

PMMA Network Session Paper

**An estimation of the willingness to pay
for community healthcare risk-sharing
prepayment scheme and the Medical
Poverty Trap: evidence from rural Nigeria**

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Poverty Trap: evidence from rural Nigeria**

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Abstract

Health care financing in Nigeria has become a source of worry for the government, policy makers and the populace most especially the poor and economically vulnerable group. It is estimated that out-of-pocket payment dominates the bulk of health care financing in Nigeria. The immediate effect of this method of health care payment is catastrophic to poor households and further impoverishes them. Prepayment plans, which have been identified to turn the unexpected health expenditures into predictable form of payments has in Nigeria not received desirable consideration. Given the importance of such prepayments schemes, it is important; therefore, for the government to know the amount rural households can afford to pay to establish prepayment schemes in rural communities, to know if there exist any difference between how much these rural households are WTP and the actual cost of treatment. This study is one such attempt. We shall use Contingent Valuation Method (CVM) and data generated from a proposed prepayment scheme in Nsukka LGA to establish empirical grounds for pricing the scheme. Unlike other health care CVM evaluation, the study employ the censored regression model proposed in Cameron (1987); Cameron & James (1988); Strazgera et al. (2003a) and a FIML sample selection model. It is expected that the findings from the research will contribute to ameliorating the catastrophic nature of health care financing and the reduction of poverty through reduction in out-of-pocket payments by making predictable, health care financing, thereby, increasing access to health care services.

1.0 Introduction/Background

Health insurance of any form has been identified to play an important role in rural households' access to health care, and turns the unexpected health expenditures into predictable payments in the form of insurance which in turn encourages households to further invest in the wellbeing of their households (Asgary et al., 2004; OECD/WHO, 2003) and further reduces the crunching effects of poverty. It increases the fungibility of funds for these households especially when such insurance schemes are well established and households face relatively low out-of-pocket payments when they use health care services. Such households will be better producers of health and also increase the consumption of health related commodities, which further enhances the health status of the household members.

Lack of access to health insurance and the health of households and individuals are said to be inversely related (Whitehead et al., 2001; OECD/WHO, 2003; Asgary et al., 2004). The scenario is even made worse in countries such as Nigeria where health insurance (or the insurance function of health care financing) is not fully in existence (Peterson & Obileye, 2002) and the dominant form of health care payment still remains out-of-pocket payment (WHO, 2000). Poverty has again been

traditionally linked to access to health care especially in rural households in developing countries since individuals and households try to cope with the unexpected shock involved in health care payments (Akin et al., 1987; Orubuloye et al., 1991; Whitehead et al., 2001; OECD/WHO, 2003; Asgary et al., 2004). This reinforces the well-known vicious circle of poverty (Whitehead et al., 2001).

The World Bank in its World Health Report 2000, noted that prepayment schemes offer the most effective form of protection from the cost of health related events, cushioning the effect of health care payments and has called for greater researches into this mechanism so as to incorporate the poor (WHO, 2000). Where also out-of-pocket payments are high, such as Nigeria (WHO, 2000; 2005), it has been advocated that measures be instituted to cater for especially the rural poor such as these prepayment schemes till a formal scheme is put in place (Devadasan et al., 2004).

In Nigeria, over 65% of the population live below poverty line of about US\$1 per day and the bulk of the poor spend over 80% of their earnings on food (WHO, 2002). This is attributed to low level of literacy and high level of income inequalities as evidenced by a high Gini coefficient of income distribution (51%).

According to WHO (2002:3),

“...the socio-demographic, political and economic challenges arising from the increased population, widespread poverty, low literacy level, urbanization and related urban-rural migration will determine the burden of disease in the country and the effectiveness of the [Nigerian] health system”

Available health statistics show that life expectancy of Nigerians have dropped from 53.8 years for females and 52.6 years for males in 1991 to 46 and 45 years respectively in 2003. Also, infant mortality rate (IMR) rose from 87.2 per 1,000 live births in 1990 to 100 in 2003. Similarly, under-5 mortality rate (U5MR) rose from 187 per 1,000 in 1998 to 198 in 2003 and about 57% of these under-5 deaths are associated with malnutrition. Maternal mortality rate also stands high at 800 per 100,000 live births and these death rates have been attributed to diseases such as malaria and diarrhoea and also to shortages in skilled medical personnel¹. The disability-adjusted life expectancy (DALE) is estimated at 38.3 years and this puts Nigeria in 187th position in ranking by the World Health Organisation (WHO, 2002).

¹ The percentage of births attended to by skilled personnel (35% in 2003).

When one looks at the nature and extent of inequalities in the distribution of resources and disease burden according to rural-urban classification or northern-southern classifications, one would observe marked differences. The bulk of disease burden are in the rural areas where standard of living is poor and social amenities are lacking (implying poverty). This is of importance if one is to fully understand the arguments and challenges the Nigerian health system is facing and it would form the bedrock for proffering solutions aimed at ameliorating the conditions of living of the rural poor and through the multiplier effect, improve their wellbeing and health status.

1.1 Health Care Payments in Nigeria and the Medical Poverty Trap Phenomenon

The Nigerian health system often described as a decentralized system, functions along three broad lines, which corresponds to the fiscal federalism structure of the country – (a) The Primary Health Care (*PHC*) corresponding to the local government level; (b) The Secondary Health Care (*SHC*) corresponding to the state governments level; and (c) The Tertiary Health Care (*THC*) corresponding to the federal government which is largely responsible for policy formulation, strategic guidance, coordination, supervision, monitoring and evaluation of all the levels.

Financing health care in Nigeria has posed challenges to the government, academics, and health policy experts (Ogunbekun, 1996). With a predominantly out-of-pocket health care payment in Nigeria, models of health care financing available in developed economies are not easily amenable and applicable to Nigeria due largely to limited institutional capacity, paucity of available data on health status and service utilization, unstable political climate and issues of low consumer awareness of health development issues (Ogunbekun, 1996). This has stifled the process of identifying appropriate financing mechanisms which uphold the principles of equity in financing for the country coupled with the nature and distribution of the population between rural (70%) and urban (30%) dwellers.

There are, however, varied sources of Health care financing in Nigeria. These include budgetary allocations from the government at all levels of the federalism structure (local government, state, and federal); loans and grants obtained from multilateral and bilateral agencies in the form of international aid; private sector contributions and the out of pocket payment (WHO, 2002).

