ADDIS ABABA UNIVERSITY SCHOOL OF GRADUATE STUDIES

A STUDY ON THE FEASIBILITY OF HEALTH INSURANCE SCHEMES FOR COMMUNITY BASED GROUPS' IN ADDIS ABABA CITY. A CASE STUDY ON IDDIRS'

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"A Study on the feasibility of health Insurance Schemes for community Based Groups' in Addis Ababa City: A case Study of "IDDIRS".

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

ACRONYMS

CBHIs = Community Based Health Insurance scheme

CV = Compensation Variation

CVM = Contingent Valuation Method

EV = Equivalent Variation

FMOH= Federal Ministry of Health

MOH = Ministry of Health

NBE= National Bank of Ethiopia

NGOs = Non Governmental Organizations

NHA = National Health Account

NHI = National Health Insurance

PAs = Pastoral Associations

USD =United States Dollar

WCMEH= World Commission for Macro Economics and Health

WHO= World Health Organization

WTA=Willingness to Accept

WTP= Willingness to Pay

Abstract

The current health financing practice in Ethiopia demands that part of the cost be covered through out-of-pocket user fees at the time of sickness. The inadequacy of current health financing arrangements, typified by progressively declining budgetary allocations implies the need to explore alternative approaches to improve the financing situation. Community Based Health Insurance scheme (CBHIs) is being seen as a promising new tool for health system improvement in low income countries, particularly in Sub-Saharan Africa. The successful implementation of this Community Based Health Insurance depends on the capacity and willingness of the community to regularly pay their contribution/premium. Given the high level of poverty in Ethiopia expansion of CBHIs could face serious challenge as the premium could be beyond the ability of the majority of the urban and rural poor.

This study analyses the feasibility of CBHIs provision for a community based organizations called iddirs by determining the member households' willingness to pay for the proposed scheme. Three iddirs are purposively selected from areas that are believed to constitute largely of the low income earning and also informally employed groups of the society in the capital city, Addis Ababa. From the three iddirs 210 households were systematically sampled for an interview. A closed ended WTA question followed by an open ended WTP question under hypothetical CBHIs was presented for the respondents to elicit their maximum willingness to pay amounts. The value member households 'attach to the proposed health insurance is estimated using the contingent valuation method (CVM).

The results show that the mean willingness to pay amount for the open ended question under the proposed CBHIs scheme is 11.56 birr per month. This amount of WTP even from the low income earning groups of the society shows that CBHIS can help to generate sufficient amount of resource that can finance the deficit of the health sector of the country without evicting the poor and those informally employed section of the population from the health care market. According to the results from the Tobit model income, secondary and tertiary education dummies, status of the respondent in the household, case of chronic disease in the household, occupation of the head and size of the household have a positive and significant effect on the amount of WTP. The Probit model shows that age, marital status, respondents status, income of the household, health care need, size of the household and occupation of the head (all of them with a positive sign) and the bid price with a negative sign, have a significant effect on the probability of accepting the bid. The setting of premium prices should consider the ability of payment and the willingness to pay of households so as to assure the sustainable provision of the scheme. Public awareness should be adequately enhanced on the functioning of the schemes and also the benefits that can be gained from it so that the service can insure a wider coverage.

1. INTRODUCTION

1.1 Background

Development process at the early stage often entails growing gaps in incomes and standards of living between the rich and poor members of the society which is also associated with inequitable access to healthcare services (Santerre & Neun, 2004). Consequently, concern has been shown by many countries to reduce the inequitable access towards health care and these issues have been high on the international policy agenda for decades; however it has been proven an elusive goal (Wagstaff & Doorslaer, 1998).

Virtually without exception, country studies show that the poor have less access to all types of health care and benefit less from publicly provided services than do higher-income groups, indicating that health status is universally lower for the poor than for the rich (Gaag, 2009). Moreover, private, uninsured and out-of- pocket expenditures on health care make up a larger share of total financial resources in developing countries than in richer countries. This share exceeds 50 percent in India and is over 75 percent in china. Evidence from surveys which cover 89 percent of the world's population suggests that 150 million people globally suffer financial catastrophe every year due to out-of-pocket health expenditures (Asfaw et al., 2009).

As stated in Hailemariam & Brenzel (1998), if someone is unfortunate enough to suffer a serious illness, the cost of being treated can be catastrophic and in a world of plenty, it

becomes increasingly unacceptable that people die or suffer because they have no access to even the most basic of medical care. What is equally distressing is that, when poverty is the result of large or catastrophic health expenditures (Asfaw and Braun, 2005).

With the view to cease such events, heavy government involvement in the health care is often used as an argument in the quest of health equality. Although many developing countries governments' promise free health care for all, they fail in the delivery and this long lasted policy failure in this area persuades us to rethink the reliance on government as the sole financier or provider of health care (Gaag, 2009).

In richer economies, insurance achieved through broad public action and appropriately developed private mechanisms has fundamentally changed the lives of poor people. This indicates that the provision of insurance for the poor, covering a variety of risks, could well be a key milestone throughout the process of bringing equity in health care and also the fight against poverty. However, the difficulty in developing countries is that insurance markets are limited, as public agencies lack the capacity to provide sufficient protection for these insurance companies (Dercon, 2009).

Ethiopia is the second most populous country in Africa with an estimated total population size of 79 million growing at a rate of 2.6% per annum (CSA, 2007/8) .This means that nearly 10 percent of the population of Sub- Saharan Africa lives in Ethiopia and is

expected to reach 100 million by 2018 and 130 million by 2030 (UNCTAD, 2002). The socio-economic feature of the country is largely rural/agricultural (which constitutes 84.3% of the total population) and informal economy, with an emerging and growing formal private and public sector. In 2007/8 life expectancy at birth was 53.4 years. The level and distribution of poverty in Ethiopia is extensive. According to the results obtained from the 1995/96 and the 1999/2000 household income, consumption and expenditure (HICE) survey of the Central Statistical Agency (CSA), about 37% percent of the population in urban areas is found to be below poverty line (CSA, 2007).

The health situation in Ethiopia is one of the worst in the world. The per capita health expenditure, the health professionals, and health facilities population ratios, etc. are very low even by the standard of Sub-Sahara African (SSA) countries (Asfaw and Braun, 2005; FMOH, Health Care Financing Team, 2006). The poor health status of the citizens is further aggravated by the high population growth and the low level of access to reproductive health and emergency obstetric. It has been indicated that, 60% to 80% of the health problems are attributed to preventable infections such as malaria, Tuberculosis and pneumonia (FMOH, 2006).

In response to such prevailing and newly emerging health problems the Ethiopian government has developed a 20 year rolling Health Sector Development Program which proposes long term goals for the sector and the means to attain them by way of a series of phases. The phases of all Health Sector Development Programs (HSDP) have clear

strategies for making targeted interventions against poverty related diseases which are in the main HIV/AIDS, Malaria and Tuberculoses. Other focus areas of interventions are Child Survival, Reproductive Health and Maternal Health Care giving. HSDP is designed in accordance with the wider policy frameworks such as PASDEP (Plan for Accelerated and Sustained Development to End Poverty) and MDGs (Millennium Development Goals). The Health Sector Development Program includes, among other things construction of health facilities, extension, information and education, pharmaceutical services, equipping and access, human resource development, and health care financing (MOH, 2007/8).

In addition to these movements, the third National Health Accounts of the country, for the year 2004/2005 states that expenditure from all sources has been increasing and improvements have been achieved through government investment on health (FMOH, 2006). Despite this claim, the current level of Ethiopia's health expenditure per capita is only US$2.1 which is far below the financing requirement of (US$34) per capita that has been recommended by the World Health Organization's (WHO'S) Commission for Macroeconomics and Health as being necessary to cover essential health interventions in developing countries (MOH, 2007/08; FMOH, 2006).

This financial deficit has a direct implication on the health care financing system of the country. The current health financing practice in Ethiopia demands that part of the cost be covered through out of pocket user fees at the time of sickness. Although the user fees are extremely low relative to what the services actually cost, access to health services is

restricted as even this low level of user fee is often beyond the ability to pay of most households. The quality of health services is also constrained by the inadequate user fees that cannot adequately support the system (FMOH, 2008).

The provision of low-cost health insurance to low-income households in the country can be one innovative method through which to avoid catastrophic out-of-pocket health expenditures and narrow the huge financing gap that exists while comparing current level of expenditure on health and the amount required delivering essential health services (Mariam, 2003; Asfaw and Braun, 2005; Dercon, 2009).

The introduction of health insurance will enable to mobilize additional resources to the health sector. More importantly, substantially pooling risks between the poor and the better off as well as the sick and healthy will enhance equity in health service delivery. In addition, as health insurance schemes remove or substantially reduce cash requirement at the point of getting services, members will be encouraged to seek service when they need it. This will ultimately increase the demand for health care and utilization of the service (Gottret and Shieber, 2006).

The health insurance system of a country needs to be harmonious with the existing socio-economic situations. Hence, while mandatory social health insurance is necessary for the citizens in the formal sector, community based health insurance is more desirable for urban

dwellers who are mainly employed in the informal sector and the majority of the Ethiopian people both in the rural farming and livestock rearing economy (FMOH, 2007).

Nowadays, across low income countries, Community Health Insurance (CHI) represents a response to the problem of access to care and financial protection faced by those excluded from formal insurance systems, mainly poor people working in the informal sector. Thus it attempts to bridge the gap in access and social protection between people covered by formal schemes and those left to pay for care out of their own pocket. There is a growing consensus among scholars that this scheme will ensure the sustainable and organized provision of health services to communities who have been suffering from lack of adequate health services (Stephen N, 1999; Jütting, 2001; Allegri et al., 2009).

Community-based health insurance scheme (CBHI) is therefore being seen as a promising new tool for health system improvement in low-income countries, particularly in Sub-Saharan Africa. Community group members pool their resources to share the financial risks of health care, own the scheme and control its management, including the collection of premiums, the payment of health care providers, and the negotiation of benefits package. Unlike private insurance, premiums are paid by households and not based on individual risk assessments (Donga et al., 2003).

In Ethiopia, there are funeral associations, known as *iddir* — associations that ensure a payout in cash and in kind at the time of a funeral for a deceased member of the family of a member of the association. These 'iddirs' which are literary known as traditional insurance associations have the culture of risk sharing at times of accidents and are major forms of indigenous arrangements utilized mainly for assisting victims in bereavement and executing funeral related activities. These associations are also called upon in various self-help activities and sometimes provide health insurance, even though mostly in an informal manner. Therefore, they are regarded to have the potential to serve as social financing mechanisms. Findings also show that these local institutions are quite inclusive and include the chronic poor as well as the relatively well-off members of the community (Mariam, 2002; Dercon et al., 2004; Dercon, 2009).

However, introducing health insurance function into the iddir system strongly requires information on both the demand and the supply side. Thus determining the demand or willingness –to – pay of households' for health insurance on the demand side and the actuarially fair premium level which is set by the insurers on the supply side is crucial in ascertaining the feasibility of such schemes. This will in turn help to establish prices, and set potential subsidy levels: for there are difficulties in raising sufficient resources.

Thus, this study is directed to the analysis of the feasibility of community based health insurance schemes for the low income earning and informally employed groups of the society through these traditional institutions (iddirs) found in Addis Ababa. The aim of the

study is to obtain reliable information on the amounts that these potential clients would be willing to pay, and the major determinants influencing this choice using the willingness to pay (WTP) approach.

1.2 Statement of the problem

Ethiopia has completed three rounds of National Health Account (NHA) estimates and the fourth one is on its way to be officially declared. The first and second rounds showed that the national health expenditure per capita in 1996 and 2000 were US$ 4.5 and US$ 5.6 respectively, which is too low to purchase adequate and quality health services. This financial paucity has strongly manifested itself in the low health service coverage and consequently the poor health outcomes (FMOH, 2006).

According to the third National Health Account of the country, the public per capita health expenditure for the year 2004/05 was US $7.14 (which is half less than the Sub- Saharan African per capita average of US$13 for the same period) and US$2.23 for the year 2007/08 (FMOH, Planning and Programming Department, 2007/08). This indicates that the government is off track towards its HSDP III target of a per capita expenditure of US$9.60 by 2008/09 and also that a considerable additional resource mobilization is needed to achieve the US$15.41 per capita required to reach the MDG targets or the US$34 recommended by the World Health Organization's (WHO'S) Commission for Macroeconomics and Health to deliver essential Health services in developing countries (MOH, 2007/08; FMOH, 2006).

Primary health care and expanded program on immunization coverage in 2004 and 2005 were 72% and 70% respectively. The health service utilization rate that is the average number of visit to health service providers by residents of the country per annum was only

0.36% for these same periods. Similarly, health outcomes are also at their lowest level; for example, infant and maternal mortality rates were 77 per 1000 and 673 per 100,000 respectively for the year 2007/8 which is among the world's worst (MOH, 2007/2008; NBE, Annual Report, 2007/08).

While looking at the health care financing system, the third NHA of the country reports that the private sector is a major financer of health care, contributing 31% of total health expenditure, where as the government and public enterprises contribute 28% and 3% respectively. The Rest of the world contributes 37%, and private employers and other private funds contribute 1%. Most of the private sector expenditure, which amounts up to 80%, is administered by households, followed by local NGO'S (15%) reflecting the insignificant share of health insurance. Moreover, although households' share of the national health expenditure has declined from 36% in 1999/2000 to 31% in 2004/05, their expenditure in absolute terms has increased from 1.1 billion birr to nearly 1.4 billion birr (FMOH, 2006).

Private sector insurance in health is underdeveloped and covers only a small proportion of the population through the Ethiopian Insurance Corporation (EIC) and recently through seven private insurance companies. From these seven companies only one of them (Ethio-Life Insurance) is licensed for the provision of life insurance products only, where medical insurance is still an extension. The other six are licensed for the provision of both life and

non-life insurance and health insurance is an extension of life insurance which indicates the limited practice of health insurance in Ethiopia (NBE, 2008).

Beneficiaries of health insurance schemes are few private organizations and public enterprises where the private health insurance accounts only for 1.1 % of the total health expenditure (FMOH, 2006). The exact coverage of the population with in a health insurance scheme is not exactly known due to its insignificance from the overall insurance coverage (NBE, 2007/8). Thus, Ethiopia's health care financing system is characterized by significant out of pocket expenditure and long history of user fee charges rather than a developed insurance provision (FMOH, 2007). As a study by Akalu (2008), which examines out of pocket payments for maternal health in rural Ethiopia , reported, nearly three fifth of the surveyed families paid out of pocket expenditures which exceeds 20% of their monthly household expenditure and about 61.3% of them paid more than 40% of their non-food expenditure on maternal health care.

The financial burden of out-of-pocket medical expenditures is regressive financing as it is the poor that pay a larger share of their income for out-of-pocket medical expenditures. Households in the lower wealth quintiles are paying greater proportion of their income (49%) than those in the highest wealth quintile who paid 19% of their income. Even if direct expenditures at point of service in public providers are assumed to be negligible, households are obliged to go to expensive private providers to reduce the indirect costs of care seeking such as waiting time. Households usually borrow from relatives and friends as

a coping mechanism to respond to expenditure and some resort the sale of their assets (Akalu, 2008).

