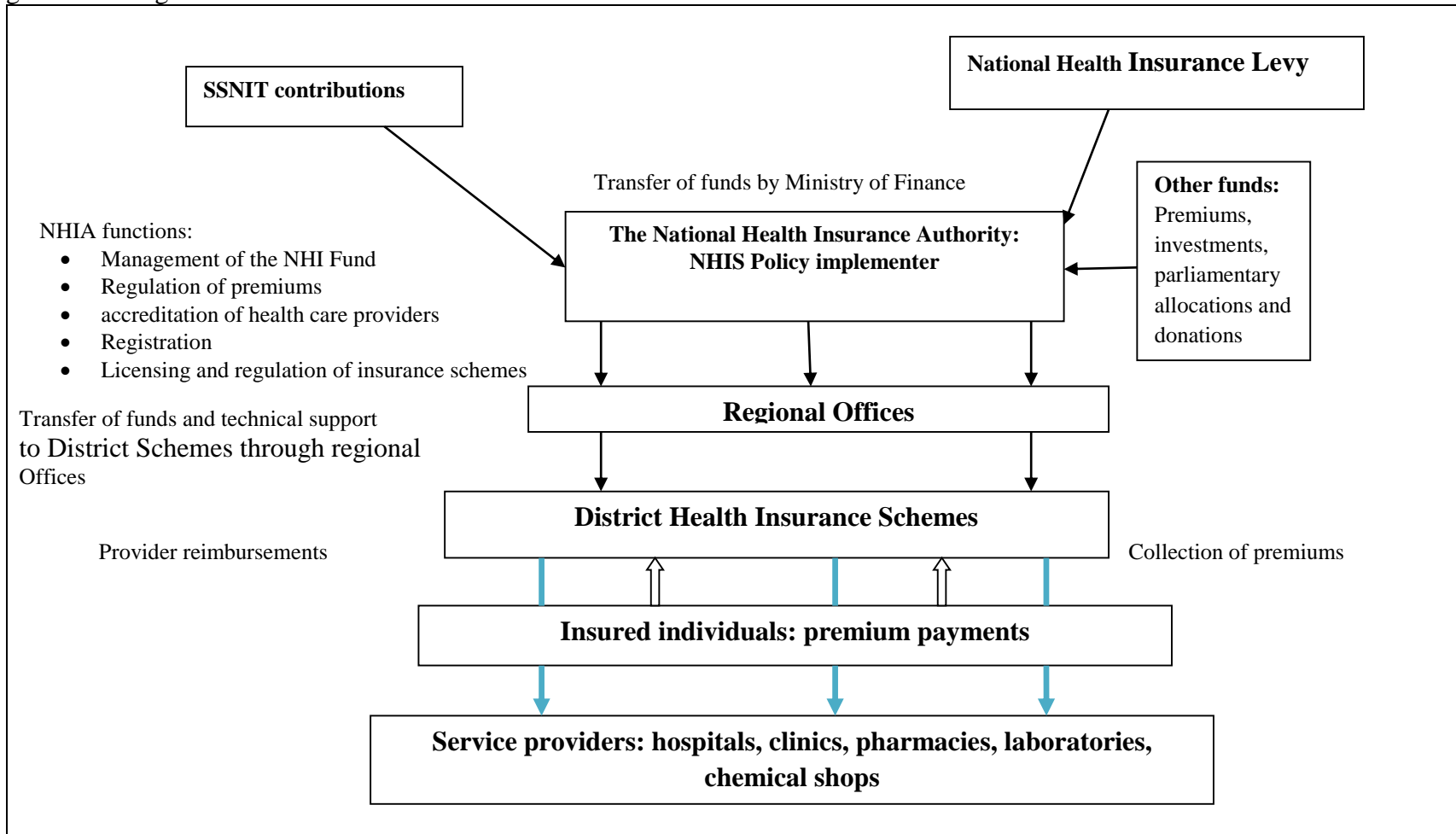
Source: Author's interpretation based on National Health Insurance Authority Report (2010), and the Joint Learning Network for Universal Health Coverage illustration of NHIS institutional framework.

According to the policy documents, universal health coverage is "a key priority for the government in its own right, but also a cornerstone of Rwanda's development policies and goals (EDPRS) and linked to other targets like the Millennium Development Goals" (MOH-R 2010). It is also apparent from policy documents that the government has strategically adopted the cultural concept of *Ubudehe* as an important medium to gain significant degrees of community involvement in the development agenda for Rwanda (Republic of Rwanda 2001, Mapenza 2010). *Ubudehe* in general refers to the Rwandan cultural practice of collective action and solidarity in approach to community problems. The practice is believed to date back to over a century, originating in the form of agricultural cooperatives. At the time, most likely in response to time limitations of the agricultural seasons, community members would work in rotation from one family farm to the next, speeding up the clearing process in time for planting. Members who were unable to participate for reasons as disability or illness would be helped next. With colonization and transitioning to a cash economy the practice weakened as hired labor became available yet community organizing and solidarity would be expected as a characteristic of Rwandan culture. Policy makers have thus capitalized on this cultural characteristic and adapted poverty reduction programs in ways that meet the needs of beneficiaries.

Consequently, the 'Ubudehe Program' was launched in 2001 as part of the efforts to draft Rwanda's poverty reduction strategy. Ubudehe Facilitators would, for example, visit communities to facilitate discussions about the nature of poverty, the effective ways to solve problems or the responsibilities that the community would on take to address issues. Community cooperatives, micro credit schemes and consequently the Mutuelles have begun in this way. The Ubudehe Program may be considered as an institutional

grassroots participation or participatory governance in Rwandan society and more so enables the contextualization and applicability of policy interventions. The Ubudehe approach to policy has had positive outcomes, even also receiving political and international and political acclaim. Regardless, the Ubudehe has had its share of problems that render it potentially ineffective for reasons such as a lack of funding and the political branding it receives as a tool intended to garner a spotlight on the government and less as the poverty reduction tool intended to build trust among citizens (Mapenza 2010).

It is also through the Ubudehe program that Rwanda has in recent years developed its six SES (Ubudehe) classifications of households. It is also possible that Ubudehe classifications would be a closer approximation of actual living conditions than an alternative measure (based only on conventional household surveys) given the possibly increased authenticity of information confirmed through peer reviews and community consensus.

Rwanda also possess a common language and arguably a smaller challenge in language barriers than the case of Ghana and therefore the likely advantage that policy interventions would have a faster reach of populations, all things considered. For instance, in Ghana, social marketing campaigns, the NHIS a case in point, have required targeting all major language groups, obviously a greater logistical challenge than the case of Rwanda. Nevertheless, in matters of national policy and a universal health care policy for that matter, the polity, political processes and the political economy for that matter may be more powerful explanations of outcomes than just logistical problems.

Table 4-9: Institutional differences between Rwanda Mutuelle and the Ghana NHIS

| | Key differences | |
| --- | --- | --- |
| | Rwanda Mutuelle | Ghana NHIS |
| Policy Origins | Community-grown pilot program<br>Intended as a development program | Top-down government initiated program of free health care<br>Intended as a social insurance program |
| Year of implementation | On pilot basis in 3 selected districts beginning in 1999; nationwide expansion starts in 2005 | Nationwide expansion starts from the beginning in 2005, starting with the conversion of a handful of pre-existing provider-based schemes into district schemes |
| Implementing agency | Ministry of Health | National Health Insurance Authority |
| Structure and governance | Decentralized:<br>Schemes are organized around communities of 50,000 (Sectors) and managed by community appointed representatives<br>Each of 30 Districts comprises several pooled sectors and covers between 250,000 to over 500,000 populations. | Relatively centralized<br>Schemes are organized around the (152) administrative Districts, and a scheme covers a population of about 60,000 in rural to over 250,000 in a subdivided metropolis<br>Management board comprises local and government appointees.<br>Implementation decisions shared between NHIA and district board |
| Political context | Stable political regime<br>Consistent policy orientation | A change in political regimes and associated (proposed and contested) changes to policy |
| Targeting:<br>Population<br>Insurance cost subsidy | Consistent<br>Informal sector; rural; poor<br>Standardized, by socioeconomic status of households based on an integrated system of classification | Inconsistent, contradictory<br>Blind targeting.   All residents<br>Different standards: demographic, SSNIT affiliation, abject poverty status & |

| | Key differences | |
| --- | --- | --- |
| | Rwanda Mutuelle | Ghana NHIS |
| Fiscal commitment | Increases with performance and development partner support | Implicitly depends on the level of transparency in central budget allocations of the earmarked taxes, levies and donations |
| Public perception | A national development agenda; poverty reduction strategy<br>Community ownership | Political branding: a program to influence voter sentiments<br>A program to eliminate "cash-and-carry" |
| Evaluation tools | Integrated: performance based financing (pay-for-performance).<br>Includes systematic client-based evaluations.<br>Emphasizes perceived quality of care. | Integrated in technical efficiency of providers. Reactive otherwise.<br>Licensing: Scheduled/unscheduled technical and financial audits of providers.<br>Lacks an integrated client-based evaluation component. Ad hoc commissioned studies on demand-side factors.<br>Reliance on client-based evaluations originating from independent/outside agents |
| Financing | >50% from annual member premiums<br><25% from other social insurance funds<br><13% from Ministry of Health annual budget<br><12% from the Genocide victim's fund<br>Other: Development partners, charitable organizations, private health insurance levies, local government | <7% from annual member premiums<br><19 % from social security (SSNIT) pension funds<br><70% from earmarked taxes<br>Other: Development partners, Parliamentary allocations |
| Mode of provider claims and reimbursements | Performance-based assessments and then payments according to:<br>Fee-for-service or Capitation | Payment by Diagnostic-Related Group: (in most districts)<br>Capitation: for outpatients (in selected districts)<br>Fee-for-service: for medicines |

Source: Ministry of Health, Rwanda Annual Reports 2008, 2010, 2011, 2012; Ghana National Health Insurance Authority Annual Reports 2009, 2010, 2011, 2012; interviews with representatives of selected District Health Insurance Schemes and the National Health Insurance Authority, May 2015.

a. Rwanda's approximations are based on government reports over various years hence the difference in current allocations shown in Table 4-13.

### 4.4.4 The political context of universal coverage

Having looked at the policy design features of the Mutuelle and the NHIS a further look through the lens of the political processes surrounding the programs gives yet a clearer picture of how these programs differ.

### 4.4.4.1 Political motivation for the NHIS in Ghana

Health care financing and out-of-pocket payments have been influential in the political history of Ghana. After independence in 1957, citizens enjoyed free health care. Subsequent years of economic recessions coupled with growing health care expenditures weakened the ability of government to finance health care. User fees were increasingly introduced at point of service and following the Bamako initiative user fees were institutionalized with the Legislative Instrument (LI) 1313 of 1985. The exemptions for vulnerable groups were inadequate to minimize catastrophic effect of user fee charges being increasingly felt across the country (Agyepong and Nagai 2011). The nostalgic longing for free health care would be understandably strong among the generation of baby-boomers and beyond who had experienced full public provision in a relatively socialist republic beginning with Nkrumah's rule after independence. Politicians in the past have been known to capitalize on the growing burden of out-of-pocket payments for education and health care and the desire to return the country back to free public provision to drum up support for coup d'état or political unrests (Wahab 2008). The National Patriotic Party (NPP) was the first democratically elected government to peacefully transition to power in 2000. The NPP, arguably the most conservative political party in Ghana made "free health care for all" a prominent theme in its manifesto. It appears this promise was instrumental to winning the elections against the left-leaning government of Jerry John Rawlings who

been in power (under different governments) for two decades. And this after winning by a significant margin the second round of contested elections against the National Democratic Congress (NDC) party of Jerry John Rawlings.

Political strategizing, political commitment, political acclaim and political disapproval features prominently in the evolution of the NHIS even after a decade of its implementation. The passage of the National Health Insurance Law (Act 625) of 2003 was remarkably fast paced even amidst resistance from opposition parties, prominent labor unions and development partners. Criticisms by civil society (notably the Unions) had to do with inadequate democratic processes by which the law had been created (Rajkotia 2007, Wahab 2008). Other concerns had to do with the technical soundness of program design with respect to the sustainability of a social insurance scheme given the apparently weak institutional set up of the country (McKinnen et al 2011; Brigiavinni and Pace 2010). Development partners preferred an expansion from a pilot phase (similar as in Rwanda) of the several existing mutual insurance schemes that were being successful, similar to the case of the Mutuelle. Understandably the opposition party (NDC) was in favor of this approach as under their rule these pilots had been initiated with the apparent intention to approach universal access by expanding community-based schemes nationwide following the proposed model of development partners.

In reality the NPP had made a campaign promise and therefore after coming to power commissioned a task force to find ways to establish a program of free health care. Another election cycle was due to arrive. The assignment given to this task force by the government was specific and threefold as elaborated by Rajkotia (2007). The task was to

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design a program to: (1) eliminate out of pocket payments for health care (2) be implement immediately and (3) be expanded nationwide in a short amount of time

A free health care program that would be financed by a combination of taxes and therefore a social health insurance program met the criteria. Such a program would be faster implemented through the district governments given the already existing administrative set up. The task force had its fair share of political manoeuvring as consultants who recommended changes and considered a fast track implementation of such a program to be impractical were labelled as unpatriotic and marginalized (Rajkotia 2007). Consultants favoring a sounder design had suggested using a long term approach by growing the schemes from bottom up in a gradual expansion of the pre-existing community-based models. Other suggestions included an element of coinsurance to raise revenues and gate-keep to contain costs. The political machinery of the government was astute to limit advocacy and consequent resistance in order to fast-track the parliamentary processes to get a bill passed into law. Opposition parties, labor unions and civil society groups protested the general lack transparency and participatory approach. A compromise was reached with unions to exempt workers from paying premiums given the payroll taxes going to fund the scheme. Hence the all-important feature of exemptions for SSNIT contributors. Another compromise was to delegate some management functions at the discretion of each district and in that way attain some semblance of community participation to appease some protesting publics. In place of copayments the favored proposal was a premium decided as the equivalent of the poverty line and hence a $1.25 equivalent in premiums was decided with the argument that this amount would maintain solvency initially while also acknowledging that financial sustainability may (or not) work

depending on outcomes. It is apparent that while making health care freely accessible was desired, the government political agenda was the overriding factor in adopting a seemingly unsound technical design for a start. The NHIS Law was passed in 2003, NPP was voted again into power in 2004 and implementation of NHIS begun in 2005.

The NHIS grew in popularity and reported fast enrollments in the early years and has won international acclaim for the innovation of combining social insurance with community-based approaches (Rajkotia 2007, Apoya et al 2011, National Health Insurance Authority 2011). The willingness of the incumbent government (since 2008) to maintain the NHIS even though it had been perceived of as the legacy of the previous government, underscores the critical role political commitment has played. The NDC government subsequently attempted to implement a one-time payment for a life-time subscription to the NHIS and one may not ignore the fact this was a manifesto and the NDC won the elections in 2008. As early as 2009 the government initiated plans to implement the one-time-payment. The stated rationale was to eliminate the key problems plaguing NHIS: the delays in registration renewals and the difficulties in identifying the poor to be granted premium exemptions. Judging from the news archives of prominent news journals (the Daily Graphic, The Ghanaian Times) the one-time payment not surprisingly elicits much debate, with most citizens perceiving the policy of as an impractical, or that of political gimmickry. The debate resurfaces intermittently with policy proposed variations to the one-time policy and especially around the election cycle as recorded for 2012. Even the government announcing in 2013 that one-time-payment was being shelved because of so-called stakeholder concerns could not kill the debate. Contradictory statements have resurfaced in recent months with a government official stating affirming that one-time

payment had never been abandoned whereas the NHIA senior executive had stated at a press conference that one-time payment was never an option.

NHIS has had political connotations to its existence but an advantage of this political branding is that the NHIS, as long as it is a program of free health care coverage would benefit from political commitment and the domestic consensus for pursuing in a program of free health care coverage. Free health care is an issue that is politically sensitized in Ghana, quite unlike free education or any other public provisioning of that matter. In contrast to Rwanda, NHIS may the consistency of a well planned development program with the attendant contradictions in targeting, equity and financial sustainability. Regardless of its political branding and because of this feature it is at best a political tool that unites the country and at its worst, it brings out irrational policy debates. Political commitment notwithstanding, the evidence remains that financial sustainability of the scheme is questionable which is discussed in further detail.

### 4.4.4.2 Political motivations for the Mutuelle in Rwanda

Rwanda also had a "free of charge" health care policy when the country gained independence from colonial rule in 1962 and similar to Ghana, the free health care soon proved to be unsustainable (MOH-R 2008, Schneider 2005, Dhillon 2012). It was soon abandoned. Health insurance coverage was largely nonexistent with the exception of the small group of formal sector employees who had occupational injury coverage and the mandatory insurance for public sector workers and the military. In Rwanda, the government describes the Mutuelle as a flagship health financing policy and strategy to improve access to health services (MOH-R 2008, MOH-R 2010, MOH-R 2012) and as such Mutuelle is viewed in the broader context as a means and an end in itself to poverty

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reduction. A strong political commitment (Dhillon et al 2011) is demonstrated again in the government's commitment to establish universal access as part of a larger development program towards attaining a middle-income status by 2020 (Vision 2020, EREDEP). The incumbent government has ruled since 1994 and has been described as a 'benevolent' dictatorship (Dhillon 2011). Reports elsewhere indicate a political agenda to champion a model of development in Africa, in particular to wean the country off aid (Zakaria 2012). Rwanda is believed to have an effective public administration system that is also efficient especially with external resources and this helps their cause. Universal coverage as a policy is then in the larger context of Rwanda's ambitious development program and one would expect the commitment to continue especially because of the longevity of the incumbent govern, so to speak, and the apparent domestic ownership of the development program. But then the problem arises when higher income has been attained (regardless of patterns in inequality) and where the shift toward private sector provisioning (depending on the dominant philosophies and commitment to public provisioning) and consequent capitalist dominance and consequent inequalities in access to care based on ability to pay may start to grow. One may wonder also if a change in regime would make a difference in policy emphasis.

In effect, while the originations of Rwanda's Mutuelle program may be situated within the broader context of a poverty reduction program, Ghana's NHIS has had a dissimilar beginning in an incumbent government's manifesto even though both country programs have similar legal mandates and policy prescriptions as would be expected of a policy on universal health coverage.

iii. Setbacks

Despite the impressive progress in Mutuelle coverage health insurance in Rwanda have setbacks that are to be expected of a low income country. The health infrastructure is inadequate to meeting the health needs of majority of the population. Though Mutuelle membership imply a comprehensive benefit package the complete products and services are lacking in the rural and urban periphery so that members have to pay out of pocket to acquire them from private providers. Copayments at the secondary and tertiary levels of care are a burden to the poor.

Despite community involvement and the participatory approach to Mutuelle there is still low managerial capacity and lack of autonomy of the Mutuelle, similar as in Ghana. In addition, the Mutuelle schemes started out as strong partnerships between the health centers and the communities but after the expansion into nationwide-community partnerships, the partnerships with the district and national hospitals have been weak. Scaling up of Mutuelle presents coordination, governance and management problems. While members are well represented at the local level they have weak representation at the district and national management levels.

As a result of delays in reimbursements of health care providers following financial challenges of schemes especially in recent years, it has been reported that Mutuelle clients face discriminatory practices with long wait times and unfavorably health worker attitude at the health facilities. This experience then discourages retention in membership. This is a similar situation for NHIS as the stigma attached to NHIS has discouraged participation.

Another problem common to NHIS and Mutuelle is that provider payments mechanism allows cost-creeping. Provider-induced demand, over-servicing (overutilization and over prescription), corruption and misappropriation of funds by fund

managers persist. Provider claims fraud is particularly reported in Ghana. Further discussion of the key issues that influence financial sustainability of Mutuelle and NHIS here follows.

## 4.5    Financial sustainability issues and the policy implications

Sustainability is arguably a complex concept with perspectives varying across disciplines and research traditions. With regards to health care programs, sustainability may imply the maintenance of health benefits, the institutionalization of programs, the sustenance of community capacity or the continuation of programs (Gruen et al 2010). Alternatively, sustainability is a multidimensional concept as the WHO would describe it: "The ability of a project to function effectively, for the foreseeable future, with high treatment coverage, integrated into available health care services, with strong community ownership using resources mobilized by the community and government" (WHO 2002).

Ensuring the sustainability of a health program is an important target but arguably a moving target in the sense that opportunity costs exist (and understandably greater in the context of a low income country) and these costs may be changing with time and circumstances. At the same time premature discontinuation of programs often results in wasted human, technical and monetary resources and unmet needs regardless of the context for discontinuation. Sustainability assessments are therefore essential.

While not disregarding the importance of a multidimensional approach to sustainability assessments, this study focuses on the financial sustainability of Ghana's NHIS and Rwanda Mutuelle. This involves an analysis of cost outlays in relation to the resource base to assess each country's ability to sustain its program for a given level of coverage and time period. For the purposes of this study, financial sustainability is defined

as the ability to cover all monetary costs with the existing financing streams, given the objectives of the program. The assessment is in two parts. The first makes a judgment based on published financial statements and reports. A second assessment extends the discussion to the current political economy and the implications for financial sustainability based on information from both published and unpublished sources. Finally, the analysis lays out the policy changes needed to keep the programs financially sustainable based on conclusions drawn from the analysis of financial resource allocation and sources.

### 4.5.1 Patterns in expenditures

This section compares the components and performance of expenditures by the Mutuelle and by the NHIS using the information in government published reports and financial statements (MOH-R 2012, NHIA 2012, 2011, 2010, and 2009). These reports cover the periods July 2011 to June 2012 for Rwanda and January 2009 through December 2012 for Ghana. Table 4-10 shows the compilations on expenditures. As would be expected, the provider reimbursement is the largest component: 84.72% for Rwanda (2012) and 77.2% for Ghana (average for 2009-2012). NHIS operations and logistics is on average 8.38% of total spending, with the remainder (14.35%) allocated to causes such as social intervention programs and support to partner institutions. Support to partner institutions has three components: i) primary health and preventive care ii) district health projects and iii) health services investments (NHIA 2012). Therefore, if one were to include support to partner institutions as a category in direct expenditures on health services, then at least 87.25% on average goes to health services. This number compares favorably with 84.27% in the case of Mutuelle. On average 12.75% of total expenditures by the NHIS is

allocated as operating expenses compared to 15.27% by Mutuelle but then Mutuelle categorizations are simpler: operating expenses and reimbursements.

While the relative shares of the expenditure categories are similar for Mutuelle and NHIS, the levels of expenditures differ significantly. NHIS expenditure in per capita terms is much higher even after adjusting for inflation and purchasing power parity. Between 2009 and 2012 the NHIS spent the equivalent of USD 365.38 per active member which is 11.56 times the amount by Mutuelle (USD 33.34) in 2012. For provider claims payments alone, the NHIS again spends considerably more (USD 13.53) per outpatient and inpatient contact than the Mutuelle (USD 3.49) as demonstrated in Table 4-11 and Table 4-12.

#### 4.5.1.1 Efficiency issues

There is reason to believe that additional information on Mutuelle from previous years would show similar patterns and Mutuelle average expenditure per capita would not exceed the amount for 2012. In the first place, the active membership of Mutuelle has increased much faster over the years than the case of the NHIS as indicated in Table 4-7. One may question whether the relative depth (number of services) and height (proportion of costs) of coverage accounts for much of the difference in expenditures per capita especially if the cost, the quality or the intensity in consumption of services is comparatively greater for NHIS. Accordingly, the information that would give a good estimate of the degree to which the relative cost of services accounts for the dissimilarity in expenditures per capita include disaggregated data on the reimbursement schedules and rates as well as the case mix (e.g. claims per diagnostic related grouping). Given the nature of the relevant information and given the scope of this study, such information has been difficult to access. However, some evidence on health services costs from sources outside

the NHIS or the Mutuelle could be useful in making some conclusions about the relative performance of expenditures by the NHIS and the Mutuelle.

