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Http://www.cscanada.org Http://www.cscanada.net  
E-mail: mse@cscanada.org; caooc@hotmail.com

# Asymmetry Information Problem of Moral Hazard and Adverse Selection in a National Health Insurance:

## the Case of Ghana National Health Insurance

Obeng Nyantakyi Clement<sup>1</sup>

**Abstract:** Due to special properties of moral hazard and adverse selection in health insurance contract, governments' effort to efficiently provide health care services to their citizens tends to encounter many problems, especially in low income countries. The National Health Insurance of Ghana has not been immune to this problem. This paper, explores empirical research to test for the asymmetric information problem of moral hazard and adverse selection in health insurance contracts. It uses both quantitative and qualitative to analyze data gathered through a meaningfully administered questionnaire in the Sekyere West District of Ghana to make its conclusion on the subject matter.

Keywords: National Health Insurance; Moral Hazard; Healthcare; Adverse Selection; Asymmetry Information

## 1. INTRODUCTION

According to mainstream health-care economists, special properties of health service delivery-asymmetric information problem of adverse selection and moral hazard, make health care different from other goods (Carlstrom 1994). Because of these properties, governments' effort to efficiently provide health care services to its people tends to encounter many problems, especially in low income countries. Since the implementation of the National Health Insurance Schemes (NHISs) by the government of Ghana in 2005, though membership registration is estimated to have reached fifty-five percent of the population, the cost of financing has increased to the extent of some schemes resulting in financial distress. This can be attributed to moral hazard and adverse selection problem among others. Asymmetrical information means that the distribution of information between buyers and/or sellers is skewed, i.e. not equal. Information asymmetry models assume that at least one party to a transaction has relevant information whereas the other(s) do not. In the health insurance industry, sellers/providers

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<sup>1</sup> School of Management, Wuhan University of Technology, Wuhan, Hubei, 430070, China.  
Email: [aclementno@yahoo.com](mailto:aclementno@yahoo.com).

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(governments in this case) do not have the same information as consumers. As discussed by most scholars and practitioners I emphasized in this paper that, the half twin of this problem is moral hazard.

Moral hazard is defined as the effect of insurance on the behavior of the insured. More broadly, moral hazard occurs when the party with more information about its actions or intentions has a tendency or incentive to behave inappropriately from the perspective of the party with less information. In health insurance, because individuals no longer bear the cost of medical services after acquiring insurance, they have an added incentive to ask for pricier and more elaborate medical service, which otherwise may not be necessary. In these instances, individuals have an incentive to over consume, simply because they no longer bear the full cost of medical services. On the other hand, the term adverse selection as originally used in insurance describes a situation where an individual's demand for insurance (either the propensity to buy insurance, or the quantity purchased, or both) is positively correlated with the individual's risk of loss (e.g. higher risks buy more insurance), and the insurer is unable to allow for this correlation in the price of insurance. With respect to medical care, this means that insurers generally refuse coverage to all but the very healthy. One possible explanation for this is the transaction costs involved with writing policies for high risk patients (Glied & Remier, 2002).

## **2. THE LITERATURE**

The empirical test of the asymmetric information problem of moral hazard and adverse selection has in recent years catch the intellectual analysis of many scholars. Whiles some researchers use health or life insurance data, others analyze automobile insurance contracts.

On their part, Holly, Lucien and Gianfranco (1998) estimates a structural model of health insurance, where the existence of a complete coverage, described by a dummy variable, is allowed to impact health expenditures in addition to a possible correlation between error terms. Estimating a parametric version of the model, they suggest that the former effect can be interpreted as moral hazard, whereas the second represents adverse selection. Though the robustness of the qualitative results with respect to changes in the parametric assumptions (and in particular the form of the distribution) is a difficult issue in this context, they made a positive finding in their hypothesis with regards to the presence of information asymmetry.

In a related but different approach, Cardon, James, and Hendel (2001) exploit an interesting feature of employer-provided health insurance contracts. They emphasize that, while workers may, in any particular firm, be proposed one or several contractual options, the menus offered widely differ across companies. Assuming that the choice of an employer is not primarily driven by the characteristics of the associated health insurance plan, Cardon, James and Hendel argue that these data provide a 'quasi-natural experiment', in the sense that similar agents turn out to be facing different (menus of) contracts for exogenous reasons. Then the existence of adverse selection they tested using the self-selection of agents among the various contracts of a given menu, whereas the estimation of moral hazard relies on the differences between the menus proposed by different firms. Again, although the estimation idea is in principle non-parametric, they construct and estimate a fully parametric model.