Such contexts point towards the need to undergo a health sector reform (HSR) in the area of health care financing; which is a sustained process of fundamental changes in national health policy and institutional arrangements, designed to improve the functioning and performance of the health sector financing system and ultimately, the health status of the poor (Gill & Lucy, 1994).

To our knowledge, there are only few studies made in Ethiopia on how to finance the health care sector of the country. These are studies made by Mariam & Brenzel (1998), Mariam (2003) and Asfaw & Braun (2005) primarily with a central focus on the role that community based health insurance scheme can play in changing the structure of the financing system of the health care sector. The study by Mariam and Brenzel (1998) was conducted in Adama Hospital and town, in Oromiya region, and Arbaminich and Yirgalem hospitals and towns in SNNPR, on the feasibility of community based health insurance in Ethiopia. The second study by Mariam (2003) was conducted in the regions of Amhara and Oromia based on a survey of 1200 respondents. The author concluded that iddir based schemes are options for experimentation as mechanisms for financing health care in rural Ethiopia. The study reported a mean WTP of Birr 2.50 (based on household survey) and Birr 3.40 (based on exit interview). However, it is not clear whether these amounts were per individual or per household and the coverage of the proposed scheme or the types of

insurance products to be provided were not stated and these same problems exist also in the former study.

The study by Asfaw and Braun (2005) which assesses the prospect of Community Based Health Insurance scheme (CBHIs) using a double bounded dichotomous contingent valuation was also conducted in the rural areas of Ethiopia. The results of the willingness to pay amount were estimated from a log-linear model which was implemented to improve the fit compared to the linear model. However, according to Hanemann (1984) estimating such *ad hoc* expressions, where the data used cannot measure the continuous risk attitude of the respondent may result in a utility function which will not generate the model estimated.

The above studies focused mainly on the rural areas and regional towns of Ethiopia. However, let alone the rural areas of the country, community based health insurance schemes are not yet developed even in the capital city where a higher potential is expected to prevail. In addition, although there is a growing consensus about the role that community based health insurance schemes can or should play in alleviating the financial crisis of the health sector of the country and benefiting the poor largely, these studies did not focus on the low income earning groups which are most vulnerable to risky situations and inefficient health care services.

Therefore, this study focuses on estimating households' willingness to pay for a community based health insurance scheme in three selected traditional associations (Iddirs') found in

the capital, Addis Ababa, where most of the Iddir members are informally employed and with a low standard of living.

Research Questions

1. Can Iddir household members' be financially able to get insured against health risks?
2. What determines the willingness to pay for health insurance among household members of the community group?
3. Whether or not the provision of a health insurance service for this community based group members' is feasible?

1.3 Objectives of the study

The general objective of the study is to determine household's willingness to pay for the proposed health insurance scheme which covers a fixed amount of the health expenditure of households under a hypothetical voluntary scheme. The study further compares the WTP amount with the actuarially set premium prices in the insurance market.

The specific objectives of the study are:

1. To elicit households' willingness to pay for a community based health insurance scheme from a hypothetical market scenario.
2. Identify the major determinants of household's willingness to pay for the proposed health insurance scheme.
3. To find the difference between the actuarially fair premium level asked by the insurance companies and the maximum willingness to pay for health insurance of the households.

1.4 Significance of the study

Looking for proper and effective ways of financing health care for the citizens is one of the most important preoccupations of governments everywhere. Even though this problem affects both developed and poor countries, it is more acute in developing countries due to the inefficient resources generated to finance the health care system. Such problems can be alleviated by looking for alternative ways of generating resources. In response to such

crises different countries have initiated the provision of community based health insurance and have succeeded with it. However since the monetary contribution of policy holders is the main engine of such schemes the analysis of clients willingness to pay, especially in poor countries such as Ethiopia, is necessary for the sustainable provision of the scheme. Thus this study is significant in that it analyzes the willingness to pay for CBHIs of low income earning and informally employed households which will in turn help to establish prices, and set potential subsidy levels.

1.5 Methodology and Data Source

The future health profile of an individual can be viewed as stochastic, and a treatment changes the probability that the individual will experience a particular health status. In a risky world, the money measure derived for the certainty cases is defined as a state independent (non-contingent) payment (which is independent of the health state that the individual actually experiences (Johansson, 1995).

It is becoming increasingly popular in health economics to use the WTP approach to elicit the value people place on health and health care activities. In the absence of monetary measurements of such values found on functioning markets (where consumers reveal how much of other goods they are willing to sacrifice to get a certain product) researchers rather ask potential consumers how much they would be willing to pay (Lofgren et al., 2008). Usually, WTP is measured with the contingent valuation method (CVM). Contingent valuation is a survey method to elicit the maximum WTP for a good. First, the good and a

hypothetical market in which the good can be bought are described to the respondent (the contingency), the respondent is then asked to state the maximum amount s/he would be willing to pay for the good (the valuation) (Bärnighausen et al., 2007).

Household members from three selected Iddirs were presented with a hypothetical market scenario which covers the health expenditure costs of each household member that amounts up to 1500 birr within a year period of time. The Iddir members are asked to state their maximum willingness to pay for the proposed community based health insurance scheme using a well designed structural questionnaire. The selection of the iddirs was based on purposive (judgmental sampling) with the believe that the selected iddirs will constitute largely of the informally employed and also the low income earning groups of the society. A total of 210 sample units from each iddirs are selected using a systematic sampling for the face – to – face interview. A pre test questionnaire was also developed for respondents outside the sample which used to: restructure the main survey questionnaire in setting the appropriate bid prices and re-specify the factors which are expected to affect WTP amount. Information on the current status and functioning of the selected iddirs' is obtained from each iddir judges.

The survey responses were analyzed descriptively and econometric models (Tobit and Probit) are also applied for the econometric analysis using STATA. The mean willingness to pay amount of respondents is compared with the amount that should be paid if insurance was to be provided for these households on the basis of the average premium price that currently prevails in the insurance market.

1.6 Scope and limitation of the study

This study will be focusing only on three community groups ("Iddirs' ") found in the capital city Addis Ababa, which are believed to constitute, mainly of: the low income earning and informally employed households. This basis of selection is purposive since initial identification of household's living standard and socio economic characteristics' was not possible given the limited time and financial resource.

1.7 Organization of the Study

Following this introductory chapter the theoretical and empirical literatures will be reviewed in chapter two. In chapter three the research methodology is explained. This chapter consists of a brief description of the survey area, the method of data collection, the specification and discussion of the empirical model and description of variables. In chapter four the empirical findings will be discussed. Conclusion and policy implications are given in the last chapter, chapter five.

2. LITERATURE REVIEW

2.1 Theoretical Review of Literature

This part reviews both the demand side and supply side theoretical discussions in the literature of medical insurance. While the demand side review is a discussion on the need for health insurance that arises from medical risks, the supply side discussion tries to review issues on health care financing in relation to insurance markets which is justified on efficiency grounds and also equity considerations.

2.1.1. Health Risks

The standard household risks of fire, theft, unemployment, sickness, and mortality are all more severe for poor families in developing countries, and rural households. Nevertheless, given the variety and severity of risks to be dealt with, shocks inevitably have serious welfare consequences (Dercon, 2009). As Besley (1995) tries to expound it, perhaps one of the central differences between poor and rich countries is the importance of risk in the everyday lives of their inhabitants'. The argument is essentially that especially in poorer households' household survival strategies preclude the adoption of any course of action that increases the riskiness of the households' livelihood which most productivity raising technologies are likely to do. In low income countries, life is more precarious. Beyond the obvious risks for example, poor sanitation creates a greater risk of contracting infectious diseases (Mosley, 2001).

A typical feature of medical treatments is that their consequences are not known with certainty in advance. They rather shift the probability that an individual will experience from one health state to another health state (Johansson, 1995). People seem to dislike risk. The pervasive purchase of insurance of many types offers concrete evidence of this dislike. People often willingly pay insurance companies far more than the average loss they confront in order to eliminate the chance of really risky losses. We describe people who behave this way as risk adverse. Risk aversion arises from a simple additional assumption, namely that the marginal utility of income, while positive, gets smaller and smaller as a person's income gets larger (Phelps, 2002).

To analyze the behavior of such individuals, a brief discussion on the concept of health in a risky world, following the work of Johansson (1995), will be considered next. Let us consider an individual who maximizes his/her expected utility. The individual's health status is assumed to be given. Similarly, income, net of any taxes, is taken to be fixed. The problem of utility maximization for the individual can there for be written as follows:

$$Max\ U(x, z)$$

$$S.t.\ \ y - P\,x = 0 \quad \ldots\ldots (2.1)$$

Where x is consumption good and z is the health status, y is the fixed income; p is a price vector of order 1.n. The individual is assumed to act as if s/he maximizes a well behaved utility function subject to a budget constraint. Setting the first order conditions for the utility maximization problem in (2.1) and solving these conditions for x in terms of prices income and health yields demand functions for goods:

$$x = x\ (p, y, z) \ldots\ldots (2.2)$$

Where $x = [x_1(p, y, z), \ldots\ldots, x_n(p, y, z)]$ is a vector of goods demand. The quantity of a commodity demanded is a function of prices, income and health status and the individual's health status has an impact on his or her demand for different private goods. Substituting (2.2) into (2.1) yields the indirect utility function.

$$v = v\ (p, y, z) = u[x\ (p, y, z)\ z] \ldots\ldots (2.3)$$

The indirect utility function expresses utility as a function of prices, income and health. In order to illustrate the meaning of risk attitudes it is useful to consider an individual who faces an uncertain income. There are just two states of the world: the individuals' income is either high or low. Let π_1 denote the subjective probability that the high income state occurs. The probability that the low income state occurs is therefore $\pi_2 = 1 - \pi_1$. The individual is assumed to be equipped with an indirect utility function: $V\ (p, y_i, z)$ for each possible state of the world where i =1, 2, y_1 is a high income and y_2 is a low income. The expected utility of the individual is:

$$\mathbf{E\ (V)} = \Sigma_i \pi_i V\ (p, y_i, z) \ldots\ldots (2.4)$$

Where **E** is the expectation operator. Expected utility is thus a weighted average of the utility attained in the different states of the world with the probabilities used as the weights. Taking partial derivatives of the utility function V (p, y_i, z) with respect to income yields:

$$\partial \mathbf{v}\ (.) / \partial y = \mathbf{v}_y$$

$$\partial^2 \mathbf{v}\ (.) / \partial^2 y = \mathbf{v}_{yy}$$

An individual is said to be risk averse with respect to income risk if $V_{yy} < 0$. Conversely, he is a risk lover if $V_{yy} > 0$, and risk neutral if $Vyy = 0$.The followings are a Friedman-savage (1948) diagrams as cited in Johansson (1995).

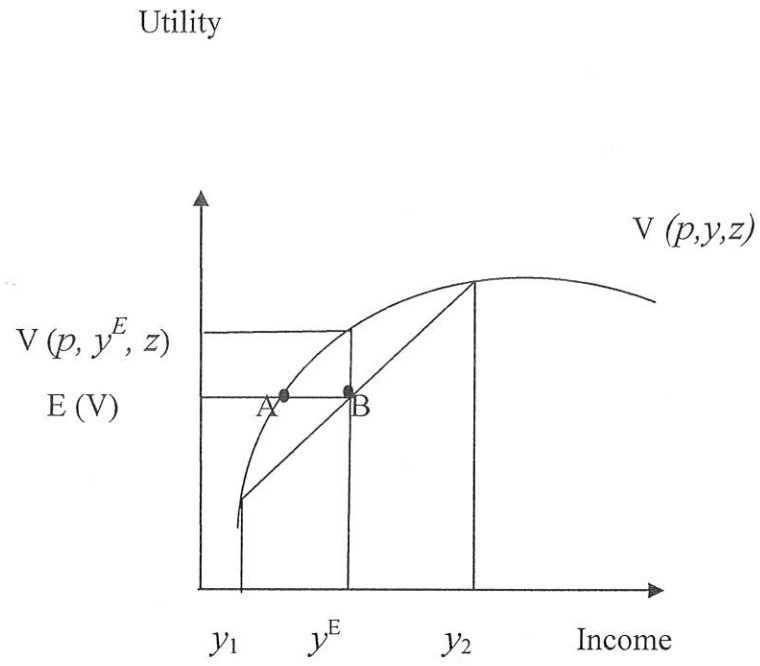

Figure 2.1) Risk averse

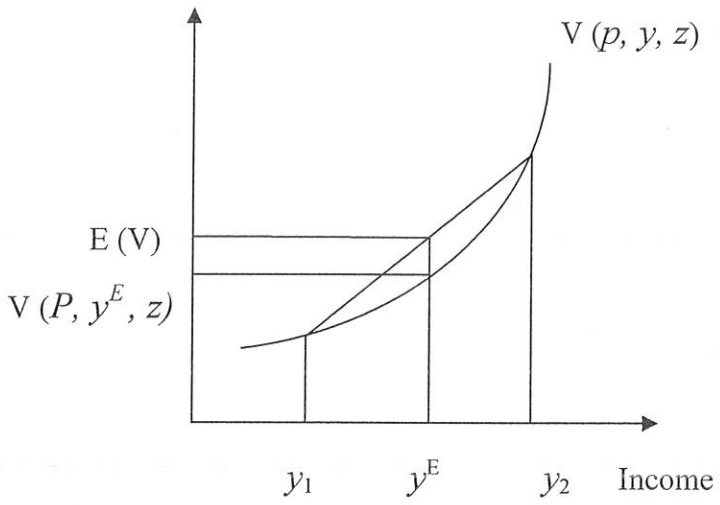

Figure 2. 2) Risk loving

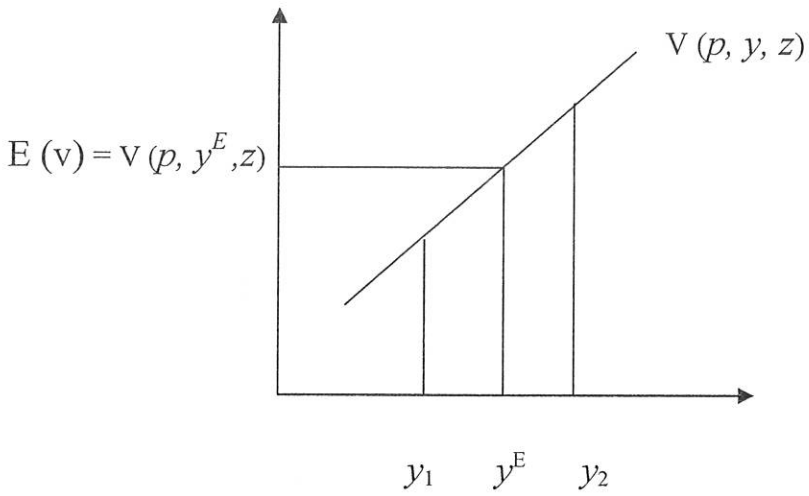

Figure 2.3) Risk neutral

In figure (1) utility is depicted as an increasing function of income while all prices and health status are held constant. The figure is drawn on the assumptions that $V_{yy}<0$ while,

$\pi_1 = \pi_2 =$ 0.5. The individual clearly prefers to get the expected income $y^E = 0.5\ (y_1+y_2)$ rather than the 'gamble' since:

$$V(p, y^E, z) > E(V) = \Sigma_i \pi_i V(p, y_i, z)$$

Such behavior preferring the expected value of the gamble rather than the gamble is called risk aversion. The utility function of a risk averter is strictly concave in income. Figure (2) pictures the case of a risk loving individual ($V_{yy} > 0$). In this case the straight line between y_1 and y_2 is above the corresponding segment of the utility function. Thus the individual may prefer a risky prospect to a certain one even if the former gives a lower expected income. The risk lover has a utility function which is strictly convex in income. Finally, a risk neutral individual ($Vyy = 0$) has a utility function which is linear in income. The cost of risk bearing is the amount of money a risk adverse individual is willing to forego in order to turn a risky prospect into a certain one. In terms of figure (1) the cost of risk bearing is an amount of money such that the individual is moved from point A to point B. Denoting this amount C, the individual is indifferent between having income Y^E- C with certainty and participating in the gamble whose expected outcome is Y^E. The amount C is called the risk premium since it is the smallest compensation the individual needs in order to be prepared to choose the risky prospect (Ibid).