Government funding to the health sector has over the period (1998-2002) remained relatively constant and low as a percentage of the total health spending. Given the decline in total health expenditure as a

fraction of the gross domestic product (GDP) over the same period, it will interest us to know that with the growing population (growth rate of 2.8%), the fraction of GDP attributed to health expenditure declined steadily from 5.5% (1998) to 4.7 (2002). Government funding of health services in Nigeria have relatively decreased or could be said to be relatively constant over the period (1998-2002). This is evidenced, from Table 1 where government expenditure as a percentage of total health expenditure rose slightly from 26.1% (1998) to 33.5% (2000) and then began to decline since 2000 and stands at 25.6% (2002). Though these figures have been undulating over the same period, with its peak in 2000 (33.5%), the general trend is an overall decline.

In terms of per capita public expenditure on health, Nigeria is said to be performing poorly. Per capita public health spending in Nigeria has been relatively stagnant and low over the period 1998 to 2002. From Table 1, it can be observed that on the average, per capita public health expenditure over the period is US\$5, which is about 680% less than the WHO recommended US\$34 for low-income countries (WHO, 2002).

In terms of government spending on health as a fraction of total government spending, the Nigerian health sector has not witnessed continual governmental interest as evidenced in the steady decline in budgetary allocations to the sector. From Table 1 it can be observed that public health expenditure as a fraction of general government expenditure declined from about 7.1% in 1998 to as low as about 3% in 2002. The government of Nigeria in an effort to mitigate the low per capita allocations to the health sector has over the years adopted series of initiatives which include the revolving fund scheme for some selected services (e.g. drugs) in hospitals and the national health insurance scheme (WHO, 2002).

Table 1: Relative shares of various health care financing mechanisms in Nigeria

Indicator \ Country	Total Health expenditure as a fraction of GDP	Government expenditure as a percentage of total health expenditure	Private sector expenditure on health as a % of total health expenditure	Private households' OOP* as a % of private sector health expenditure	Prepaid and risk-pooling plans as % of Private sector expenditure on health	General government expenditure on health per capita at exchange rate	General government health expenditure as a % of general government expenditure	External resources on health as a % of Total expenditure on health
Nigeria								
1998	5.5	26.1	73.9	95.0	2.4	4	7.1	13.1
1999	5.4	29.1	70.9	94.8	3.4	5	5.4	13.8
2000	4.4	33.5	66.5	92.7	5.1	6	5.9	16.2
2001	4.5	31.4	68.6	91.4	6.5	6	3.4	5.6
2002	4.7	25.6	74.4	90.4	6.7	5	3.3	6.1

* Out-of-pocket payment.

Source: WHO (2005).

In terms of public/private mix in health care financing in Nigeria, the private sector accounts for the bulk of health care expenditure as private expenditure on health as a fraction of total health expenditure as at 2002 stands at 74.7% (WHO, 2002; 2005) with the government accounting for roughly about 26%. The scenario has been relatively similar from 1998 to 2002 (see Table 1). Also, the bulk of private health care spending is out-of-pocket payment (Ogunbekun et al., 1999; WHO, 2002) where over the period (1998 to 2002), over 90% of private expenditure on health is out-of-pocket payment, which is regressive and only about 6.7% of private health expenditure is attributed to private pre-paid plans as in 2002 (WHO, 2002; 2005) and the burden of payment rests more on the vulnerable and low socioeconomic groups especially for payments out-of-pocket. Though the fraction of private health expenditure attributed to pre-paid plans have been on the increase from 2.4% in 1998 to 6.7% in 2002, the proportion of the Nigerian population covered by private insurance cover (including employers' plan) is estimated to be about 0.03% (Ogunbekun, 1996). This reduction in public health spending draws its origin from the neo-liberal ideas brought about by Structural Adjustment Programmes in the mid 1980s de-emphasizing spending on social and health services (WHO, 2002).

With regard to relative dependence of Nigeria on donor funding especially in the health sector, there has been a decline in external resources on health as a percentage of total health expenditure over the period (1998 to 2002). External resources to the health sector generally witnessed a decline from 13.1% (1998) to 6.1 (2002) (see Table 1). This decline was however not matched with increased domestic sourcing of financial resources as public expenditure on health declined over the same period. The general decline in donor funding in Nigeria is said to have a historical perspective (WHO, 2002). The decline that began especially in the 1990s was due largely to the continual reign of military regimes and political unrest in the country, which led to loss of confidence of the donors in the country and stringent imposition of economic sanctions. The long reign of military regimes saw to the promotion of anti-democratic governance and ideas, which were not favourable to the donor agencies. During the period of intense military rule, only the United Nations provided moderate financial assistance to the Nigerian health sector. Other bilateral and multilateral donor assistance only resumed following the reverse of the political scene in the country in 1999 (WHO, 2002). Following the reversal of the trend, external resources to the health sector showed a relative increase up till 2000 when it stood at about 16% and declined sharply to about 6% in 2002. The bulk of the problem faced by Nigeria is the lack of donor coordination and the limited internal capacity of the domestic government to manage funds (WHO, 2002).

Given the predominance of OOP payments, the nature and distribution of population between the urban and rural and the extent of poverty identified in Nigeria, further impoverishment of households is rife given continual OOP payments. This has been identified as the link between poverty and health and has long been acknowledged in literature (see Whitehead et al., 2001; Phipps, 2003; OECD, 2003 etc). The poor when one is analysing poverty with regards to income or ability to command a certain minimum level of basic needs, are generally constrained by income, which implies limited capacity and opportunity for making choices, which also implies that they have limited access to basic amenities and factors that are inherent in their *health production function*², thereby reducing their ability to produce health (see Grossman, 1972) and obviously imply that they will have poorer health status and high burden of disease. Similarly, the unhealthy have limited capacity and productive ability due to the loss of work hours and the morbidity factor. With reduction in work hours, income/wages is affected too thereby reducing growth and income generation capacity. Closely linked to the link between poverty and health is the medical poverty trap phenomenon. This arises due to increasing predominance of out-of-pocket (OOP) payments for health care in most of the developing countries including Nigeria. These OOP payments in both the public and private health care facilities are driving households into poverty and further deepening the poverty levels of those already below the poverty line (Whitehead et al., 2001). This has been identified to generate four main effects (Whitehead et al., 2001)

- (a) Untreated morbidity: This is as a result of inability to finance health care expenditure thereby leaving the illness untreated. This could also further increase or lead to deterioration due to complexities or even eventual death.
- (b) Reduced access to health care: Due to poverty and increased user charges, the poor often delay seeking of health care until such conditions turn out to be severe emergencies which would further erode their financial base and lead to seeking care at a more expensive level. This increased user charges have been identified to generate negative consequences of poorer health status and increased medical expenses and bills.
- (c) Long-term impoverishment: Medical payments are often forced payments (Whitehead et al., 2001) which mean that payment for health care is not a matter of allocation of scarce resources but one of ensuring that finance is sought even if the resources are not available at hand. This is often through borrowing or even the sale of assets. Health care payments of

² The health production function of an individual is a function of several variables (inputs), which include among others, nutrition, income, general consumption of goods, education, consumption of health care services, etc. Some of these inputs enter into the function directly while others enter indirectly.

this sought is the leading cause of impoverishment in some countries of the world and often leads to *catastrophic payments*³ which are often felt more by the poor and the vulnerable within the community.