The WHO estimates of per unit cost of hospital care for outpatient and inpatient visits (excluding drugs and diagnostic services) in Rwanda and in Ghana is listed in tables in Appendix D. The data suggest that Rwanda's hospital costs in 2005 were generally higher than those in Ghana (see Table with estimates of unit costs at hospitals in Rwanda and Ghana in Appendix D) and Rwanda experienced faster growth in per unit costs (measured in constant international dollar) from 2000 to 2005. This may suggest that in later the unit costs (in constant international dollar terms) of health services in Rwanda would at least match those in Ghana. It is reasonable to assume that the higher expenditures of the NHIS are not all accounted for by a higher cost of health services per se. It is important to note, however, that these WHO estimates exclude the cost of drugs and diagnostic services.

Another question arises about whether the differences in the relative size of the standard benefit package for NHIS versus Mutuelle (see Table 4-8) would be a significant factor in the differences in expenditures. It is difficult to directly compare benefits. On one hand NHIS benefits are limited to a number of services although it purportedly covers 95% of diseases and zero copayments by policy. On the contrary Mutuelle coverage is limited to 90% of the cost of services (after a deductible) while also the number of services is limited to (100% of services at primary facilities but only inpatient services and selected surgeries in secondary and tertiary facilities). But the implication for costs is clear: the co-payments component in Mutuelle is potentially more effective at gate-keeping and deterring overutilization of services and consequently limiting the cost of claims, than the

NHIS. The average number of contacts per active member of the NHIS (2.77) is greater than the case of the Mutuelle (1.07) as illustrated in Table 4-11 and Table 4-12.

### 4.5.1.2 Influence of provider reimbursement methods

Another factor could be the inflation of costs by providers. Fee-for-service payments method had been the approach in reimbursing health services providers until 2008 when NHIA introduced the Ghana Diagnostic Related Groups (G-DRG) as the framework. Medicines remain on the fee-for-service system but prices are standardized across the country (Agyepong-Martefio and Yankah). The opportunity exists for cost escalation and patient over-servicing. Rwanda is also considering moving to a DRG basis from its current fee-for-service (MOH-R, 2011). In addition, Rwanda has a comprehensive performance-based financing framework since 2006 that integrates many variables into assessing provider performance and compensating accordingly. The monitoring of performance is based on quarterly evaluations of a list of 13 services and 185 variables to measure facility outputs, quality of service, access to care and administration. Provider payment is then scaled to performance based on the evaluations made at the district and sector levels (Kajonga 2007, Joint Learning Network). Consequently, the performance-based financing provides an incentive structure that puts pressure on providers to improve quality of service to satisfy their Mutuelle clientele. Given the higher enrollments in the Mutuelle, risk pooling is larger and so the per capita costs relative to mobilized resources would be lower for a given cost of claims. Also, the chances for Mutuelle providers to escalate costs may be lower than the case of Ghana NHIS because of the inbuilt provider performance evaluation tool by which Mutuelle provider reimbursement claims are assessed. Ghana NHIA has similarly introduced a capitation payments system on a pilot

basis in the Ashanti Region beginning in 2012. This system involves advanced payments of an agreed predetermined amount per client per period. Capitation has been limited to outpatient services except specialist services. It is believed that capitation payment method would be an effective cost control, simplify claims processing, generate competition between providers and provide better risk-sharing between providers, schemes and subscribers. Capitation was met with a lot of resistance especially by health care providers in the private sector who at the time considered the proposed monthly capitation of GH 1.1 (1 USD) for diagnosis and GH 0.65 (USD 0.70) for drugs per active member in the catchment area as inadequate and will force an increase in out of pocket payments. In consonance with the capitation system members now are limited to a referral system and may not roam, to provide some measure of gate-keeping for providers.

Alternatively, provider claims in Ghana may be more inflated than the true cost of services. NHIS is a significant channel of public facility financing based on some evidence that the NHIS alone provides upwards of 80% of public hospital internally generated funds (MOH-G 2012). Some evidence suggests that a number of health centers in Rwanda could operate at a surplus with the funds received from the Mutuelle (Kabugare 2006) hence Mutuelle could similarly be a significant channel of finance for health facilities though the relative proportions in national expenditures cannot be compared this way.

Table 4-10:  Expenditure components of the Mutuelle and the NHIS

| | Ghana National Health Insurance Scheme | | | | Rwanda Mutuelle | |
|---|---|---|---|---|---|---|
| Year of published financial statement | 2009 | 2010 | 2011 | 2012 | 2011/12 | 2012/13 |
| | Distribution of expenditures by category (% of total) | | | | | |
| Reimbursements/claims payment | 84.3 | 74.9 | 71.8 | 78.2 | 84.7 | 82 |
| Operating expenses | 5.9 | 8.6 | 8 | 11.0 | 15.3 | 18 |
| Support to partner institutions | 9.8 | 14.3 | 6.5 | 9.5 | N/A | N/A |
| Social intervention programs | - | - | 12.0 | - | N/A | N/A |
| Depreciation | - | 2.21 | 1.7 | 1.3 | N/A | N/A |
| Total | 100 | 100 | 100 | 100 | 100 | 100 |
| Surplus/deficit (% of total expenditures) | -5.0 | -13.0 | -19.0 | -2.0 | 7.2 | -10.2 |
| | Amount of total expenditures | | | | | |
| Total expenditures in millions local currency | 427.1 | 531.3 | 764.2 | 788.3 | 22,737.6 | 27,971.1 |
| Total expenditures in million US$ (constant 2010 prices) | 335.4 | 371.6 | 465.6 | 368.96 | 33.34 | 35.7 |
| | Expenditures in per capita terms | | | | | |
| US$ per active subscriber (constant 2010 prices) | - | 45.51 | 56.6 | 41.5 | 3.2 | 3.7 |
| In international $ (PPP) per subscriber (2010 prices) | - | 81.4 | 122.0 | 106.77 | 7.18 | 8.9 |
| | Active membership | | | | | |
| Number of subscribers (millions) | - | 8.16 | 8.23 | 8.89 | 10.39 | 9.53 |
| Percent of national population | - | 34 | 33 | 35 | 90.7 | 80.9 |

Sources: Ministry of Health Rwanda Annual Report, various years, Ghana National Health Insurance Authority Annual Reports, and author's calculation.

Table 4-11: NHIS reimbursements per outpatient and inpatient contact, 2005-2012

| | GHS millions (current) | Total number of outpatient and inpatient contacts (thousands) | Active members (thousands) | Contacts per active member | Proportion inpatient | Average cost[a] per inpatient contact, USD (current) | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | | | | | | Assumes GHS 12.69b[b] per OPD contact | Assumes inpatient cost at 3.35x OPD | Assumes same weight for OPD |
| 2005 | 7.6 | 626.8 | - | - | 0.05 | 0.5 | 40.7 | 13.5 |
| 2006 | 35.5 | 2,569.2 | - | - | 0.05 | 37.7 | 45.7 | 15.3 |
| 2007 | 79.3 | 4,952.0 | - | - | 0.06 | 74.1 | 52.0 | 17.8 |
| 2008 | 183.0 | 9,967.1 | - | - | 0.06 | 93.4 | 48.7 | 16.7 |
| 2009 | 362.6 | 17,603.2 | - | - | 0.06 | 111.2 | 43.6 | 14.7 |
| 2010 | 397.6 | 17,655.7 | 8,163.7 | 2.2 | 0.04 | 180.2 | 49.2 | 16.1 |
| 2011 | 548.7 | 26,937.7 | 8,227.8 | 3.3 | 0.05 | 103.5 | 40.4 | 13.6 |
| 2012 | 616.5 | 25,303.4 | 8,885.8 | 2.9 | 0.06 | 122.0 | 40.0 | 13.53 |

Source: Ghana National Health Insurance Authority Annual Report, various years.
a. Author's estimations based on National Health Insurance Authority Annual Reports
b. This is an average based on data this author obtained in January 2013 from the outpatient unit of Ridge (regional) Hospital in Accra. This data consists of unaudited claims the hospital had prepared for the month of December 1-31st, 2012 and covered some 2,044 outpatient contacts.

Table 4-12: Claims payments for services provided to Mutuelle members, 2011/2012

| | 2012/2013 | 2011/2012 | | average cost per contact [b] | | |
|---|---|---|---|---|---|---|
| | Total number of outpatient and inpatient contacts [a] | Total cost (in millions RWF) | Total number of outpatient and inpatient contacts | Rwandan Franc | International $ (PPP) | USD (current) |
| Health centers | | 7,215.2 | 7,337,349 | 983.4 | 3.8 | 1.6 |
| District Hospitals | - | 8,095.9 | 695,942 | 11,633.0 | 45.3 | 19.1 |
| National Referral Hospital CHUK | - | 1,331.2 | 64,339 | 20,690.2 | 80.5 | 34.1 |
| Ndera Hospital | - | 104.0 | 12,590 | 8,263.6 | 32.2 | 13.6 |
| SCPS Kanombe | - | 55.0 | 7,471 | 7,361.7 | 28.6 | 12.1 |
| Military Hospital | - | 44.9 | 4,037 | 11,121. 0 | 43.3 | 18.3 |
| King Faisal (Private) | - | 373.4 | 1,494 | 249,953.8 | 972.6 | 411.8 |
| Total | 6,874,295 | 17,219.7 | 8,123,222 | 2,119.8 | 8.3 | 3.5 |
| Contacts per active member | 1.23 | - | 1.07 | - | - | - |
| Proportion inpatient | 0.05 | - | 0.08 | - | - | - |

a. For health centers only. Based on provisional estimates in Ministry of Health, Rwanda Annual Report for year ended June 2013.
b. Author's estimations based on Republic of Rwanda Ministry of Health Annual Reports.
Source: Republic of Rwanda Ministry of Health CBHI Report 2012, Republic of Rwanda Ministry of Health Annual Report 2013.

Expenditures may have been under reported in the case of Rwanda Mutuelle or it is plausible that a sizable portion of the difference in expenditures could be explained by Mutuelle being more cost efficient than Ghana. The assumption that Mutuelle is relatively cost efficient than NHIS may be testable where ample relevant disaggregated data is available but the foregoing discussion in this study suggests that it is a reasonable assumption. NHIS has consistently run a deficit (by as much as 19% of total expenditures in 2011) as may be seen in Table 4-10 though the deficit improved in 2012. Following is a discussion of the sources of funds with the observation that patterns in financial sustainability, as observed, could very likely improve if each country commits to and succeeds in improving accountability and efficiency in the current financing arrangements, and without changes to the existing policy design.

### 4.5.2    Funding sources and the prospects

While there is some similarity in the relative weight of expenditure categories for NHIS and Rwanda, the sources of funds are markedly different. The information in Table 4-13 shows relative importance of the funding sources for Mutuelle and for NHIS. Levies are the most significant source of funds for Ghana and at the same time the least important source for Rwanda. The opposite may be said of premiums. Premium collections are the most significant source of funds for the Mutuelle (55%) followed by government sources (21%) and then the Global fund (11%), an external source. The NHI Law (2003) established a National Health Insurance Fund (NHIF) to finance the NHIS. More than sixty percent of the fund is obtained from the National Health Insurance Levy (NHIL) – an additional 2.5% of value added tax (VAT) on qualifying imports and goods and services supplied.

Table 4-13: Funding sources for Rwanda Mutuelle and Ghana NHIS in various years

| Financial year | Ghana National Health Insurance Scheme | | | | Rwanda Mutuelle | |
|---|---|---|---|---|---|---|
| | 2009 | 2010 | 2011 | 2012 | 2011/12 | 2013/12 |
| | Distribution of the funding sources by category (%) | | | | | |
| Insurance premium | - | - | 4.5 | 3.7 | 55.0 | 66.0 |
| Levies | 80.9 | 63.3 | 72.8 | 74.1 | 2 | 1 |
| SSNIT | - | 18.9 | 17.4 | 18.3 | N/A | N/A |
| Government | - | - | - | - | 21 | 14 |
| Copayments | N/A | N/A | N/A | N/A | 5 | 6 |
| Global fund/External | N/A | N/A | N/A | N/A | 11 | 10 |
| Other | 19.2 | 12.8 | 5.3 | 3.9 | 6 | 3 |
| Total | 100 | 100 | 100 | 100 | 100 | 100 |
| | Amount of funds | | | | | |
| Total in million local currency units | 407.5 | 461.0 | 617.8 | 773.8 | 24,374.3 | 25,107.0 |
| Total in million US$ (constant 2010 prices) | 320.0 | 322.4 | 376.4 | 362.2 | 35.7 | 32.0 |
| In US$ per subscriber (constant 2010 prices) | - | 39.5 | 45.8 | 40.8 | 3.4 | 3.4 |

Source: Ministry of Health Rwanda Annual Report in various years; National Health Insurance Authority Annual Report in various years; author's calculations.

Another important source is mandatory 2.5% of individual contributions to the Social Security and Pensions Scheme Fund mostly by the formal sector. In the literature these two sources have been interchangeably referred to as NHIL contributions (see Table 4-14). The other sources of fund include parliamentary allocations, returns on Fund investments and grants and donations made to the Fund. Informal sector adults are required to make direct contributions in the form of premiums to their district health insurance fund. Premiums are determined on a sliding scale (between GHS7.2 to GHS 48) depending on the SES status of the District, or by category of exemption. Additional revenue sources that have been proposed for the NHIF are petroleum taxes, 'sin tax' and higher levies.

It is evident that the financial sustainability NHIS is technically linked to the domestic tax revenues consequently to the performance of the economy. On average more

than 70% of the reported funding is the earmarked sales taxes, hence levies, as described in Table 4-13. That means the greater portion of pooled funds is not in tandem with the level of subscriptions, and similarly not in line with the level of claims payments, unlike the case of Mutuelle. Given the relatively low share of premiums, one may conclude that the financial sustainability of the NHIS is all a problem of the premium component but may be inconsequential. The NHIS financing model implies that funding is less sensitive to subscriber participation which is a good feature for planning purposes. In principle, macroeconomic management is the most significant influence on funding.  The advantage for Ghana NHIS compared to Rwanda Mutuelle is the higher level of domestic ownership and less dependence on the credibility of external sources. To the extent that domestic sources are adequate the higher level of domestic ownership of NHIS is an important advantage for long term sustainability. The challenge remains to ensure domestic revenue growth is adequate for the growth in insurance coverage, assuming funds are well managed and costs are contained. The challenge also is to ensure political commitment across regimes.

It would take a significant increase in premium rates and or enrollment rates to make any meaningful impact on funding given the status quo. As shown in the foregone analysis, increasing the cost of premiums would likely decrease membership rates while rolling back the gains made so far in improving access. On the other hand, increasing enrollment rates, even if that would entail a reduction in premium rates and better targeting of vulnerable groups, could still have a positive impact on risk pooling and adverse selection while also increasing access. The potential for adverse selection is a program design feature of NHIS. Figure 4-11 illustrates the distribution of membership by

exemption status [8]. It is apparent that premium exemptions are gradually displacing contributors (545 in 2010 and 60% in 2012) while contributors have consistently been in the minority. Pregnant mothers have increased in share from 3.5%, 5.5% and 8.6% in 2008, 2009 and 2010. It is a good thing also indigents have increased from 1.4% to 4.4% from 2010 to 2012. The proportion of informal contributor has also increased by three percentage points from 2010 to 2012 even though the contributor base is declining.

Figure 4-11: Percent of NHIS active membership by category of premium exemption, 2008-2012
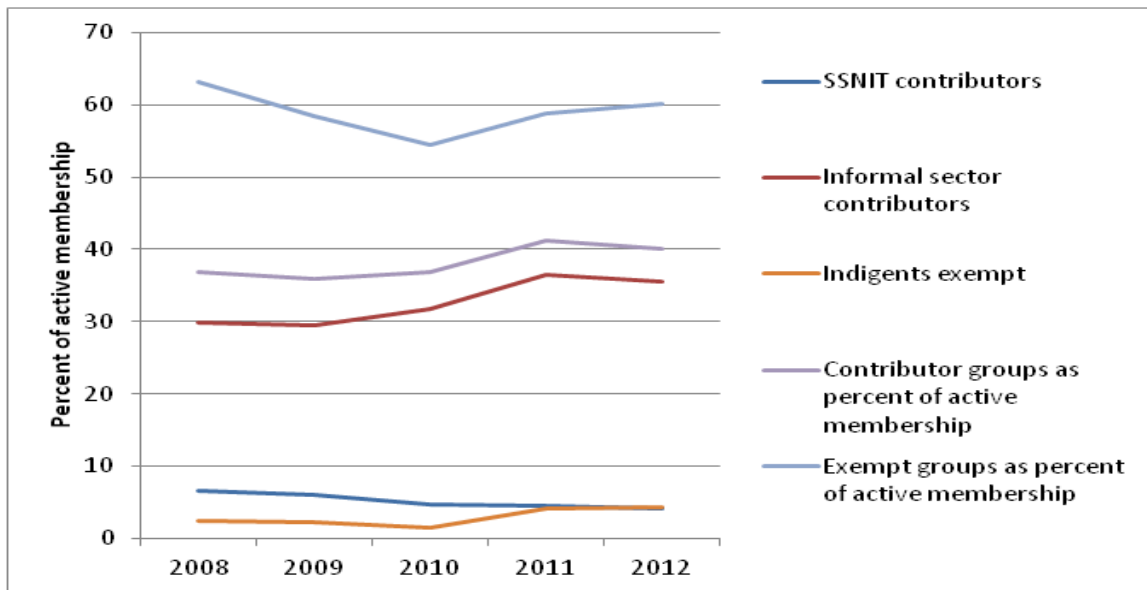


Source: National Health Insurance Authority Annual Reports for 2009, 2010, 2011 and 2012.

Pregnant women, the aged and children under five are more likely to use health care than other groups of the population. At the same time improving their access to health care

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[8] The lower accuracy of the data prior to 2010 and subsequent change in methodology for calculating the membership numbers may explain the kink in the observation.

makes the most impact on measured health outcomes such as in the millennium development goals.

The second most important source of funding for NHIS is the contributions from the Social Security and National Insurance Trust (SSNIT) pension fund. This source technically varies with the amount of payroll contributions to the pension fund. The core contributors are therefore public sector formal employees where SSNIT contributions are mandatory. The SSNIT-contributor base is a smaller (about 4%) proportion of the total population of Ghana in comparison to the informal sector contributor-base (by way of premium payments) of about 10% of the population (NHIA 2013). The SSNIT contributions have been a significant component of central government revenue allocations to NHIS. SSNIT contributions to the NHIL have ranged between 32% to 21% as shown in Table 4-14 and only by 4% of the population, this proportion is significant compared to the contributions from value added taxes and custom duties (also shown in Table 4-14). These taxes, together with the SSNIT contributions, as a proportion of total government revenues have ranged from 7% in 2008 to 5% in 2014. While additional revenue sources such as 'sin' taxes (e.g., on alcohol and tobacco) and fuel levies have been proposed (NHIA 2013) it is obvious that there is room for improvement from the existing tax sources without increasing the tax burden by improving accountability and efficiency in managing existing funding sources. In fact, one may argue that the long term sustainability of NHIS and similarly the NHIS could be assured through a fundamental improvement in accountability by the different stakeholders without the need for fundamental changes in the policy design, as may be illustrated in the discussions that follow.

Table 4-14: National Health Insurance Levy contributions and allocations

| Year | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|---|---|---|---|---|---|---|---|
| National Health Insurance Levy revenue sources | | | | | | | |
| In million GHS | 318.3 | 319.0 | 388.0 | 550.2 | 714.0 | 806.7 | 999.9 |
| Of which (%) | | | | | | | |
| Customs Collection | 44.6 | 53.2 | 47.1 | 51.9 | 51.0 | 50.2 | 46.3 |
| Domestic VAT Collection | 22.6 | 28.6 | 34.2 | 33.85 | 29.7 | 30.1 | 31.9 |
| SSNIT Contribution | 32.8 | 18.2 | 18.7 | 14.27 | 19.3 | 19.3 | 21.8 |
| National Health Fund allocations | | | | | | | |
| In million GHS | 256.5 | 182.5 | 351.3 | 377.0 | 587.3 | 752.8 | 947.2 |
| As a ratio of NHIL revenues (%) | 80.6 | 57.2 | 90.5 | 68.5 | 82.3 | 93.3 | 94.7 |
| NHIL as ratio of tax revenues (%) | 7.4 | 6.9 | 6.2 | 5.6 | 5.7 | 5.6 | 5.1 |

Source: Republic of Ghana Ministry of Finance and Economic Planning Annual Budget Statements, various years; author's estimations.

### 4.5.3   Fiscal accountability and the threat to program sustainability

Inadequate resources for ambitious projects could easily be understood to cause problems for sustainability especially in the developing country context. However, the analysis in this section builds on evidence suggesting that the mismanagement of funds is as critical as the lack of resources for the sustainability of the NHIS and the Mutuelle.

### 4.5.3.1   Fiscal commitment

Some financial sustainability issues of NHIS have been attributed to problems in central government allocation of funds to the NHIS. According to published reports and financial statements (NHIA 2009, 2010, 2011, 2012) fund allocations have improved in timeliness but delays persist (NHIA 2012). Delays in provider reimbursements is one factor that discourages potential providers from joining the scheme and these delays have been largely attributed to the Ministry of Finance delays in releasing budgeted allocations from

the NHI Fund. When delayed funds are released they are done in installments. Vetting of provider claims is another explanation for the contested delays in provider reimbursements, and claims vetting could of itself improve financial sustainability so long as it is reasonable amount of time. All the same administrative delays could be considered one problem that threatens NHIS financial sustainability. As may be seen, central government annual allocations to the NHIS have varied between 57% and 95% of the NHIL revenues collected (see Table 4-14). This pattern may be demonstrating that when lower than budgeted funds allocated in a given particular year, arrears payments improve amounts allocated in subsequent years.

There is indication that administrative inefficiencies occur in managing SSNIT contributions such that even when funds from domestic sources could be adequate administrative bottlenecks have made them inaccessible to the NHIS. For example, at a parliamentary hearing on April 30th 2015 the Controller and Accountant General's Department have admitted delaying the transfer of SSNIT contributions to a designated account at the Bank of Ghana (Ghana News Agency 2015). However, the Controller General indicated having no knowledge of the amount of funds involved although the period concerned is 2012 and 2013. The government's Auditor General similarly claimed to have had no knowledge of the delayed transfer of funds. It is unfortunate that such oversight would occur and the responsible public officials fail to account for funds of this scale. Such an occurrence could possibly hurt efforts to encourage voluntary participation of the private sector in the SSNIT pension scheme. The potential for improving NHIS funding through the important SSNIT contributions is therefore limited to mandatory public employee contributions.

Compared to Ghana, budget performance for Rwanda appears higher judging from budgetary allocations to the health sector. For example, the allocations for the fiscal year 2011/2012 were on target and executions were 105% of allocated funds according to the published budget statements (MOH-R 2012). In fiscal year 2012/2013 also expenditures on human resources exceeded target by 6%, while financial accessibility to health services (i.e. subsidies to households) was on target at 100%, diagnostics and treatment was at 102% of approved funds, with availability of drugs and consumables the only category that obtained less than the approved funds, at 75%. The other category not on target, expenditures on geographic access to health services, was exceeded by 40% with the note that budgetary support from extra sources been received. Budgetary statements of the Ministry of Health in Ghana indicate fund allocations had been about 13% below target for the 2011/2012 fiscal year; this was a midyear observation however (MOH-G 2012). Beside the many factors that could influence budget outcomes, it is likely that, fiscal commitment to the Mutuelle is relatively high in Rwanda. Apparently, also, external support has been reliable in Rwanda.