2.1.2 Why the need for insurance

The fundamental uncertainty driving the demand for health insurance arises not because of any financial events but rather because of the random nature of health and illness. The rational response of a consumer who becomes sick (to seek a cure for the illness with appropriate medical care) creates a financial risk, health insurance protects against this derived risk (Phelps, 2002).

Brown (2001) set three important questions which should be raised before the need for insurance is declared. The first is whether the clients need assistance in reducing vulnerability to risks through insurance. If the client does not want the kind of protection that a specific type of insurance provides no matter how compelling the rationale to the providers is, there is no justification for developing the product. After realizing these issues if their response is positive the providers should go on to consider if insurance is the most appropriate financial service for the provision of this protection which is the second question according to the author.

One can ask why people will have to prefer insurance than credit or saving and the advantages of one over the other. If we see credit and risk sharing these two are closely linked for three main reasons. As Mosley (2001) puts it; first, credit serves as an insurance substitute when market opportunities for risk sharing are limited; an individual may borrow in lieu of receiving an insurance payment, thus smoothing out transitory shocks. Second the distinction between credit and insurance becomes blurred when lenders are willing to relent

on some part of the repayment in the event of an unforeseen negative shock to the borrower. Third the optimal form of contracts when information is incomplete and/or enforcement is a problem seems to look like a combination of credit and insurance.

However there is a difference between credit and insurance when we look at the time dimension. As Hoogeveen (2002) explains it, an important difference between insurance and credit or savings is the time dimension of the latter instrument. Where the principle behind mutual insurance is the cross-sectional sharing of incomes implying that households have to decide on an optimal sharing rule, the use of credit and saving implies that households have to decide on the optimal inter temporal allocation. The author gave an example about two individuals in a village where both of them have identical wealth, of comparable variation of their income and a situation where they cannot insure each other but lend when the income of one is lower than the other. When the unfortunate house hold borrows and he will have to pay in the future with an interest rate, his expected income will be lower than the fortunate household whose expected income is higher since he will be paid with interest. Relying on a credit arrangement therefore leads to inequality between fortunate and unfortunate households which would not have occurred had the households relied on a mutual insurance arrangement.

In addition to the above reasoning on credit Besly (2001) stated that opportunities for personal savings in low income countries are often constricted i.e. good saving instruments

may be scares. Given the wide spread experience with inflation in poor countries it can be hard to find an asset that assures a positive return for postponing consumption[1].

Moreover, fluctuation in prices of basic food stuffs can also be an important source of risk to which monetary saving is not indexed. According to Brown (2001) the third one is to check the clients' willingness and ability to pay and thus a price at which the insurance can be delivered.

2.1.3 Health care financing systems

There is a tremendous gap between rich and poor countries with respect to health spending and health needs. Developing countries account for 84 percent of the global population and 90 percent of the global disease burden, but only 12 percent of all health spending. High income countries spend about hundred times more on health on a per capita basis than low income countries. Even if cost of living differences is taken into account the spending is 30 times more (Gottret & Schieber, 2006).

The purpose of health financing is to ensure that all individuals have access to effective health care by making funding available and also setting the right financial incentives to providers. Health system financing has three interrelated functions to ensure individuals have access to health services. These are: revenue collection, pooling resources and

[1]The form of insurance provision in Ethiopia is more or less the same as saving since it sets a fixed amount of coverage in case of medical need.

purchasing. There are various ways of collecting revenue or processes by which health systems receive money from households, organizations, donors, etc; these are general taxation, health insurance which can be mandatory or voluntary and out-of pocket (OOP) spending. Most high income countries depend on taxation and insurance while low income countries depend more on out of pocket revenues. Revenue raising capacity increases as country's income increases (greater formalization of economy, better ability to pay, better tax administration system etc) (Donaldson and Gerard, 1993).

Gottret & Schieber (2006) discusses the four main health insurance mechanisms which are used to pool health risks, promote repayment, raise revenues, and purchase services. The first one is State funded systems through ministries of health or national health services in which primary fund comes from general revenue. The medical coverage to the countries entire population is provided through a network of public providers. Although these systems have the potential to be equitable and efficient, reliance to the government budget is vulnerable to the vicissitudes of annual budget discussions and budget is low in many developing countries. The second mechanism is Social health insurance which is characterized by: independent or quasi independent insurance funds, a reliance on mandatory earmarked payroll contributions and the right to a defined package of health benefits. Funds are generally nonprofit and supervised by the government. This system cannot support a broader population since it often only covers those workers in large formal sector. In addition contribution may also have a deleterious effect on employment and economic growth if it decreases labor costs (Ibid).

The third financing system is Voluntary or Private health insurance. Because of high and unpredictable medical costs, people arrange to get covered through insurance schemes, where the illness is pooled among the insured group. The premium will depend on agreement to co-payment by the insured one on a proportion of any resultant medical costs. A willingness by the insured to pay a greater proportion of any medical bill will result in lower initial premium (Donaldson and Gerard, 1993). Administrative costs in running the scheme (including medical examinations, advertising, and the paper involved in claims) which may make them inefficient as resource generators and also the problem of moral hazard and supply induced demand[2] are common in these systems (Mc Guire et al., 1993).

The fourth one is Community based health insurance schemes. Community based health insurance schemes have existed for centuries. They were the precursors to many of the current social health insurance systems such as those in Germany, Japan and the Republic of Korea. They are currently prevalent in sub-Saharan Africa. The schemes can be broadly defined as not for profit prepayment plans for health care that are controlled by a community that has voluntary membership. Most community based health insurance schemes operate according to core social values and cover beneficiaries excluded from other health coverage (Gottret & Schieber, 2006). CBHIs often complement government health care financing efforts. They generally provide supplementary insurance, over and above that which is covered by universal health care systems or social health insurance (Tabor, 2005).

[2] Supply induced demand is the case where a physician persuades a client to take more treatment (supplies more treatment) than what is needed just because the client is insured.

However, the protection and sustainability of most community based health insurance schemes are questionable. They are often unable to raise significant resources because of the limited income of the community and the pool is often small, making it difficult to serve a broad risk spreading and financial protection function. The schemes size and resource levels make them vulnerable to failure. They are also paced at risk by the limited management skills available in the community (Ibid).

Government intervention could improve the efficiency and sustainability of such schemes through subsides, technical assistance and links to more formal financing arrangements. CBHIs should be regarded as a complement to, not as a substitute for, strong government involvement in health care financing and risk management, related to the cost of illness (Tabor, 2005).

2.1.4 Insurance is a risky business

Insurance works by sharing risk across a large population. Thus Insurance Institutions should verify that their proposed coverage meets the law of large numbers (Brown, 2001). As it is stated in Pietro et al. (2005) the law of large numbers indicates that when the number of contract increases and the policy is appropriately priced so that the premium equals the expected loss of each individual contract the insurer gains non-negative profit in the long run and the insurer has the risk with his or her business activity and finds motivation to undertake it and promote economic growth and activity.

Brown (2001) suggests the minimum number in the pool not to be less than 1000-2000 and less than that will create undue risk for the provider. Besides, insurance can only be designed to protect specific risks for which the chance of loss can be calculated and not covariant risks. Covariant risks, such as a flood or HIV/AIDS, are likely to cause similar damage to a large portion of insurance client at the same time. If a client base is concentrated in a single community, an epidemic or disaster can quickly bankrupt the insurance plan (Ibid).

As Mc Cord (2001) notes it, the insurance business requires specialized management skills. Formal sector insurers are normally regulated to ensure that management is adequately skilled, exhibiting appropriate fiduciary responsibility in their insurance activities. Ultimately, the objective of supervisory boards is to protect the consumer who pays premiums and expects coverage under the agreed terms (Ibid).

2.1.5 Moral hazard and adverse selection

Once insured, households have less of an incentive to put in the level of effort they would have put in had the insurance been absent (Hoogeveen, 2001). Moral hazard arises once an individual has joined a scheme. Because the member has already pre- paid for health services there may be a tendency to over utilize services which has implications for the financial viability of the health insurance fund (Brenzel, 1999). As a study made on Mexican residents in US , evidenced, those with health insurance were more likely to visit a doctor than those without health insurance if sick (Bustamante, 2008).

Policy holders' ability to influence whether the risk actually occurs must be limited or controlled. If a policyholder can control the timing or likelihood of loss, claims can quickly increase beyond expectations leading to bankruptcy. These risks are especially high in the case of health and property insurance (Brown, 2001).

The consequences of moral hazard are less if villagers feel a certain altruism or responsibility toward each other. Each household then internalizes the undesirable implication of shirking. Intense monitoring in combination with punishment also allows one to deal with moral hazard. This kind of monitoring is possible in close knit communities and offers an explanation of why privacy is a scarce commodity in village economies. The need for monitoring also clarifies why many informal insurance arrangements are between members of (extended) families, those of the same (ethnic) background, people collaborating closely or those living in the same community (Hoogeveen, 2001). In close monitoring, village members are likely to have an advantage over formal institutions which explains why non market institutions may function in environments where formal institutions fail (Besely, 1995).

As Gaag (2009) noted insurance provision also suffers from serious informational and enforcement problems possibly even to a greater degree than those faced by credit markets. Because it is difficult to observe the exact risk profile of each member of the population, insurance may attract those facing relatively higher risks on average leading to adverse selection problems affecting the sustainability of a scheme. Adverse selection occurs when

sicker individuals choose to enroll with a greater probability than healthier individuals so that the health insurance fund is burdened with higher medical costs (Brenzel , 1999).

These types of problems provide explanations for the limited development of insurance markets in poor communities. And because any scheme undertaken by the public sector or a nongovernmental organization (NGO) would face similar problems, there is a strong rationale for improving the design of insurance mechanisms in efforts to economize on these costs (Dercon, 2009).

2.1.6 Valuing health risks

Government intervention in the health sector and the further complication that risk plays make it difficult to use econometrics to estimate demand curves since market data to assess the value of health changes does not reveal buyers and sellers preferences (Johansson, 1995). The three most frequently used and /or suggested methods in the literature are human capital approach, indirect methods using market data (market based estimation methods) and survey techniques. The human capital approach views the value of an individual as being equal to the value of his or her contribution to total production and assumes that this value can be measured as his or her earnings. This method is simply not consistent with the individualistic foundation of welfare economics, since it does not take people's own preferences on changes in health risks into account. The contingent valuation method (CVM) is the modern name for the survey method (since the answers to a valuation question are contingent upon the particular hypothetical market described to the

respondents. The survey technique is thus widely used for the estimation of environmental benefits in particular, and there is a large body of knowledge on the methods advantages and disadvantages. Presently this technique is also used in a number of health care studies. In contrast to the CVM which aims at a direct preference revelation the market based estimation methods are often referred to as indirect methods since the preference revelation is indirect via a market. These are a class of methods which exploits people's behavior in markets where goods related to health risks are traded. For example analysis of individual's house market preferences, use of seatbelt and wage differentials (which is sometimes called hedonic wage function) are among the methods used to examine once attitude towards health risks. The difficulty of observing all relevant data is the main problem in empirical research while using this method (Ibid).

2.1.6.1 The contingent valuation method

Contingent valuation is a survey method to elicit the maximum WTP for a good. First, the good and a hypothetical market in which the good can be bought are described to the respondent (the contingency). The respondent is then asked to state the maximum amount s/he would be willing to pay for the good (the valuation) (Bärnighausen et al., 2007). Binam et al. (2004) in their study of willingness to prepay for community health insurance in the center region of Cameroon showed that it is possible to do a contingent valuation survey among a very poor population and obtain reasonable, consistent answers. The authors also suggest that contingent valuation surveys may prove to be a viable method of

collecting information on individuals' willingness to prepay or pay for a wide range of public infrastructure projects and public services in developing countries.

A variety of different elicitation methods to measure WTP by CVM surveys exists, i.e. open-ended questions, payment cards, bidding games, and the discrete choice approach (take-it – or-leave-it), each having strength and weaknesses (Heinzen & Bridges, 2008). The open-ended elicitation format simply asks the respondent how much they would be willing-to pay. It is possible that a lack of context might lead respondents merely to pick a number out of the air, and hence results might lack construct validity. The dichotomous choice elicitation format often referred to as the take-it or leave- it focuses on a simple yes/no question regarding whether an individual would pay a specified price. Given that prices are set exogenously, it has been argued to be more representative of market (demand) situations. It produces less conservative results compared with open-ended, potentially because it does not seek maximum willingness to pay. The limitations of the dichotomous choice elicitation method are that it is subject to yea saying tendency of the respondent to respond positively to a hypothetical scenario regardless of the content or scenario presented. The payment card elicitation format presents a list of prices to the individual and asks them what value represents their maximum willingness to pay. The method circumvents the need to produce a single starting point, but unlike the open-ended method it does provide the respondent with a context for determining their willingness to pay. However, given that one has to present a maximum and minimum price, the payment card elicitation format can introduce an alternative framing effect known as *range bias,* that is, the maximum and/or minimum price has an influence on the result (Ibid). In addition, the

payment card method could give rise to 'protest zeros' (i.e. false zero valuations in order to express dissent to some attribute of the WTP question). The payment card was found to be inappropriate in cases where illiteracy rate is high (Donga et al., 2003).

The original contingent valuation elicitation method, the bidding game is a series of yes/no questions that aims to find the maximum willingness to pay. Like the dichotomous choice method, the respondent is presented with an initial price, if the respondent accepts that initial price; s/he will be offered higher and higher prices until the respondent says no. Alternatively, if the respondent is a non demander, then the prices are repeatedly decreased until the respondent accepts. Whereas the bidding game can be subject to starting point bias, the repeated nature of the elicitation method allows a greater amount of time for the respondent to contemplate their answer, however this method can be boring for the respondent (Heinzen & Bridges, 2008). In this study the closed ended question is followed by an open-ended question to elicit the true maximum willingness to pay of respondents. Although the discrete choice method suffers from a starting bid bias which can be controlled by a pilot survey it is easier and not boring like the bidding game method.

The central problem in a CVM study is to make the scenario sufficiently understandable plausible and meaningful to respondents (Asfaw & Braun, 2005). The respondent must understand the characteristics of the good s/he is asked to value. Johansson (1995) citing Mitchell and Carson (1989) has discussed a number of other pitfalls and problems in using

the CVM and many of the principal biases that may appear in a CVM study are also briefly described. The most well known problems according to Johansson (1995) are:

Free rider problem (strategic bias): If consumers have to pay according to their stated WTP, either they may try to conceal their true WTP in order to qualify for a lower price or, they may have an incentive to overstate their WTP in order to secure a large supply of the (public) good. However, the available evidence from a number of empirical studies and experiments seems to indicate that strategic bias is a minor problem in CVM studies.