- (d) Irrational drug use: With increasing cost of accessing health care, poor households often resort to cheaper alternatives which might not necessarily be efficacious. In Nigeria, there has been increase in the predominance of patent medicine vendors and prescriptions by unqualified personnel (See, Brieger et al., 2004).

1.2 Research Problem

In Nigeria, it is estimated that about 70% of the population live below the poverty line (WHO, 2002) of about one US dollar per day spending over 80% of their earnings on food and food related expenditure leaving a smaller fraction for non-food expenditure (WHO, 2002) out of which they make their health care spending. Similarly, only about 60% of rural dwellers have access to health care, which is mainly of a poorer quality of care (ILO, 2001). Access to health care has been greatly reduced for the poor households due to their low purchasing power evidenced by their earnings and expenditure patterns. This is as a result of the nature of the predominant health care financing mechanism earlier identified. Hence, occurrence of illness which is often times stochastic requiring payment at the time of occurrence further restricts rural households' access to health services and further impoverish these households hence denying the poor, access to basic care (OECD/WHO, 2003). This catastrophic nature of financing health care for the poor and often rural population has been a source of worry for the country and other low and middle-income countries (LMICs) of Africa. Advocates, therefore, have been in favour of developing alternative financing schemes to cater for the unexpected nature of health care expenditure which should cover the vulnerable (poor (both urban and rural)) within the society and where these alternative sources of financing have been instituted, they tend to favour the higher socioeconomic groups (Ogunbekun, 1996) and are often targeted at urban areas and cities where the burden of disease is low which reinforces the inverse care law (Hart, 1971). To get around this problem and safeguard the rural poor from the catastrophic nature of health financing, prepayment schemes and community based insurance schemes have been advocated (WHO, 2000; Ogunbekun, 1996; Dong, 2003a). These community schemes, where they have been

³ Such payments are payments in excess of $x\%$ of the household income

instituted have demonstrated success at a small-scale level and further evaluation has been called for to extend the coverage on a larger scale (OECD/WHO, 2003) of which the research is one.

1.3 Aim and Objectives of the Study

The aim of this research is to apply the contingent valuation methodology (CVM) to investigate on empirical grounds the basis for community premiums of the proposed risk-sharing scheme aimed at poverty alleviation and to mitigate the catastrophic effect of health care payment especially in rural areas of Nigeria.

Specific objectives of the study are:

1. To estimate the willingness of rural households to pay for a community prepayment scheme using the Dichotomous Choice Method (DCM) and the Stochastic Payment Card (SPC) design;
2. To determine the major factors that determine rural households' willingness to pay for the proposed scheme;
3. To determine the performance or applicability of other payment vehicle other than cash as it relates to rural communities;
4. To estimate the demand function for a community based health care prepayment scheme; and
5. To compare the results from the two CVM formats for health policy and methodological reasons.

1.4 Justification of Research

The Nigerian government recently re-launched the National Health Insurance Scheme (NHIS) in June 2005 that was first launched in October 1997 (DFID, 2002; ThisDay, 2005) and it is yet to be fully implemented. The NHIS was borne out of the general poor state of the nation's health care services; the excessive dependence and pressure on government provided facilities; dwindling funding of health care in the face of rising costs and population; and poor integration of private health facilities in the nation's health care delivery system (NHIS Protocol, 2004). The major objectives of the NHIS was among others, to ensure that every Nigerian has access to good health care services; protect families from the financial hardship of huge medical bills; limit the rise in the cost of health care services; ensure that health care cost are distributed equitably among different income groups; and ensure high

standard of health care delivery services within the scheme (Laws of the Federation of Nigeria Decree 35, 1999). The benefits to be derived from the scheme include, outpatient services, prescribed drugs under the Essential Drugs List (EDL), diagnostic tests, maternity, antenatal and postnatal care, immunization and family planning among others⁴ (Laws of the Federation of Nigeria Decree 35, 1999).

To ensure the smooth takeoff of the scheme, it was further designed into six distinct programmes to cater for different groups of people. These programmes are:

- (i) Formal Sector Social Health Insurance Programme (FSSHIP)
- (ii) Rural Community Social Health Insurance Programme (RCSHIP)
- (iii) Urban Self Employed Social Health Insurance Programme (USESHIP)
- (iv) Permanently Disabled Persons Social Health Insurance Programme (PDPSHIP)
- (v) Children Under – Five Social Health Insurance (CUFSSHI) and
- (vi) Prison Inmates Social Health Insurance Programme (PISHIP)

Of primary interest in this research is the *RCSHIP*, which is targeted at rural dwellers who are not in regular employment to increase their access to health care. The programme is designed to be run by community members elected by the community and a pocket of such communities in Nigeria where these schemes have been launched are Ijah in Niger state, Jada in Adamawa state, Ibogun Olaogun in Ogun state and Warrake in Edo state (NHIS Protocol, 2004) but these schemes are yet to be fully functional.

Before the full commencement of such schemes in rural Nigeria, quantitative data is needed to quantify and evaluate the intended benefits of the proposed programmes. Often times, these poverty reduction and alleviation schemes are not assessed quantitatively by desk officers charged with the design of the schemes due to sometimes, the lack of knowledge of existing quantitative methodologies which would provide valuable insights into the feasibility or otherwise of the project/programme/policy (Fonta and Ugwuozor, 2005). It is important; therefore, for the government of Nigeria to know the amount rural households are willing to pay (WTP) for any such health insurance scheme on the basis of the contingent valuation method (CVM), and to know if there exist any difference between how much these rural households are WTP and the actual cost of treatment. This information helps the government, planners and policy makers to know if the introduction of such schemes justifies the intended objective and the form of subsidies and

⁴ For a detailed list of the prescribed minimum benefits of the scheme, see (Laws of the Federation of Nigeria Decree 35, 1999)

supplementary funding from the government and donor agencies to cover for the differences if any. Similarly, level of community trust, participation and confidence can be assessed since the scheme is to be instituted in the rural communities.

Obtaining in monetary terms the amounts households are WTP for such insurance scheme which is aimed at mitigating the unexpected effect of health care payments and help alleviate poverty, will involve observation of how much individuals are willing to part with to restore their health state in event of deterioration since health is not directly tradable on the market like any other commodity. The research is hoped to provide empirical grounds in the application of CVM to studies in health care and the relative importance of the formats to be used and help broaden the literature in this area.