### 4.5.3.2  Misappropriation of funds

It is to be expected that, for an insurance program, principal agency problems would arise but the extent to which such problems influence financial sustainability may be compounded by inefficiencies in the system. In the NHIS, as in the Mutuelle, different stakeholder groups have been implicated in specific misconducts that minimize the trust and the solidarity that such social programs depend on as illustrated in the discussion that follows. One may observe that the patterns in misconducts that have been publicly

identified have varied in accordance with the institutional contexts and the design of the programs but the negative impact on financial sustainability has been similar and evident.

In recent years the Mutuelle has experienced falling rates in subscriptions which purportedly came as a surprise to citizens and policy makers alike (MOH-R 2012, MOH-R 2013, Hakizimana 2014, Ngoboka 2015). The impact was well realized when a crises of sorts began to emerge. The hardest hit districts have been unable to keep up to schedule in providing health services. Health facilities have been affected for instance with the lack of financing to restock medicines and in turn Mutuelle subscribers have felt cheated to have paid for insurance and not have access to the expected services. The feedback on further falling rates in enrollments have meant some districts operating increasingly at a deficit. While cross subsidizations with surpluses by other districts as well as public and donor support have been available for failing districts, the repercussions are a potential erosion of the gains Rwanda has made expanding access to health care and a an eventual collapse of the Mutuelle system. In advance of recent public debates, parliamentary probes and commissioned studies about the falling rates in Mutuelle membership (Hakizimana 2014, Rwembeho 2015, Ngoboka 2015, Asaba 2015, Ntirenganya 2015, Bucyensenge 2015) interesting patterns in enrollments had been observed by policy makers (MOH-R 2011, MOH-R 2012).

Previously, some sections had been recording enrollment rates that were in excess of population size. Among the probable causes, the Ministry of Health (MOH-R 2011, 2012) cites one such reason as the pressure scheme managers felt to report progress in order to obtain acclaim and improved allocation of resources given the requirements of the performance-based payments system. It would soon be clear after systemic investigations

and extensive audits that mismanagement of funds was happening on a massive scale especially in select Western province districts that had experienced the worst of the crises in enrollments and health service disruptions. An example is the recent high profile arrests of several district mayors charged with falsification of documents and conniving with pharmacies to defraud the Mutuelle. In one instance as much as RWF 9.6 million had been embezzled in the Eastern Province (Hakizimana 2014, Rwembeho 2015, Ngoboka 2015, Asaba 2015, Ntirenganya 2015, Bucyensenge 2015).

Similarly, the Minister of Health (Dr. Binagwaho) has gone on record that although enrollments have marginally improved, the Mutuelle has experienced as much as RWF 7 billion in uncollected revenues for the fiscal year 2014/2015 alone (Ngoboka 2015, Asaba 2015). To give context to this loss, the amount reported as premiums collected in the 2012/2013 fiscal year is about RWF 16 billion. These losses compound the financial position of the Mutuelle and coupled with the losses of health centers and hospitals that depend on the Mutuelle for internally generated funds, the repercussions are greater. The quick response of the administration in apprehending culprits, commissioning extensive audits and research, and the general public's advocacy for sustaining the Mutuelle (Hakizimana 2014, Ngoboka 2015, Asaba 2015, Ntirenganya 2015) may worked to regain some trust of the citizens in the Mutuelle system.

In the case of the NHIS, the publicized examples of fraudulent practices of providers give another perspective into how serious the problem of resource mismanagement and leakages in the system is and the threat to financial sustainability the program (Marma 2008, Peacefmonline 2009, Ghanaweb 2010, JoyNews 2013, Bannerman 2014, Andoh 2015). The NHIA recouped the equivalent of USD7.4 million over a two-

year period for fraudulent claims charged by providers. Some providers have been known to recycle processed claims from month to month (Bannerman 2014). In one instance a provider who owns a private practice and works as well in a public facility processed claims for 1540 clients in the two facilities at exactly a month apart. The fraudulent claims involved were estimated at about USD500,000. A recent example involved the physician in charge of one administrative district's health system, in which case the fraudulent claims have been estimated at about USD150,000 (Andoh 2015). A similar report involves a physician charged with falsification of documents by submitting claims for services rendered to phantom patients, and again presenting claims for said patients for services in several facilities owned by same physician. This doctor's fraudulent claim from January to December of 2013 alone is estimated at about USD 60, 000 USD (Nti 2015). Such news has become common especially following special audit exercises by the NHIA. If one considers that total funds for NHIS was USD 362.2 million in 2012 then such level of fraud for a few publicized high profile cases, in addition to the probable countless others that have not been publicized or even identified suggest that the leakage of funds could be phenomenal. In addition to providers, patients, contractors and scheme managers have been known to make fraudulent claims on the NHIS funds. Cases of impersonation whereby a non-member uses the identification of an active member to access services are known to be common. Similarly ganging is known to be happening, whereby a number of individuals, typically household members, access services using one active member's credentials. Members are known also to misuse services by filling prescriptions on behalf of non-members in exchange for cash (NHIA 2013).

It becomes apparent that attaining long term financial sustainability of the NHIS is a herculean task unless mechanisms are incorporated to force and maintain an adequate level of accountability. With this sketchy data one may conclude that the so-called inadequate financing structure is arguably made worse as a result of fund misappropriation and mismanagement by the different levels of agency be it the central government, Scheme managers, service providers and contractors. NHIS clients themselves have been implicated in defrauding the Scheme (NHIA2013).

### 4.5.4    The financial sustainability verdict of the status quo

Judging by the available financial statements it is apparent that the NHIS is not financially sustainable, regardless of the positive impact that has been observed in improved access to health services.  While the Mutuelle has managed to operate at an overall surplus of 7% in 2012 and 2013 (MOH-R 2013), the NHIS has operated at a loss in every year since 2009. While the exact losses in 2013 and 2014 have not been estimated in this study some evidence gathered suggests that the financial collapse of the NHIS is imminent unless there is a significant injection of funds. Public debates about the financial sustainability of NHIS have been ongoing since its inception and the debates have intensified in recent months as evidenced in the records on parliamentary proceedings and in the media.  The NHIS, within three short years of its implementation, turned from operating on a surplus to a deficit beginning in 2008 (NHIA 2009). While public officials have been known to make assurances about the government's commitment to NHIS, alternative reports from the providers' perspective may suggest that the losses in recent years are unsustainable.

According to news reports in March 2015 the Christian Health Association of Ghana (CHAG), the largest group of non government provider (about 183 health facilities), has made know its intention to no longer accept NHIS card bearers (Owusu 2015, Nti 2015). Previously, an ultimatum was announced in September 2014 to withdraw services from NHIS due to nonpayment of arrears. It was reported at the time that GHS50 million (US$14 million) was owed in arrears to the CHAG. In other news, The Society of Private Medical and Dental Practitioners ordered its members to withdraw services to NHIS clients with effect from May 4, 2015 due to nonpayment of claims due (Starfm 2015). Similarly, the Chamber of Pharmacy had since August 2014 refused to supply medicines and supplies on credit to health facilities as health facilities had been failing to settle bills in a timely fashion because of the delays in NHIS reimbursements (Nti 2015). The Health Insurance Service Providers Association of Ghana has regularly threatened to withdraw services from NHIS-cardholders and is on record to have issued a two-week ultimatum for delayed reimbursements in late 2014. Politicians in the opposition have given momentum to the awareness about the financial difficulties facing the NHIS. For example, during budget readings in March 2015, a highly publicized event in Ghana, a parliamentarian went on record in stating that the 'cash-and-carry' system has been reinstated to near pre-NHIS levels due to failure to expand the NHIS. The deputy Minister of Health is on record to have stated (in reaction to protesting health providers in May 2015) that the NHIS owed an amount of GHS460 million (USD 120 million) to health care providers but that government was on course to working out a strategy to bailout the NHIS. On the other hand, similar such statements of reassurances appear to lack specific details about what plans government is making to address the so-called imminent collapse of the NHIS.

Some statements by the non-government sector, specifically the Universal Access to Healthcare Campaign (UAHCC), a network of Ghanaian and international nongovernment organizations, add to the evidence about the financial position of the NHIS. From the perspective of the UAHCC the current state of the NHIS requires an urgent restructuring of financing by the government especially because the national health insurance levy is a huge resource envelop but the delays by the Ministry of Finance in releasing these funds is the issue at stake. From this perspective, Ghanaians have been contributing adequately in taxes and levies towards financing the NHIS but a huge gap persists between resources mobilized and NHIS financing. The urgent call on government is thus to be transparent about the amount of resources mobilized and to what uses they have been put (Starfm 2015). Another perspective of the UAHCC is that operational inefficiencies are well to blame as the cost of processing claims is estimated to have increased by a factor of forty in ten years (Jakubowski 2014). Recent reports by the National Health Insurance Authority add another perspective to the financial sustainability problem of the NHIS. From this perspective corruption in claims processing, the poor quality of pharmaceutical products on the Ghanaian market and generous claims payments are critical factors influencing the financial state of the NHIS (NHIA 2013).

The Mutuelle on the other hand has potential for sustainability in the long term. From the provisional estimates for 2013, the share of premiums has increased rather appreciably to 66% (MOH-R 2012) but this may be a displacement of revenue since the overall revenue envelope shrunk. At the same time enrollments decreased. Given the increasing challenges with fraud and the consequent interruptions in enrollments and services, the reduction in revenues is to be expected. While surpluses at the section level

were adequate to absorb losses at the district and national levels in 2011/2012, the losses by districts in 2012/2013 outstripped the surplus balances at the section level. With the recent improvements in enrollment rates, financial sustainability could be expected to improve when the districts return from operating deficits to a surplus position. The Mutuelle system could be expected to be financially sustainable over the long term. Beside the large premium contributions component, direct central government allocations as the second most important source of funds implies that political commitment to Mutuelle (as a poverty reduction strategy) would sustain the program. Based on the available data and the stipulated funding sources one may conclude that the 21% share of government is exclusive of the additional 11% from external sources, the Global Fund. As long as the external component is sustainable, the Mutuelle is sustainable over the long term.

### 4.5.4.1    The multidimensional context of sustainability

Looking at the data on financial sustainability the verdict is to rule out the viability of the Ghana NHIS as a mechanism to attain universal health coverage given the status quo. However, extending the discourse to a multidimensional context of health care program sustainability, one may consider also the context for the interaction of socio-cultural, political, geographical and health system characteristics in addition to resource availability (Shediak-Rizkallah and Bone 1998, WHO 2002, Gruen et al 2010, Shell et al 2013). In this context, to the extent that health outcomes of NHIS are desirable, policy makers would be justified to extend NHIS regardless of financial sustainability, considering other alternatives as defunding other programs or running indefinite deficits.

Another important relational framework for assessing program sustainability is the interaction between a program and the driving forces in resource mobilization for program

delivery. For instance, donor funds may be affected by the status of the economy, the polity and tax base of the donor country, or by competing priorities of host governments, multilateral institutions and the implementing agencies delivering the health interventions, or even possibly by the perspectives of the beneficiaries being helped. This context aptly describes the sustainability conditions for Rwanda where external sources are upwards of 11% specifically for CBHI and an even higher proportion of over 50% generally in the national expenditures on health. Regardless, some countries have achieved substantial improvements in population health by prioritizing health development despite major constraints in limited resources and dependence on external sources for that matter (Gruen et al 2010, Stuckler et al 2010). Another complex interaction that influences program sustainability involves stakeholders and what they identify, define and prioritize as health concerns or how they choose to do this (Gruen et al 2010). This is because defining and prioritizing issues concerning hierarchies of health needs involves some subjectivity and different stakeholders would have different emphases. The approach to universal coverage therefore may not be dictated simply by the financial sustainability horizon. Financial sustainability may in turn be dictated by stakeholders' priorities in choosing the mode of financing, whether by mandatory taxation or by mandatory private insurance, or by public financing through a single-payer system or a combination of public and private financing with varying degrees of emphasis on private versus public roles. In effect, regardless of the verdict on financial sustainability, a broader assessment about sustainability would be required to make concrete statements about the sustainability of the programs. The focus in this study has been narrower as it has been limited to the financial viability of the programs based on a limited set of information.

### 4.5.5 Policy changes needed for financial sustainability

We propose several changes that would improve financial sustainability of the NHIS and the Mutuelle. However, these recommendations are based on the assumption of the status quo in the disease profiles, the defined package of benefits and the rate of health care utilization. Given the sources of funds and the performance over the years as illustrated in Table 4-13, one area where improved performance is needed for Ghana NHIS is the informal sector contributory client base (subscriptions) considering the smaller population coverage. An increase in the contributory client base is the more practical approach since a raise in the premium rates is not politically desirable. In addition, without improvements in means testing, an increasing in the cost of insurance premiums would worsen the existing problems in equity. As has been demonstrated in this study, NHIS coverage is stronger associated with higher socioeconomic status and more of the poor are excluded. Increasing the contributory base may improve sustainability while also reducing effectiveness of the NHIS in attaining the desired goal of universal coverage. Also, public sector reforms towards efficient mobilization of tax revenues would similarly improve the channelling of funds to the NHIS. Given the sensitivity of NHIS revenue to economic performance, it would be necessary to establish an emergency fund that could absorb the shortfalls in public revenues during economic downturns.

The Mutuelle in Rwanda has attained a higher population coverage for the given benefit package it provides. Given the status quo an improvement in revenue sources might still be possible without compromising the goal of universal coverage. Rwanda should target a higher share of domestic funding for the Mutuelle even while benefitting from donor support. One approach to improve domestic sources would be an increase in the

existing earmarked taxes from insurance markets. Enforcement of these taxes could improve the funding from domestic sources.

Cost containment is most impactful in provider reimbursements as is often the case for universal health care programs (Stuckler et al 2010, Lagormasino 2012, Aryeetey et al 2012). The evidence indicates that both countries are expending efforts to improve efficiency in provider reimbursements through the adoption of capitation in Ghana and performance-based reimbursements approaches in Rwanda. While the search for cost containment is laudable, it is critical that stronger efforts are expended to minimize fraud and misappropriation of funds. The ample evidence in this study illustrates that fraud by providers and clients alike is a common problem with NHIS. The capitation system of reimbursements might be effective in curtailing fraud provider claims fraud as has been promised by the NHIS. Similarly, there is increasing evidence that fraud by scheme managers is a potential threat to the sustainability of the Mutuelle. The Rwandan government's swift response through investigations and prosecutions is a step in the right direction. Such efforts should be sustained to deter increases in fraudulent activities that could threaten financial sustainability.

## 4.6 Conclusion

This study set out to examine the critical factors in the successes and challenges of the community-based health insurance approaches to universal health care coverage in Rwanda and in Ghana. The objective has been to compare the outcomes and the differences in using these models as the mechanism to expand equitable access to health care. Specifically, evidence in the literature has been compiled to evaluate outcomes in health care utilization, health status and protection from the financial risks of accessing health

care. Further assessments have been made about the key institutional characteristics that have influenced differences in these outcomes. The analysis has focused also on the financial viability of the universal coverage models and the key factors that influence long term sustainability. The underlying hypotheses had been that the community-based models make significant impact on expanding access to health care and that differences in political and community involvement have been key to outcomes, as also the mode of financing is key to sustainability.

Some common patterns have been observed for both country models. Overall, the results strongly suggest that the community based models have been useful as a starting point to target unreached populations. A critical feature of these models is that public expenditures and consequently fiscal commitment is necessary to the usefulness of community-based approaches in reaching levels commensurate with universal access. The evidence shows that the mode of financing is important as far as a sound policy design but this is not the critical factor for long term sustainability, which is in slight contradiction to the initial hypotheses of this study. This study finds that the policy design and implementing structures are not exclusive to technical soundness but a more practical approach in conformity to the context of the domestic political economy.

Financial sustainability indeed is the critical deciding factor of sustainability since strong domestic commitment to the goals of universal access to health already exists. In turn a critical factor for financial sustainability is the harnessing of political and institutional forces towards the efficient use and allocation of the available resources. Resources have been made available through considerable domestic resource mobilization capacity and external support. Fundamentally, the financial sustainability in both countries

is threatened by the usual principal-agent problems that are characteristic of insurance. Consequently, financial sustainability depends on improvements in accountability in order to reduce incidences of misappropriation of the available resources, whether by clients, providers, managers or even the political regime. Both country models have benefitted also from social capital (although in different forms in conformity to the socio-cultural and political economy contexts) in terms of popular support for free access and consequently a domestic ownership of policy on universal access to health care.

Beside these common factors, the study has shown that Rwanda and Ghana differ in many respects in regards to the implementation and the outcomes of their community-based universal health insurance models. It is evident that the health care system in Rwanda is not without problems and in some respects Ghana is better endowed. Ghana has relatively a higher burden of non-communicable diseases. Poverty levels are worse in Rwanda. This study has shown that the models in both countries have potential to expand access to health care because significant improvements in insured households' health care utilization and financial risk protection. However, in the case of Ghana, relative difficulties in charging premiums based on ability to pay have resulted in inequitable coverage. The cost of insurance is a significant deterrence to participation especially by the poor. The NHIS studies indicate a strong association between high socio-economic status and NHIS membership which suggests that disadvantaged groups are excluded. If one were to use the rates of health insurance among the population as a measure of universal health coverage then the conclusion would be Rwanda, but not Ghana, has succeeded with its model. Problems in equity in access to health care persist in terms of the poor not being able to access health services due to other problems as the cost of transportation.

The relatively rapid progress of Rwanda's Mutuelle program in terms of coverage can be attributed to significant grassroots participation and the incorporation of internal experiences and evidence-based strategies in adapting Mutuelle into ongoing poverty reduction strategies. The Rwandan model is an integrated approach to poverty reduction and therefore ties into other ongoing rural development strategies and forms part of national development programs. On the contrary political branding of Ghana's NHIS has overshadowed its relevance as a development strategy. The NHIS originated as a health sector reform with politically charged motivations and by relatively non-participatory approaches.

The enabling factors in country contexts go beyond the obvious factors of a smaller population and higher density in addition to common language that makes grassroots organizing relatively more approachable in principle and in logistic terms in Rwanda's case. The Rwandan model has incorporated socioeconomic status (Ubudehe) classifications that make it relatively more effective in tying insurance premiums to households' ability to pay. Although voluntary, Rwanda's model promotes higher enrollments since whole households are required. Ghana's model has a relatively blind approach. Regardless of policy prescriptions that target the poor, and even though the abject poor have been reached, inability to charge premiums by ability to pay has meant that the poor as well as middle income households in the informal sector are discouraged by the cost of insurance. In addition, enrollment organized on individual rather than household basis does not promote higher enrollments while also encouraging adverse selection.

Political will has been a key feature in both country models but for different reasons. The incumbent government's ambition to attain a middle income country status by year 2020 among other development goals has been evident. Hence, the commitment to health improvements and therefore the Mutuelle the adopted model to expand coverage. In the case of Ghana, arguments about which political regime has claim to a legacy in NHIS, sometimes leading to inconsistent policy debates overshadows the commitment to the NHIS as the country's strategy to attain access to health care for all. The political branding of NHIS diminishes solidarity and the consequent domestic resource mobilization potential that could ensure long term financial sustainability.

It is necessary to amend the NHIS policy to include whole household enrollments as a measure to reduce the problem of adverse selection. Another recommendation is to developing several insurance packages for a segmented market to encourage enrollments. Price signals may be a second best option to price discriminate given the problems with charging premiums by ability to pay, for the same standard package. The finding that households in higher SES tend to refuse to enroll because NHIS is not needed suggest that targeting a different package of care while also ensuring a standardized package of care universally may enrollment. Such a package may include coverage for high end hotel costs in inpatient services or select non-communicable diseases. However, such a policy would necessarily require risk assessments, coinsurance and deductibles as measures to minimize adverse selection and moral hazard. Evidently, such a policy changes are not financially sustainable without fundamental changes to the payments system that would minimize fraud. To this end inclusion of electronic identifications and billing, inclusion of

performance-based financing and inclusion of more stringent public accountability while improving administrative efficiency could improve resources for NHIS.

This study has provided a general overview of the relatively higher per capita costs of the NHIS in comparison to a similar policy in a fellow Sub-Saharan African country, Rwanda. A more detailed investigation of the cost schedules in Ghanaian health facilities and pharmaceutical industry would provide more critical information for evidence-based payments structure of the NHIS. Also as more household data have become available from recent national surveys it would be possible to investigate the determinants of health insurance demand and out of pocket payments to identify what impact NHIS has made over the years and what evidence-based changes to policy design would improve its usefulness as a universal access program. Such information could identify the feasibility or usefulness of targeting a different package to different segments of the population. Of particular interest is the investigation into the extent of leakages of funds through misappropriation of funds. Given the increasing amount of fraudulent practices, a compilation of the incidences and conditions of fraudulent activity would help to identify effective means of improving accountability.

# CHAPTER 5

# CONCLUSION

Health is integral to the quality of life. Health is a means to, and outcome of economic development. It plays a critical role in poverty reduction. Health is a fundamental human right. Knowing the nature of household health costs and the burden that it places on them is important to any meaningful effort to expand access to health services, to reduce health inequities and to improve health outcomes. Out of pocket payments for health care often act as a barrier to essential health services particularly for those that need it most. Hence a growing number of countries aspire to attain universal health coverage with the main objective to make essential health services available to all regardless of ability to pay. However, universal health coverage comes with formidable challenges for developed and developing economies for reasons such as the consensus building required, the massive mobilization of resources and the problems in targeting due to changing population, environments and priorities. Ghana and Rwanda are prominent examples that have committed to establishing national health insurance programs with the intent to speed up progress toward universal health coverage.

This study set out to analyze out of pocket health care expenditures of households and the incidence of catastrophic payments, the reach of Ghana's National Health Insurance Scheme in reducing inequities in access to quality health care, and to identify program features that are critical to the long term success of NHIS. The study compared outcomes in the case of Ghana with those of Rwanda which has a similar national health insurance program but is not so similar in approach. The first essay analyzed the determinants of household health costs and the potential for catastrophic expenditures on

health. The second essay investigated the determinants of out of pocket payments and perceived quality of health care as experienced by the insured. The third essay undertook comparative analysis of the relative impact of the community-based approaches to universal health coverage in Ghana and Rwanda, and the institutional factors of the gains and sustainability of the schemes. A systematic review of the literature has been undertaken to compare the impact on financial risk protection, health care utilization and health status. The study further compared the institutional features of each country model and how these features could explain differences in outcomes. It compared the financial viability and the key factors that influence long term sustainability of both country models of universal insurance coverage. The results from this collection of essays have policy implications for improving progress toward universal health care coverage.

## 5.1    Summary of findings

The empirical analysis of household health care expenditures is based on data from the Ghana Living Standards Survey conducted in 2005/2006 (coinciding with the first year of NHIS implementation). The results show that the majority (85%) of the individuals reporting any expenditure on health care had to be financed out of pocket.  At least two-thirds of households reported some health expenditures irrespective of illness status. With regard to the distribution of health care spending, medication is the most frequent expenditure while hospitalization is the most expensive as one would expect. A difference across localities shows up in rural households having a higher proportion of health expenditures on inpatient services and urban household's having a higher proportion spent on medication. The proportions spent on health provider consultations and transportation to health facility is statistically similar across localities. Health expenditures are higher

among households that have experienced hospitalization as may be expected, but the poorest households are the most affected.