Incentives to misrepresent responses: such biases may occur if the respondent reacts positively or negatively to the fact that a particular institution is sponsoring the study. For example if a new medicine to be produced is being evaluated by a company, respondents may report different WTPs depending on whether they are informed that the study is sponsored by the company since they might suspect the study is to set future prices for the medicine. Similarly respondents may avoid reporting his/her true WTP in order to please the interviewer.

These problems however occur if the valuation question is sufficiently biased. In this study, following Johansson (1995) a question which asks what expenses the respondents are planning to reduce in order to be able to pay the amount of money they specified to pay is also included so that respondents will take a caution not to overstate their willingness to pay.

Implied value cues (Starting bid bias): It is difficult to locate one's maximum WTP for a proposed project. In order to simplify the task, a respondent may try to use some pieces of

information provided by the researcher as cues to the projects correct value. This can lead to the occurrence of a starting bid bias. But; this can also be controlled if care is taken at the time of the interview to let the respondents give their own maximum WTP.

2.1.7 Welfare measures of the value of health changes

Although there are a great number of measures that are proposed to measure the value of health changes, those which are frequently applied in the literature are the concepts of compensating and equivalent variation. The compensating variation (CV) gives the maximum amount of money that can be taken from the individual while leaving him or her just as well off as s/he was before an improvement in health. In other words, compensating variation is the willingness to pay (WTP) for an improvement in health. If health quality deteriorates, CV is the minimum amount of money that must be given to the individual to compensate him or her for the loss of health quality. CV thus measures the willingness to accept compensation (WTA) for deterioration in health. The Equivalent Variation is the minimum amount of money that must be given to the individual to make him or her as well of as s/he could have been after an improvement in health. If health deteriorates, EV is the maximum amount that the individual is willing to pay to prevent that deterioration (Johansson, 1995).

When the money measures are to be used in a risky world an individual will be faced with two states; a bad state and a good state. An insurance provision can be viewed as causing a

shift in the probability distribution; hopefully it reduces the probabilities of experiencing bad health states and increases the probabilities of attaining good ones.

In evaluating this shift in health, one possibility is to assess the change in expected health i.e. to compare $E_1(z) = z^1$ and $E_0(z) = z^0$. This is parallel to the approach used in section 2.1 Where E is the expectation parameter and z is health state and $z^i = 0....f$. The different health states are ordered so that z^0 refers to the worst possible health state (death) and z^f refers to full health. Let $E_1(z)$ be the expected health level with insurance coverage and $E_0(z)$ be the health level without insurance coverage. To find the money measure which equate utility with the treatment i.e. $V(p, y, z^1)$ and without the treatment $V(p, y, z^0)$ [3], we define a state independent CV i.e. a payment / compensation which is independent of the health state that the individual actually experiences .This amount such that;

$$E_1[V(p, y - CV, z)] = E_0[V(p, y, z)]$$

Where CV denotes a uniform or sate independent amount of money such that the individual experiences the same level of expected utility with the treatment as he would do without the treatment. This 'contract ' which specifies that the individual commits himself to paying/ receiving the same amount of money regardless of what health he will experience is here referred to as a non contingent CV. It can be regarded as an insurance premium which is also paid regardless of what state of the world one will experience later on (Ibid).

[3] As previous, p denotes a vector of fixed prices of consumption goods and services while y is a fixed income.

2.2 Empirical review of literature

In the absence of real world experience, economists gauge the willingness to pay (WTP) for health insurance by means of contingent valuation method (CVM). The number of studies in this area is rapidly growing and provides a consistent picture.

A study by Dror et al. (2006), conducted in India using a CVM provides evidence on Willingness to pay (WTP), gathered through a unidirectional (descending) bidding game among 3024 households in seven locations where micro health insurance units are in operation. In the study it was found that insured persons have slightly higher WTP values than uninsured. About two-thirds of the sample agreed to pay at least 1%; about half the sample was willing to pay at least 1.35%; 30% was willing to pay about 2.0% of annual household income as health insurance premium. In this study, it has been established that WTP is positively correlated with income. The same positive correlation has been established with nominal WTP but with a negative correlation when WTP is expressed as percentage of income.

(Lofgren et al., 2008) studied the willingness to pay of 2070 households which were randomly selected for the study in the district of Fila Bavi in Vietnam using a CVM. In this study determinants of households' willingness to pay were studied through interval regression. Households' average willingness to pay (WTP) was higher than their costs for public health care and self-treatment. For 70–80% of the respondents, average WTP was also sufficient to pay the lower range of premiums in existing health insurance programmes. However, the average WTP would only be sufficient to finance about half of

total household public, as well as private, health care costs. Variables that reflect income, health care need, age and educational level were significant determinants of households' willingness to pay. Contrary to the authors' expectations, age was negatively related to willingness to pay. These results are somehow similar with our results except that age is negatively related to WTP.

A study by Asfaw et al. (2009) analysis the willingness to pay for health insurance of 1,750 respondents and hence the potential market for new low cost health insurance product in Namibia, using double bounded contingent valuation (DBCV) method. The finding suggest that 87 percent of the uninsured respondents are willing to join the proposed health insurance scheme .Respondents in the poorest income quintile are willing to pay up to 11.4 percent of their income. A bivariate probit model is estimated to examine the impact of various factors that affect the willingness of respondent to join the proposed insurance scheme. The young are more likely to join the scheme than the elderly. The income variable is statistically insignificant in explaining the decision of respondents to join the scheme. However, education plays a statistically significant role in determining the decision of respondents to join the scheme. The marginal coefficient of the education variable shows that a one grade increase in the highest grade completed will increase the probability of respondents to join the proposed scheme by 0.6 percent, ceteris paribus. Most of the health status indicator variables (poor/bad health, weight loss, number of members sick) show the absence of adverse selection problem in joining the scheme. Most of the coefficients of the occupation variables (office workers, self employed, laborers) show no statistically significant differences across different occupations. On average, an uninsured individual in

the Greater Windhoek Area of Namibia is WTP US$6.60 per capita per month, which is on average 2.25% percent of their income for the proposed health insurance. The richest quintile is willing to pay more than double that of the poorest quintile. As income increase, the mean WTP value also increases. However, despite the mean WTP value of respondents in the poorest quintile is small; they are willing to pay more than 11 percent of their income. Respondents in the richest quintile are willing to pay only 0.22 percent of their income.

In recent years, a number of reviews have generated evidence on the potential of community health insurance (CHI) to increase access to care and offer financial protection against the cost of illness for poor people excluded from formal insurance systems.

The feasibility of a community-based health insurance package using a CVM was studied in the rural areas of Burkina Faso by Donga et al. (2003) and the results suggest that the average individual was willing to pay US$ 3.17 and US$ 4.25 as elicited by the take it or leave it (TIOL) method and the bidding game method respectively, to join Community Based Health Insurance for him/herself. In their study the authors used logistic regression and linear regression to analyze the impact of factors on household WTP. The head of household agreed to pay US$ 8.6 and US$ 13.03 as elicited by the take it or leave it (TIOL) and the bidding game methods respectively to join the health insurance scheme for his/her household. These results were influenced by household and individual ability-to-pay, household and individual characteristics, such as age, sex and education. The two methods yielded similar patterns of estimated WTP. Logistic regression analysis showed that age,

distance to health facility and the starting bid had negative effects, reducing the probability of accepting the bids. However, individual cash income, expenditure, household medical expenditure, age, sex, education, monogamy, traditional religion, and the starting bid had positive effects on the bidding results, increasing the value of WTP.

From a study on Nigeria by Onwujekwe (2009), generally, less than 40% of the respondents were willing to pay for Community Based Health Insurance membership for themselves or other household members. The proportions of people who were willing to pay were much lower in the rural communities, at less than 7%. The average that respondents were willing to pay as a monthly premium for themselves ranged from (US$1.7) in a rural community to (US$2.9) in an urban community. In the study males and people with more education stated higher WTP values than females and those with less education. The results from the Log OLS regression showed that previous out- of pocket payment for health care was negatively related to WTP while paying for health care using any health insurance mechanism was positively related to WTP.

Measure of willingness to prepay for community health insurance were conducted by Binam et al. (2004) using a bidding game techniques on 471 rural households in the center region of Cameroon. The statistical results of the study show the mean value of the willingness to prepay is equal to 7230 Cameron Frank /person/year with a median of 6000 Cameron Frank /person/year. The econometric results based on ordered probit model of willingness to prepay determinants suggest that some attributes such as the level of

revenue, gender, the habit of frequenting the health service center, the associative experience (being a membership to a community club or association which corresponds to the iddir variable of our study), the household health status, due to the respondents and attributes such as the availability of the basic drugs and regular or periodical attendance of the physician at the health service center have a significant impact on the willingness to prepay value. According to the authors, there does not appear to be a major problem with starting point bias. Unlike the result of this study, the variable iddir which corresponds with the associative experience is negatively related to WTP in our case.

In his extensive review of literature on the operational difficulties of community based health insurance in Africa, Allegri (2009) suggested that the major difficulties currently faced by CHI in SSA are operational in nature and cluster around five areas. These are (i) lack of clear legislative and regulatory framework; (ii) low enrolment rates; (iii) insufficient risk management measures; (iv) weak managerial capacity; and (v) high overhead costs. Consequently the authors review calls for appropriate policy interventions, specifically: (i) greater commitment towards the development of adequate legislation in support of CHI; (ii) increasing uptake of measures to expand equitable enrolment; (iii) the adoption of adequate risk management measures in all schemes; (iv) substantial investments from host countries as well as from sponsoring agencies to improve managerial capacity; and (v) collective efforts to control overhead costs.

A study conducted in; Adama Hospital and town, in Oromiya region, Arbaminich and Yirgalem hospitals and towns in SNNPR, on the feasibility of community based health insurance in Ethiopia by Damen and Brenzel (1999) revealed a willingness to join and participate in health insurance schemes by "iddir" members. As the study shows 86.4% of households and 74.8% of exit interview patients were willing to join an "Iddir" based health insurance scheme. Assuming a monthly premium of 5 birr per member, the revenue that could be generated was 94,500 birr per month in Adama area and 10,000 birr per month in each Arbaminch and Yirgalem areas. The authors concluded that pilot health insurance schemes could be feasible, given they are designed and implemented in a way to overcome some of the potential risks and problems faced by insurance companies. However this study does not clearly state the elicitation method and also the method used to analyze the willingness to pay amounts.

An exploratory study was conducted in 40 villages found in the Amhara and Oromia regions of Ethiopia to assess the possible roles iddirs might play in providing insurance for health financing. These two regions and the four zones in them were purposively sampled with the author's expectation to reflect the diverse geographic and socio cultural setting that is representative of the country's population. Five kebeles were selected for the study within each wereda considering that iddirs were present within the chosen kebeles. From these kebeles 30 households were selected by the cluster sampling method which resulted in 1,200 households to be surveyed. Heads of households and representatives were respondents for the interview and exit interviews were also conducted on randomly selected patients utilizing health institutions. The results from a logistic regression indicated that

education was not associated with willingness to join possible iddir based health insurance schemes. On the other hand respondents with higher income than the median were willing to join a possible iddir based scheme than those with less income. The mean affordable monthly premium was found to be 2.5 birr and 3.4 birr for the household and the exit survey respondents respectively. The study concluded that iddir based schemes are, indeed, options for experimentation as mechanisms for financing health care in rural Ethiopia. However whether the above mean affordable monthly premium values were on household or individual basis is not clearly stated and the type of insurance product which was proposed for the respondents is not specified. In addition, the purposively sampled areas only, cannot be expected to represent the socio cultural settings of the country.

A study by Asfaw and Braun (2005) which assesses the prospect of CBHIs in the rural areas (Amhara, Oromiya, SNNP and Dire Dawa,) of Ethiopia selecting 550 households based on a three stage sampling procedure from seven villages or peasant associations was conducted using a double bounded dichotomous contingent valuation method. The double bounded dichotomous choice model (or 'dichotomous choice with follow-up') which fits to two dichotomous responses and takes the possible dependence of the second response to the information provided in the first response is used. The results from the bivariate probit model shows that sex of the household head (being male), family size, membership in 'iddirs', and log income affects willingness to pay positively and significantly. In the study, first, log of the bid values to compute the mean willingness to pay values were included and since mean WTP cannot be derived directly from the difference of two utility functions the indirect utility function was linked to the log of the bid values. However as it is

demonstrated by Hanemann (1984), estimating *ad hoc* expressions, such as replacing explanatory variables by their logarithms may result in a utility function which will not generate the model estimated and the calculation of mean WTP from such complicated models is also difficult in cases where the data used cannot measure the continuous risk attitude of the respondent. Second, covariates were included in the estimation of mean WTP. Although it is argued by researchers like Johanssom (1993), McFadden (1994) that covariates should not be included in the estimation of mean WTP, this was ignored and the socio economic characteristics of households were included. The authors referring to the works of other researchers like (Dercon, 1997; Kloos and Etea, 1987) noted that shortage of finance is the 'single most' important factor that affects the performance of the Ethiopian health sector. But they also asserted that even in one of the poorest countries of the world, there is a promising prospect to introduce CBHIS.

3. METHODOLOGY

This chapter is devoted to the presentation of the methods used, including the rationale for using the WTP technique, brief description of the survey area, the method of data collection and the specification and discussion of the empirical model. This is followed by the description of variables.

WTP provides information on the efficiency of health care services which cannot be provided comprehensively by other measures used in economic evaluations and hence a growing interest is being shown in willingness to pay (WTP) as a measure of benefits in economic evaluations of health care. Usually, WTP is measured with the contingent valuation method (CVM). CVM is a survey-based, hypothetical and direct method, i.e. respondents are faced with the effects of a health care improvements as well as payment and provision mechanisms and are asked to state their hypothetical WTP.

3.1 Description of the survey area

There are endogenous funeral associations in Ethiopia which are known as 'iddir'. These traditional associations use indigenous voluntary assurance schemes to cope with the urgent and large financial shocks represented by funerals. Many of these institutions tend to co-exist within the same community and have well-defined rules and regulations. In addition to the premium-based insurance for funeral expenses, other forms of insurance and credit to help address hardship are also offered in many cases. Payments are made when members incur costs related to funerals, following the death of a relative covered by the policy (Dercon et al., 2004).

The financial logic of the iddir is not different from any insurance system. In most situations members contribute a fixed amount of money on a monthly basis and whenever a member has a problem a fixed amount (depending on the bylaws of the particular iddir) is taken out of the common pool and given to that member (Mariam, 2002).

The actual payout is conditional on the relationship of the member to the deceased: for example, the payment for the spouse of a member is typically different from the payout for a child or for uncles and aunts. Payouts occur in cash and in kind (food) as well as in the form of labor services. There are rules which define membership criteria, payout schedules, contributions and also a set of fines and other measures for non-payment of contributions, or for matters such as failure to attend funerals or not contributing enough in terms of labor on these occasions (Dercon et al., 2004).