In a more recent study, Finkelstein and Poterba (2006) developed a test for adverse selection that avoids the limitation of heterogeneity in risk preferences. Their test is based on using data on observable characteristics of individuals that are correlated with the outcomes but are not used by insurers in pricing contracts.

Although the works of the above literature might not have a direct correlation with this paper, with respect to the different approaches and methodologies adopted by the various authors, their findings and academic marks remains prudent to this work. In this paper, I propose an alternative approach to assessing the problem of moral hazard and adverse selection in health insurance markets. My approach is based on exploring quantitative and qualitative analysis to examine consumer demand for health insurance, motivation behind the quest for health insurance, and health service utilization.

### **3. THE NATIONAL HEALTH INSURANCE OF GHANA: OVERVIEW**

Health care financing in Ghana has gone through many dynamics recognizing free health care at the eve of independence, introduction of the nominal fee in the 1970s, and the 1980s' full cost recovery, popularly known as the "cash and carry" system. Recognizing the problems that the cash and carry system posed to accessing health care, the government of Ghana declared its intention to abolish the system, and began exploring the feasibility of introducing a national health insurance scheme to be managed at the district level. (Sulzbach, S, Garshong, B and Banahene, G)

In August 2003, the government of Ghana moved from planning to action by passing the National Health Insurance Act. Its primary goal was to improve access to quality basic health care services in Ghana through the establishment of district-level Mutual Health Organizations (MHOs) or district-wide insurance schemes. They are regulated by the National Health Insurance Council (NHIC). The role of the NHIC is to register, license, and regulate health insurance schemes and to accredit and monitor health care providers operating under the schemes (Government of Ghana 2004). To mobilize additional funds to support implementation of the district mutual health insurance schemes, the government of Ghana instituted a National Insurance Levy of 2.5 percent on specific goods and services. In addition, 2.5 percent of the 17.5 percent social security contributions paid by formal sector employees are automatically diverted to support the NHIS, and they and their dependants automatically enrolled in their district schemes. Approximately 80 percent of the NHIS is financed by these taxes. For those in the informal sector, community health insurance committees categorizes residents into social groups based on economic status, and those identified as 'core poor' are exempted from paying premiums (Government of Ghana 2004).

### **4. DATA, RESEARCH METHODOLOGY AND HYPOTHESES**

The paper employs a simple empirical test for the presence and significance of the asymmetry information problem of moral hazard and adverse selection in the operations of the NHISs in Ghana. It uses a meaningfully designed questionnaire to gather information related to the subject matter. The study population comprises residents of the Sekyere West District in the Ashanti Region of Ghana.

This non-random sampling technique was employed because I was without doubt that the chosen sample frame has fair knowledge about the activities of the national health insurance in the district.

Out of a total of four hundred questionnaires administered, three hundred were obtained for the necessary corrections and computations to be made. My working hypotheses are:

First, people who purchased insurance are more likely to have a higher consumption rate of health care services than people without insurance;

Second, people purchase insurance due to their inferior health status or expected future high consumption rate.

Though the NHIS in Ghana is mandatory, half of the population is not registered. This makes the comparison of health care utilization between insured and uninsured people meaningful. Besides, I observe the number of visits and how frequent people with health insurance visit, compared to when they were not insured. Finally, the presence of the large number of exempt people enables the identification of the two types of asymmetric information effects. Recall that people who are exempt from paying premium essentially enjoy the same coverage as people who pay premium but completely free of charge. So for this people there is no self-selection bias, i.e. no adverse selection effect. So for this people the excessive consumption of medical care should be the result of pure moral hazard effect. Contrary to this, for people who actually pay insurance premium, their behavior when it comes to health care

consumption will be impacted by both adverse selection effect (they bought the insurance because of their inferior health), and moral hazard (having the insurance changed their behavior relative to when they were uninsured).

## **4. ANALYSIS AND INTERPRETATION OF RESULTS**

### **4.1 TABLES AND INTERPRETATIONS**

The study has explored a random sampling method in the Sekyere West District Assembly of Ghana without preference to age, sex and employment status. For age however, only those within the matured age (18 and above) were considered. The findings are therefore interpreted below. I must acknowledge that all figures have been computed in percentage.