With regard to factors that influence the decision to spend on health care, the incidence of illness and its severity are the key determinants of household health expenditures. Again in the decision to spend, the effect of socioeconomic characteristics such as education of the head of household or household poverty status as indicated by welfare is found to be statistically weak. However once a household has decided to spend, education becomes a significant factor in the amount of expenditures. In addition to morbidity and its severity, longer than average time in travel to reach health care provider or facility has significant marginal impact on health care expenditures. Yet, the indicators of ability to pay are statistically weak determinants of the amount of expenditures. It is safe to conclude that out of pocket expenditures on health are nondiscretionary and health services are not regarded as a normal good whereby expenditures vary strongly with affordability.

With respect to catastrophic expenditures as measured in proportion to food expenditures, the evidence shows that all households have a potential for financial risk but the risk is statistically stronger for poorer households. In descriptive statistics wealthier households have a higher ratio of health to food expenditures but this observation indicates the ability to pay given the smaller ratios of health to non-food expenditures. When other factors are controlled for, poorer households show up as the most affected by catastrophic out of pocket payments. Again, the regions and localities with a higher poverty distribution have a higher financial risk of household out of pocket expenditures on health care. These findings lead to the conclusion that the structure of household health expenditures in Ghana

has strongly built in the financial risk regardless of wealth status. The poor face the most risk because of the higher health needs as measured by self reported health status, coupled with the lower ability to afford higher health expenditures. Out of pocket health expenditures have the potential to drive households into deeper poverty or tip non-poor households into poverty. Reducing financial risks in household health expenditures has significant potential to reduce poverty.

Looking at the poverty-inducing patterns in household health care expenditures, it is a strategic policy to have the NHIS established with the goal to make health care free at the point of service. One would expect that enrollment in the NHIS, especially by the poor, would minimize the risk of catastrophic household expenditures on health care. The findings from the second essay suggest that the socioeconomic status of the household, residence and gender are the key predictors of the likelihood that an individual is insured. Specifically, the four regions to the north and especially rural communities and females have a better chance of being insured than the Western and other regions to the south. More importantly, individuals from households in upper wealth brackets are the most likely to be insured still after controlling for locality of residence and gender. When insured individuals have had to make out of pocket payments, the need for uninsured services is the driving factor even when ability to pay is accounted for. This leads to the conclusion that NHIS improves access to health care but does not eliminate the potential for catastrophic expenditures especially among the poor. In spite of NHIS coverage, out of pocket payments have a financial risk potential for the insured households that can least afford them in the event of acute health care expenses not covered by insurance. The findings suggest a majority (80%) of the insured perceive NHIS beneficiaries receive better

or similar quality of services as the non-NHIS members. Yet among the insured, out of pocket payment is the most significant predictor of the dissatisfaction with quality of services whereas socioeconomic factors such as wealth status, education or residence are statistically insignificant. Unfavorable attitude of health worker has a stronger effect on the likelihood of NHIS-client dissatisfaction compared to long waiting times, communication about the treatment process and any other factors.

The conclusion that can be made of the progress of NHIS is that a good attitude of health workers could significantly improve voluntary enrollments in NHIS and consequently create a strong subscriber base that could ensure long term sustainability of the scheme with the attendant gains in welfare. Evidence in the literature suggests that high attrition rates occur in NHIS membership and the evidence show that population coverage has slowed down to about a percentage point increase each year since 2010.

The evidence from the third essay provides a context to examine the progress that NHIS has made toward equitable access to health care, and the ways to overcome challenges in attaining coverage levels commensurate with universal access to health care. Rwanda has similarly adopted a national health insurance policy as the mechanism to ensure protection against the financial risk of accessing health care. Rwanda began an expansion of community based health insurance from a pilot phase in three districts around the time Ghana began implementing the NHIS in 2005 also with a handful of pre-existing community-based schemes. By the end of 2006, voluntary enrollments had increased to reach 76 percent of the Rwandan population and by 2010 at least 90 percent of Rwandans had some form of health insurance. By 2006 15 percent of the population in Ghana was enrolled in NHIS and by 2010 about 33% were enrolled in addition to 5% in alternative

private health insurance. Hence the progress of Ghana in expanding access to health care while reducing household financial risks is compared alongside Rwanda's apparent achievements in additional population coverage.

One explanatory factor in the higher rates of population coverage in Rwanda is that, unlike the Ghana's NHIS, Rwanda has the advantage of enrollment by whole households and payment contributions are more strongly aligned with household ability to pay. Not surprisingly, the findings indicate that disadvantaged groups are excluded from Ghana's NHIS to a greater extent than in Rwanda. The empirical evidence in the literature indicates that NHIS enrollments have been strongly associated with higher socioeconomic status and with formal employment. Health care utilization rates have shown similarly impressive outcomes in both country models. The improvement in financial risk protection is relatively stronger in Rwanda than in Ghana. On health status, the evidence in the empirical literature indicates that Rwanda has a stronger association between health status and health insurance whereas insured individuals in Ghana tend to have a poorer health state than the general population. The evidence suggests that adverse selection is stronger in Ghana NHIS as household members of poorer health status are more likely to be enrolled, given that enrollments are selective on individual basis and, unlike in Rwanda, enrollments are not mandatory by whole household units. A relatively higher tendency for adverse selection into NHIS is an expected outcome especially since affordability of insurance is the most significant reason for not enrolling, (especially by the bottom two quintiles of welfare), while having no desire for health insurance is a reason most cited by uninsured individuals in the upper quintiles.

With regard to institutional differences, the Rwandan model is an integrated approach to poverty reduction which benefits from a high level of political commitment. On the contrary political branding of Ghana's NHIS overshadows its relevance as a development strategy given the public perception of political motivation in NHIS as a tool to gain political votes.  The political economy but not the technical soundness of policy has been the necessary condition for the effectiveness of the model adopted in either country. Making enrollment mandatory for households has been a major factor for achieving universal coverage in Rwanda. In contrast the NHIS in Ghana is yet to establish and enforceable mandatory component. In addition, Rwanda has inbuilt performance evaluation and monitoring with a client-based component which helps to reduce principal-agent problems. Ghana lacks an integrated client-based evaluation component though it does well in monitoring provider effectiveness through accreditations, and evaluations such as clinic audits. These measures have not deterred considerable fraud in the provider claims.

Contrary to the initial hypothesis concerning financial sustainability, the mode of financing is not the necessary condition for long term sustainability although it is important.  Institutional accountability is the critical factor for financial sustainability both in Ghana and then in Rwanda. Rwanda has adopted a two-sector approach to universal health care financing consisting of community-based health insurance on one hand and social health insurance on the other while Ghana combines both. In the literature one of the critiques of the community-based health insurance (CBHI) approach to universal health coverage (UHC) is the tendency for fragmentation of the health system in ways that could slow down progress toward UHC (McIntyre et al 2008, Lagarsimano et al 2012).  For this

reason, Ghana's greater reliance on well-defined financing sources (earmarked taxes, payroll deductions, insurance premiums) that integrate traditional social health insurance approaches, with less emphasized CBHI sources has potential to improve equity in the contributions. Alternately, the structure of the economy presents challenges with a large informal sector. This coupled with weaker ability to target premiums by ability to pay of the non-exempt adult population the problem of affordability for the poor and the problem of smaller risk pool and adverse selection weaken the benefits of Ghana's relatively larger social health insurance component. In contrast, Rwanda has proven to benefit from community-based financing by adapting UHC to its political economy and cultural contexts. However, the financial sustainability may be undermined by dependence on external financing and the usual principal-agent problems in the management of funds.

## 5.2 Policy implications

Efforts to effectively target health care to households with critical health care needs have to be stepped up. Moreover, these efforts would be most effective if accompanied by effective education programs that increase access to quality health care and health behaviors. The goal of achieving equity in health care by equal access for all would not be realized without an emphasis effectively targeting quality health care to disadvantaged households while also improving universal access to a basic package of health care. In the same vein, reducing regional resource gaps and poverty gaps has strong potential to improve access to health care for all citizens and the associated benefits that may feed back into equity in economic growth and consequently real progress in development. Making whole household enrollments mandatory in NHIS would increase coverage. To improve targeting of coverage to less advantage groups, Ghana could adopt the community-

supported mechanisms that have been tested through existing household cash transfer programs to develop socioeconomic classifications to decipher household ability to pay for insurance. A blanket increase in insurance premiums would worsen the problem of inequity in coverage.

Improving interpersonal interactions between health care workers and clients is critical to NHIS sustainability. Understandably, the NHIS is situated in the context of the systemic problems in health care delivery in Ghana such as long wait times, staff unwelcoming attitude, and the general lack of resources for up to date technology and medical supplies. NHIS is being carried out through pre-existing health care system with the deficit in infrastructure and human resources. However, the evidence in this study corroborates what has been reported elsewhere that NHIS card holders face an extra level of frustration from intimidating staff demeanor (SEND-Ghana 2010, Dalinjong and Laar 2012). The results suggest that provider and staff attitude toward clients is the most critical cause of dissatisfaction with quality.  Information from personal interviews with National Health Insurance Authority (NHIA) representatives in Accra (January 30, 2013) suggests that the NHIA is keenly aware that client dissatisfaction with quality is an important cause of the shortfall in the level of subscriptions required to keep the Scheme operating sustainably.

The results from this study suggest that improving interpersonal relations in health care delivery to NHIS cardholder may yield quick results in client satisfaction and consequently improve attractiveness of NHIS. In particular, discriminatory practices against NHIS subscribers must be tackled aggressively. One approach would be a social marketing campaign or public advocacy for behavioral changes among health care workers

in general and especially toward NHIS clients. In some communities there may be the need to remove cultural biases that view NHIS as a health care program for the destitute.

A rebranding of the NHIS to appeal to different consumer groups could be another remedy to reduce stigma, improve client satisfaction and increase NHIS attractiveness. In such an effort possibly, in addition to the existing NHIS uniform plan package that covers a standard package of services, supplementary packages may be defined to attract different segments of the population and thereby encourage more enrollments. For example, separate plans may be defined to cover acute inpatient care only for households who would prefer to use NHIS as supplementary insurance but at a higher premium to contribute to the existing standard minimum package that could be further subsidized to reach the poor. This plan may improve financial sustainability while also improving universal access. Alternative packages that cover basic care (such as physician office visits and hospital registrations) with differentiated prices may be more affordable or attractive for individuals who may consider existing plans too expensive for the expected benefits. Similarly, NHIS could have separate plans to cover only prescription medicines for individuals who may prefer that option. NHIS could then become attractive to households who consider the current uniform package not suitable to their needs. Similarly, more providers may qualify to join, or may be attracted to join the Scheme. At the same time as more citizens opting into the program would improve universal access.

Arguably the financial sustainability of a universal coverage program and the NHIS for that matter requires a large client base and consequently the need to make enrollments mandatory and enforceable. Providing a supplementary insurance through NHIS may help

to increase acceptance of mandatory insurance especially in a large informal sector where enforcements of social insurance contributions are difficult.

Emphasizing improvements in health care delivery is the efficient approach to universal access. The results have shown that waiting times is the primary cause of dissatisfaction with health services. Reducing systemic problems in health care delivery could yield faster results in increasing access. Regardless of free health care at the point of service, accessibility is compromised if prompt health care seeking is discouraged by costly long wait times. The tendency to rely on unskilled care or to seek proper care too late reduces the benefits of free health care at the point of service.

## 5.3 Limitations of the study

With regard to the first essay, the absence of panel data means the results lack the time trend that could be useful for differentiating random shocks from predicted behaviors regarding health expenditures. Using data from secondary sources means a lack of control on data generating processes. Similarly, the data lacks detailed information about health status such as chronic disease and frequency of illness that could significantly predict demand for health insurance. In a similar vein, the data is limited in information about long run income, savings, safety nets, social capital and other socio-cultural factors that might be important indicators of household coping mechanisms to catastrophic health shocks. Hence significant factors in determining the financial risks households face might be omitted. However nationally representative survey data from secondary sources is an available alternative to undertaking an (expensive and financially less feasible) original national survey for this study. Also, the study does not include indicators of the supply-side factors (availability of health services, economic and social infrastructure) that could

give a better insight into household health care demand and the resulting impact on health expenditures.

Similarly, the second essay falls short in several areas due to limitations of the Ghana Demographic and Health Survey data in addressing the research questions. In addition to the data limitations listed for essay one, another limitation of this study is the lack of control for heterogeneity in health insurance schemes such as differences in insurance premiums (e.g., insurance registration fees and premiums vary by poverty and socioeconomic status of districts with wealthier districts setting higher charges), administrative performance and effectiveness (e.g., inherited and longer established schemes versus relatively new insurance schemes), the local economies and the health system within which the schemes operate. This distinction could be relevant in evaluating reducing unobserved characteristics that influence insurance enrollments and outcomes.

In the third essay, equity issues in utilization, whether overconsumption of health services or under consumption by different groups occurs so that in reality expanding access deepens inequities in health care utilization. The nature of access is also important. For instance, emphasis on curative care may be misleading; intensive use of curative care by subscribers could be due to a lack of quality care hence poor outcomes resulting in repetitive use. It may also be due to sheer overutilization of services (when gate-keeping is not effective) or may be provider-induced, hence cost escalation. Institutional comparisons would require a more in-depth knowledge and personal experiences of the country context. For instance, information through key informant interviews would improve this aspect of the research. The analysis on Rwanda falls short in this area. The analysis of financial sustainability would require information about current financial status and trends in

financing and expenditures as well as expected future revenue flows and expenditures. The lack of data has made such an analysis impossible.

## 5.4  Research prospects

This study suggests a follow up that would empirically investigate the interrelationships between household socioeconomic status, health seeking behavior and access to health care to shed more light on the direction of impact on health care expenditures and poverty status in Ghana. A more recent nationwide household survey data (the sixth round of the Ghana Living Standards Survey in 2012/2013) makes it feasible to investigate these relationships. It would be useful to estimate equity gaps such as in the differences in access to health care and health care seeking behavior attributable to differences in the socioeconomic status of individuals or households. Similarly, it would be useful to find out if the NHIS has improved upon its inclusiveness by reducing equity gaps in enrolment of disadvantaged households. It would be possible to compare recent catastrophic payments incidence and what progress NHIS has made in improving protection against the economic risks of household health care seeking. It would be possible to investigate the determinants of health insurance demand and out of pocket payments to identify what impact NHIS has made over the years and what evidence-based changes to policy design would improve its usefulness as a tool for universal access. Such information could possibly identify the feasibility or the usefulness of targeting a different package of insurance benefits to different segments of the population.

While access to care may be crucial to promoting and maintaining good health, access is not enough. An important aspect of the discussion of access to health care should include the technical quality of health care and whether access to care translates effectively

into better health outcomes. The supply-side factors about the NHIS that have to be studied include the technical effectiveness of health services including clinical procedures and outcomes and accreditation of facilities and providers. Also, information gathered from key informant interviews conducted in the process of this study suggest that NHIS faces critical challenges in the area of provider incentives, processing of benefits claims and reimbursements.

Another prospect for research is to evaluate the relative impact of the pilot phase of capitation reimbursement program introduced in the NHIS. This pilot phase provides a natural experiment to compare capitation and the traditional fee-for-service method of reimbursement in terms of provider incentives in cost containment, quality of services and the relative gains in efficiency for the NHIS.

This study has provided a general overview of the relatively higher per capita costs of the NHIS in comparison to a similar policy in Rwanda. A detailed investigation of the reimbursement structure of the health insurance programs would provide useful information for evidence-based payments structure of the NHIS. This information in addition to studies on the cost schedules in Ghanaian health facilities and the pharmaceutical industry could provide information about the reasons for the relatively high per capita costs of the NHIS. Of particular interest is the investigation into the extent of leakages of funds through misappropriation of funds. Given the increasing amount of fraudulent practices, a compilation of the incidences and conditions of fraudulent activity would help to identify effective means of improving accountability.

**PATTERNS IN POVERTY, DISEASE BURDEN, HEALTH SERVICES AND
HEALTH SPENDING**

Life expectancy and mortality rates in selected African countries, 2009

|  | Ghana | Africa | Nigeria | Rwanda | South Africa | Low income | High Income | Global |
|---|---|---|---|---|---|---|---|---|
| Life expectancy at birth | 60 | 54 | 54 | 59 | 54 | 57 | 80 | 68 |
| Under-five mortality[§] | 69 | 127 | 138 | 111 | 62 | 117 | 7 | 60 |
| Infant mortality[§] | 47 | 80 | 86 | 70 | 43 | 75 | 6 | 42 |
| Maternal mortality[¤] | 350 | 620 | 840 | 540 | 410 | 580 | 15 | 260 |
| Adult mortality rate | 332 | 383 | 370 | 279 | 496 | 321 | 88 | 176 |

Source: World Health Statistics, WHO 2011.
§ Per 1,000 live births.
¤ Modeled estimate per 100,000 live births and year 2008.

Private health expenditure ratios in Ghana

|  | 2000 | 2008 | 2013 |
|---|---|---|---|
| Private expenditure on health as % of total health expenditure | 58.6 | 50.0 | 39 |
| Out-of-pocket expenditure as % of private expenditure on health | 79.6 | 78.8 | 91.9 |
| Private prepaid plans as % of private expenditure on health | 6.1 | 6.2 | - |
| Per capita total expenditure on health (PPP int. USD) | 66 | 114 | 214 |
| Per capita government expenditure on health (PPP int. USD) | 27 | 57 | - |
| Per capita total expenditure on health at average exchange rate (USD) | 18 | 55 | 100 |
| Source: National health accounts data (World Health Organization, 2011) | | | |

Sources: National health accounts data (World Health Organization, 2011), World Bank World
Development Indicators.

Percent poor in Rwanda by districts, 2011

## EICV3: poverty



District__ 2006__ rw92.shp
- 0.085 - 0.203
- 0.203 - 0.378
- 0.378 - 0.493
- 0.493 - 0.57
- 0.57 - 0.734
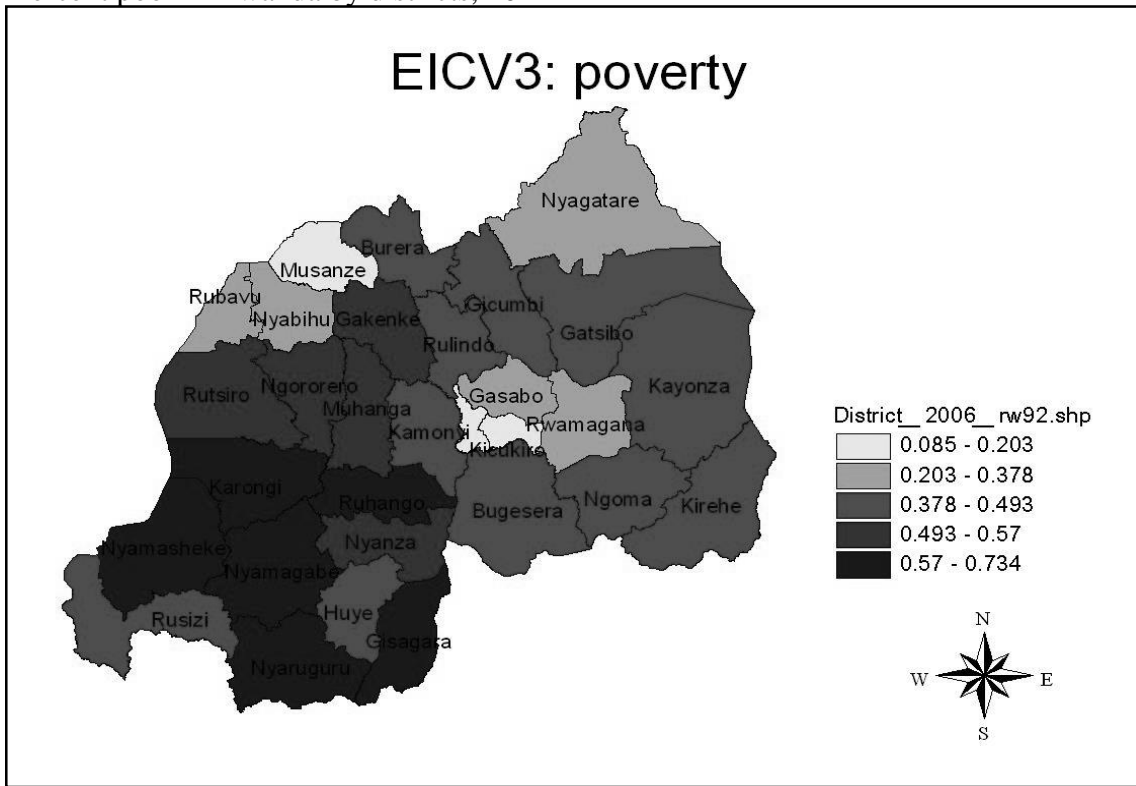
Source: National Institute of Statistics, Rwanda (2012), p. 17.

Distribution of poverty in Ghana, by district
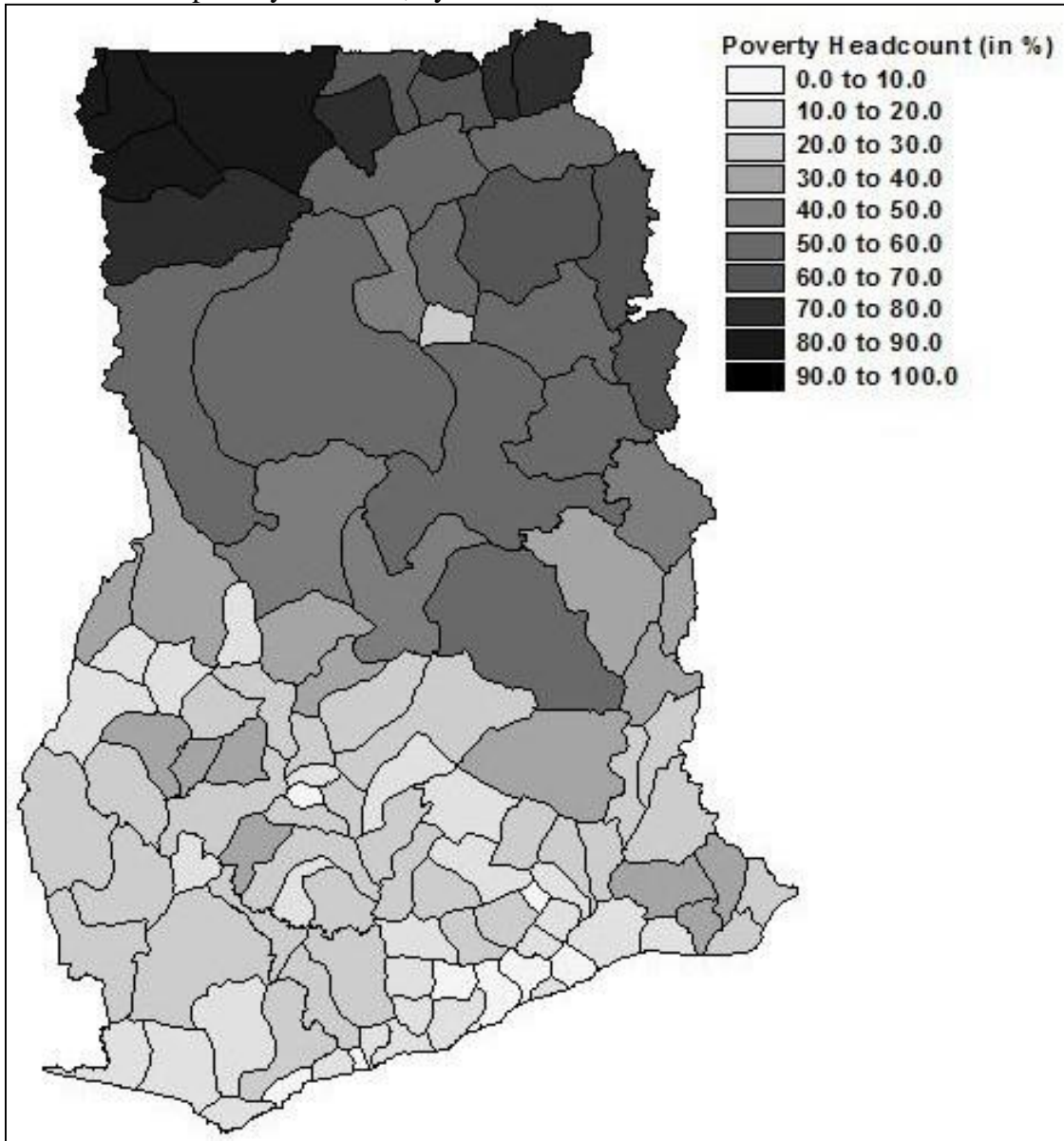


Source: World Bank, 2011b, Map 1 based on GLSS5 2005/06 and CWIQ 2003.