These associations have an obvious potential for serving as social financing mechanisms. Since these are already functioning groups the administrative costs for the extra health-related activity are not as inhibiting as when forming a new insurance entity (Mariam, 2002). Insurance provision in any form is affected by asymmetric information issues, leading to problems of moral hazard and adverse selection, as well as by enforcement problems, if contract enforcement is not possible by straight forward legal means. While formal insurance markets may not have developed in rural Ethiopia for exactly these reasons, informal arrangements within such well-defined communities may face a better informational environment (i.e. monitoring is less costly) and they may be able to use local

means for enforcing contracts (from indigenous customary law to socially enforceable norms). In addition to these benefits the widespread membership across the population suggests that iddir groups are quite inclusive and thus compatible for the functioning of CBHI (Dercon et al., 2004).

3.2 Data source and Sampling strategy

In this study three iddirs from Addis Ababa are purposively selected from areas which are believed to constitute the low income earning groups of the society. These selected areas are, Cherkos market area in Kirkos sub- district, Piasa area in Arada sub district and Arat killo area also in Arada sub district. The two iddirs at Kirkos sub district and Arat killo (Arada sub district) have a monthly payement of 10 birr while the iddir at Piasa has 12 birr payement. The name of the first iddir found at Kirkos sub district is "Hibrete selam yemeradaja iddir" and was established in 1942 and is located in kebele 11 and respondents were from kebele 11/12. Presently it has 204 members. The second iddir found at Piasa kebele 10, Arada sub-district was established in 1957 and is called "Adawa Godana Afewerk menged yemot meredaja iddir" and 99 households are members of this iddir. The third one at Arat killo is called "Wereda 14 kebele 07" iddir and was established 30 years ago in 1980.It is the largest of the three with 400 members.

Table 3.1 Reimbursements for members at time of accident from each iddir according to their bylaw.

Name of the iddir	Amount of reimbursement at time of accident (in birr)				Capital	
	Member	Member's children	Member's father/ mother	Member's Brother/ sister	In cash (birr)	In-kind
" Wereda 14 kebele 07"	1,600	500	400	250	580,000	400,000
"Adawa Godana Afewerk menged yemot meredaja"	1,000	400	400	200	-	-
"Hibrete selam yemeradaja iddir"	1,200	250	300	220	80,000	300,000

Source: Respective Iddir Leaders, 2010

In addition to the payments the iddirs also support their members by giving them from 50-100 birr at times of holidays and special occasions. Moreover the iddirs also engage in different activities such as looking for donations from Non Governmental Organizations for the poorest members in their iddir (in the case of the iddir at Piasa) and also buying shares from share companies (which is the case of the iddir at Arat Killo). The iddir from kirkos sub-district is working in collaboration with an NGO called "Elshaday" to help beggars that are scattered throughout the capital, to be able to go back to their villages.

The three iddirs in total have 703 members. Using a systematic sampling procedure, 30% (210) respondents out of the total population of 703 household members were selected using the members' list obtained from each iddir leaders.

From the first, the second and the third iddir 61, 30 and 119[4] members were proportionally sampled respectively, constituting 210 respondents' in total. These iddir members' from each iddir were interviewed in person to elicit their willingness to pay for the proposed health insurance scheme.

3.3 Survey Design and Administration

The data type used in the study mainly includes primary and cross sectional for the time period of 2010. The contingent valuation survey conducted was the main data source for the study. The main survey questioner which was used to collect the primary data has three parts. The first part deals with respondent's behavior at the time of sickness and their experience as members of the iddir. The second part constitutes questions regarding respondents' willingness to join and pay for the proposed health insurance scheme. Questions on the socioeconomic characteristics' of respondents constituted the third part of

[4] 204x29.87=61 for the first iddir

99x29.87=30 for the second iddir

400x29.87=119 for the third iddir

the questioner. The willingness to pay question is specified under a hypothetical scenario as follows:

The CBHIs Hypothetical scenario

Let us assume that there is an insurance company which can cover the health care expenses of each family member in a household whenever one or more family members are faced with accidental sickness. The annual insurance coverage of health care expense of a member amounts up to 1500 birr. And the provision of such a scheme would require a monthly fee (premium) that should be contributed per house hold.

Before developing the main survey questioner a pre test questioner was designed to test the questionnaire, in particular the premiums. A pilot of 30 in-depth interviews with heads of households outside the study sample and iddir leaders were undertaken by the researcher. In the pretest questioner the starting single bid for the willingness to pay question was first set according to the lowest actuarially fair prices of premiums in the insurance market. In the pre survey respondents were asked if they are willing to accept the premium prices which were first calculated by the researcher based on the lowest premium price that exists in the market. That is, household heads were asked if they were willing to pay 12%, 8%, and 5% of the proposed coverage per month for their female, male and children (below the age of 23) members respectively. The proposed coverage is 1500 birr within a year period and is also the minimum coverage in the insurance market. However as responses from the pre test questionnaires showed, almost all household heads were unable and thus unwilling to pay even this lowest premium price, for other relatives other than their spouse in the house hold.

For this reason instead of using the premium price set in the insurance market as a starting bid, household heads were asked to specify their own maximum willingness to pay for the proposed scheme which they thought is fair. Consequently 2, 16, 8, 3 and 1 respondents were willing to pay 5, 10, 15, 20 and 25 birr per household respectively. While setting the starting bid for the main survey five birr was rejected since it can be too low as a household premium for a health insurance and 25 birr was also rejected since it was only one person who was willing to pay that amount. The unit of analysis was the household for that CBHI schemes are provided on a household basis. Thus, instead of individual willingness to pay amounts, household willingness to pay amounts were collected. Finally for the main survey, 10, 15 and 20 birr were selected as starting bids and distributed equally and randomly among all the respondents. On another move among the factors that affect household's unwillingness to pay for the proposed scheme, having one or more iddir was given as a reason by the pre surveyed household heads. Thus, a question which asks if a household is a member of more than one iddir was also included in the first part of the questionnaire.

3.4 The Empirical Model Specification

In this study a single bound close ended discrete choice "yes" or "no" questions followed by open ended questions were presented for the respondents to elicit households willingness to pay for the proposed health insurance scheme. Both the single bound and the open ended survey responses were analyzed by specifying the appropriate econometric models for each. In the first case where the dependent variable assumes discrete choice values the appropriate models are discrete choice models, Probit model in our case. In the

case of the open ended questions the independent variables were observable for the whole sample whilst information on the dependent variable is available only for some observations. Such samples are known as censored samples and hence censored regression model (or the Tobit model) is used.

The Tobit model

The survey responses of 197 respondents out of the 210 sample units are estimated using the Tobit model. From the excluded thirteen, six of them were invalid responses and the rest seven were incomplete responses. Willingness to pay amount is estimated under the proposed CBHIs using the Tobit model. The formulation of the model is as follows:

$$MWTP^* = \beta_0 + \beta_j X_i + \varepsilon_i, \quad \text{where } \varepsilon_i \sim N(0, \sigma^2) \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (3.1)$$

$$MWTP = 0 \text{ if } MWTP^* \leq 0 \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (3.2)$$

$$MWTP = MWTP^* \text{ if } MWTP^* > 0 \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (3.3)$$

Where MWTP* is a latent variable which is observed when it is greater than zero and unobserved if less than or equal to zero.

MWTP = the maximum willingness to pay under the proposed scheme

X_i = a vector of explanatory variables

B′ = a vector of coefficients

ε_i = the disturbance term

Expanding equation (3.1) will give us:

$$MWTP^* = \beta_0 + \beta_1 INCOME + \beta_2 SEX + \beta_3 AGE + \beta_4 PRIMEDU + \beta_5 SECEDU + \beta_6 TEREDU + \beta_7 MARRIED + \beta_8 BID + \beta_9 HHEAD + \beta_{10} MEMBERSHIP + \beta_{11} CHRONIC + \beta_{12} HCNEED + \beta_{13} OCCUP + \beta_{14} INSURAN + \beta_{15} IDDIR + \varepsilon_i \quad \text{.....(3.4)}$$

Where $\varepsilon_i \sim N(0, \sigma^2)$

β_j = coefficients where j = 0....15

All variables are defined in section 3.5

The Probit Model

The 'closed ended' or 'discrete' (TIOL) approach, confronts each respondent with a single bid which s/he has to accept or reject. Insurance works like a 'yes/no' question (Johansson, 1995). The respondent either agrees or declines to pay the specified insurance premium. We use this 'yes/no' data to arrive at a WTP measure for the proposed health insurance scheme. The typical formulation of the underlying choice problem as first presented by Hanemann (1984) which was drawn on McFadden's (1973) random utility model ignores risk faced by the respondent. A slightly modified version incorporating risk is presented here following Johansson (1995).

The indirect utility function of the respondent is assumed to be of the form:

$$v = v(\pi, y, z, \varepsilon) \quad \text{.....(3.5)}$$

Where π is the exogenous survival probability, y is income and z is the health state of the respondent and ε is a random variable whose expected value is equal to zero. This equation is the same as the one specified in equation (2.3). The particular assumption behind this formulation is that the respondent knows his or her utility function with certainty, but from the point of view of the investigator it contains some unobservable elements. In other words, on average the investigator is right, i.e. $v=v(\pi,y,z)$, since the expected value of ε is zero, but in the individual case the investigator is wrong due to unobservable and seemingly stochastic variations.

Say the respondent is offered a measure which changes the survival probability from π^0 to π^1 in exchange for a payment of '**A**' amount of birr (the premium).

$V_i = v_i(\pi^0, y_i, z_i, \varepsilon_{i0})$,.....the i^{th} respondent's indirect utility before the provision of insurance

$V_i = v_i(\pi^1, y-A_i, z_i, \varepsilon_{i1})$.....the i^{th} respondent's indirect utility after the provision of insurance.

Where ε_{i0} and ε_{i1} are random components of the indirect utility of individual i before and after the provision of a health insurance respectively.

The proposal is accepted if:

$$v_i(\pi^1, y-A_i, z_i, \varepsilon_{i1}) > v_i(\pi^0, y_i, z_i, \varepsilon_{i0}) \quad \ldots\ldots(3.6)$$

Or $v_i(\pi^1, y-A_i, z_i) + \varepsilon_{i1} > v_i(\pi^0, y_i, z_i) + \varepsilon_{i0}$

$$\Delta v = v_i(\pi^1, y-A_i, z_i) - v_i(\pi^0, y_i, z_i) + \eta > 0 \quad \ldots\ldots(3.7)$$

Where $\eta = \varepsilon_{i1} - \varepsilon_{i0}$ assuming that utility function is additively separable in deterministic and stochastic preferences. The investigator can only make the probability statement of yes or no responses based on the bid gets accepted or not but cannot know the random components of preferences. The respondent accepts the proposal or says 'yes' if s/he thinks s/he is better-off under the provision of the insurance scheme. The probability of saying yes for the proposed scheme for the respondent is:

$$Pr(yes) = [v_i(\pi^1, y-A_i, z_i) + \varepsilon_{i1} > v_i(\pi^0, y_i, z_i) + \varepsilon_{i0}] \quad \ldots\ldots(3.8)$$

Or $$Pr(yes) = [v_i(\pi^1, y-A_i, z_i) - v_i(\pi^0, y_i, z_i) + \eta > 0] \quad \ldots\ldots(3.9)$$

It is based on these probability statements that the binary responses are analyzed. Let us denote all the household characteristics and attributes of a given choice by X. Thus the natural regression model which is the index function model is the following:

$$WTP^* = \beta_0 + \beta' X_i + \varepsilon_i \quad \ldots\ldots(3.10)$$

- Where β' is vector of parameters of the model

- X_i is vector of explanatory variables
- ε_i is the random variable with a normal distribution of mean zero and common variance σ^2
- WTP* = unobservable respondent's actual WTP for the proposed health insurance scheme

Since we cannot observe the actual willingness to pay value of the respondent we cannot estimate this model, instead the investigator can observe:

WTP = 1 if WTP* $\geq$ A .....(3.11)

WTP = 0 if WTP* < A .....(3.12)

The respondent will be confronted with a single bid which s/he has to accept or reject for the proposed health insurance scheme and hence the name a single bounded contingent valuation method. The probability of a yes response for the proposed bid (A) or a no response can be set in terms of a random utility maximization chosen by the respondent. Since the actual willingness to pay amount of the respondent (WTP*) cannot be known by the investigator only the random variable (WTP) from the random utility maximization chosen by the respondent is known. This random variable has a cumulative density function (cdf) denoted by G (A, θ) where θ represents the parameters of this distribution. The response probabilities related to the underlying WTP distribution are:

Pr (WTP = 1) = pr (WTP* $\geq$ A) =pr($\beta x + \varepsilon \geq A$) = pr ($-\varepsilon \leq \beta x - A$)=G(A, θ).....(3.13)

Pr (WTP = 0) = pr (WTP* < A) = 1 - G(A, θ).....(3.14)

Where Pr (WTP = 1) is the probability of saying yes to the initial bid and

Pr (WTP = 0) is the probability of saying no to the initial bid.

Hanemamm (1984) shows that the stochastic nature of the model means that a cumulative distribution function (*cdf*) can be used to calculate the average or expected WTP. This *cdf* is defined as a function $G(A, \theta) = prob\{WTP \geq A\}$ yielding the probability that the respondent is willing to pay no more than birr **A**. The average or expected WTP can be written as:

$$\text{Mean WTP} = \int_0^b G(A)\,dA - \int_a^0 [1 - G(A)]\,dA \quad \text{.....(3.15)}$$

Where $a \leq 0$ and $b > 0$, a and b are the lower and upper limits of integration, respectively.

The log likelihood function for the response of the contingent valuation survey using the single –bounded format is:

$$\text{Ln } L(\theta/x) = \Sigma\{y_i \ln G(A, \theta) + (1-y_i) \ln [1- G(A, \theta)]\} \quad \text{.....(3.16)}$$

Where $y_i = 1$ if the i^{th} response is yes and 0 if the i^{th} response is no.

Equation (3.10) can be expanded as follows:

$$\mathbf{WTP^* = \beta_0 + \beta_1\ INCOME + \beta_2 SEX + \beta_3 AGE + \beta_4 PRIMEDU + \beta_5 SECEDU + \beta_6 TEREDU + \beta_7 MARRIED + \beta_8 BID + \beta_9 HHEAD + \beta_{10} MEMBERSHIP + \beta_{11} CHRONIC + \beta_{12} HCNEED + \beta_{13} OCCUP + \beta_{14} INSURAN + \beta_{15} IDDIR + \varepsilon_i \quad \text{..... (3.17)}}$$

All variables are defined in section 3.5

$$\text{Mean WTP} = \frac{\text{Intercept}}{\text{Bid coefficient}} \quad \ldots\ldots (3.18)$$

3.5 Variable Description of the Model

The choice of background variables, which were collected through the interview, follows the literature and our hypotheses about the determinants for WTP. Health insurance demand is a function of, the price of the insurance, the respondent's degree of risk aversion, perceived risk of injury/illness, perceived extent of the loss caused by illness/injury, and income (Santerre and Neun, 1996). In addition to the socio-demographic factors that affect once attitude towards risk, the predisposition factors generally arise from the socio-cultural environment of the respondent which is concerned with the local mutual help tradition (associative experience) and the open-mind of the respondent (Binam et al.,2004).