2.0 Brief Literature Review

2.1 Theoretical underpinning

Drawing from the neo-classical theory of welfare economics and analysis which incorporates the preferences of individuals/households, where interest lies in obtaining monetary values for any changes in welfare (gain or loss) due to the availability of a specified public good, or in the case of health and health care, changes in the states of health led to the use of the willingness to pay (WTP)⁵ and the willingness to accept (WTA)⁶, which are often referred to as methods of contingent valuation (CVM)⁷ (Hanemann, 1991; Johannesson, 1996; Bala et al., 1999). Originally used in the theory of welfare economics to analyse price changes, Karl-Göran Mäler (1974) first showed that the concept could be employed to analyse quantity changes (see Hanemann, 1991). Closely related to the theory of consumer demand, the maximum amount an individual is WTP gives the value of a health intervention aimed at improving the state of health of the individual (Donaldson et al., 1998; Bala et al., 1999). The amount individuals are WTP is assumed to be additive across individuals within a certain household and community. This implies that the maximum amount a household is WTP is the sum of the WTP amounts for each individual in the household. The same analogy holds for the community.

⁵ This is defined, as the maximum amount an individual is willing to part with to have the scheme initiated. In this context, this may be referred to as *Compensating Variation (CV)*.

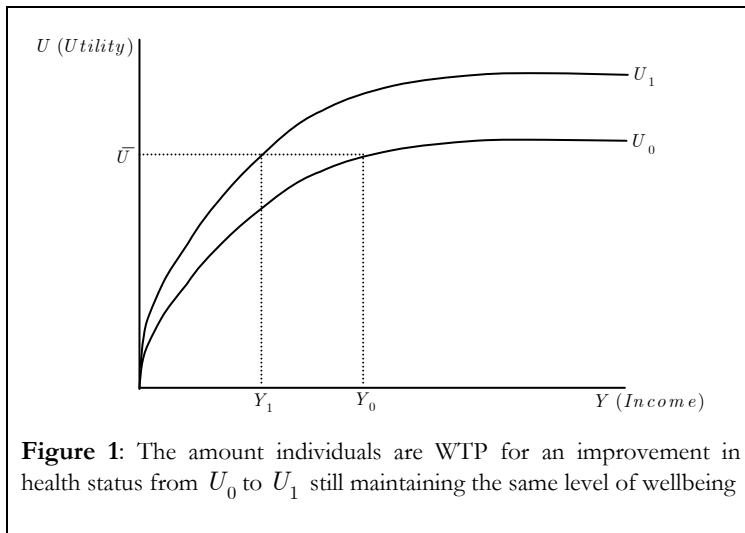
⁶ This is the minimum amount an individual or household will be willing to accept to forgo the initiation of the scheme. This may also be interpreted as the *Equivalent Variation (EV)*.

⁷ It is simply a survey-based device, which operates on the general assumption that one can put monetary valuation on certain classes of goods and services for which there is no market and therefore no price or compensation payment.

Let i represent the individual in the j th household and k represent the community of j households then,

$$\sum_i WTP_i = WTP_j \text{ and } \sum_j WTP_j = WTP_k \quad (1) \text{ and } (2)$$

Assume individuals to be *risk averse* with respect to income in demanding health care, and employing the utility income mapping, also assuming that utility or well-being of an individual is dependent on income and health, the amount an individual will be WTP for an improvement in health or in this case, the amount to be paid into the prepayment scheme, will be the amount of income the individual will be willing to part with still leaving the individual on the same level of utility or well-being as before the payment.



The maximum amount individuals are WTP for the improvement in health state as shown in Figure 1, is defined as the gap between Y_0 and Y_1 measured as $Y_0 - Y_1$ where the curve U_0 denotes the original level of health status and U_1 denotes the improvement in health status. It can be immediately observed that the income level at an improved state of health is lower ($Y_1 < Y_0$) due to

the payment, though the individual still maintains the same level of utility denoted by \bar{U} on an improved health state. If the individual had to pay higher than the amount $Y_0 - Y_1$, then the loss in income will more than offset the increase in wellbeing as a result of the increase in health status (Bala et al., 1999; Johannesson, 1996). This implies that the amount an individual is WTP determines the level at which the individual values the health in relation to the income level and how serious the case of ill health may be. Since health care is not a good traded on the market as other commodities (Johannesson, 1996; Bala et al., 1999), one cannot obtain valuations of WTP directly hence the use of methodologies such as the contingent valuation methodology (CVM).

For simplicity, assume again where individuals are *risk averse* with respect to income, consider a utility framework where the utility of an individual is dependent on the consumption of non-health private

goods (N_h) on the one hand and the health of the individual (H) on the other hand given a certain level of income Y . The utility function of the individual is expressed as:

$$U = u(N_h, H) \quad (3)$$

Under the neo-classical framework, given the respective prices of the various components of the utility function as P_{N_h} and P_H , the affordable combination of bundles is defined by the budget line given these prices. According to Fisher (1996), the individual maximizes utility by choosing the level of provision of N_h but not H as this is out of the immediate control of the individual.

We may express the indirect utility function for the individual as

$$V = v(Y, H, N_h) \quad (4)$$

Where Y is the disposable income of the individual. Assuming that $Y > 0$, we then use the indirect utility function to obtain monetary values of changes in health state. The amount individuals are WTP, otherwise known as the *compensating variation* (CV), is the amount individuals are WTP for a restoration of health state or an improvement in health state still remaining on the same level of welfare defined by (4).

If H is the initial level or state of health, and we assume further that H' is an improved state of health where $H' \succ H$, then WTP of an individual for the improvement in the state of health from H to H' is given as

$$v(Y - CV, H', N_h) = v(Y, H, N_h) \quad (5a)$$

or
$$v(Y - WTP, H', N_h) = v(Y, H, N_h) \quad (5b)$$

The CV or WTP defined in (5a) and (5b) is analogous to the gap $Y_0 - Y_1$ defined in figure 1. This implies that the maximum amount individuals are WTP for the prepayment scheme to obtain the predetermined benefit package is defined by CV out of their disposable income Y , while the individual or household as the case may be, still maintains the same level of utility or state of wellbeing (Varian, 1992; Mas-Colell et al., 1995; Johannesson, 1996).