## Map of Ghana: Administrative Regions/Capitals

UPPER EAST
BOLGATANGA

UPPER WEST

WA

TAMALE

NORTHERN

BRONG AHAFO

VOLTA

SUNYANI

ASHANTI

KUMASI

HO

EASTERN

KOFORIDUA

WESTERN

GREATER ACCRA
ACCRA

CENTRAL

CAPE COAST

TAKORADI

N

Designer: Seth Kwarteng

80     0     80     160   Kilometers
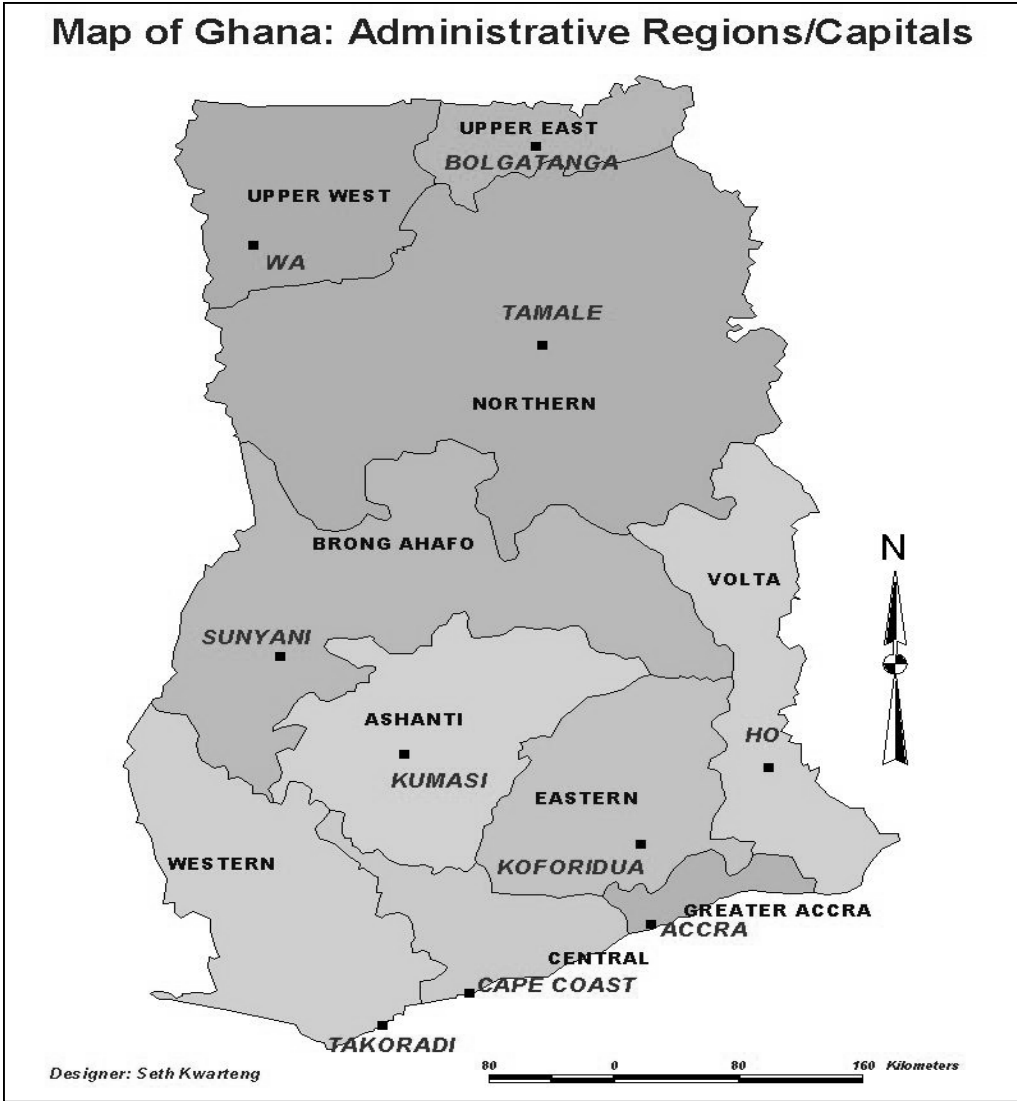
Source: National Report on Ghana: Global Study on Child Poverty Disparities (UNICEF, 2010 p. xi).

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Under-five mortality rates per 1000 live births, 1990-2009
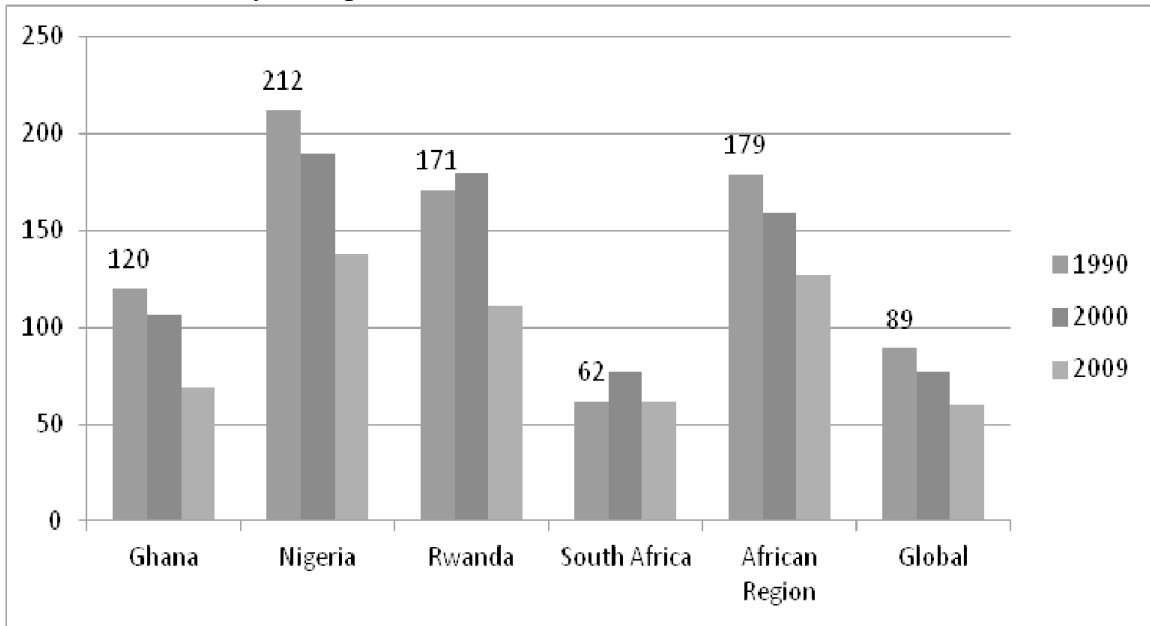


Source: World Health Statistics, WHO 2011.

Adult mortality rates per 1000 population age 15-60 years
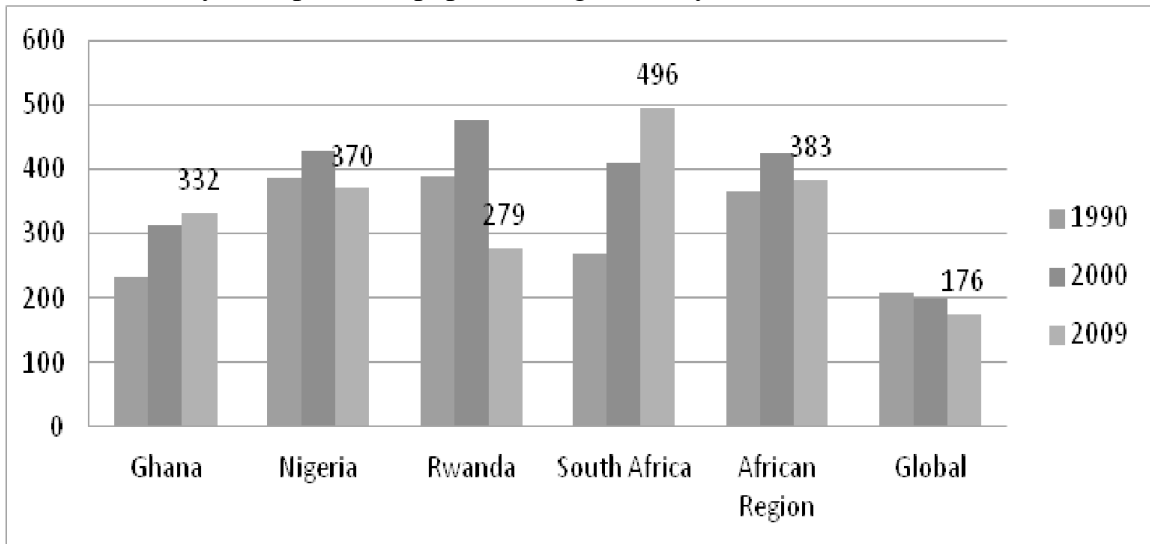


Source: World Health Statistics, WHO 2011.

Regional distribution of outpatient attendance per capita Ghana, 1997-2008
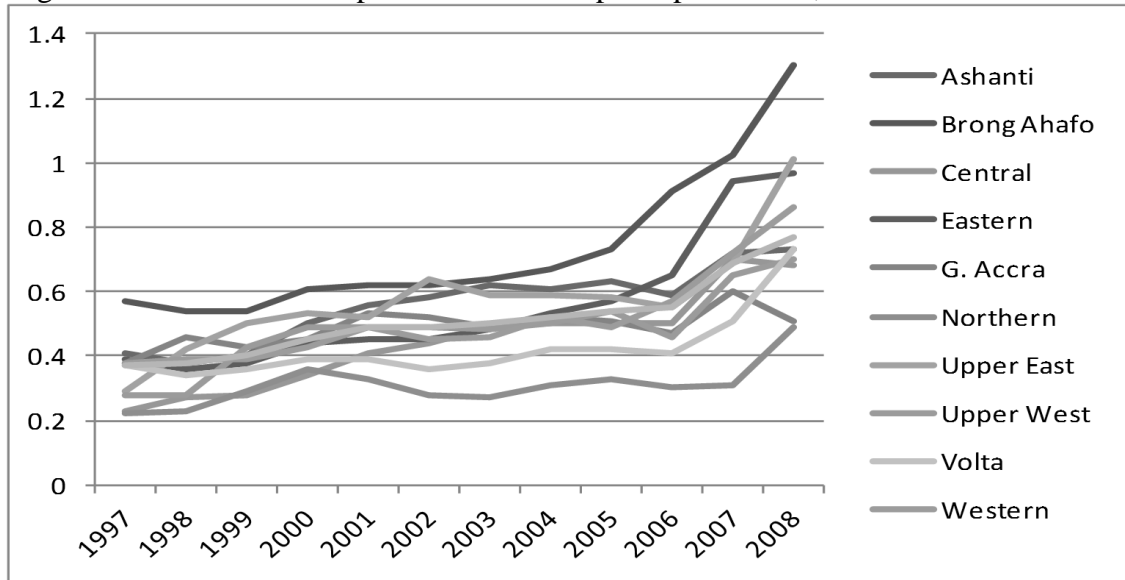


Source: The Health Sector in Ghana: Facts and Figures 2009 (Ghana Health Service 2010).

Population per nurse by regions, Ghana, 2003-2008
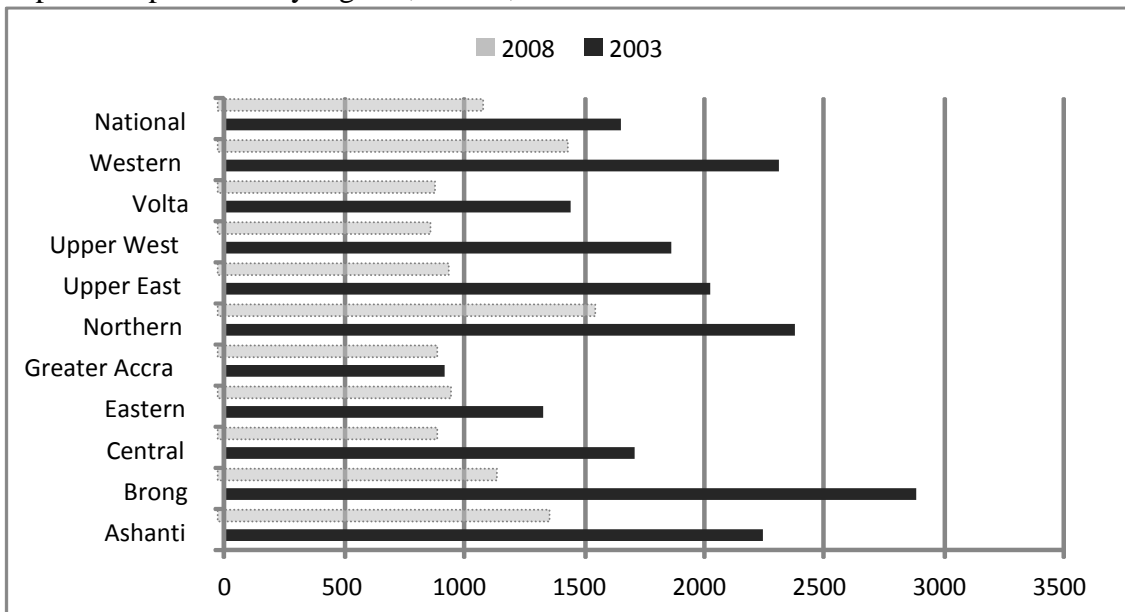


Source: The Health Sector in Ghana: Facts and Figures 2009 (Ghana Health Service 2010).

Population per doctor by regions, Ghana, 2003-2008
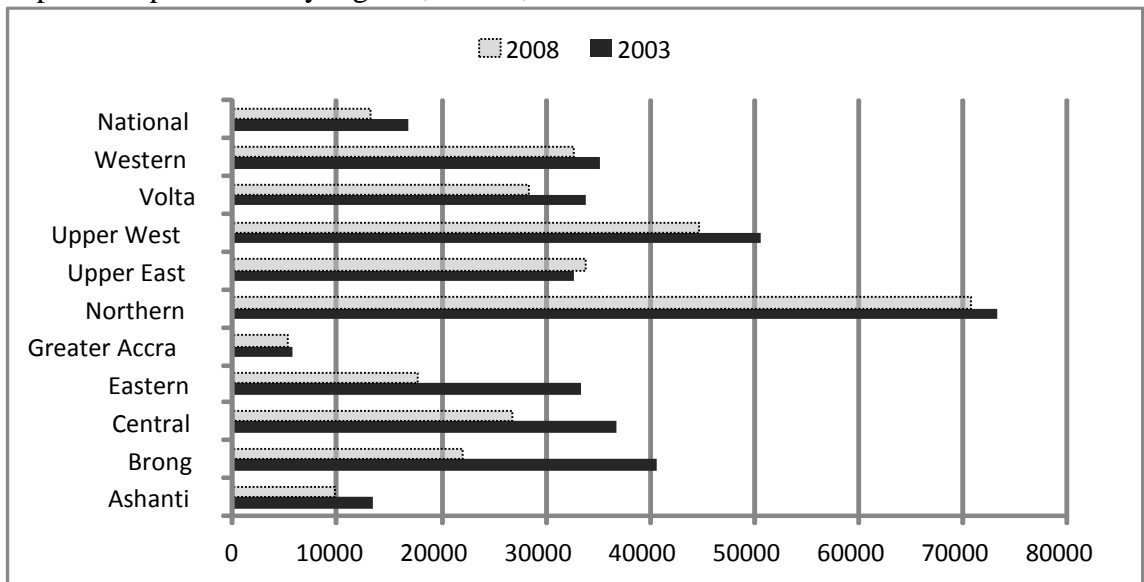


Source: The Health Sector in Ghana: Facts and Figures 2009 (Ghana Health Service 2010).

The leading causes of death in Ghana

| Rank | Cause | Mortality (%) |
|------|-------|---------------|
| 1 | Malaria | 13.4 |
| 2 | HIV/AIDS related conditions | 7.4 |
| 3 | Anemia | 7.3 |
| 4 | Cerebro Vascular Accidents | 6.4 |
| 5 | Pneumonia | 6.2 |
| 6 | Septicemia | 5.1 |
| 7 | Hypertension | 4.1 |
| 8 | Cardiac diseases | 4 |
| 9 | Meningitis | 2.3 |
| 10 | Diarrheal diseases | 2.3 |
| | All other causes | 41.5 |
| | Total | 100 |

Source: The Health Sector in Ghana: Facts and Figures 2009 (Ghana Health Service 2010).

**PATTERNS IN HEALTH CARE DEMAND IN GHANA**

Health practitioner first visited in the two weeks preceding interview, GLSS5 2005/06
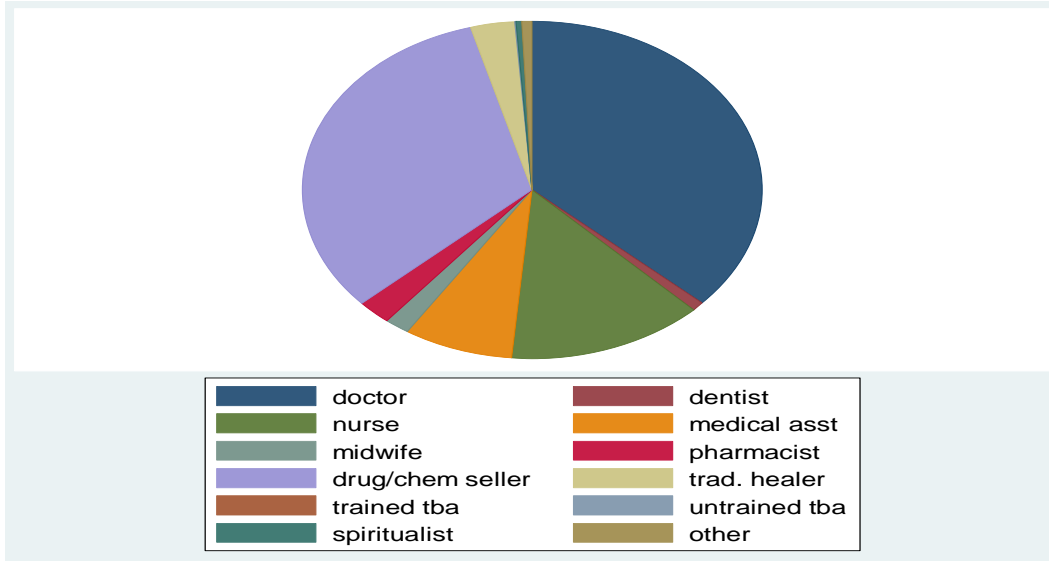


Source: Calculations based on data from Ghana Living Standards Survey V 2005/2006.

Main reason for consulting a health practitioner, GLSS5 2005/2006



2005/06
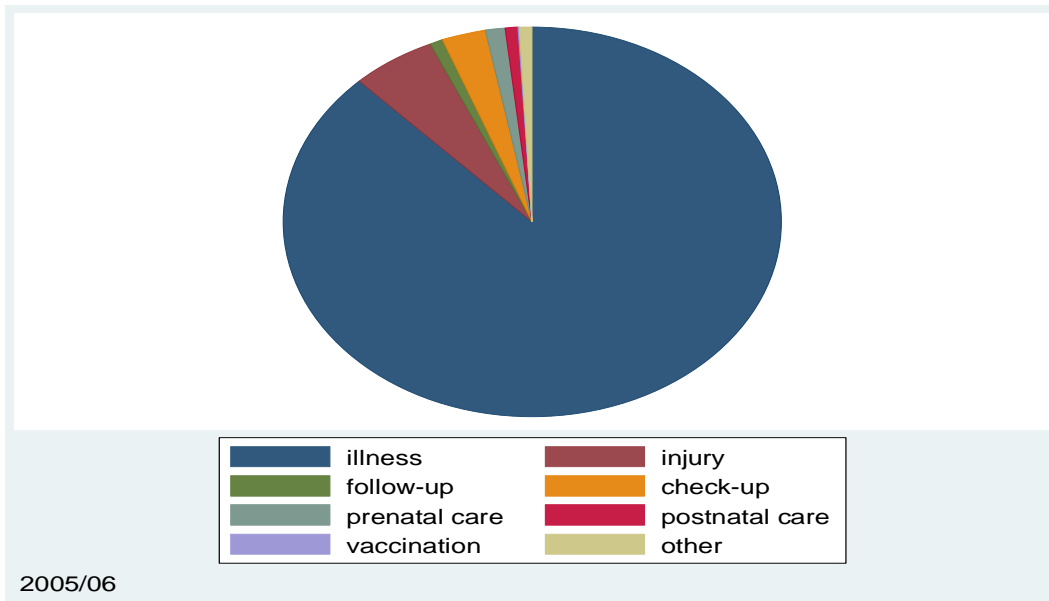
Source: Calculations based on data from Ghana Living Standard Survey V, 2005/2006.

Percent distribution of patient facility use by type of health practitioner first consulted in the two weeks preceding interview, GLSS5

| | Hospital | Clinic | MCH Clinic | Maternity Home | Pharmacy | Chemical Store | Consultant's Home | Patient's Home | Other | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| doctor | 86.8 | 32.5 | 13.2 | 5 | 1.8 | 0 | 7.0 | 2.0 | 1.4 | 36.7 |
| dentist | 1.1 | 1.2 | 0 | 0 | 0 | 0.5 | 0 | 0 | 4.2 | 0.9 |
| nurse | 8.1 | 38.4 | 22.6 | 22.5 | 1.8 | 0.1 | 8.3 | 4.6 | 30.6 | 13.9 |
| medical asst | 2.5 | 23.3 | 54.7 | 7.5 | 0 | 0.1 | 1.3 | 0.7 | 7.0 | 7.7 |
| midwife | 1 | 3.8 | 5.7 | 35 | 0 | 0 | 0.6 | 2.0 | 1.4 | 1.8 |
| pharmacist | 0 | 0.2 | 1.9 | 0 | 83.0 | 0.9 | 0.6 | 0 | 2.8 | 2.4 |
| drug/chem seller | 0.2 | 0.1 | 0 | 17.5 | 13.4 | 98.2 | 18.5 | 46.7 | 26.4 | 32.4 |
| trad. healer | 0 | 0.4 | 0 | 10 | 0 | 0 | 57.3 | 27 | 5.6 | 3.1 |
| trained TBA | 0 | 0.1 | 0 | 0 | 0 | 0.1 | 0 | 0 | 0 | 0 |
| untrained TBA | 0.1 | 0 | 0 | 0 | 0 | 0 | 1.9 | 0.7 | 0 | 0.1 |
| spiritualist | 0.1 | 0 | 0 | 0 | 0 | 0 | 3.8 | 1.3 | 8.3 | 0.3 |
| other | 0 | 0 | 1.9 | 2.5 | 0 | 0 | 0.6 | 15.1 | 12.5 | 0.8 |
| | | | | | | | | | | |
| Total | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |

Source: Calculations based on GLSS5 data.