Using insurance theory, assuming a decreasing marginal utility of income, it follows that the higher the degree of risk aversion, the higher WTP will be when all else is equal. This is also the case for the perceived extent of the loss incurred by illness or injury. Some of the factors that are expected to determine the willingness to pay amount and the effect on the degree of risk aversion and the perceived extent of the loss incurred by illness with the other predisposition factors are explained below.

Monthly Income of the Household (INCOME)

It is hypothesized that, the higher the income of a household is, the higher will be the households' willingness to pay for the proposed health insurance scheme. Since there is a strong positive relation between income and the willingness to pay amount, income is regarded as a strong determinant of household's willingness to pay.

Sex of the Respondent (SEX)

Females are regarded to be more vulnerable to diseases than men, as burdens such as child bearing and more other related health care needing activities lie on them. Thus they have a higher risk of illness. Hence, female household heads are expected to pay more than their male counterparts. To capture this relation a dummy variable is used which takes the value 1 if the household head is female and 0 other wise.

Age of the Respondent (AGE)

Age is one of the variables that will affect risk aversion. It is assumed that the degree of risk aversion increases with age, as does the perceived extent of the loss. Thus, the older the respondent is, the higher the perceived risk will be for him/her. An older person has more experience and can therefore more accurately envisage the effect of illness or injury on their household. For this reason willingness to pay is expected to increase with age.

Education of the Respondent

Education is the other variable that will affect risk aversion. The more people are educated; the value that they will assign for their and their family's health will increase. We can assume that respondents who have been educated to a relatively high level will have more knowledge about the effects of and need for health care due to illness. Thus educated persons will tend to be risk averters. The education dummy is categorized into four parts. The first category represents those who can only read and write with the illiterates and the second represents those who had a primary education, which is (1- 8) and is categorized under primary education (PRIMEDU). Those with education of grade 9-12 are categorized under secondary education (SECEDU) and above that are categorized under tertiary education (TEREDU).

Respondent's status in the household (HHEAD)

The decision of the household's willingness to pay is affected by the one who is regarded as the household head. The household head is the breadwinner in the family and with a higher decision making power. Thus household heads are expected to be more willing to pay than the other members. This variable is a dummy variable taking the value 1 if the respondent is a household head and 0 otherwise.

Household size (MEMBERSHIP)

Size of the household indicates the total number of members in a household. The proposed scheme is the one which covers the health care cost of each and every member in the household. Thus, households with a larger size are expected to be more willing to pay for the proposed scheme since the scheme will insure larger members in the household.

Case of chronic diseases in the household (CHRONIC)

The presence of one or more family members in the household with chronic diseases is assumed to increase the perceived extent of the loss, as well as the perceived risk of sickness in the household. This variable is a dummy variable taking the value 1 if there are one or more members in the household with chronic disease and 0 other wise.

Health care need within the last one year (HCNEED)

Utilization of health care within the last one year can be an indicator of greater awareness of what might happen in case of illness/injury. This variable is a dummy variable which will take the value 1 if the household needed a health care service within the last one year and zero if not.

Starting bid (BID)

The starting bid is the monthly fee proposed for the respondents to accept it as a premium price. This variable is included in the regression to check if a starting bid bias exists.

Marital status of respondent (MARRIED)

People are likely to be more risk averters by the time they start a family than they were single. Thus married respondents are expected to be more willing to pay for the proposed scheme than unmarried people. This variable will take the value 1 if the respondent is married and 0 otherwise.

Any type of insurance coverage in the household (INSURAN)

It is expected that household heads with any insurance coverage will have a better awareness about the benefits of the scheme and thus will be willing to pay higher amounts. This variable takes the value 1 if the household is covered with some sort of insurance and 0 otherwise.

Occupation of the head (OCCUP)

Informally employed heads usually earn unstable income than formally employed groups, thus the higher the probability that they will be reluctant to be involved in such schemes that requires fixed and continuous payments. Thus formally employed respondents are expected to be willing to pay more than those informally employed. The variable will take the value 1 if the respondent is formally employed and 0 otherwise.

Number of iddirs' of the household (IDDIR)

Many respondents in the pre survey gave their membership for more than one iddir as a reason for their reluctance in accepting the proposed bid. This was because their monthly income will be allocated for the monthly payment of these additional iddirs to the extent it is allocated for the one they are surveyed within. Thus having more than one iddir is expected to decrease households WTP for the proposed scheme. This variable will take the value 1 if the household is a member of more than one iddir and 0 otherwise.

Unlike many other studies we have discussed above the individual (or household) determinants of WTP together with the variable iddir which can represent a "social determinant". As Lofgren et al., (2008) tries to indicate, an interesting discussion today concerns the importance of "social determinants" in the form of social capital that could significantly affect household preferences for health insurance. Although there is not a clear consensus surrounding the definition of social capital, it is generally agreed that it concerns informal networks that are established between households, and furthermore the trust and solidarity that characterizes these networks. Interestingly, the existence of social capital may affect WTP for health insurance both positively and negatively. However as there is not a clear consensus on this issue the variable iddir is not related to any individual or household risk attitudes in our case. Instead the respondent's general predisposition was taken into an account while including the variable. In a study from Cameron by Binam et al.,(2004) a variable representing the associative experience (being a membership to a community club or association) was included as a determinant of WTP and the variable was positively related with WTP amount however no theoretical backgrounds were given for the relation that would exist.

Four interviewers (college students and a degree holder) and two supervisors including the researcher participated in the survey which took place from February 14 up to April 5. For this purpose the interviewers were trained for two days using a role play method so as to know how to administer the contingent valuation questions.

4. EMPERICAL FINDINGS: RESULTS AND DISCUSSION

4.1 Descriptive Analysis of the Survey Data

Out of the total 210 sampled households who were asked whether they would be willing to participate in the study, 197 of them consented to participate. The number of questionnaires that were incomplete and unacceptable for data analysis was 13. Where 7 of these were classified as incomplete responses, the rest 6 were protest zeros due to mostly respondents giving up in the middle of the survey. This left us with a response rate of 93.8%.

4.1.1 Household characteristics

The respondents from the three iddirs have a total of 855 household members. The average household size is 4.3 (1 being the minimum and 12 being the maximum size). From these respondents 66.5% of them had a family size of 1-5 while 32% and 1.5% of them had a size of 6-10 and more than 10 respectively. Of the total respondents 130 (66 %) were female respondents while the rest 67 (34%) were males and they were either the household heads or representatives of the heads. In cases where the parents were pensioners from their children it is the breadwinner member that was recorded as a household head since the amount of payment is highly dependent on his/her willingness to pay. The mean age of the respondents was 56.7 years, 28 being the youngest where as 90 is the oldest. Interviewers restricted themselves to interviewing the head of the household if this person was at home at the time of the interview or the spouse. In cases where these requirements were not fulfilled the interview was presented for the appropriate respondent at the monthly association of the iddir. From the surveyed households (56.4%) were male headed and the

remaining (43.6%) were female headed. The majority of the respondents 114 (57.8%) were household heads.

Respondents' educational background was categorized into four levels. The first category represents those who can only read and write with the illiterates, and the second represents those who had a primary education, which is grade (1-8). The third and the fourth categories represent those respondents with a secondary education of grade (7-12) and those above that level (above grade 12) respectively. Majority of the respondents (44.7 %) had some primary education while 21.3 % had a secondary education. Those who can only read and write together with the illiterates constituted 20.3% and the rest 13.7% of them had tertiary or a more than secondary education.

Regarding occupation 74.6% of the heads were informally employed while the rest 25.4% were formally employed. The term formal employment here refers to legally recognized permanent engagements or that of non-casual engagements. Although CBHI solves the problem of access to care and financial protection faced by those who are informally employed, the ability of these informally employed clients to pay premiums in a regular interval is limited as most informal engagements and thus the earnings are casual. This in turn hinders the sustainable and efficient provision of the scheme. The mean monthly income for the sampled households was 634 birr. The minimum amount of income earned was 70 birr while the maximum was 1600 birr. The per capita mean monthly income of household members was 147 birr per month which means 5 birr per day. In cases where

respondents were reluctant to reveal their monthly income their expenditures on major items were used as a proxy to monthly income.

4.1.2 Health status and health care needs of households

From the survey the majority of the respondents (45.2%) preferred to go to health stations whenever they needed a health care service the other 25.4% preferred to go to private clinics. Those who preferred public hospitals and traditional healers such as religious places constituted 14.7% each. Most of the respondents who opted for a high cost health care service from private clinics gave: occurrences of accidental sicknesses, lack of satisfaction with the quality of service and longer waiting time at public hospitals as justifications for their choice. Of the sampled households 54.31% of them had one or more members who needed a health care service within the last one year and 57.36% of the respondents reported either one or more family members with chronic diseases. The chronic diseases reported by respondents mainly include heart related problems, diabetes, blood pressure, mental problems and the like. Regarding the management of health care financing the majority (66.50%) of the households asserted that they had borrowed the last two or three times they needed a health care service while 29.95% of them used their own income. The remaining 3.55% claimed free health care provision.

Unsurprisingly, it was only 9 of the household heads (4.57%) that had health insurance coverage and no other types of insurance coverage's were detected. From these insured household heads 7 of them were being provided with the service either by government

or private sectors in which they were employed. Another respondent at Piasa (Kebele, 10) said that he served in the Korean War and thus has health insurance coverage. All these insured household heads could not be regarded as risk averters as the service was the provider's prior concern. As an exception, there was a 75 years old female respondent from Arat kilo who said that she has a health insurance from locally performing insurance providers with a monthly premium of 3 birr per person.

4.1.3 Households' willingness to pay for a Community Based Health Insurance Scheme (CBHI).

Respondents were presented with a hypothetical insurance market; which will cover the health care expenses of each family member in a household that amounts up to 1500 birr within a year period whenever one or more family members are faced with accidental sickness. In exchange to this service the household is required to fulfill a monthly fee (premium) payment. Thus households were asked to state their maximum WTP for such a scheme.

At the time of the survey the idea of CBHIs was highly favored by the respondents and it is only three respondents who preferred out of pocket payments and face the health related uncertainties than being covered with the insurance. However, in addition to these respondents 13 informally employed household heads were not willing to join the scheme and stated that they are not in a position to qualify for any regular payments given their nature of employment. That is the respondents gave the higher variance in their income as

an excuse for their zero WTP amount. There was also one respondent who stated that he has an already existing health insurance coverage provided by an employer institution and thus another insurance coverage would be a waste of money. In total, from 197 observations, 17 (8.6%) exhibited zero willingness to pay amount.

From those respondents who were willing to participate in the scheme and also the contribution, the majority 91 (46.2%) of them were willing to pay a maximum of 10 birr and less as a monthly premium while 71 (36 .1%) were willing to pay a maximum premium price which is between 11 and 20 birr. The remaining 18 (9.1%) respondents gave a maximum willingness to pay amount between 21 and 40 birr as a monthly premium for the proposed scheme.

Table 4.1: Maximum WTP values stated by Respondents under the hypothetical CBHIs

Maximum willingness to pay as a monthly premium (in birr)	Maximum willingness to pay for the proposed health insurance scheme	
	Number of respondents	Percent of respondents
0	17	8.63
3	1	0.51
5	44	22.34
6	1	0.51
7	1	0.51
10	44	22.34
12	3	1.52
15	53	26.90
20	15	7.61
23	1	0.51
25	15	7.61
30	1	0.51
40	1	0.51
Total	197	100

Source: own survey, 2010

The mean willingness to pay figure under the proposed CBHIs scheme is 11.5 birr per month. The maximum willingness to pay is 40 birr while the minimum is zero birr. Aggregating this mean for the whole population of households in the three iddirs which is 703 will give us an amount which equals to 8126.68 birr per month. Computing the per capita contribution of each family member in a household under the scheme, the payment amounts to be 2.68 birr per month and 32.1 birr per annum. This figure is greater than the public per capita health expenditure of the country (23.1 birr) for the year 2007/08. This

means these households can at least contribute an amount which equals to the country's per capita annual health care budget. This amount of WTP even from the low income earning groups of the society shows that CBHIs can help to generate sufficient amount of resource that can finance the health sector deficit of the country without evicting the poor and those informally employed section of the population from the health care market.

4.2 Econometric Analysis

In this section the relationship between WTP amounts and the different socio economic variables will be examined using the two maximum likelihood estimation models of Tobit and Probit as they are discussed in the methodology part. While the Tobit model enables us to identify the socio economic and health care need related factors that will affect households willingness to pay for a CBHI scheme, the Probit model enables us to identify the factors affecting the probability of positive willingness to pay for the proposed scheme.

In cases where explanatory variables are highly inter-correlated disentangling the effects of the explanatory variables on the dependent variables will be difficult (Maddala, 1992). Hence a multicollinierity test was made to check if this problem existed or not, and the results revealed that there was not a serious problem of multicolliniearity among the explanatory variables. Multicolliniearity is a serious problem if the correlation matrix results are greater than 0.8 (Gujarati, 1995).

The presence of hetroskedasticity is a common problem in survey and cross-sectional data (Verbeek, 2004) thus a test for the presence of heteroscedasticity problem in the model was also done and the test result showed that this problem does exist. Hence, robust standard errors are estimated. The starting bid was also included as an explanatory variable in the model to check if there exists a starting bid bias. In addition to the bid price, a dummy variable (household head) taking 1 if the respondent is the household head and 0 if otherwise is also included as an explanatory variable to check if asking representatives of household heads rather than household heads has an effect on the willingness to pay amount.

4.2.1. The Results of the estimated Tobit Model

Income of the household

The household average monthly income approximated by household expenditure has a positive impact on the willingness to pay amount as expected and is highly significant (at 1%). Thus income is a strong determinant of household's willingness to pay and the provision of such schemes by any insurance companies should consider the payment ability of the low income earning households while setting premiums.

Sex of the respondent

This variable has a positive sign indicating that females are more willing to pay for the proposed health insurance scheme than male. However this difference of willingness to pay is not significant and hence the difference in the willingness to pay amount between men and women is tenuous.

Age of respondent

This variable is positively related with the willingness to pay amount of respondents but is insignificant at 10%. This indicates that an increase in the respondent's age results in a higher willingness to pay amount. But this increment in willingness to pay is not significant indicating that age is not a strong determinant of WTP.

Educational level of respondents

As already discussed in the methodology part the educational level of respondents is classified into four categories' and the group representing the illiterates and those who can only read and write are in the first group and this group is taken as a control group to eliminate the dummy variable trap. The three educational dummies are positive. While secondary and tertiary education dummies are significant at 5 percent, primary education dummy is not significant at 10%. This might be due to the effect of education on the understanding of the safety and security that insurance brings in to one's life.

Table 4.2 Maximum Likelihood Estimates of the Determinants of WTP

(Tobit Model)

Explanatory variable	Coefficient	Stand.error	P- Value
CONST.	-2.997346	2.466391	0.226
SEX	0.2901643	0.7377135	0.695
AGE	0.0048452	0.0299577	0.872
BID	0.123594	0.0901888	0.172
PRIMEDU	1.565948	0.9958237	0.118
SECEDU	2.398193**	1.251432	0.057
TEREDU	3.766015**	1.733535	0.031
MARRIED	1.100423	0.7290864	0.133
HHEAD	1.515736**	0.7609753	0.048
INCOME	0.0076025***	0.0017686	0.000
HCNEED	0.7142254	0.7955111	0.370
CHRON	1.545296*	0.8481325	0.070
INSURAN	0.1014656	1.326371	0.939
MEMBSH	0.5940643***	0.1817004	0.001
OCCUP	1.851789**	0.8282924	0.027
IDDIR	-0.6950974	0.6976834	0.320

Source: Own survey, 2010 ***Significant at 1% **Significant at 5% *Significant at 10%

Marital status of the respondent

The variable married has a positive sign indicating that married people are more willing to pay for a health insurance than unmarried people. However the variable is insignificant at 10% meaning, there is not a significant difference in WTP between married and unmarried respondents. Thus marital status is not a strong determinant of WTP.