From table 4.1, the survey recorded a significant larger number of insured respondents than uninsured respondents. According to the gender distribution of the insured, more than half of the respondents are female in their reproductive age against 30% of male insured respondents. This could be attributed to the mere fact that women are more vulnerable to sickness and for that matter seek to take precaution against cost of health care utilization by enrolling in the insurance scheme. Besides, they could have sought for insurance after pregnancy as most of these women fall within their reproductive age and have dependants as well. In either way, this is a case of adverse selection. Additional analysis explored the age distribution of respondents. There exist vast differences between the percentages of insured and uninsured in all the categories. For instance, the survey recognized a large number of uninsured respondents in the active age (19-45) category. This group of people is generally seen to be healthier and such don't pay much attention to health issues hence the low number recorded. However, among the 70s and above, because they enjoy insurance without paying premium, not much can be said about the differences between both insured and uninsured. The significant differences between the insured and uninsured in the 46-49 ages category can as well be attributed to the problem of adverse selection. Focusing on employment factors of respondents, it is recorded that none of the public workers observed was uninsured. This is due to the fact that premiums of public servants are deducted by the government from their social security and as such makes it mandatory. For private workers the big differences between insured and uninsured could be the fact that they might belong to other private insurance companies or as a result of economic status as in the unemployed.

Table 4.2 highlights patterns in health service accessibility among both insured and uninsured in a year. Of particular interest is whether enrollment in a health insurance scheme increases access and utilization of health care services or not. Much emphasis is placed on the health care utilization pattern of the insured. The survey reveals that respondents with insurance visited a physician more frequently in a year than do uninsured respondents. More than 50 percent of the insured visits the physician or a hospital more than three times in a year. This observation has two implications. On one hand, these people might have acquired health insurance due to the poor nature of their health status, hence a clear evidence of adverse selection. On the other hand, respondents' rate of healthcare consumption increased after acquiring the insurance which could be attributed to mere moral hazards.

Table 4.3 seeks to examine the motivation behind the quest for insurance among the insured. Respondents were asked about what motivated them to register for the insurance. The qualitative implication shows that some registered after being sick and also after pregnancy. This exhibits adverse selection. For those whose registration was as result of mandatory it is observed that all of them fall under the public workers category and had no choice since their premium is deducted from source by the government. Most interesting observation is the result on their healthcare consumption status both before and after registration. The result shows that most respondents visit a physician once in a year before registration. However, the pattern of visits changed totally after registration. For instance, after registration, it is observed more than 50 percent visit a physician more than three times in a year. This obviously has two implications. Significantly, they probably acquired the insurance as a result of their poor health status hence adverse selection, and/or their consumption pattern changed as a result of moral

hazard.

#### **4.2. MORAL HAZARD AND ADVERSE SELECTION IN THE NHIS**

The findings presented in this research provide a baseline for testing the information asymmetry problem of moral hazard and adverse selection in health insurance contract, using the National Health Insurance Scheme of Ghana as a case study. The information collected both on insured and uninsured centers on the reasons behind registering for a health insurance and the consumption pattern of the insured, both before and after insurance. The study's hypotheses revolve around the opinion that the national health insurance in Ghana is not immune to the problem of adverse selection and moral hazard.

The study found that insured respondents in the survey sought for healthcare services in a year than their uninsured counterparts. Insured respondents also significantly revealed vast differences in health care utilization after they were insured than before insurance. More than 50 percent utilized healthcare services more than three times within a year as compared to 11 percent of same respondent utilizing health care at the same time period before they had health insurance. The findings in this report reveals evidence of adverse selection, that's they acquired the insurance as a result of their expected future utilization of healthcare services. Moral hazard implication is also vividly evident looking at the high rate of health care utilization by insured respondents, and also compared to when they were not insured.

The study found evidence of adverse selection through analysis of the background data of respondents. First, the survey found more women, majority in their reproductive age and with dependants, who mostly registered after they found pregnant. Secondly, respondents within the ages 46-69 and adults over the age of 50 were significantly more likely to be enrolled, and those within the age range of 18 and 45 were significantly less likely to be enrolled in an insurance scheme. This suggests that individuals from higher-risk groups were more inclined to join the scheme, whereas those at lesser risk were less inclined to join. In a nut shell, the two hypotheses of the study have been proven positive. Indeed, people who purchased insurance are more likely to have a higher consumption rate of health care services than people without insurance, and people purchase insurance due to their inferior health status or expected future high consumption rate. There is therefore evidence of moral hazard and adverse selection in Ghana's health insurance.