Pair-wise correlation: Payments for consultation, travel, medicines and hospital stay

|  | Inpatient services | medicine | consulting |
|---|---|---|---|
| medicine | 0.69* |  |  |
| consulting | 0.1 | 0.17* |  |
| travel | 0.07 | 0.21* | 0.11* |

Source: Calculations based on data from GLSS5.
*p<0.05.

Hospitalizations and health care payments by locality of residence, GLSS5 2005-06

|  | Admission rate (% of respondents) | Population | Average length of stay | Average inpatient payment (₵) | Std Deviation | Maximum payment (₵) | Average total payments for health care |
|---|---|---|---|---|---|---|---|
| Accra (GAMA) urban | 4.5 | 16 | 3.6 | 188,667 | 289,405 | 1,150,000 | 87,778 |
| coastal | 5.0 | 13 | 4.4 | 28,300 | 47,563 | 120,000 | 61,250 |
| urban forest urban | 3.1 | 21 | 5.9 | 178,667 | 274,655 | 1,000,000 | 52,482 |
| savannah | 6.1 | 19 | 4.1 | 92,789 | 164,995 | 660,000 | 39,806 |
| rural coastal | 5.9 | 19 | 7.2 | 2,104,429 | 6,240,074 | 23,600,000 | 99,052 |
| rural forest rural | 4.0 | 49 | 4.3 | 297,213 | 945,167 | 6,500,000 | 55,270 |
| savannah | 7.0 | 95 | 4.2 | 175,505 | 442,690 | 3,000,000 | 40,007 |
| Total | 5.1 | 232 | 4.6 | 296,502 | 1,633,308 | 23,600,000 |  |

Source: Calculations based on GLSS5 data.

Health care payments by individuals by category of expenditure and location, GLSS5

| | Mean (₵) | Std. Err. (₵) | Linearized ratio | 95% Confidence Interval | |
|---|---|---|---|---|---|
| Consult | | | | | |
| urban | 4,433 | 374 | 8.0% | 6.8% | 9.3% |
| rural | 3,977 | 359 | 8.1% | 6.1% | 10.0% |
| Travel | | | | | |
| urban | 3,105 | 195 | 5.6% | 5.0% | 6.3% |
| rural | 3,173 | 246 | 6.4% | 4.9% | 7.9% |
| Inpatient Services | | | | | |
| urban | 2,579 | 637 | 4.7% | 2.5% | 6.8% |
| rural | 10,415 | 4,364 | 21.1% | 7.8% | 34.4% |
| Medicine and medical supplies | | | | | |
| urban | 44,961 | 1,933 | 81.6% | 79.1% | 84.1% |
| rural | 31,744 | 1,164 | 64.4% | 53.6% | 75.2% |
| Total | | | | | |
| urban | 55,078 | 2,279 | 100% | | |
| rural | 49,309 | 5,019 | 100% | | |
| | | | | | |
| Estimated total where unable to break down (N=698) | | | | | |
| urban | 129,533 | 16,284 | | | |
| rural | 101,690 | 12,870 | | | |

Source: Calculations based on GLSS5 data.
N=9117


Household health expenditures as a ratio of non-food expenditures, by quintile and location, GLSS 5 2005/2006

| | 1 | 2 | 3 | 4 | 5 | All quintiles |
|---|---|---|---|---|---|---|
| **All Urban** | **2.37** | **0.97** | **0.75** | **0.50** | **0.35** | **0.58** |
| GAMA | 4.19 | 1.34 | 0.80 | 0.84 | 0.42 | 0.79 |
| Urban coastal | 1.16 | 0.65 | 0.89 | 0.59 | 0.34 | 0.50 |
| Urban forest | 2.17 | 1.01 | 0.82 | 0.32 | 0.34 | 0.50 |
| Urban Savannah | 1.68 | 0.66 | 0.42 | 0.3 | 0.21 | 0.51 |
| | | | | | | |
| **All rural** | **0.72** | **0.64** | **0.50** | **0.55** | **0.39** | **0.57** |
| Rural coastal | 0.82 | 0.60 | 0.55 | 0.68 | 0.50 | 0.61 |
| Rural forest | 0.74 | 0.65 | 0.53 | 0.49 | 0.35 | 0.54 |
| Rural Savanna | 0.71 | 0.64 | 0.41 | 0.54 | 0.29 | 0.60 |
| | | | | | | |
| **All locations** | **0.89** | **0.71** | **0.57** | **0.52** | **0.36** | **0.58** |

Source: Calculations based on GLSS5 data.

Household health expenditures as a proportion of non-food expenditures by quintile and location, GLSS 4 1997/98

| | 1 | 2 | 3 | 4 | 5 | All quintiles |
|---|---|---|---|---|---|---|
| **All Urban** | **2.34** | **0.35** | **0.34** | **0.31** | **0.26** | **0.47** |
| GAMA | 2.21 | 0.10 | 0.13 | 0.29 | 0.25 | 0.27 |
| Urban coastal | 0.45 | 0.37 | 0.43 | 0.32 | 0.26 | 0.33 |
| Urban forest | 0.73 | 0.33 | 0.38 | 0.27 | 0.27 | 0.73 |
| Urban Savannah | 0.69 | 0.40 | 0.21 | 0.46 | 0.18 | 0.36 |
| | | | | | | |
| **All Rural** | **0.58** | **0.44** | **0.38** | **0.35** | **0.36** | **0.42** |
| Rural coastal | 0.54 | 0.45 | 0.37 | 0.40 | 0.32 | 0.41 |
| Rural forest | 0.5 | 0.41 | 0.40 | 0.35 | 0.37 | 0.10 |
| Rural Savanna | 0.63 | 0.49 | 0.37 | 0.30 | 0.41 | 0.50 |
| | | | | | | |
| All locations | 0.94 | 0.42 | 0.37 | 0.34 | 0.31 | 0.44 |

Source: Calculations based on data from the GLSS4 1998/1999.

The ten highest observations for household health expenditure, old cedis, GLSS5

| | Total health expenses | Inpatient expenses | Consult expense | Medicine expense | Travel expense | inpatient days | household size | Location | Household head | Travel time in hrs |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1,375,000 | 960,000 | 10,000 | 385,000 | 20,000 | 4 | 1 | rural | male | 1.3 |
| 2 | 1,527,500 | 1,000,000 | 22,500 | 500,000 | 25,000 | 7 | 5 | rural | male | 5.0 |
| 3 | 1,252,000 | 1,105,000 | 15,000 | 132,000 | - | 8 | 9 | rural | male | 6.3 |
| 4 | 1,680,000 | 1,150,000 | 20,000 | 490,000 | 20,000 | 6 | 9 | urban | male | 4.0 |
| 5 | 1,518,000 | 1,200,000 | - | 315,000 | 3,000 | 14 | 5 | urban | male | 3.5 |
| 6 | 3,364,500 | 2,800,000 | 18 ,000 | 546,500 | - | 5 | 7 | rural | male | 4.0 |
| 7 | 3,595,000 | 3,000,000 | - | 520,000 | 75,000 | 14 | 9 | rural | male | 1.3 |
| 8 | 3,260,000 | 3,000,000 | 10,000 | 200,000 | 50,000 | 7 | 1 | urban | male | 1.0 |
| 9 | 6,655,000 | 6,500,000 | 35,000 | 82,000 | 38,000 | 5 | 7 | urban | male | 1.2 |
| 10 | 26,400,000 | 23,600,000 | 200,000 | 2,500,000 | 60,000 | 14 | 2 | urban | male | 4.0 |

Source: Calculations based on data from GLSS5 2005/2006.

Distribution of health expenditures by household units: levels versus log transformation, GLSS5
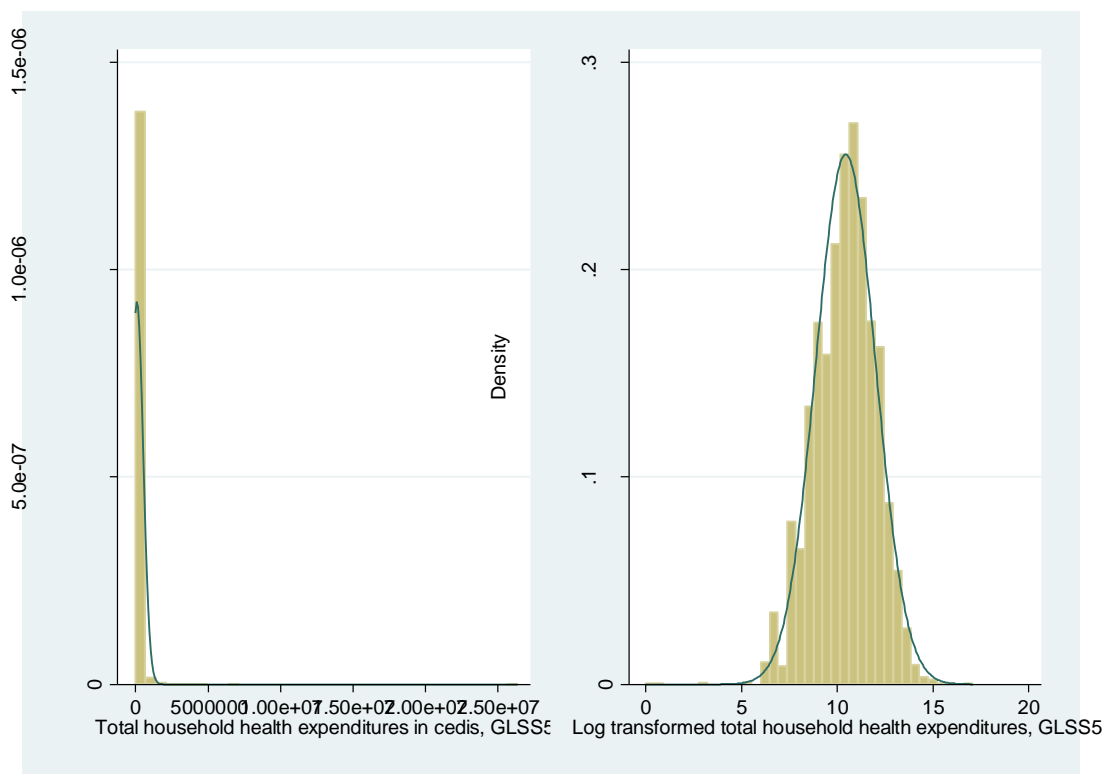


Source: Calculations based on data from GLSS5 (2005/2006).

Number of households for whom government, employer or insurance gives support for the majority of health care expenditures, GLSS5

|  | welfare quintile | | | | | |
| --- | --- | --- | --- | --- | --- | --- |
|  | 1 | 2 | 3 | 4 | 5 | All |
| Supported | 55 | 96 | 136 | 145 | 194 | 626 |
| percent | 3.6 | 6.8 | 9.0 | 8.4 | 7.6 | 7.2 |
| Not supported | 1,457 | 1,314 | 1,370 | 1,573 | 2,347 | 8,061 |
| percent | 96.4 | 93.2 | 91.0 | 91. 6 | 92.4 | 92.8 |
| Total | 1,512 | 1,410 | 1,506 | 1,718 | 2,541 | 8,687 |
| percent | 100 | 100 | 100 | 100 | 100 | 100 |

Source: Calculations based on GLSS5 data.

**APPENDIX C**

**REGIONAL DIFFERENCES IN HEALTH INSURANCE COVERAGE IN GHANA, DHS V (2008)**

Distribution of respondents by insurance status and socioeconomic characteristics, Ghana DHS 2008

| Had insurance at any time in past 3 months? | No (%) | Yes (%) | Total (%) | Count |
|---|---|---|---|---|
| Region | | | | |
| Western | 64.1 | 35.9 | 9.3 | 881 |
| Central | 74.3 | 25.7 | 6.6 | 622 |
| Greater Accra | 75.6 | 24.4 | 13.6 | 1292 |
| Volta | 73 | 27 | 9 | 849 |
| Eastern | 56.6 | 43.4 | 9.9 | 935 |
| Ashanti | 61.4 | 38.6 | 15.8 | 1495 |
| Brong Ahafo | 48.2 | 51.8 | 8 | 763 |
| Northern | 65.3 | 34.7 | 10.8 | 1021 |
| Upper East | 55.8 | 44.2 | 7.7 | 729 |
| Upper West | 53.2 | 46.8 | 9.5 | 897 |
| All | 63.2 | 36.8 | 100 | 9484 |
| Pearson chi2(18) = 310.5   Pr = 0.00  Cramér's V =   0.128 | | | | |
| *wealth* quintile 1= poorest | | | | |
| 1 | 74.2 | 25.8 | 23 | 2181 |
| 2 | 69.3 | 30.7 | 18.9 | 1789 |
| 3 | 63.6 | 36.4 | 17.2 | 1634 |
| 4 | 55.2 | 44.8 | 20.9 | 1984 |
| 5 | 52.5 | 47.5 | 20 | 1896 |
| read watch listen how often | | | | |
| not at all | 71.9 | 28.1 | 9.5 | 854 |

| Had insurance at any time in past 3 months? | No (%) | Yes (%) | Total (%) | Count |
|---|---|---|---|---|
| less than once a week | 52.2 | 47.8 | 0.3 | 23 |
| at least once a week | 62.3 | 37.7 | 86.7 | 7803 |
| almost every day | 48.4 | 51.6 | 3.5 | 316 |
| Pearson chi2(6) = 60.2634  Pr = 0.000 Cramér's V = 0.0579 | | | | |
| loc2 | | | | |
| urban | 58.1 | 41.9 | 43 | 4076 |
| rural | 67 | 33 | 57 | 5408 |
| Dummy agegp | | | | |
| 15-19 | 62 | 38 | 20.9 | 1979 |
| 20-24 | 68.1 | 31.9 | 16.6 | 1575 |
| 25-29 | 66.2 | 33.8 | 15 | 1425 |
| 30-34 | 59.4 | 40.6 | 12.2 | 1160 |
| 35-39 | 61.9 | 38.1 | 12.1 | 1148 |
| 40-44 | 60.6 | 39.4 | 9.3 | 878 |
| 45-49 | 63.4 | 36.6 | 8.4 | 801 |
| 50-55 | 59.3 | 40.7 | 5.5 | 518 |
| Dummy gend | | | | |
| male | 68.4 | 31.6 | 48.2 | 4568 |
| female | 58.3 | 41.7 | 51.8 | 4916 |
| Dummy married_status | | | | |
| never married | 65.4 | 34.6 | 36.8 | 3486 |
| married | 59.8 | 40.2 | 48.1 | 4565 |
| living together | 67.2 | 32.8 | 8.5 | 809 |
| widowed | 68.1 | 31.9 | 3.8 | 364 |
| not living together | 72.3 | 27.7 | 2.7 | 260 |
| Dummy has children living at home | | | | |
| No | 65.4 | 34.6 | 47.6 | 4516 |

| Had insurance at any time in past 3 months? | No (%) | Yes (%) | Total (%) | Count |
|---|---|---|---|---|
| Yes | 61.1 | 38.9 | 52.4 | 4968 |
| Dummy occupation | | | | |
| not working | 60.2 | 39.8 | 22.2 | 2103 |
| professional/managerial/technical | 38.8 | 61.2 | 6.1 | 583 |
| clerical and services | 62.7 | 37.3 | 9.2 | 874 |
| sales | 58.1 | 41.9 | 17.6 | 1666 |
| agricultural | 72.5 | 27.5 | 32.8 | 3113 |
| manual | 63.4 | 36.6 | 12.1 | 1145 |
| educlevel | | | | |
| no education | 71.5 | 28.5 | 21.5 | 2035 |
| primary | 70.1 | 29.9 | 18.2 | 1727 |
| secondary | 60.1 | 39.9 | 54.5 | 5166 |
| higher | 39.2 | 60.8 | 5.9 | 556 |
| Dummy relnhead | | | | |
| head | 65.7 | 34.3 | 42.1 | 3997 |
| wife | 56.7 | 43.3 | 22.8 | 2162 |
| daughter | 62.5 | 37.5 | 24.3 | 2307 |
| other relative | 68.1 | 31.9 | 9.9 | 935 |
| not related | 69.9 | 30.1 | 0.9 | 83 |
| Dummy tobacco | | | | |
| no | 77.9 | 22.1 | 4.8 | 456 |
| yes, smokes nothing | 62.4 | 37.6 | 95.2 | 9028 |
| All | 63.2 | 36.8 | 100 | 9484 |

Source: Calculations based on Ghana Demographic and Health Survey V 2008

Distribution of respondents by incidence of out of pocket payments and by perceived quality and socioeconomic characteristics, DHS 2008

| *oop* (Need to pay out of pocket?) | Distribution of respondents, DHS 2008 | | | | |
|---|---|---|---|---|---|
| | No | Yes | Sometimes | Total | Total |
| | % | % | % | % | Count |
| needsvs | | | | | |
| no | 85.6 | 9.8 | 4.6 | 79.5 | 2778 |
| yes | 67.2 | 22.8 | 10.1 | 20.5 | 716 |
| dsvsqlty | | | | | |
| good | 83.6 | 11.2 | 5.3 | 80 | 2794 |
| Not good | 74.9 | 17.7 | 7.4 | 20 | 700 |
| svsqlty | | | | | |
| yes | 83.6 | 11.2 | 5.30 | 80 | 2794 |
| no, waiting times too long | 75.3 | 15.6 | 9.1 | 9.7 | 340 |
| no, staff not polite | 64.9 | 26.3 | 8.8 | 1.6 | 57 |
| no, did not receive enough information on treatment/illness | 66.9 | 24.4 | 8.70 | 3.6 | 127 |
| other | 83 | 14.2 | 2.8 | 5 | 176 |
| dnhisqlty | | | | | |
| good | 84.6 | 11.6 | 3.8 | 50.3 | 1757 |
| Not good | 79 | 13.4 | 7.7 | 49.7 | 1737 |
| nhisqlty | | | | | |
| better | 84.6 | 11.6 | 3.8 | 50.3 | 1757 |
| same | 80.3 | 11.9 | 7.8 | 35.9 | 1254 |
| worse | 73.5 | 17.7 | 8.70 | 10.2 | 355 |
| don't know/not sure | 81.3 | 15.6 | 3.10 | 3.7 | 128 |
| whopaid_ins | | | | | |
| yes, respondent paid for self | 76.7 | 16.6 | 6.6 | 41.9 | 1415 |

| | Distribution of respondents, DHS 2008 | | | | |
|---|---|---|---|---|---|
| *oop* (Need to pay out of pocket?) | No | Yes | Sometimes | Total | Total |
| | % | % | % | % | Count |
| yes, paid by relative/friend | 87.1 | 8.9 | 4.00 | 48.3 | 1633 |
| yes, paid by employer/ssnit | 79.7 | 13.8 | 6.5 | 7.7 | 261 |
| no, other | 87 | 8.7 | 4.3 | 2 | 69 |
| gend | | | | | |
| male | 78.9 | 14.9 | 6.2 | 41.3 | 1444 |
| female | 83.9 | 10.8 | 5.4 | 58.7 | 2050 |
| region | | | | | |
| Western | 81.3 | 11.4 | 7.3 | 9 | 316 |
| Central | 88.8 | 8.1 | 3.1 | 4.6 | 160 |
| Greater Accra | 70.2 | 20.6 | 9.20 | 9 | 315 |
| Volta | 57.6 | 38.9 | 3.5 | 6.6 | 229 |
| Eastern | 80 | 9.4 | 10.60 | 11.6 | 406 |
| Ashanti | 80.6 | 11.1 | 8.3 | 16.5 | 577 |
| Brong Ahafo | 86.3 | 6.3 | 7.30 | 11.3 | 395 |
| Northern | 84.5 | 13 | 2.5 | 10.1 | 354 |
| Upper East | 93.5 | 5.6 | 0.9 | 9.2 | 322 |
| Upper West | 89.5 | 10 | 0.5 | 12 | 420 |
| occupation | | | | | |
| not working | 87 | 8.7 | 4.3 | 24 | 838 |
| professional/managerial/technical | 73.9 | 16.8 | 9.2 | 10.2 | 357 |
| clerical and services | 79.4 | 13.2 | 7.4 | 9.3 | 326 |
| sales | 78.4 | 13.6 | 8.00 | 20 | 698 |
| agricultural | 84.2 | 12.5 | 3.30 | 24.5 | 856 |
| manual | 80.9 | 13.8 | 5.30 | 12 | 419 |
| educlevel | | | | | |

| oop (Need to pay out of pocket?) | Distribution of respondents, DHS 2008 | | | | |
|---|---|---|---|---|---|
| | No | Yes | Sometimes | Total | Total |
| | % | % | % | % | Count |
| no education | 86.9 | 10.9 | 2.2 | 16.6 | 579 |
| primary | 87.6 | 9.5 | 2.9 | 14.8 | 516 |
| secondary | 80.4 | 13 | 6.6 | 59 | 2061 |
| higher | 73.1 | 16.9 | 10.1 | 9.7 | 338 |
| All | 81.8 | 12.5 | 5.7 | 100 | 3494 |

Source: Calculations based on Ghana Demographic and Health Survey V, 2008

Regional distribution of socio-demographic characteristics, insurance status and quality perceptions, Ghana DHS 2008

| | Western | Central | Greater Accra | Volta | Eastern | Ashanti | Brong Ahafo | Northern | Upper East | Upper West | Total | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | % | % | % | % | % | % | % | % | % | % | Count | % |
| **Wealth** | | | | | | | | | | | | |
| Poorest | 4.3 | 0.8 | 0.3 | 8.2 | 5.8 | 3.6 | 9.3 | 25.2 | 22.1 | 20.4 | 2181 | 0.2 |
| Poorer | 14.9 | 7.2 | 1.7 | 11.7 | 12.6 | 15.4 | 9.4 | 10.1 | 5.3 | 11.7 | 1789 | 0.2 |
| Middle | 9.8 | 11.5 | 4.9 | 14.2 | 13.8 | 19.3 | 8.9 | 8.7 | 2 | 6.9 | 1634 | 0.2 |
| Richer | 9.6 | 8.7 | 17.3 | 7.6 | 12.2 | 22.3 | 9.5 | 4.8 | 3.1 | 4.8 | 1984 | 0.2 |
| Richest | 9 | 6.2 | 43.9 | 4.2 | 6.1 | 20.1 | 3 | 2.8 | 3 | 1.8 | 1896 | 0.2 |
| All | 9.3 | 6.6 | 13.6 | 9 | 9.9 | 15.8 | 8 | 10.8 | 7.7 | 9.5 | 9484 | 1.0 |

Cramer's V = 0.35 Pearson $\chi2(36)$ = 4620.54 Pr = 0

read, watch, listen to news

| | Western | Central | Greater Accra | Volta | Eastern | Ashanti | Brong Ahafo | Northern | Upper East | Upper West | Total | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| not at all | 3.5 | 4.4 | 4.2 | 6.4 | 3.2 | 7.1 | 7 | 28 | 19.8 | 16.3 | 854 | 0.1 |
| less than once a week | 4.3 | 4.3 | 17.4 | 13 | 4.3 | 30.4 | 0 | 13 | 4.3 | 8.7 | 23 | 0.0 |
| at least once a week | 10.2 | 6.8 | 14 | 9.5 | 10.9 | 16.7 | 8.4 | 8.6 | 6.1 | 8.8 | 7803 | 0.9 |
| almost every day | 11.7 | 4.7 | 41.1 | 7 | 5.1 | 10.4 | 4.1 | 8.9 | 5.4 | 1.6 | 316 | 0.0 |