Head of the household

This variable is directly related to WTP amount and is significant at 5%. This may be because household heads are more concerned about their families health status since much of the responsibility falls on them when a member of the family gets sick.

Health care needs of the household

This is positively related with willingness to pay of respondents but the variable is not significant at 10%. Thus the health care need of the household within the last one year is not a significant determinant of willingness to pay for health insurance.

Case of Chronic diseases in the household

Willingness to pay is higher for households that have at least one member with a chronic disease and this positive relation is significant at 10%. This might be due to the fact that these households will have a greater perception of the extent of the loss whenever a health care service is needed by the member with a chronic disease and thus their higher willingness to pay for the proposed CBHIs. This result may indicate the existence of adverse selection in the surveyed area i.e. a higher probability that riskier people will join the scheme. However, if the risk can be pooled or in other words, if the service will be provided for a larger part of the population, adverse selection would not be as such a severe problem.

Insurance coverage of any type

It was expected that household heads with any insurance coverage will have a better awareness about the benefits of the scheme and thus will be willing to pay higher amounts. Contrary to this expectation, the results reveal that having any insurance coverage with in the household decreases WTP. However, this variable is insignificant at 10% indicating that the presence of any insurance coverage in the household is not a strong determinant of WTP amount.

The size of the household

This variable is positively related to willingness to pay amount and is significant at 1%. The proposed scheme covers the health related expenses of each and every member within a household, which means households with large size have larger number of members to be covered within the scheme. Thus, the bigger size of the service may be the reason for the higher WTP. The size of the household is a strong determinant of willingness to pay amount.

Occupation of the household head

This is directly related to willingness to pay amount and is significant at 5%. This may be because household heads who are formally employed have a better probability of earning a sustainable and higher income than those who are informally employed and earn unsustainable and lower income and hence WTP more. Having unsustainable income was one of the reasons given by respondents for their lower amount of willingness to pay during the survey.

Bid

The bid variable is positively related with the households' willingness to pay but insignificant at 10%. Thus the bid price is not a major determinant of household's willingness to pay amount and a starting bid bias is not a problem. This could be due to the caution given at the time of the interview to let the respondents give unbiased answers.

Number of Iddirs of the household

This variable is negatively related with WTP amount but insignificant at 10% under the proposed scheme.

4.2.2 The Results of the estimated Probit model

Measures of Goodness of fit for probit model

The goodness of fit for models with qualitative dependent variable is measured by the Likelihood Ratio Index (LRI) .The computed value of the LRI shows that 75.74 percent of the variation in the dependent variable is explained by the variation in the explanatory variables of the model (appendix II). The estimated results of the Probit model is presented in Table 4.3. As expected, income of the house hold has a strong positive effect, increasing the probability of accepting the bid. The coefficient shows that, as income increases by 1 birr, the probability of accepting the bid increases by 0.15 while all other variables remain unchanged. This variable is significant at 1%. Being one year older increases the probability of accepting the given bid by 1.7 and this increment is also highly significant. Being married increases the probability of accepting the proposed bid by 30.9 and the variable is significant at 10% which means that being married strongly determines the probability of accepting the bid. The status of the household has a positive influence increasing the probability of accepting the bid by 26.3 and thus being a household head strongly affects the probability of positive willingness to pay as the variable is significant at 10%. Health care need of the household is positively related to the probability of willingness to accept and is highly significant. The coefficient shows that needing a health

care within the last one year either by one or more members of the household increases the probability of accepting the bid by 34.22, keeping all other variables constant. The existence of one additional member in the household increases the probability of accepting the bid by 8.4, and this increment is highly significant. The occupation of the household head is positively related with the probability of accepting the bid and is significant at 1%. This indicates that having a permanent employment increases the probability of positive willingness to pay by 48.9. This result is also supported by the responses from the interview as many of the informally employed respondents stated that they cannot qualify for higher bids as their casual and by chance employments could not assure them with sustainable source of income. Consistent with the theory of demand, the response of households is sensitive to the bid levels as shown by the negative and significant coefficient of the bid. This variable decreased the probability of respondents' willingness to accept and is significant at 1%. This is to mean a one birr increment in the value of the bid will decrease households' probability of accepting it by 14.14, keeping all the other variables constant. The variable sex and all the education dummies are positively related to the probability of willingness to accept but insignificant and thus rejected. The presence of one or more family member with chronic disease directly affects the probability of the households' willingness to accept. Having any type of insurance is also directly related with the probability of accepting the bid and having more than one iddir decreases the probability of willingness to accept. However all these variables are not significant and thus are rejected.

Table 4.3. Maximum Likelihood estimates of the determinants of probability of accepting the bid (Probit Model)

Expla. variable	Coefficient	Marg.Effect	Stand. Error	P-value
Sex	0.5246768	0. 206787	0.13596	0.128
Age	0.0444649	0.017720***	0.00633	0.005
Bid	-0.3548711	-0.141429***	0.02866	0.000
primedu	0.0492607	0.019627	0.23097	0.932
Secedu	0.5258907	0.203554	0.2222	0.360
teredu	0.2071244	0.081891	0.30756	0.790
married	0.7956055	0.309118**	0.16645	0.053
hhead	0.6719737	0.263111*	0.15942	0.099
income	0.0038894	0.001550***	0.00043	0.000
Hcneed	0.887355	0.342216***	0.14155	0.016
Chronic	0.4367495	0.172848	0.14697	0.240
Insuran	0.6843046	0.251938	0.24113	0.296
Membersh	0.2113061	0.0842133***	0.02972	0.005
Occup	1.421279	0.489424***	0.12542	0.000
Iddir	-0.1742 827	-0.0650484	0.14797	0.639
constant	-2.95622	-	-	-

Source: Own survey ***significant at 1% **significant at 5% *significant at 10%

Computation of the mean willingness to pay amount

It is often complicated to derive formulae for the average WTP from 'yes /no' data. Suppose that we estimate:

$$WTP^* = \alpha + \beta A$$

In order to obtain estimates of α and β, where WTP* is as defined previously, α and β are the constant and the bid coefficient respectively.

Then the mean willingness to pay is equal to:

Mean WTP= $-\alpha/\beta$

The total WTP is obtained by multiplying the mean WTP by the total number of individuals in the population. According to Johansson (1995) an investigator who may want to include other independent variables than the bid can calculate the mean using the mean values of these other independent variables, an approach which often turns out to be very complicated.

Mean WTP= - (1.730144/-0.115113)

=15.03

Thus the mean willingness to pay is 15.03 birr.

However asymptotically, the mean remains unchanged if other independent variables than the bid are included (Johansson and Kristrom, 1992) cited in Johansson (1995). The mean willingness to pay values under the proposed scheme is presented in the Table 4.4.

4.3 Estimating aggregate WTP and aggregate potential revenue

In order to estimate the aggregated willingness to pay of the 703 households from the three iddirs', class boundaries for the maximum willingness to pay values are used.

Table 4.4. Total WTP and Total Revenue from Hypothetical CBHIs

WTP interval in birr	Class mark for WTP	Sampled Distribution		Total HHS	Total WTP (in birr)	Sample HHs WTP at least that amount		Total HHs WTP at least that amount (cumm)	Total Revenue (in birr)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
		No.	%			No.	%		
0 - 3	1.5	18	9.13	64	96	197	100	703	1054.5
3.1 - 6	4.55	45	23	162	735.9	179	90.9	639	2878.8
6.1 - 10	8.55	44	22.3	156	1333.8	134	68.0	477	4087
10.1 - 15	12.55	55	28	196	2459.8	90	45.7	321	4022.3
15.1 - 22	18.55	17	8.6	60	1120.4	35	17.7	125	2307.6
22.1 - 25	24.55	16	8.1	57	1399.3	18	9.13	65	1576.1
25.1 - 30	27.55	1	0.5	4	110.2	2	1.01	8	195.6
30.1 - 40	35.55	1	0.5	4	142.2	1	0.5	4	124.42
Total		197	100	703	7397.06				

Source: own survey, 2010

In Table 4.4 columns (1) and (2) indicate the class boundaries for the willingness to pay amounts and the class marks (the mid willingness to pay amount) calculated from the class boundaries respectively. While the third column shows the number of the sample households whose maximum willingness to pay fall within the given interval, the fourth

column shows the percentage of these sample households whose maximum willingness to pay fall within this same interval. These percentages of the sample households are used to calculate the equivalent number from the total population of the three iddirs which constitutes 703 households all together, as it is presented in column five.

Total willingness to pay as presented in column six is calculated by multiplying the mid willingness to pay amount of column two by the total amount of households willing to pay that amount (from column five). Thus if the proposed scheme of health insurance can be provided these low income earning households from the three iddirs collectively can generate 7397.06 birr per month which amounts to 88,764.7 birr per annum.

The number of sample households willing to pay at least the amount stated in each boundary is indicated in column (7) while the percentage is indicated in column (8). As the class mark for WTP amount increases the number and the proportion of sample households that are willing to pay at least the amount stated in the class boundary diminishes continuously. This is the same for the total households in the three iddirs (in column 9) as calculated using column five. A demand curve is depicted to show this relation between the class mark for WTP amount and the total number of households willing to pay that amount. As shown in figures 4.1 in the appendix the demand for a health insurance decreases as the monthly premium price increases, satisfying the low of demand.

Total revenue from the 703 households is calculated by multiplying the total number of households who are willing to pay at least the amount in the boundaries by the class mark of willingness to pay and this is presented in the last column (10). The figures from this column initially increase as the willingness to pay amounts increases and reach at the maximum which is 4022.3 birr at the monthly payment of 12.55 birr. After reaching its peak the total revenue amount start declining and reaches 124.42 birr at a monthly premium payment of 35.55 birr.

4.4 Feasibility of the scheme

Of all the risks facing poor households, health risks pose the greatest threat to their lives and livelihoods. A health shock adds health expenditures to the burden of the poor precisely at the time when they can afford it the least (Tabor, 2005). As it has been discussed throughout the first two chapters' one of the ways that poor communities manage health risks, in combination with publicly financed health care services, are community-based health insurance schemes (CBHIs).

These schemes can bring an equitable and efficient health care service provision for those who are informally employed and mainly low income earning groups of the society. However, the effective introduction and implementation of this scheme cannot be achieved if the current pricing system is going to be employed without considering the affording power of these low income and informally employed groups of the society. In Table 4.5 total willingness to pay amount from the survey is compared with the total amount of

revenue that should be collected if the scheme is to be provided based on the average premium prices that currently prevails in the insurance market.

Table 4.5 Comparison of total willingness to pay amounts from the survey and total amount of revenue based on the average premium in the market

	Premium price (in Birr)	Total amount of revenue (in Birr)	
		Per month	Per annum
WTP from the survey	11.56	8,126.68	97,520.2
If health insurance is to be given based on the average premium prices that currently prevails in the market	77.4	54,918.36	659,016

Source: Survey data and data from insurance companies, 2010.

In Table 4.5 the total payment amount 8,126.6 Birr is obtained from the survey results of willingness to pay amount. Calculation of total amount of revenue that should be collected if health insurance is to be provided based on the current average market premium price was gained by multiplying individual premium price (which is 18 birr) by the average number of members in a household (4.3 members) and then by the total number of households in the three iddirs (703 members). The difference between the total revenue that should be collected using the market premium price and the total amount that the households are willing to pay is 46,791.7 birr per month and 561,495.8 birr per annum. This means that 561,495.8 birr should be subsidized every year either by the government or

donors if the provision of CBHIs is to be introduced and implemented for these low income earning groups under the current premium price; which is a huge amount. Tabor (2005) underlines that government, and its development partners, should support the growth of CBHIs by ensuring that there is a satisfactory supply of appropriate health services, by subsidizing start-up costs and the premium costs of the poor. This can be done by assisting CBHIs to build technical and managerial competence, by helping to foster development of CBHI networks, and by assisting CBHIs establish and strengthen links with formal financial institutions and health care providers to better manage covariate shocks and catastrophic health risks. However the actuarial premium price of insurance companies also needs a revision since subsidy by itself cannot provide long lasting support for the CBHIs.

5. SUMMARY, CONCLUSION AND POLICY IMPLICATIONS OF THE STUDY

5.1 Summary and conclusion

Low-income countries often have large rural and informal sector populations, limiting the taxation capacity of their governments. Often times, "free" health care delivery systems do not work, and in practice, are never free as resources are inefficient. These difficulties have lead direct out-of-pocket health payments to be a distinctive feature of health care financing in many low- and middle-income countries. Efforts are underway in many developing countries to improve quality, access, efficiency and effectiveness of health care.

Health is one of the priority areas in the development efforts of Ethiopia too, as it is reflected in the plan for accelerated and sustained Development to end poverty (PASDEP); a wider policy framework which is the road map for the country's action for the period 2005/06 -2009/10 and the health sector development programme (HSDP) which is designed in align with PASDEP. With such movements, improvements have been achieved through government investment on health. However, substantial and sustainable changes are unlikely to come with the current financial crises being faced by the health sector. As in most developing countries Ethiopia's health care financing system is characterized by significant out of pocket expenditure, limited capacity to generate domestic resource and hence reliance on external assistance. The current level of Ethiopia's health expenditure per capita is (US$2.1) which is far below the financing requirement of (US$34) per capita that has been recommended by the Commission for Macro Economic and Health as being necessary to cover essential health interventions in developing countries. These contexts witness the need

to undergo a health sector financial reform which can be a key milestone through the effort of changing the health profile of the country.

Introduction of health insurance will enable to mobilize additional resources to the health sector. More importantly, substantially pooling risks between the poor and the better off as well as the sick and healthy will enhance equity in health service delivery. In addition as health insurance schemes removes or substantially reduce cash requirement at the point of getting services, members will be encouraged to seek service when they need it. This will ultimately increase the demand for health care and utilization of the service.

There is increasing advocacy for community-based health insurance (CBHI) schemes as part of a broader solution to health care financing problems in low-income countries such as Ethiopia. In this regard community-based organizations such as *iddirs* are among the most important mechanisms for the successful implementation of the multi-sectoral response to the problem, as they are strategically placed to facilitate community involvement. Health insurance is mainly financed by the contributions/premium regularly collected from its members. Hence successful implementation of health insurance depends on the capacity and willingness of the community to regularly pay their contribution/premium. Given the high level of poverty in Ethiopia, expansion of CBHIs could face serious challenges as the premium prices could be beyond the ability of the majority of the urban and rural poor. Thus, this study tried to see the feasibility of CBHIs provision for these community based organizations called iddirs by analyzing the member households' willingness to pay for the proposed scheme. The value member households 'attach to the proposed health insurance

was estimated using the contingent valuation method (CVM). For this purpose three iddirs were purposively selected from areas that are believed to constitute largely of the low income earning and also informally employed groups of the society in the capital city, Addis Ababa. From the three iddirs which constitute 703 members 210 households (30%) were systematically sampled for an interview. A closed ended WTA question followed by an open ended WTP question under the proposed scheme was presented for the respondents to elicit their maximum willingness to pay amounts.