2.2 Applications to Health and Health Insurance Evaluations

It has been identified elsewhere in models of demand for health insurance that various factors influence the demand for health insurance including access to health care facilities, health care expenditure, and other household socioeconomic and demographic factors including information (Hopkins & Kidd, 1996; Besley et al., 1999; Asgary et al., 2004) and recently, employers plans (Bundorf, 2002). Similarly, the WTP for health and health related interventions by households and individuals is related to factors such as household demographic factors (age, sex, family size, etc); socioeconomic factors (income, wealth, employment, level of education, etc.); health and health related factors (state of health, illness experiences, etc.); and rural characteristics (nature of dwellings, distance to health facilities, etc.) among others (Bala et al., 1999; Dong et al., 2003a, 2003b; Asenso-Okyere et al., 1997; Asgary et al., 2004; Olsen et al., 2004; Binam et al., 2004). In eliciting WTP amounts in contingent valuation studies, the household rather than the individuals have been adjudged to be a better enrolment unit (Dong et al., 2004a, 2005) hence information on these characteristic are better obtained at household level as opposed to individual level.

The WTP methodology though originally applied in the field of environmental economics has been used for years in valuing health benefits and dates back to 1970s (Asgary et al., 2004). Its use, though not only limited to developed countries, is said to be relatively few in the area of health insurance in developing countries (Diener et al., 1998; Asgary et al., 2004). WTP responses have also been identified to be used in ordering preferences and aid in decision making for policy makers in the light of alternative interventions and in deciding on an intervention programme (Asgary et al., 2004; Olsen et al., 2004; Cranfield & Magnusson, 2003; Dong et al., 2004b). Extensive literature exists in the area and field of environmental economics (see Fonta, 2005; Fonta & Ichoku 2005a; 2005b).

Most of the studies carried out in the field of health economics have focused on evaluating benefits from health care interventions and programmes using the Willingness to pay (WTP) approach such as Onwujekwe et al. in south-eastern Nigeria valuing retreatment of mosquito nets with insecticide in four communities, valuing community-based ivermectin distribution; Bala et al. valuing health benefits; Walraven valuing WTP for health services in a district hospital in Tanzania; Weaver et al. valuing the WTP for child survival in Central African Republic, etc. (Walraven, 1996; 1997; Weaver et al., 1996; Stewart et al., 2002; Olsen et al., 2004; Onwujekwe et al., 1998, 2000, 2001, 2005; Bala et al.,

1999) where elicitation were obtained on an *ex post* basis⁸ (Johannesson, 1996; Olsen et al., 2004). Olsen et al. (2004), Gafni (1990) and Johannesson (1996) argue that there are theoretical arguments in favour of the use of *ex ante* as opposed to *ex post* basis for elicitation where insurance-based questions are asked in cases where the actual need for health care and the eventual outcomes are uncertain. The use of *ex post* WTP will not be able to mimic the population as only very few of the population have specific information about the disease and treatment required (Johannesson, 1996). The use of the *ex ante* (insurance based) elicitation guards against one of the argument raised by Cookson (2003) about the presence of ‘budget constraint bias’ where respondents are only faced with making a decision about one intervention relative to others they are not asked about. This is clearly evident in the fact that insurance based elicitation factor into the analysis, possible illnesses and the framework builds on dividing income between health and non-health needs. This approach of *ex ante* elicitation as will be adopted in this research is quite of relevance as it is aimed at eliciting from the individuals or households amounts they will be willing to pay as ‘premiums’ to mitigate the catastrophic nature of health care payments especially when the need arises and the immediate payment out of pocket (OOP), will push the household below the initial welfare state.

In the area of health insurance and community pre-payment schemes, studies carried out include Dong et al. (2003a) in Burkina Faso estimating WTP for community-based insurance, Binam et al. (2004) in rural Cameroon, Dong et al. (2004b) analysing the differences in WTP of household heads for community-based health insurance premiums for themselves and other members of the household, Asenso-Okyere et al. (1997) using the large informal sector of Ghana to value WTP for health insurance, Dong et al. (2003) comparing gender effects of WTP in Burkina Faso for a community-based health insurance scheme, Asgary et al. (2004) in Iran estimating rural household’s WTP for health insurance, etc. These studies conducted to obtain WTP amounts in the area of health insurance have adopted various methods of elicitation of WTP responses ranging from *take-it-or-leave-it process* or the simple *dichotomous choice method* (Dong et al., 2004b); iterative bidding game process (Asgary et al., 2004; Dong et al., 2003b, 2004a, 2004b, 2005; Binam et al., 2004); to a more or less informal elicitation mechanism such as the combined use of focus group discussions (FGDs), in-depth interviews, and a general assessment mechanism of whether households are willing to join in the scheme or not (Asenso-Okyere et al., 1997). Other techniques such as the payment ladder approach

⁸ This relates to where patients have had or are currently presenting the condition of interest but the eventual outcome of the condition as to improvement or deterioration is uncertain.

and the more recent structured haggling technique (Onwujekwe et al., 2005) has not been found in literature to be used for eliciting WTP insurance based responses from respondents.

2.3 Limitations of Community Insurance or Prepayment Schemes Based Elicitations

Assuming the need to pay for the establishment of a community prepayment scheme for curative as well as for preventive care, in the absence of a certain condition or previous condition of ill health, the respondent being in this case, the household head will be faced with series of decisions as to attachment of weights and probabilities to certain latent conditions. The outcome of this process might not be optimal since varied probabilistic statements or assumptions by respondents is dependent on their own perceptions and risk valuation which obviously might vary from respondent to respondent hence the problem of carrying out an aggregative analysis might cast some shadows on the reliability of the result. Further researches need to be carried out in this area to see if with a larger number of respondents, the errors cancel out or at least is minimal.

3.0 Methodology

“Rather than suggesting that there is one universally correct approach to eliciting WTP-values, we would hold that it is the issue and the policy context that should determine the chosen approach” (Olsen et al., 2004: 226)

3.1 Study Population/Area

The study population for the research is rural households in Nsukka Local Government Area (LGA) of Enugu State of Nigeria with a projected population of 254,442 (1996) (NPC, 1996). Nsukka LGA is located in the northern part of Enugu State, south-eastern Nigeria. It consist of 15 communities with the following populations: Anuka (776), Okutu (4,022), Ibagwa-agu (1,304), Okpuje (9,259), Ibagwa-ani (9,443), Okpaligbo (2,500), Obukpa (20,056), Alor-uno (6, 530), Edem (16,661), Obimo (12,753), Lejja (15,325), Ede-oballa (14, 368), Opi (25, 384), Ehalumona (36, 129) and, Nsukka (79, 913). The LGA has quite a number of health facilities. In 2003, there were two general hospitals run by Enugu State Government, 20 primary health clinics run by Nsukka Local Government, 20 private and mission hospitals, 25 private maternity centres, 11 private clinics and, a medical centre which is located in the University of Nigeria (Ichoku & Leibrrandt, 2003).