Cramer's V = 0.19 Pearson $\chi2$ (27) = 941.08 Pr = 0

loc2

| | Western | Central | Greater Accra | Volta | Eastern | Ashanti | Brong Ahafo | Northern | Upper East | Upper West | Total | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Urban | 8.2 | 5.8 | 28.2 | 5.9 | 8.5 | 20.6 | 7.4 | 7.4 | 3.4 | 4.6 | 4076 | 0.4 |
| Rural | 10.1 | 7.1 | 2.6 | 11.3 | 10.9 | 12.1 | 8.6 | 13.3 | 10.9 | 13.1 | 5408 | 0.6 |

Cramer's V =0.431 Pearson $\chi2$ (9) = 1758.2 Pr = 0.000

Agegp

| | Western | Central | Greater Accra | Volta | Eastern | Ashanti | Brong Ahafo | Northern | Upper East | Upper West | Total | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 15-19 | 9.4 | 6.8 | 11.1 | 10 | 9.6 | 15.1 | 7.1 | 10.4 | 8.3 | 12.2 | 1979 | 0.2 |
| 20-24 | 7.6 | 6.3 | 15 | 7.9 | 9.8 | 18.4 | 8.5 | 10.4 | 7 | 9.1 | 1575 | 0.2 |

| | Western | Central | Greater Accra | Volta | Eastern | Ashanti | Brong Ahafo | Northern | Upper East | Upper West | Total | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | % | % | % | % | % | % | % | % | % | % | Count | % |
| 25-29 | 7.4 | 6.5 | 15.5 | 8.3 | 9.1 | 18.2 | 8.9 | 10.4 | 7 | 8.6 | 1425 | 0.2 |
| 30-34 | 9.2 | 5.3 | 16.6 | 7.9 | 8.7 | 14.3 | 9.9 | 12.2 | 6.7 | 9.1 | 1160 | 0.1 |
| 35-39 | 11.9 | 7.1 | 13.2 | 8.6 | 10.2 | 13.9 | 7.4 | 11.7 | 8 | 7.9 | 1148 | 0.1 |
| 40-44 | 10 | 6.8 | 13.9 | 9.5 | 10.4 | 14.2 | 7.1 | 9.3 | 9.6 | 9.2 | 878 | 0.1 |
| 45-49 | 9.7 | 6.5 | 10 | 10.6 | 11.1 | 17.1 | 7.9 | 11.7 | 7.2 | 8.1 | 801 | 0.1 |
| N/A | 11.8 | 7.5 | 13.3 | 9.5 | 12 | 11.4 | 6.9 | 10 | 8.3 | 9.3 | 518 | 0.1 |

Cramer's V = 0.05 Pearson $\chi2$ (63) = 148.4 Pr = 0

Gender

| | Western | Central | Greater Accra | Volta | Eastern | Ashanti | Brong Ahafo | Northern | Upper East | Upper West | Total | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Male | 9.7 | 6.3 | 13.1 | 9.1 | 10 | 14.9 | 7.9 | 11.5 | 7.8 | 9.7 | 4568 | 0.5 |
| Female | 8.9 | 6.8 | 14.1 | 8.8 | 9.7 | 16.6 | 8.2 | 10.1 | 7.6 | 9.2 | 4916 | 0.5 |

Cramer's V = 0.04 Pearson $\chi2$ (9) = 13.9 Pr = 0.13

Marrital status

| | Western | Central | Greater Accra | Volta | Eastern | Ashanti | Brong Ahafo | Northern | Upper East | Upper West | Total | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Never married | 8.4 | 6.4 | 16.1 | 8.5 | 10.6 | 16.6 | 6.8 | 9.5 | 7 | 10 | 3486 | 0.4 |
| Married | 10.7 | 5.5 | 12.2 | 8.4 | 9.4 | 12 | 7.2 | 14 | 9.7 | 10.9 | 4565 | 0.5 |
| living together | 4.4 | 11.2 | 10.1 | 14.8 | 8.9 | 29.7 | 15.7 | 2.8 | 0.5 | 1.7 | 809 | 0.1 |
| Widowed | 8.8 | 12.1 | 12.6 | 4.7 | 10.2 | 19.8 | 11.3 | 4.9 | 8.2 | 7.4 | 364 | 0.0 |
| not living together | 11.5 | 4.2 | 16.9 | 13.1 | 10.8 | 21.9 | 11.2 | 3.8 | 2.7 | 3.8 | 260 | 0.0 |

Cramer's V = 0.13 Pearson $\chi2$ (36) = 681.69 Pr = 0

has children living at home

| | Western | Central | Greater Accra | Volta | Eastern | Ashanti | Brong Ahafo | Northern | Upper East | Upper West | Total | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| No | 9.1 | 6.4 | 16 | 9 | 10 | 17.2 | 7.4 | 8.8 | 6.6 | 9.4 | 4516 | 0.5 |
| Yes | 9.4 | 6.7 | 11.4 | 8.9 | 9.8 | 14.4 | 8.6 | 12.5 | 8.7 | 9.5 | 4968 | 0.5 |

Cramer's V = 0.10 Pearson $\chi2$ (9) = 97.0 Pr = 0.000

Occupation

|  | Western | Central | Greater Accra | Volta | Eastern | Ashanti | Brong Ahafo | Northern | Upper East | Upper West | Total | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
|  | % | % | % | % | % | % | % | % | % | % | Count | % |
| not working | 8.8 | 6.7 | 16.6 | 9.3 | 10.4 | 15.1 | 7.2 | 8.3 | 6.6 | 11 | 2103 | 0.2 |
| professional/managerial/technical | 10.3 | 8.4 | 23.2 | 8.6 | 8.2 | 14.1 | 6.2 | 8.6 | 6.7 | 5.8 | 583 | 0.1 |
| clerical and services | 9 | 5.4 | 23.3 | 7 | 11.4 | 23.7 | 7.3 | 4.5 | 4.1 | 4.2 | 874 | 0.1 |
| Sales | 9.4 | 8.2 | 20.4 | 9.4 | 12 | 18.2 | 6.5 | 7.1 | 4.6 | 4.1 | 1666 | 0.2 |
| Agricultural | 9.1 | 5.4 | 1.6 | 9.6 | 8.4 | 10.8 | 10.9 | 18 | 12.3 | 13.9 | 3113 | 0.3 |
| Manual | 10 | 7.2 | 18.8 | 7.6 | 9.5 | 21.7 | 5.4 | 6.9 | 5 | 7.9 | 1145 | 0.1 |

Cramer's V = 0.16 Pearson chi2(45) = 1269.4 Pr = 0.000

Educlevel

|  | Western | Central | Greater Accra | Volta | Eastern | Ashanti | Brong Ahafo | Northern | Upper East | Upper West | Total | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| no education | 5.5 | 3.2 | 3.6 | 6.9 | 3.6 | 6.2 | 8.5 | 29.2 | 15.7 | 17.5 | 2035 | 0.2 |
| Primary | 9.5 | 7.9 | 8.9 | 10.8 | 10.3 | 13.7 | 9.3 | 6.8 | 10.8 | 12 | 1727 | 0.2 |
| Secondary | 10.8 | 7.3 | 17.3 | 9.5 | 12.4 | 20.6 | 7.7 | 5.1 | 3.4 | 5.8 | 5166 | 0.5 |
| Higher | 8.6 | 7.2 | 31.1 | 5.9 | 7.7 | 11.9 | 5.2 | 8.3 | 8.5 | 5.6 | 556 | 0.1 |

Cramer's V = 0.28 Pearson $\chi2$ (27) = 2166.54 Pr = 0

Relnhead

|  | Western | Central | Greater Accra | Volta | Eastern | Ashanti | Brong Ahafo | Northern | Upper East | Upper West | Total | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Head | 10.3 | 7.5 | 14.7 | 7.1 | 10.2 | 16.6 | 9.5 | 9.7 | 6.9 | 7.5 | 3997 | 0.4 |
| Wife | 10.4 | 5.7 | 12 | 8 | 8.8 | 13.2 | 7.8 | 14.8 | 9.3 | 10 | 2162 | 0.2 |
| Daughter | 7.6 | 6.1 | 12.5 | 11.2 | 11 | 16 | 7.2 | 10.3 | 7.8 | 10.3 | 2307 | 0.2 |
| other relative | 6.3 | 5.3 | 14.5 | 13.9 | 8.1 | 17.5 | 4.4 | 7.5 | 7.9 | 14.4 | 935 | 0.1 |
| not related | 10.8 | 8.4 | 24.1 | 3.6 | 9.6 | 15.7 | 8.4 | 8.4 | 0 | 10.8 | 83 | 0.0 |

Cramer's V = 0.08 Pearson $\chi2$ (36) = 267.3 Pr = 0

0 for uses 1 for does not use

|  | Western | Central | Greater Accra | Volta | Eastern | Ashanti | Brong Ahafo | Northern | Upper East | Upper West | Total | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| No | 6.4 | 2 | 7.9 | 7.7 | 4.8 | 10.7 | 9.6 | 20.2 | 14.9 | 15.8 | 456 | 0.0 |

| | Western | Central | Greater Accra | Volta | Eastern | Ashanti | Brong Ahafo | Northern | Upper East | Upper West | Total | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | % | % | % | % | % | % | % | % | % | % | Count | % |
| yes, smokes nothing | 9.4 | 6.8 | 13.9 | 9 | 10.1 | 16 | 8 | 10.3 | 7.3 | 9.1 | 9028 | 1.0 |

Cramer's V = 0.12 Pearson $\chi2$ (9) = 145.9 Pr = 0.000

Insured

| | Western | Central | Greater Accra | Volta | Eastern | Ashanti | Brong Ahafo | Northern | Upper East | Upper West | Total | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| No | 9.4 | 7.7 | 16.3 | 10.4 | 8.8 | 15.3 | 6.1 | 11.1 | 6.8 | 8 | 5990 | 0.6 |
| Yes | 9 | 4.6 | 9 | 6.6 | 11.6 | 16.5 | 11.3 | 10.1 | 9.2 | 12 | 3494 | 0.4 |

Cramer's V = 0.18 Pearson $\chi2$ (9) = 304.9 Pr = 0

Needsvs

| | Western | Central | Greater Accra | Volta | Eastern | Ashanti | Brong Ahafo | Northern | Upper East | Upper West | Total | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| No | 9.6 | 4.4 | 8.9 | 5.8 | 10.9 | 14.3 | 12.8 | 10.3 | 10 | 12.8 | 2778 | 0.3 |
| Yes | 6.7 | 5.2 | 9.6 | 9.4 | 14.2 | 25 | 5.4 | 9.4 | 6 | 9.1 | 716 | 0.1 |

Cramer's V = 0.18   Pearson $\chi2$ (9) = 106.4 Pr = 0

Indicator for service quality

| | Western | Central | Greater Accra | Volta | Eastern | Ashanti | Brong Ahafo | Northern | Upper East | Upper West | Total | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| good | 10.5 | 4.5 | 7.9 | 6.1 | 11.6 | 16.2 | 12.4 | 9.1 | 9.4 | 12.2 | 2794 | 0.3 |
| not good | 3.3 | 5 | 13.3 | 8.3 | 11.6 | 17.7 | 7 | 14.1 | 8.4 | 11.3 | 700 | 0.1 |

Cramer's V = 0.16 Pearson $\chi2$ (9) = 84.1 Pr = 0

Svsqlty

| | Western | Central | Greater Accra | Volta | Eastern | Ashanti | Brong Ahafo | Northern | Upper East | Upper West | Total | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Yes | 10.5 | 4.5 | 7.9 | 6.1 | 11.6 | 16.2 | 12.4 | 9.1 | 9.4 | 12.2 | 2794 | 0.8 |
| no, waiting times too long | 2.4 | 4.1 | 12.9 | 7.1 | 14.4 | 20.3 | 5.6 | 10.3 | 11.5 | 11.5 | 340 | 0.1 |
| no, staff not polite | 3.5 | 1.8 | 26.3 | 8.8 | 15.8 | 14 | 7 | 10.5 | 5.3 | 7 | 57 | 0.0 |
| no, did not receive enough information on treatment/illness | 6.3 | 4.7 | 11.8 | 11 | 7.9 | 18.1 | 12.6 | 11.8 | 3.9 | 11.8 | 127 | 0.0 |
| Other | 2.8 | 8 | 10.8 | 8.5 | 7.4 | 13.6 | 5.7 | 24.4 | 6.8 | 11.9 | 176 | 0.1 |

Cramer's V = 0.11 Pearson $\chi2$ (36) = 154.1 Pr = 0

NHIS service quality better

| | Western | Central | Greater Accra | Volta | Eastern | Ashanti | Brong Ahafo | Northern | Upper East | Upper West | Total | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Yes | 11 | 2.8 | 5.9 | 5.9 | 8.9 | 18.7 | 10.5 | 11.2 | 9.8 | 15.4 | 1757 | 0.5 |

| | Western | Central | Greater Accra | Volta | Eastern | Ashanti | Brong Ahafo | Northern | Upper East | Upper West | Total | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | % | % | % | % | % | % | % | % | % | % | Count | % |
| No | 7 | 6.4 | 12.2 | 7.2 | 14.4 | 14.3 | 12.1 | 9.1 | 8.6 | 8.6 | 1737 | 0.5 |

Cramer's V = 0.21 Pearson $\chi$2 (9) = 154.8 Pr = 0

NHIS cardholder versus nonholder

| | Western | Central | Greater Accra | Volta | Eastern | Ashanti | Brong Ahafo | Northern | Upper East | Upper West | Total | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Better | 11 | 2.8 | 5.9 | 5.9 | 8.9 | 18.7 | 10.5 | 11.2 | 9.8 | 15.4 | 1757 | 0.5 |
| Same | 7.1 | 5.6 | 11.6 | 8.5 | 17.4 | 15.4 | 12.6 | 5.7 | 9.6 | 6.5 | 1254 | 0.4 |
| Worse | 7.6 | 8.7 | 15.2 | 3.1 | 7.3 | 11.8 | 12.1 | 16.3 | 4.5 | 13.2 | 355 | 0.1 |
| don't know/not sure | 4.7 | 7.8 | 9.4 | 6.3 | 4.7 | 10.2 | 7.8 | 21.9 | 10.9 | 16.4 | 128 | 0.0 |

Cramer's V = 0.17 Pearson $\chi$2 (27) = 299.7 Pr = 0

paid for insurance

| | Western | Central | Greater Accra | Volta | Eastern | Ashanti | Brong Ahafo | Northern | Upper East | Upper West | Total | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| yes, paid for self | 7.2 | 4.9 | 10.2 | 8 | 12.6 | 16 | 10 | 9.7 | 9.8 | 11.7 | 1415 | 0.4 |
| yes, paid by relative/friend | 8.9 | 3.9 | 8.1 | 4.7 | 11.3 | 16 | 13.4 | 11 | 9 | 13.7 | 1633 | 0.5 |
| yes, paid by employer/SSNIT | 18.4 | 6.1 | 8.4 | 10.7 | 11.5 | 10.7 | 5.7 | 11.5 | 10 | 6.9 | 261 | 0.1 |
| no, other | 11.6 | 8.7 | 5.8 | 13 | 5.8 | 10.1 | 14.5 | 10.1 | 11.6 | 8.7 | 69 | 0.0 |

Cramer's V = 0.10 Pearson $\chi$2 (27) = 102.51 Pr = 0

Source: Calculations based on data from the Ghana Demographic and Health Survey V, 2008.

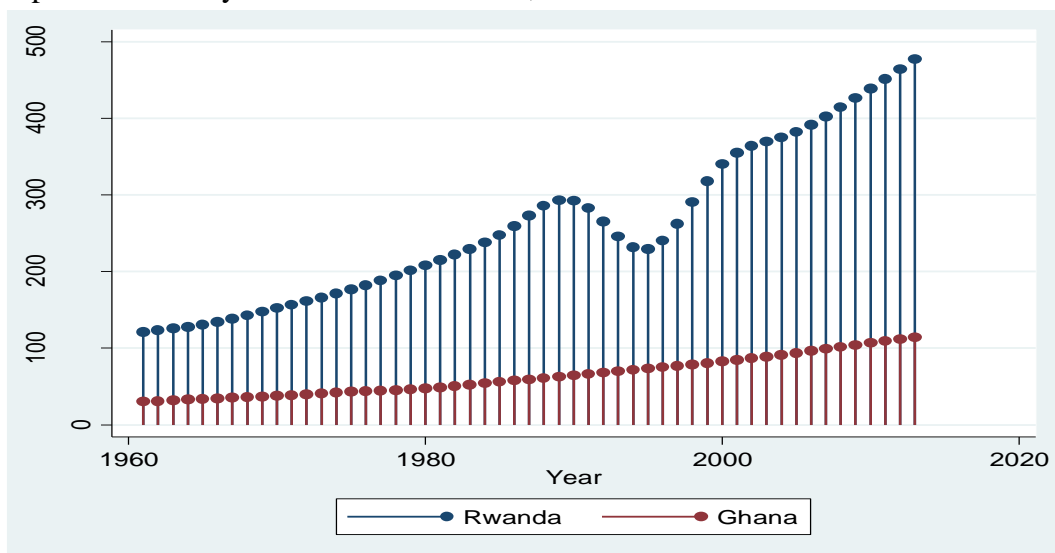**FEATURES OF THE ECONOMY, HEALTH SERVICES AND HEALTH INSURANCE COVERAGE IN GHANA AND RWANDA**

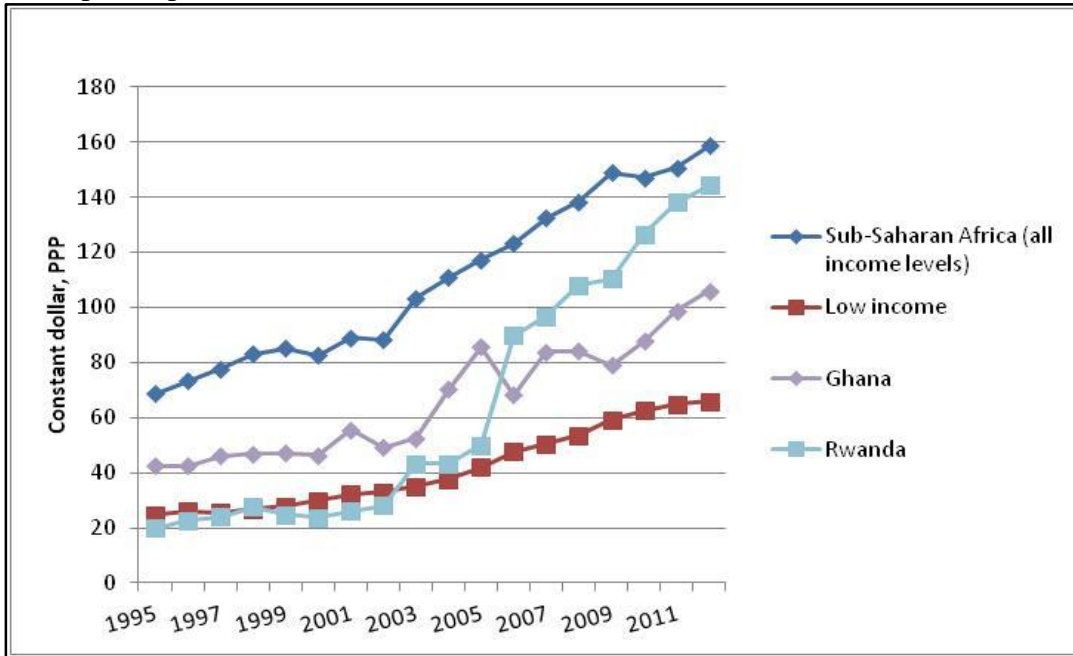Gini index for Ghana and Rwanda, 1995-2012
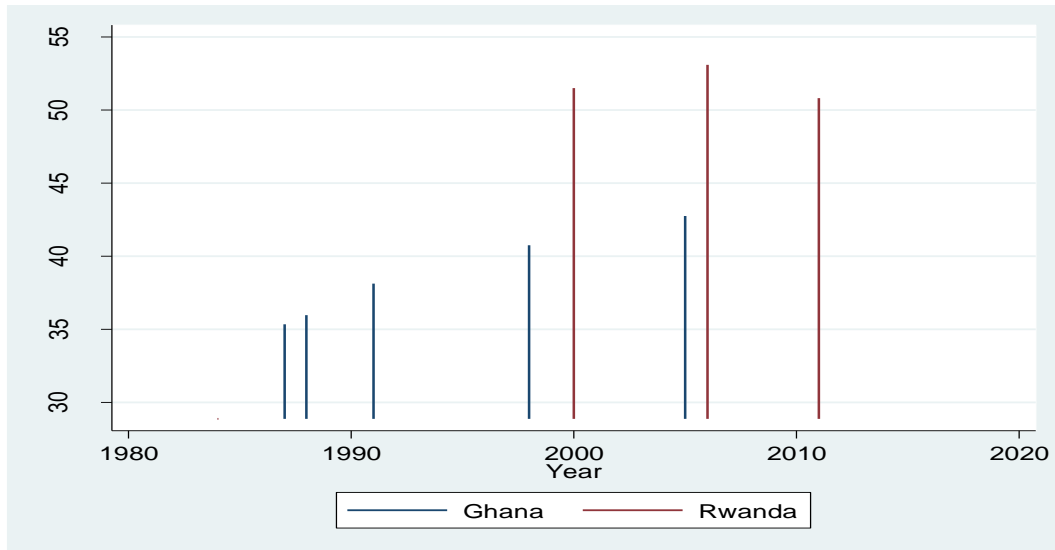


Source: World Bank World Development Indicators.

Population density in Ghana and Rwanda, 1960-2014



Source: World Bank World Development Indicators.

Per capita expenditures on health, in constant 2005 international dollar



Source: World Bank World Development Indicators.