Both descriptive and econometric methods are applied to analyze the information obtained from the survey. The results from the descriptive analysis show that 76.14% of the heads were informally employed while the rest 23.86% were formally employed. The average per capita income of one household member is around 5.53 birr per day. The majority of the respondents (45%) preferred to go to health stations whenever they needed a health care service the other 25.38% preferred to go to private clinics and the rest preferred public hospitals and traditional healers each constituting 14.72%. Among the reasons given by the respondents to choose private clinics were occurrences of accidental sicknesses and dissatisfaction with the quality of the service. Of the total respondents, 54.31% of them had needed a health care service within the last one year and 43.65% of the respondents reported either one or more family members with chronic diseases such as; heart related problems, diabetes and the like. Regarding the management of health care financing (66.50%) of the households asserted that they had borrowed the last two or three times they needed a health care service while 29.8% of them used their own income. The remaining 3.55% claimed free health care provision. It was only 9 of the household heads (4.57%) that had health

insurance coverage and no other types of insurance coverage's were detected. From the interviewed households 97.9% of them were willing to join the proposed health insurance scheme. Those unwilling to join the scheme preferred to face health risks than to be insured.

A hypothetical health insurance scheme which covers the medical cost of each household member; that amounts up to 1,500 birr within a year period was proposed for the households. Given this hypothetical market, the households on average are WTP 11.56 birr. The total WTP amount under the proposed scheme is 8126.68 birr. This means on average each individual member of a household can contribute 2.68 birr per month and 32.2 birr per annum under the proposed scheme, which is greater than the public per capita health expenditure of the country (23.11birr) in 2007/08. This amount of WTP even from these low income earning groups of the society shows that CBHIS can help to generate large and substantial amount of resource that can finance the health sector deficit of the country without evicting the poor and those informally employed section of the population from the health care market. The maximum total revenue that can be generated per month is 4087 birr at a monthly payment of 8.55 birr, under the specified scheme.

The appropriate econometric models were applied for the econometric analysis depending on the nature of the data. The data on WTP amounts from the open ended question was censored at zero and hence the Tobit model was applied to identify factors that affect the amount of money households are willing to pay for the proposed health insurance scheme. The Probit model was applied for the data from the closed ended WTP question to identify

those factors that affect the probability of having a positive willingness to pay of households, for the proposed health insurance scheme.

According to the results, income, secondary and tertiary education dummies, status of the respondent in the household, case of chronic disease in the household, occupation of the head and size of the household have a positive and significant effect on the amount of WTP. Age of the respondent, sex, primary education dummy, having any type of insurance, being married and the health care need of the household within the last one year have a positive but insignificant effect. Having more than one iddir has an insignificant negative effect on WTP amount.

Looking at the variables that affect the probability of accepting the bid, age, marital status, respondents status, income of the household, health care need, size of the household and occupation of the head (all of them with a positive sign) have a significant effect on the probability of positive willingness to pay. The bid price with a negative sign, significantly affects the probability of positive WTP. The mean willingness to pay value, as calculated from the probit model is 15 birr. The current premium price in the insurance market is high above the ability of these low income earning households, which makes a health insurance hardly affordable by them.

The successful implementation of health insurance depends on the capacity and willingness of the community: to regularly pay their contribution/premium on one hand and the insurance industry's: adequate assessment of the actuarial risk (identification of factors that

can affect the WTP amount of households for a health insurance scheme) and insuring the risks through pooling, on the other hand. The promotion of CBHI promotes the access to equitable and sustainable quality health care, increased financial protection and effective social inclusion in the health sector for the majority of Ethiopian families.

5.2 Policy Implication of the study

The various interventions in the health sector such as the health extension program have promoted health service seeking behavior among communities. However, the current health financing practice demands that part of the cost be covered through out-of-pocket payments and user fees at the time of sickness. The poor who are constrained by their level of earnings and the nature of lifestyle cannot afford to make such payments at the point of utilization. Users' access to health services is restricted as user fee is often beyond the ability to pay of most households'. On the other hand, these user fees are extremely low relative to what the services actually cost and the quality of health services is also constrained by these low user fees that cannot adequately support the system. There is a huge financing gap compared with the amount required to deliver essential health services. Such contexts point towards the need to undergo a health sector financing reform, which is a sustained process of fundamental changes in national health policy and institutional arrangements, designed to improve the functioning and performance of the health sector financing and ultimately, the health status of the poor .

The consequences of raising user fees to provide an improved quality of service will most likely be unbearable especially by the poor. Therefore to sustain a reasonable quality of health service it may be necessary to introduce a system that will spread the financial burden arising from higher health services costs. Such a risk sharing system is expected to make health service affordable at the time of sickness thereby reducing the financial barrier associated with higher user fees.

The provision of community based health insurance should be considered for the majority of urban people in the informal sector as well as the majority of Ethiopians in the rural farming and livestock rearing economy.

In the mean time, the setting of premium prices should consider the ability of payment and the willingness to pay of households so as to assure the sustainable provision of the scheme. The current premium price that prevails in the insurance market is beyond the ability to pay of the poor.

The majority of the respondents (78%) did not have the knowledge on how a health insurance scheme functions. Thus public awareness should be adequately enhanced on the functioning of the schemes and also the benefits that can be gained from it so that the service can insure a wider coverage. As it can be seen from the regression results the secondary and tertiary education dummies were significant in determining the willingness to pay amounts which also reflects the need to create awareness on the use of insurance to protect against expenditure fluctuations.

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Appendix I

Likelihood ratio test

The likelihood ratio test is a test against the null hypothesis that all the slopes coefficients are equal to zero. This test is given by:

$$LR=2[L(\beta_0, \beta_i) - L(\beta_0, 0)]$$

Where L (β_0, β_1) is the value of log likelihood function for the unrestricted model (the maximized value of the log likelihood of the model being estimated), L (β_0, 0) is the value of the restricted log likelihood function (estimated only with the constant term). β_0 is the regression constant and β_i is the slope coefficient. LR has a x^2 (n) distribution with n degrees of freedom where n is the number of independent restrictions. The null hypothesis that all slope coefficients are zero will be rejected if LR $\geq x^2$ value. The test result for the probit model is as follows.

$$LR= 2[-33.119352 - (-136.54746)]$$

$$= 103.42811$$

The critical value of the chi- square at 15 degrees of freedom is 24.99 at 5% level of significance. Thus the null hypothesis that all the slope coefficients are equal to zero is rejected; hence the model has some explanatory power.

Appendix II

Measure of Goodness of fit for Probit model

The estimators from the Probit model are non-linear and the traditional R square measure is unsuitable for non linear estimators. Researchers have developed alternative measures of the goodness of fit for nonlinear estimators; which is the likelihood ratio index and is computed as follows:

$$LRI = 1 - \frac{\ln Lu}{\ln Lr}$$

Where lnLu denotes the log likelihood calculated from the full model including the explanatory variables, lnLr denotes the log likelihood calculated from the constrained model. The likelihood ratio index lies between 0 and 1.As LRI approaches the model fit improves and a value of LRI which equals 1 implies perfect fit however there is no interpretation to scale between 0 and 1.

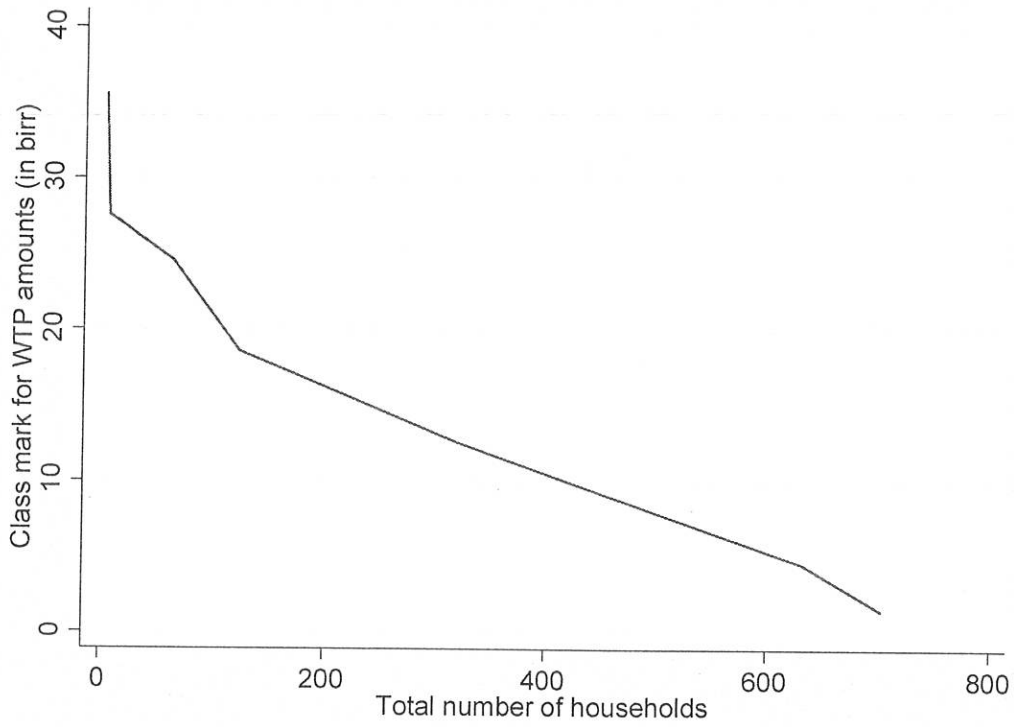
$$LRI = 1 - \left(\frac{-33.119352}{-136.54746}\right)$$

$$= .75745$$

This result indicates that the probit model explains 75.74% of the variation.

Appendix III

Figure 4.1 Estimated Demand Curve for the proposed health insurance scheme



Appendix V

CONTINGENT VALUATION SURVEY- HOUSEHOLD QUESTIONNAIRE

This survey is being undertaken by a student of Addis Ababa University Faculty of Business and Economics in the Department of Economics as a partial fulfillment for the award of MSc in Economics.

This questionnaire is designed to obtain information on the current health care situation of household members of iddirs in Addis Ababa. The findings of this study may help policy makers to: understand the problems related to health care financing, consider the need for a health care reform regarding the health care financing system of the country and take the monetary values households are willing to allocate in cases of reforming the current financing system.

The information collected from the survey will be kept confidential and name and personal information of the respondent will never be disclosed hence, you are requested to participate in this discussion as truthfully as you can.

TO BE FILLED BY THE INTERVIEWER

Name of the interviewer: _____

Date of Interview: _____

Time of Interview: From _____ to _____

I. QUESTION ON CURRENT SITUATION OF HEALTH CARE NEED.

1. From the following alternatives which one do you choose when a member of the household is faced with sickness?

A .Heath station B. Hospital C. Clinic D. Traditional healers

If the answer for question number (1) is either heath station or traditional healers pass to question number (3)

If the answer for question number (1) is either hospital or clinic pass to question number (2)

2. Which one was it?

A. Private B. Public

3. Would you specify the reason for opting one from the other?

_____

4. Is there any family member with chronic disease in your family?

A. Yes B. No

If yes would you specify the age please? _____

5. Was there any family member in your household who needed a health care service within the last one year period?

A. Yes B. No

If no pass to question number (7)

If yes pass to question number (6)

6 How much did you spend? _____

7. How do you manage to cover your health care expenses? (In reference to the last two or three times)

A. Saving

B. Borrowing

C. From monthly expenditure

D. claim for a free service

E. Would you please specify if any other:_____

8. Were there times in which you could not finance your health care expenditure?

A. Many times B. Some times C. Not at all

9. Do you have the knowledge by what it is meant a health insurance and how it functions?

A. Yes B. No

10. Do you have any type of insurance coverage?

A. Yes B. No

If the response is (yes) pass to question number (11)

11. Would you please specify what type of insurance is it?_____

II. SPECIFICATION OF THE HYPOTHETICAL SCHEME AND OPENING STATEMENT ON WILLINGNESS TO PAY QUESTIONS.

We see many people being exposed for catastrophic health expenditure and also exacerbated poorness due to the occurrence of accidental sickness and lack of ability to pay for it. However if someone buys a health insurance the insurer company (the company which provides the insurance) will cover his/her (the persons' who buys the insurance) health care expenditure at the time of sickness .And for someone to get such a service he /she (the insured one) should pay a fixed amount of money either per month or per annum as a premium.

Let us assume that there is an insurance company which can cover the health care expenses of each family members' in a household whenever one or more family members are faced with accidental sickness .The per annum insurance coverage of health care expense of each family member amounts up to 1500 birr. And such schemes would require a monthly fee (premium) that should be contributed per house hold for this service provided for each member of the household.

III. QUESTIONS ON HOUSEHOLDS WILLINGNESS TO PAY

1. Are you willing to join such a scheme?

   A. *Yes* *B No*

If the answer for question No (1) above is no pass to question No(5)

If the answer for question Yes (1) above is no pass to question No(2)

2. Would your household be willing to pay 10/15/20 birr per month for such a scheme which will cover the health care expenditure of each and every member of the family whenever sickness happens?

A. Yes B. No

3. What is the maximum amount of payment that you are willing to pay for such a scheme: that will cover the health care expenditure of each and every member of your household that amounts up to 1500 within a year period?

4 What expenses are you planning to reduce in order to be able to pay the amount of money you just specified in the above question? _____

_____

5 Would you please specify your reason for not willing to join the specified scheme?

A. Lack of money

B. Preferring to face the risk rather than getting insured

C. Would you specify if any other? _____

IV. QUESTIONS ON SOCIO ECONOMIC CHARACTERSTICS

1. Name of the respondent _____
2. Name of head of the household _____

3. Sex of the head

4. Sex of the respondent

   A. Male B. Female

5. Age of the head _____

6. Age of the respondent _____

7. Education level of the head _____

8. Education level of the respondent _____

9. Marital status of the respondent

   A. Married B. Unmarried

10. Marital status of the head

A. Married B. Unmarried

11. Would you tell me the age, sex, education, and occupation of your family members?

No.	Relation ship	Age	Educational level	Occupation

If the above table is not enough use the back of the page.

12. Household head occupation _____

A Government /private sector

B Legally known own business

C Informal (Legally unknown)

13. In which year did you become the member of this iddir? _____

14. Have you ever been reimbursed for accidents since you become the member of this iddir?

A. Yes B. No

15. If your response to the above question is (yes) how much was it? _____

16. How much is the monthly income of the household head? _____

17. Other monthly income of the household from other members and other sources? _____

18. Would you please tell your monthly expenditure for the following items?

A. For food _____

B. For house rent (if any) _____

C. For electricity and water consumption _____

D. For education fee _____

E. For energy consumption (fuel, charcoal, transportaion etc.)

19. Address: Wereda _____ Kebele _____ House No. _____

Declaration

I, the undersigned, declared that this thesis is my original work and has not been presented for a degree in any other university, and that all source of materials used for the thesis have been duly acknowledged.

The examiners' comments have been dully incorporated.

Declared by:

Name: Israel Ferede Zewde

Signature: _____

Date: 5/07/10

Confirmed by Advisor:

Name: _____

Signature: _____

Date: _____