### **5. CONCLUSIONS AND POLICY IMPLICATIONS FOR THE NHIS**

This study has attempted to capture information related to health care utilization and health insurance registration for its qualitative and quantitative analysis in examining the asymmetric information problem of moral hazard and adverse selection in the NHIS of Ghana. It is envisaged that the results of this study will be of great importance to the government of Ghana as it continues to implement the policy. In the long term, mandatory enrollment in the NHIS could minimize the impact of adverse selection and help pool the risk. In the short term, I suggest an introduction of risk rating to minimize the effect of adverse selection. For moral hazard, there is the need to introduce a policy of cost-sharing to curb the situation. However, there is the need to consider the socio-economic of the policy. Systematic analyses of other countries' health insurance systems especially that of advance countries would also be very useful. The academic relevance of the study has been the application of empirical study to test for the problem of moral hazard and adverse selection and its contribution to the literature. The design called for conducting a subsequent round of surveys with a wider coverage. Such a survey could capture increases in insurance enrollment, as well as the effects of enrollment on health care seeking behavior and out-of-pocket expenditures. In addition, a subsequent survey could complement district MHO data by providing insights on respondents' perceptions of the NHIS, and for the uninsured, reasons for not enrolling.

## REFERENCES

- Carlstrom, Charles T.. (1994). The Government's Role in the Health Care Industry: Past, Present, and Future. *Federal Reserve Bank of Cleveland Economic Commentary*, 1 June. pp 1-6.
- Glied, S. A., & Remier, D. K. (2002): What every public finance economist needs to know about health economics: Recent advances and unresolved questions. *National Tax Journal*, 55(4), 771-788.
- Holly, A., Lucien, G., Gianfranco, D., Brigitte, B.. (1998). An econometric model of health care utilization and health insurance in Switzerland. *European Economic Review*, 42, 513-522.
- Cardon, James H., and Igal Hendel. (2001). Asymmetric Information in Health Insurance: Evidence from the National Medical Expenditure Survey. *RAND Journal of Economics*, 32 (3) (Autumn): 408-427.
- Finkelstein A. and Poterba, J.. (2004). Adverse Selection in Insurance Markets: Policyholder Evidence from the U.K. *Annuity Market, JPE*, Pp 2-4.
- Sulzbach S, Bertha G, and Banahene G. December. (2005). *Evaluating the Effects of the National Health Insurance Act in Ghana: Baseline Report*. Bethesda. MD: The Partners for Health Reformplus Project. Abt Associates Inc. pp 2-6
- Government of Ghana. (August 2004). *National Health Insurance Policy Framework for Ghana*. Ministry of Health. pp 3-5.

## TABLES

**Table 4.1 Respondents' Background and Employment in Percentage**

	No.(%)	Sex		Age			Employment		
		Male	Female	18-45	46-69	70 ≥	Public Workers	Private Workers	Unemployed
Insured	1.00	0.30	0.70	0.21	0.45	0.34	0.46	0.09	0.44
Uninsured	1.00	0.78	0.22	0.60	0.22	0.18	-	0.55	0.45

**Table 4.2 Respondents' Health Care Accessibility Status**

	No. (%)	Number of Visits to a Physician in a Year			
		Once per Year	Twice Per Year	Trice Per Year	More than trice per Tear
Insured	1.00	0.09	0.15	0.25	0.51
Uninsured	1.00	0.47	0.33	0.13	0.07

**Table 4.3 Determinants and Health Care Consumption of Insured**

Motivation behind Registration	No. (%)	After Sickness	After Pregnancy	Mandatory	Self Motivated
		1.00	0.21	0.12	0.30
Visits to a Physician Before Registration	1.00	Once per Year	Twice Per Year	Trice Per Year	More than Trice Per Year
		0.41	0.27	0.21	0.11
Visits to a Physician After Registration	1.00	Once per Year	Twice Per Year	Trice Per Year	More than Trice Per Year
		0.09	0.15	0.25	0.51