The impact of Ghana NHIS access to health care and financial protection: selected literature

| Studies on Ghana | | | Findings | | | | Data and methods | |
|---|---|---|---|---|---|---|---|---|
| Author(s) | Research objective(s) | Period studied and sample | Enrollment | Utilization | Financial protection | Health state | Quantitative | Data source |
| Parmar et al (2014) | Evidence on older people's awareness of NHIS. Investigate whether social exclusion determines enrollment | 2012. 4050 households and 435 individuals aged 70+ in 5 districts in 5 administrative regions | 72% of older people are insured; 2.4 and 4 times more likely for 3rd and 4th quartile of wealth, than for bottom quartile. | N/A | N/A | Chronic illness and hospitalization in past 12 months' increases odds of being insured | Logit regression | Primary: structured interview: household and individual |
| Kusi et al (2015) | Examine extent to which affordability of the NHIS contribution is a barrier to full insurance for households | January-April 2011. 2430 households in 3 districts in 3 regions | 46% of households (47% of population) are uninsured: tend to be poor and cannot afford, or relatively younger and healthier. | | | Fully insured report higher illness per capita; a higher proportion have chronic disease | Descriptive statistics including statistical tests | Primary data: structured household survey |
| Akazli et al (2014) | Explore extent to which reproductive age mothers are covered by NHIS in the poorest region in Ghana | 2011. 5,469 women aged 15-49 | 33.9% bottom quintile vs 58.3% in highest quintile are insured. 40% of respondents are insured. | N/A | N/A | N/A | Logistic regression. Bivariate and descriptive analysis | Primary: structured household interviews |

| Studies on Ghana | | | Findings | | | | Data and methods | |
|---|---|---|---|---|---|---|---|---|
| Author(s) | Research objective(s) | Period studied and sample | Enrollment | Utilization | Financial protection | Health state | Quantitative | Data source |
| *Dixon Luginaa et al (2014) | Examine the factors that influence enrolment in NHIS | May-Dec 2011. 2119 individuals in Upper West Region | 54% of respondent are insured. Education a primary determinant. Gendered divisions[9] | N/A | N/A | Self-rated health is similar for insured and uninsured. | Multinomial regression | Primary: Structured individual interviews |
| Gobah and Liang (2011) | Assess the effect of the NHIS on access and utilizaiton of healthcare services in Akatsi District | April-June 2010. 320 individuals, 3 service providers, and 3 Scheme employees | 78% insured. | 91% of the insured, compared to 26% of uninsured sought care when ill. 23%(75%) of the Insured (uninsured) respondents who gave birth in 12 months had home deliveries. 96%(83%) of insured had prenatal care. 75%(25%) had skilled attendant. 83%(42%) had postnatal care. | Fewer (27%) of the insured who gave birth in 12 months paid out of pocket for birthing services, while the majority (83%) of the uninsured paid out of pocket. | N/A | Descriptive statistics including statistical tests | Structured household interviews. semi-structured key informant interviews |
| Dzakpasu et al (2012) | Assess impact of free medical care – and currently through NHIS-to | Jan 2004-2009 Dec. A sample of 91,015 deliveries for health facility delivery survey & 27,841 | 65.4% of women insured in May 2008, 91% in November 2008 and a decline to 83.7% in December 2009. | An increase from 50.1% to 71.2% in facility delivery from 2004-2009. A significant jump (7.5%) with the | N/A | N/A | Regressions: temporal trend analysis. | |

| Studies on Ghana | | | Findings | | | | Data and methods | |
|---|---|---|---|---|---|---|---|---|
| Author(s) | Research objective(s) | Period studied and sample | Enrollment | Utilization | Financial protection | Health state | Quantitative | Data source |
|  | pregnant women | deliveries for NHIS enrollment survey in seven contagious predominantly rural districts in BA | Inequality decline: May 2008: Insurance coverage among richest is 54.3% more than that for the poor. December 2009: only 11.4% higher. | introduction of free NHIS coverage. Significant decline in inequality: 87.4% of richest vs 22.7% of poorest quintiles had facility delivery in 2004 compared to 96.8% vs 43.% in 2009. | | | | |
| *Yilma et al (2012) | Investigate whether enrollment in NHIS negatively affects use of insecticide bed nets | September 2009 & September 2007. A panel of 400 households in 11 different communities in BA Region | 39% versus 53% of households insured in 2007 and 2009 respectively. Better economic status increases likelihood | Insured households use more OPD and hospitalizations.  Evidence of moral hazard: Bed net use maintained among uninsured while declines among insured households. | N/A | Fever incidence higher among insured (44) versus uninsured (36) households | Propensity score matching. Probit regressions | |
| Jehu-Appiah et al (2011) | Evaluate equity in enrollment in NHIS. Assess determinants of NHIS demand across socioeconomic groups | April 2009. 3301 households with 13865 individuals in 30 rural and urban communities 2008. | Inequitable: 41% of richest vs 27% of poorest household. 30% of households. | N/A | N/A | N/A | Principal components analysis. Multinomial logit regressions | Primary: structures household surveys |
| *Dixon Tenkorang et al (2014b) | Investigate the effect of NHIS enrolment on the likelihood | 1610 females aged 15-49 nationwide | N/A | Insured make more ANC visits regardless of socio-economic and demographic factors. | N/A | N/A | Multiple regressions : Binomial | Secondary : Ghana DHS-V 2008 |

| Studies on Ghana | | | Findings | | | | Data and methods | |
|---|---|---|---|---|---|---|---|---|
| Author(s) | Research objective(s) | Period studied and sample | Enrollment | Utilization | Financial protection | Health state | Quantitative | Data source |
| | and timing of ante-natal care use | | | Insurance has no association with crucial first visit. | | | and logit models | |
| Akazli et al (2012) | Assessment of financing and benefits incidence of NHIS | 2008: 14,050 individuals in 2,986 households in 6 districts. b)2005/06: 36,488 individuals in 8687 households nationwide | | The top quintile gains twice (24.3%) the benefits from using health care than the bottom quintile gains (12.7%); second, third and fourth gain 15.1%, 23.5% and 24.4 % respectively | Informal sector contributions to NHIS and OOP are regressive but VAT, corporate and income tax contributions are progressive. | N/A | Kakwani indices estimations. Descriptive statistics | Primary: structured interviews Secondary: GLSS5 2005/06 data |
| *Blanchet et al (2012) | Investigate effect of NHIS on health care utilization | Sept 2008-June 2009. 2543 women age 18+ in Accra | N/A | NHIS-enrolled women, compared to not enrolled: -were 40% more likely to have attend clinic -were 83% more likely to have stayed overnight -had 57% more prescriptions | N/A | Women enrolled in NHIS are on average in slightly poorer health | Descriptive statistics but also propensity score matching to reduce risk of confounding | Women Health Survey of Accra, II |
| *Mensah et al (2010) | Examine whether NHIS meets the MDG goals (#4&#5) of improved access to maternal and child health services | 2007. Women who have been pregnant in past 4 years in the sample of 2000 women aged 18-49 in two districts each in BA and Upper East Regions | | Insured are more likely to: birth at hospital and with professional assistance, receive post natal check and more often and extensive, have children vaccinated, have received preventive check in 4 years | N/A | Insured have less frequency of infant death, maternal death or birth complica-tions | Propensity score matching | Primary:St ructured interviews |

| Studies on Ghana | | | Findings | | | | Data and methods | |
|---|---|---|---|---|---|---|---|---|
| Author(s) | Research objective(s) | Period studied and sample | Enrollment | Utilization | Financial protection | Health state | Quantitative | Data source |
| Agyepong and Nagai (2010) | Describe effectiveness of user fee exemptions and health insurance in removing financial barriers for children under 5. | 2007. 300 households with children under 5 | 67.8% of under 5 children are uninsured. Uninsured are more likely to be in the lower quintiles of wealth. | 80.4 NHIS card holders have used a clinic within past 12 months | Insured children paid no fees though 78.6% of users paid fees, of which 66.2% paid full bill. Indication of failure to request exemptions for fear of negative reaction from providers | N/A | Descriptive statistics with tests of statistical significance | Primary: household survey Secondary: hospital records |
| *Chankova et al (2008) | Examine relationship between *CBHI* (MHO) membership and access to formal sector maternal health care | August-October 2004. 300 Women who delivered during previous year, from one CBHI and an adjacent non-CBHI rural districts | 48% of insured are in upper tercile SES. Benefits are limited to inpatient care. Insured are 33.9% of population | Insured are twice likely to have a caesarian delivery compared to uninsured. No significant difference between insured and uninsured in the use of formal health services. | N/A | N/A | Multiple regression: Logit and OLS models | Primary:Structured household and individual surveys |
| Sulzbach et al (2005) | Investigate baseline effects of the NHIS | September-November 2004. 1808 households plus 1303 patients in three districts in different | 47%, 38% and 35% of insured belong in upper two quintiles for the 3 different districts. | Median overnight stays for insured(uninsured) is 5(4) per individual but 4(7) per household Insured had two to five times the rate of uninsured caesarean. Delivery at health | OOP for inpatient service for uninsured households (individuals) is 8.3(23.3) times the amount paid by insured. | N/A | OLS regression models | Structured household and patient exit interviews Secondary : Scheme |

| Studies on Ghana | | | Findings | | | | Data and methods | |
|---|---|---|---|---|---|---|---|---|
| Author(s) | Research objective(s) | Period studied and sample | Enrollment | Utilization | Financial protection | Health state | Quantitative | Data source |
| | | administrative regions. | | facility is not significantly different.  Insured more likely to be 'not satisfied' with OPD and 'satisfied' with inpatient. | OOP for OPD does not differ by insurance status. Insured pay 2.5-2.9 times more for prenatal care but 2.5 times less for delivery care | | | member-ship data |

The impact of Rwanda Mutuelle on access to health care and financial protection: selected literature

| Studies on Rwanda | | | Findings | | | | Data and methods | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Author(s) | Research objective(s) | Period studied and sample | Enrollment | Utilization/quality | Financial protection | Health state | Quantitative | Source |
| *Binagwaho et al (2012) | Provide details on the on the effect of *Mutuelle* on child health | 2010. 7889 under 5 children nationwide | 90% | Insured have a high probability of receiving medical treatment when ill | N/A | Better height for age z-scores, lower likelihood to suffer from disease if insured | Two-step IV, probit, and OLS models | Rwanda DHS-V 2010 |
| *Dhillon et al (2012) | Investigate impact of subsidizing Mutuelle enrolment removing co-payments and improving service delivery on health facility use rates in Mayange district. | April 2006-February 2007 Data on OPD utilisation rates and the personnel for each health center in Mayange and two comparison sites | | Removal of copayments resulted in: - 141.7 visits per day, up from 52.9. -additional 0.6 per capita visits for curative care nearly double off the 0.65 before.  Insured children are 30-60% more likely to receive treatment when ill. | N/A | N/A | Regression analyses. Descriptive statistics including test of significance | Secondary: Health center data records |
| *Lu et al (2012) | Evaluate universal coverage for medical services or financial risk protection | 2000-2008. U5 children, birthing mothers, gen. population | N/A | Increased utilization of medical care by insured | Insured households are less likely to make catastrophic health expenditures | | N/A | Logistic regression, | DHS, LSMS, |
| *Saskena et al (2010) | Examine the effect of MHI on utilization of health | 2005/06. 34,000 uninsured or insured in MHI | 36.6% in MHI, | Insured individuals are 2 times likely to use | OOP is 6.8% (13.4%) of capacity to pay [CTP] for MHI | MHI household significantly less likely to report illness whereas | | EICV2§ |

| Studies on Rwanda | | | Findings | | | | Data and methods | |
|---|---|---|---|---|---|---|---|---|
| Author(s) | Research objective(s) | Period studied and sample | Enrollment | Utilization/quality | Financial protection | Health state | Quantitative | Source |
| | service and financial risk protection | (national survey) | 4.7% in other schemes Poorer households less likely | health services than the uninsured | (uninsured) household. 2.2% (8.6%) of MHI (uninsured) households exceed 40% CTP. 20.1% (41.6%) of MHI (uninsured) households exceed 10% CTP. Catastrophic expenditure is 4 times less likely in MHI household. | no significant difference in likelihood of illness by income status. | | |
| *Hong et al (2011) | Examine relationship between being insurance status and homebirth and births attended by skilled professional | 2005. 8715 birthing mothers | N/A | Lower odds (OR=0.71) of homebirth or (OR=75) unassisted birth if insured | Insured are less likely to have financial barriers to skill-attended delivery | Insured have a higher probability of a safe delivery | Bivariate and multivariate regressions: log odds estimations | Rwanda DHS-V, 2005 |
| *Kagubare (2006) | Assess impact of CBHI on utilization of health services and financial sustainability | 1998-2002. 52 health centers and 4 CBHI schemes in pilot and | | Four-fold increase (unchanged) in visits to 1.74(0.4) per insured (uninsured), per annum | N/A | N/A | Multivariate regressions | Second ary: Health facility data on service |

| Studies on Rwanda | | | | Findings | | | Data and methods | |
|---|---|---|---|---|---|---|---|---|
| Author(s) | Research objective(s) | Period studied and sample | Enrollment | Utilization/quality | Financial protection | Health state | Quantitative | Source |
| | | control districts | | | | | | use and cost |
| *Schneider et al (2007) | Assess cost impact of two payment mechanisms 1. User fee by uninsured 2. Capitation by informal insurance schemes | 52 health centers | | MHI members report significantly higher utilization rates than user-fee paying individuals after adjusting for need. | OOP spending increases headcount poverty ratio by 0.6% (1.3%) for in insured (uninsured).<br><br>MHI benefit without hospital care is not large enough to protect against poverty. | | | |

*Studies which incorporate robust quantitative methods to estimate the effect of health insurance.
§Integrated Living Conditions Survey 2005-2006, that is, the Living Standards Measurement Study series.

Minimum package of insurance benefits by type of health facility, Rwanda

| | The minimum package of services provided |
|---|---|
| National Referral Hospitals | Advanced inpatient/outpatient services, surgery, laboratory, gynecology, obstetrics, and radiology; specialized services including ophthalmology, dermatology, ear nose and throat (ENT), stomatology and physiotherapy |
| District Hospitals | Inpatient/outpatient services, surgery, laboratory, gynecology, obstetrics, and radiology |
| Health Centers | Prevention activities, primary health care, inpatient and outpatient, maternity, laboratory, referral |
| Dispensaries | Primary health care, outpatient, and referral |
| Health Posts | Outreach activities (i.e immunization, family planning, child growth monitoring, ANC) |
| Community | IMCI, CBP, CBNP, Hygiene, Maternal health |

Source: Ministry of Health Rwanda, Annual Report 2012/2013.

Ghana National Health Insurance Scheme standard package of benefits

Outpatient services
General and specialist Consultations reviews
General and specialist diagnostic testing including, laboratory investigation, X-rays, Ultrasound scanning
Medicines on the NHIS Medicines list
Surgical Operation such as Hernia repair
Physiotherapy
Inpatient service
General and specialist in patient care
Diagnostic tests
Medication-prescribed medicines on the NHIS medicines list, blood and blood products
Surgical operations
In patient physiotherapy
Accommodation in the general ward
Feeding (where available)
Oral health
Pain relief (tooth extraction, temporary incision and drainage).
Dental restoration (simple amalgam filling, temporary dressing).
Maternity care
Antenatal care
Deliveries (normal and assisted)
Caesarean session
Post-natal care
Emergencies
These refer to crises in health situations that demand urgent attention such as:
Medical emergencies
Surgical emergencies
Pediatric emergencies
Obstetric and gynecological emergencies
Road traffic accident

Source: National Health Insurance Authority vignette, 2015.

| Ghana NHIS benefits package exclusions |
| --- |
| Appliances and prostheses such as heart aids, orthopedic aids and dentures |
| Cancer treatment except breast and cervical |
| HIV Retroviral drugs |
| Heart and brain surgery except in cases of accidents |
| Dialysis for chronic renal failure |
| Organ transplant |
| Angiography |
| Echocardiography |
| Photography |
| Unlisted drugs |
| Cosmetic surgeries and aesthetic treatment |
| Assisted reproduction |
| Non-diagnostic medical examinations such as for visa applications, driver's license |
| VIP ward accommodations |
| Diagnosis and treatment abroad |
| Morgue |

Source: National Health Insurance Authority vignette, 2010.

## Ghana NHIS medicines list by therapeutic classification

Anesthetic agents
Pre-operative medications and sedation for short-term procedures pre-anaesthetics
Analgesics, antipyretics, NSAIDs and drugs used in gout
Anti-allergic drugs
Antidotes and other substances used in poisoning
Anticonvulsants
Anti-infective drugs
Anti migraine drugs
Anti neoplastic and immunosuppressive drugs
Anti Parkinsonism drugs
Drugs affecting the blood
Blood products and blood substitutes
Cardiovascular drugs
Dermatological preparations
Diuretics
Gastrointestinal drugs
Hormones and other endocrine drugs
Immunological
Muscle relaxants and cholinesterase inhibitors
Ophthalmological preparations
Oxytocics and anti-oxytocics
Peritoneal dialysis solutions
Psychotherapeutic drugs
Drugs acting on the respiratory tract
Solutions correcting water and electrolyte
Parental nutrition
Vitamins and minerals
Other drugs
Drugs for ear, nose and throat
Drugs for dentistry
Drugs for urology

Source: National Health Insurance Authority vignette, 2010.

Regional Distribution of NHIS approved health facility by type of ownership in Ghana

| | Ashanti | Brong Ahafo | Central | Eastern | G. Accra | Northern | Upper East | Upper West | Volta | Western | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Chemical | 19 | 34 | 12 | 6 | 1 | 69 | 17 | 10 | 9 | 25 | 202 |
| Pharmacy | 81 | 16 | 10 | 19 | 86 | 9 | 5 | 2 | 10 | 28 | 266 |
| Clinics: | | | | | | | | | | | |
| Private | 46 | 17 | 9 | 17 | 76 | 8 | 10 | 1 | 11 | 23 | 216 |
| Mission | - | 12 | - | - | 3 | - | - | 1 | - | 2 | 18 |
| Quasi | - | 1 | 1 | - | 4 | 1 | - | - | - | 2 | 7 |
| Health Centers | | | | | | | | | | | |
| Mission | 30 | - | 8 | 13 | 3 | 15 | 10 | 12 | 6 | 17 | 114 |
| Quasi- | - | - | 1 | 1 | - | - | - | - | - | - | 2 |
| Primary Hospitals | | | | | | | | | | | |
| Private | 56 | 5 | 7 | 14 | 30 | 1 | 5 | - | 5 | 4 | 127 |
| Mission | 19 | 10 | 3 | 4 | - | 4 | 1 | 2 | 8 | 4 | 55 |
| Quasi | 1 | - | 1 | 1 | 5 | - | - | - | - | 1 | 9 |
| Other Facilities | | | | | | | | | | | |
| Maternity | 60 | 36 | 20 | 20 | 20 | 5 | 1 | 5 | 9 | 24 | 245 |
| Ultrasound | 13 | 7 | 4 | 3 | 3 | 1 | - | - | - | 5 | 36 |
| Diagnostic | 8 | - | 2 | - | 6 | - | - | - | 2 | 7 | 25 |
| Laboratory | 8 | 5 | 9 | 2 | 19 | 2 | 3 | 1 | - | 19 | 68 |
| Dental | - | - | - | - | 3 | - | - | - | - | 2 | 3 |
| Eye clinic | 2 | - | 1 | - | 4 | - | - | - | 1 | - | 8 |

Source: National Health Insurance Authority: Annual Report 2012.

The expenditures and revenue performance at different levels of the Rwandas CBHI Schemes, June 2011-June 2012

| | Section Level | | District Level | | National Level | |
|---|---|---|---|---|---|---|
| | million RWF | Ratio | million RWF | Ratio | million RWF | Ratio |
| Total expenditures[a] | 18,173.4 | 1 | 10,807.7 | 1 | 3,406,539,112 | 1 |
| of which | | | | | | |
| Total Reimbursements to providers: | 7,215.2 | 0.40 | 8,095.9 | 0.75 | 3,201.7 | 0.94 |
| Section level Health care Reimbursements | *7,215.2* | *0.40* | *na* | | *na* | |
| DH Reimbursements | *na* | *na* | *8,095.9* | *0.75* | *na* | |
| NRH Reimbursements | *na* | *na* | *na* | | *3,201.7* | |
| Recurrent budget and salaries | 1,907.4 | 0.10 | 2,317.4 | 0.21 | 129.5 | 0.04 |
| Total transfer payments: | 9,050.8 | 0.50 | 394.4 | 0.04 | 75.4 | 0.02 |
| Transfers paid to the District Risk Pool | *8,171.8* | *0.45* | *na* | | *na* | |
| Transfers paid to the Common Account | *871.1* | *0.05* | *na* | | *na* | |
| Transfers paid to National Risk Pool | *na* | *na* | *394.4* | *0.04* | *75.4* | |
| Transfer from premium account to petty cash | *7.9* | *0.00* | *na* | | *na* | |
| Total revenues[b]( in millions RWF) | 19,468.3 | | 10,501.7 | | 3,441.0 | |
| of which | | | | | | |
| Opening balance | | - | | - | 298.9 | 0.09 |

|  | Section Level | | District Level | | National Level | |
|---|---|---|---|---|---|---|
|  | million RWF | Ratio | million RWF | Ratio | million RWF | Ratio |
| Total insurance premium collections: | 17,499.8 | 0.90 |  | - |  | - |
| Premiums collected from Category 1 | *4,649.6* | *0.24* | *na* |  | *na* |  |
| Premiums collected from Category 2 | *12,829.5* | *0.66* | *na* |  | *na* |  |
| Premiums collected from Category 3 | *20.7* | *0.00* | *na* |  | *na* |  |
| Insurance copayments by households | 1,212.9 | 0.06 |  | - |  | - |
| Total receipts from transfers and other allocations: |  | - | 8,353.3 | 0.80 | 3,028.0 | 0.88 |
| Transfer receipts from premiums at section level |  | - | *6,108.0* |  |  | - |
| Transfer receipts from national level |  | - | *1,143.1* |  |  | - |
| Transfer receipts from other section/district source incl common account |  | - | *1,102.2* |  | *384.5* |  |
| Transfer receipts from MINECOFIN |  | - |  | - | *2,113.1* |  |
| Contributions from private health insurance and other income from districts |  | - |  | - | *530.4* |  |
| Other revenue sources | 755.6 | 0.04 | 2,148.4 | 0.20 | 114.2 | 0.03 |
| Balance | 1,294.8 | 0.07 | -306.0 | -0.03 | 34.5 | 0.01 |

| | Section Level | | District Level | | National Level | |
|---|---|---|---|---|---|---|
| | million RWF | Ratio | million RWF | Ratio | million RWF | Ratio |
| Distribution of reserves | | | | | | |
| Reserves: | 1,294.8 | 1 | | - | | - |
| Amount of section level reserves allocated | *259.0* | *0.02* | *776.9* | *0.60* | *259.0* | *0.20* |
| Deficits to be covered | | - | 306.0 | | 593.3 [c] | |
| Net reserves | 259.0 | | 470.9 | | (334.3) | |

Source: Calculations based on data from Republic of Rwanda Ministry of Health CBHI Report 2012.

a. To avoid double counting, expenditure items exclusive to each level (section, district and national) are added together with transfer payments by sections only but reimbursements and recurrent expenditures by all three. Hence the total is RWF 22,737,565,374.

b. Total revenue is estimated by adding the total revenue at the section level, transfer payments by MINICOFIN, 'other' revenues at section and national levels and special contributions by private insurance to the national pool. Hence the total revenue estimate is RWF 24,374,296,072.

c. This amount is stated in the statement of accounts but the accounts provide little detail about the source of this deficit.

Estimates of unit costs at hospitals in Rwanda and Ghana

| | Year | Rwanda International $ (PPP) | Ghana International $ (PPP) |
|---|---|---|---|
| Cost per bed day by hospital level[*] | | | |
| Primary | 2005 | 17.9 | 15.00 |
| | 2000 | 9.25 | 12.87 |
| Secondary | 2005 | 23.35 | 19.57 |
| | 2000 | 12.07 | 16.79 |
| Tertiary | 2005 | 31.9 | 26.72 |
| | 2000 | 16.48 | 22.93 |
| Cost per outpatient visit by hospital level[*] | | | |
| Primary | 2005 | 4.98 | 4.05 |
| | 2000 | 2.30 | 3.39 |
| Secondary | 2005 | 7.07 | 5.74 |
| | 2000 | 3.26 | 4.80 |
| Tertiary | 2005 | 10.46 | 8.5 |
| | 2000 | 4.82 | 7.10 |
| Cost per visit at health centre by population coverage for a 20-minute visit[§] | | | |
| At 50% population coverage[b] | 2005 | 7.03 | 6.56 |
| | 2000 | 5.36 | 6.10 |
| At 80% population coverage | 2005 | 8.29 | 7.08 |
| | 2000 | 5.36 | 6.10 |
| At 95% population coverage | 2005 | 12.57 | 10.65 |
| | 2000 | 5.83 | 6.63 |

Source: Data tables of the World Health Organization Choosing Interventions that are Cost-Effective Project (WHO-CHOICE).
*Cost estimates for public facility at 80% occupancy rate but excludes drugs and diagnostics.
§Population coverage refers to 'the percent of population with physical access to primary health.
facilities, defined as living within 5 kilometers or 1 hour away from the facility' (WHO-CHOICE).

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