3.2 Study Design

The Sample Size for the Study

Given an annual growth rate of 3% (Todaro, 2000), the projected population based on the 1996 population of 254,442 would be about 332,000 in 2005. Given an average household size of 5 members, the projected number of households would be estimated as approximately 66,400. Obtaining an optimal sample size, we may use the Taro Yamane (1967) specification (see Israel, 1992) given as:

$$n = N / (1 + N(e)^2) \quad (6)$$

Where n = the sample size to be estimated

N = population size (Household size) and

e = error margin

Allowing for an error margin of $e = 0.05$ or $e = 5\%$, we obtained the desired optimum sample size as

$$n = \frac{66,400}{(1 + (66,400)(0.0025))} = 398 \text{ households}$$

The figure was then rounded-up to 400 households.

Data Requirements and sources

Contingent valuation studies of this nature usually require the use of primary sources of data through interviewer-administered structural questionnaires. These data will be elicited from rural household heads. Most important of the data to be obtained include socioeconomic and health characteristics, environmental and dwelling characteristics⁹, etc. Of particular importance in the understanding of the medical poverty trap is to collect data on health care seeking behaviour, cost of seeking treatment, and the nature of health care financing including the sources of payment for health care. In analysing the willingness-to-pay, data requirements include eliciting the amounts households are willing to pay and debriefing questions to identify protest zeros and outliers (protest responses), which are traditional for a sound contingent valuation study. The data will be collected through field surveys to be conducted in Nsukka Local Government Area.

⁹ A full description of the variables elicited is contained in the questionnaire.

Selection Procedure

The field survey for the study commenced in late September lasting for about 4 weeks. For sampling, a two-stage selection procedure was adopted. The first stage was to randomly select 5 communities out of the 15 communities in Nsukka LGA namely; Obukpa, Edem, Nsukka, Ibagwa-Ani and Ehalumona. From these 5 communities, the Federal Office of Statistics (FOS) enumeration-listing booklet was used to select 4 Enumeration Areas (EAs) from each of the 5 communities. In the second stage, a simple systematic random sampling technique was used to select 20 households from each of the EAs. The services of 4 seasoned professional enumerators and 2 graduate students of the University of Nigeria were employed after an intensive 4-5 days training and briefing on the CVM methodology. The questionnaire used comprises two broad sections. The first section is composed of the general information, health information, assets/housing information, and community participation in the scheme while the second section is made up the WTP questions using two formats (the Dichotomous Choice and the Stochastic Payment card formats).

3.3 Analytical Framework

In a WTP study, the choice of method of analysis is an issue that has received relative consideration in the literature (Donaldson et al., 1998). Though it has been identified that there is no 'standard' way of conducting a contingent valuation study (Asgary et al., 2004), the general agreement has been that the choice of the appropriate econometric method is dependent on the nature of WTP questions posed to respondents (Donaldson et al., 1998). Given the nature of most of the responses obtained from a WTP question of a CVM study, that is, the variable is limited or bound under a certain range, usually dichotomous $[0, 1]$ or multinomial $[0, 1, 2, \dots, n]$, this is usually as a result of accepting or rejecting the proposed price or amount. This implies, therefore, that the conventional regression analysis would not be suitable to apply to estimate an equation with limited dependent variable as such an estimation would imply the *linear probability models* (LPMs) which has been flawed on several grounds including the inability of ensuring that the predicted probabilities fall between $[0, 1]$, producing inconsistent estimates, etc. (see Wooldridge, 2002).

We therefore construct limited probability models, which are amenable to the data and capture the data generating process. The National Oceanic and Atmospheric Administration (NOAA) provides a basic guideline for conducting contingent valuation studies in environmental resources damage (Arrow et al., 1993) but in the area of health economics, researchers have been sceptical about its use (Stewart

et al., 2002). In its simplest framework, the NOAA advocates the use of the *DCM* based on the grounds of compatibility with larger sample sizes for reliability (Arrow et al., 1993; Stewart et al., 2002).

The use of limited dependent variable model (LDVM) is, therefore, evident based on the nature of responses obtained generally from a WTP question (Donaldson et al., 1998) as opposed to the conventional OLS framework or LPM as has been highlighted. Following Donaldson et al (1998), when closed ended questions are asked as is the case with the DCM, the appropriate LDVM will be the use of logit or probit models depending now on the underlying assumptions made about the distribution of the error term (Maddala, 1983; Wooldridge, 2002; Greene, 2003). Often times, the choice of either the probit or logit model depends on the preference of the researcher.

In general, we may specify a binary response model as

$$P(y = 1 | \mathbf{x}) = G(\mathbf{x}\boldsymbol{\beta}) \equiv p(\mathbf{x}) \quad (7)$$

Where $0 < G(\mathbf{x}\boldsymbol{\beta}) < 1 \quad \forall z \in \mathbb{R}$

Where \mathbf{x} is $1 \times K$, $\boldsymbol{\beta}$ is $K \times 1$ and the first element of \mathbf{x} is unity where a constant is present.

In general also, we may derive an index model given by (7) where G is a cumulative distribution function (*cdf*) from an underlying latent variable model given as:

$$y^* = \mathbf{x}\boldsymbol{\beta} + u, \quad y = 1[y^* > 0] \quad (8)$$

$$P(y = 1 | x) = P(y^* > 0 | \mathbf{x}) = P(u > -\mathbf{x}\boldsymbol{\beta} | \mathbf{x}) = 1 - G(-\mathbf{x}\boldsymbol{\beta}) = G(\mathbf{x}\boldsymbol{\beta}) \quad (9)$$

Equation (9) is obtained by substitution and simplification of Equation (8). It is important to note that u is symmetrical and has a mean of zero. It also independently distributed of \mathbf{x} . The major aim of the use of a limited dependent variable model is to explain the effects of x_i on the response probability $P(y = 1 | \mathbf{x})$ and not $E(y | \mathbf{x})$.

However, as noted by Fonta (2005: 58-61), these two models using the normal and the logistic functions have some practical limitations especially in the application to CVM studies. The limitations include:

- (1) Having information on x_i (vector of independent variables) for only some observations giving rise to a censored sample problem.
- (2) We may also record large numbers of $y = 0$ responses giving rise to an item non-response problem.
- (3) If the procedure for discarding $y = 0$ responses in limitation (2) is non-random as usually the case, we run the risk of encountering a sample selection bias problem.
- (4) Because peoples' economic valuation process of almost all classes of market and non-market goods and services is characterized by uncertainty, applications of the above models may be limited in this regard.

Given these limitations, two econometric models considered very relevant for this analysis are the sample selection, and random valuation models.

3.4 Willingness to Pay Models

In the DC with open-ended follow up questions, Strazzera et al. (2003a) suggest the use of sample selection models for modelling the two joint decision processes of the respondent. Modelling the decision process of the respondent using the joint or linked processes, which involves the decision of either participating or not, and the revelation of the reservation price, we formulate one of the equations as the choice of participating or willing to pay or not, which is a binary decision process and the second equation as the outcome, valuation or WTP equation for only the non-protesters correcting for the selected sub-sample of participants. The basic idea behind the formulation is letting a dummy variable (for the participation equation) take on the value of 1 if we have information on the respondent's reservation price and zero if otherwise; thereby defining another variable (which need not necessarily be a dichotomous variable¹⁰) that is now representing the response from the open-ended follow-up question conditional upon the initial dichotomous variable assuming the value of unity (non-protesters) for the valuation equation. This is because if such responses (protesters) are excluded from the analysis on *ad hoc* basis, we run the risk of encountering a selection bias problem, which may sensibly affect the final WTP results and welfare estimates for purposes of inferences. In order to address this problem, we shall use a sample selection model in the fashion discussed by Strazzera (2003a); Calia & Strazzera (2001); Fonta and Ichoku (2005d).

¹⁰ If the variable becomes a binary variable, the estimation procedure simplifies to a bivariate probit model usually handled by `heckprob` in stata.

Let Y_2 represent the revealed amount by the respondent and Y_1 denote a dichotomous variable which assumes the value of unity if we have information pertaining to the respondent's mean WTP and 0 if otherwise. Let also \mathbf{z} and \mathbf{w} represent the vector of covariates (socio-economic and health characteristics, etc.) for the valuation and the selection equations respectively (which may or may not be different), we may then formulate the following representations using a bivariate model as:

$$\ln Y_{2i} = \begin{cases} z_i' \beta + \sigma \mu_i, & \text{if } Y_1 = 1 \\ \text{unobserved}, & \text{if } Y_1 = 0 \end{cases} \quad (10)$$

to represent the logarithmic transformation of the revealed amount which yields the (log)WTP equation, where σ is a scale factor, as the valuation equation.

And

$$Y_{1i} = \begin{cases} 1 & \text{if } w_i' \psi + \varepsilon_i \geq 0 \\ 0 & \text{if } w_i' \psi + \varepsilon_i < 0 \end{cases} \quad (11)$$

representing the selection equation. From Equations (10) and (11), Y_2 is observed only when Y_1 is unity ($w_i' \psi + \varepsilon_i \geq 0$). μ_i and ε_i are two error terms with joint cumulative density functions c.d.f. $\mathbf{F}[\mu_i, \varepsilon_i]$, which is assumed to have a bivariate normal distribution with mean zero, unit variance and correlation $\text{corr}(\mu_i, \varepsilon_i) = \rho$. In the absence of sample selection problem, the parameters of Equations (10) and (11) can be estimated separately. Sample selection problems arises, therefore, when $\rho \neq 0$. In other words, these two processes are not separate.

Expressing the conditional expectation of the log of WTP [$\ln(WTP)$] on $Y_1 = 1$, we obtain:

$$\begin{aligned} E(\ln Y_{2i} \mid z_i, Y_{1i} = 1) &= z_i' \beta + \rho E(\mu_i \mid Y_{1i} = 1) \\ &= z_i' \beta + \rho E(\mu_i \mid w_i' \psi + \varepsilon_i \geq 0) \\ &= z_i' \beta + \rho \sigma \lambda(w_i' \psi) \\ E(\ln Y_{2i} \mid z_i, Y_{1i} = 1) &= z_i' \beta + \rho \sigma \lambda(w_i' \psi) \end{aligned} \quad (12)$$

where $\lambda(w_i' \psi) = \frac{\phi(w_i' \psi)}{\Phi(w_i' \psi)}$ represents the inverse of the Mills' ratio; ϕ and Φ are the density and distribution functions for the standard normal variable respectively.

It follows from Equation (12) that estimating the respondents mean WTP based only on observed responses where $Y_1 = 1$ (i.e., those with likelihood matrices or non-protesters) could be incorrect if there is bias introduced by self-selection of individuals that protested (i.e., those with no likelihood matrices) as can be observed from the last component on the RHS of the equation. Thus, to check the presence of sample selection bias, the two choices can be modelled simultaneously (Calia & Strazzera, 2001, Strazzera et al., 2003b) using the Heckman 2-step procedure, Maximum Likelihood estimation, etc.

For the Full Information Likelihood (FIML) estimation, we set up a likelihood function following Strazzera et al. (2003a) as:

$$\begin{aligned} \ln L = & \sum_{Y_{1i}=0} (1 - I_i) \ln \Phi(-w'_i \psi) + \sum_{Y_{1i}=1} I_i \ln \Phi\left(\frac{\ln Y_{2i} - z'_i \beta}{\sigma}\right) \\ & + I_i \ln \Phi\left(\frac{w'_i \psi + \rho((\ln Y_{2i} - z'_i \beta) / \sigma)}{\sqrt{1 - \rho^2}}\right) - I_i \ln \sigma \end{aligned} \quad (13)$$

Maximization of the Log-likelihood function yield sets of simultaneous equations of the parameters of both the Valuation (WTP) and the selection equations. However, note that if $\rho = 0$ ¹¹, then Equation (13) can be split into two parts: a Probit for the selection equation and an OLS for the outcome equation (see Breen, 1996).

In most applied empirical researches involving sample selection bias, the Heckman 2-step procedure represented by Equation (12) has been widely used because of its computational simplicity compared to the FIML presented in Equation (13) (see, Strazzera et al., 2003a) and also due to lack of convergence of the FIML computations. However, Heckman's procedure often performs poorly in the presence of collinearity between the covariates of the two choice processes hence the need to further test for the presence of collinearity in the Heckman's 2-step procedure and justify the use of the FIML estimator (Strazzera et al., 2003a). To test for collinearity, Strazzera et al. (2003a) suggest testing the significance of the R^2 obtained from the least squares (OLS) estimation of the IMR on the

¹¹ Theoretically, if $\rho = 0$, it implies the absence of sample selectivity bias.

covariates of the WTP or valuation equation¹². A high value of R^2 is an indication of collinearity. Strazzera et al. (2003a) provides a sequential basis upon which the choice among estimators (OLS, Heckman 2-step and FIML) should be based.

Following the estimation of the parameters of the valuation equation (10) with any of the standard econometric or statistical software as Stata 9.0 in this case, we also obtain the mean and median WTP. According to Strazzera et al. (2003a), given the lognormal distribution of the variable Y_2 with parameters $z'\beta$ and σ , the estimate of the median WTP will be obtained by the expression:

$$\text{Median} = \exp(z'\beta) \equiv e^{(z'\beta)} \quad (14)$$

While the mean WTP is obtained as:

$$E(Y_2) = \exp(z'\beta + \sigma^2/2) \equiv e^{(z'\beta + \sigma^2/2)} \quad (15)$$

The confidence interval for the median can be calculated using Cameron's (1991) analytical formula modified for lognormal distribution as:

$$CI_{0.95}[\text{median}] = e^{z_0'\beta} \pm t_{0.025} \sqrt{z_0' e^{z_0'\beta} \hat{\Sigma} \beta z_0 e^{z_0'\beta}} \quad (16)$$

by obtaining the estimate of the asymptotic variance-covariance matrix of $\hat{\Sigma}\beta$. While the confidence interval for the mean is obtained through a similar fashion using:

$$CI_{0.95}[E(Y_2)] = e^{(z_0'\beta + \sigma^2/2)} \pm t_{0.025} \sqrt{z_0' e^{(z_0'\beta + \sigma^2/2)} \hat{\Sigma} \beta z_0 e^{(z_0'\beta + \sigma^2/2)}} \quad (17)$$

Where also $\hat{\Sigma}\beta$ is the estimate of the asymptotic variance-covariance matrix of the parameter estimates.

For analysis of the SPC data, we utilized a Random Valuation Model (Wang & Whittington, 2000; 2005; Wang et al., 2004). In the SPC set-up, the probability that each of the CVM respondent's with a cumulative valuation distribution function $F[\bullet]$ would accept the offer presented on the card design at price of T is given as:

$$\Pr(\text{Yes}) = \Pr[\text{WTP} > T] = 1 - F[T] \quad (18)$$

¹² Another test suggested is the use of condition number (see, Strazzera et al., 2003a).

Where, WTP is the respondent's true valuation for the scheme, and T is the price (or amount). The cumulative valuation distribution function $F[\bullet]$ in equation (18), the valuation probability density function, as well as the mean, and variance, of the probability function can be estimated with the likelihood matrix data obtained with the SPC approach.

To estimate the valuation distribution is straightforward. From equation (18) the valuation distribution is estimated as follows:

$$P_{ij} = 1 - F_i[T_{ij}] \quad (19)$$

Where, P_{ij} is individual i 's probability (i.e., the number circled by respondent i on the SPC) of being willing to pay the stated price T_i indicated at the j^{th} payment point; and $F_i[\bullet]$ is his/her cumulative valuation distribution function. Assuming that $F_i[\bullet]$, is normally distributed such that:

$$P_{ij} = 1 - \Phi \left[\frac{\mu_i - T_{ij}}{\sigma_i} \right] \quad (20)$$

$$T_{ij} = \mu_i + \sigma_i \Phi^{-1}(1 - P_{ij})$$

Then, with each individual's set of T_{ij} 's and P_{ij} 's contained in the likelihood matrix obtained with the SPC design, simple regression can be used to estimate the mean and variance (μ_i, σ_i) of each individual's valuation distribution. However, for individuals who do not have a valuation, mean WTP cannot be observed. If such responses are excluded from the analysis on ad hoc basis, we run the risk of encountering a selection bias problem, which may sensibly affect the final WTP results for purposes of inferences. In order to address this problem, we shall use a sample selection model as discussed in Fonta and Ichoku (2005d), Strazzer et al. (2003a) and as shown in Equations (10) to (17).

4.0 Ethical Considerations

As a standard procedure for most health related researches, ethical clearance was obtained from the University of Cape Town (UCT) ethical research committee, the Nsukka local government authority and also consent obtained from the respondents who are interviewed in their own language (Ibo). The research was fully explained to the respondent (household head) as contained in the questionnaire and their participation and response was voluntary and are, therefore, free to withdraw from the study

at any point in time they wish to without any harm to them. These respondents are also free to ask for clarification in terms of questions posed which they are not clear about. The respondents having being briefed of the potential benefit(s) and expected duration of the interview were assured of anonymity and confidentiality of responses provided.

5.0 Econometric Software

The software for analysis are MS-Excel used for data entry and preliminary cleaning, and STATA 9.0 for both the Dichotomous choice model and the Stochastic Payment Card (SPC) method.

6.0 Work Plan

s/n	ACTIVITY	DURATION (MONTHS)
1	Comprehensive Review of relevant literature	1
2	Preparation and refinement of survey instrument	1
3	Field work exercise including piloting	2
4	Data entry, cleaning and coding	1
5	Data analysis (including preliminary analysis)	2
6	Preparation of Report	2
7	Dissemination of Findings	1
Total		10 months

7.0 Policy Relevance of Research

Out-of-pocket (OOP) payments for health care in the Nigeria contribute over 70% of health care expenditure which impoverishes poor households who barely manage to live on basic subsistence. Health care prepayment schemes as have been established in some resource poor countries have been proffered as a viable option as a means of safeguarding the poor from the huge burden of disease and forced medical bills. As a preliminary step in moving towards a comprehensive health insurance, these health prepayment schemes can serve the purpose of increasing rural households' access to health care and reduce the burden of illness which often leads to the medical poverty trap phenomenon.

To design a viable and attainable prepayment scheme for the poor and predominant rural population, quantitative data is required as a policy guide to aid the government and stakeholders in an optimal decision making path. These data are easily available through the contingent valuation methodology employing the willingness-to-pay approach. One of the important extensions to this for policy purposes is the inclusion of uncertainty in modelling individual's behaviour using the Stochastic Payment Card design to mimic decision making in the real world situation. Results obtained from this study will inform policy in:

1. Knowing the value rural households and the poor place on their health and health care needs in relation to their socioeconomic environment;
2. Knowing the willingness and readiness of these households to participate in a community financing scheme which will form a basis for expansion of such schemes in the country and help reduce the financial burden of forced health care payments;
3. Identifying the vulnerable groups and to determine what form of contributions in the form of sliding premium scales and different or mixed contributory mediums to apply;
4. Identifying the volume of financial resources that will be available to such schemes (from a welfare estimation perspective) and to know if there exist any significant difference between these amounts and the actual cost of treatment, hence identify the nature and commitment of the government, donors and other financial contributors toward health care subsidy; and
5. Helping in the design of an integrated poverty alleviation scheme, and move the country toward universal health insurance coverage while also moving toward the attainment of the Millennium Development Goals.

8.0 Expected Output and Dissemination of Findings

The findings obtained from the research, will be disseminated at national conferences involving issues of health financing in developing countries, and also pertinent issues surrounding the design of health insurance and prepayment schemes in developing countries and in Nigeria.

The findings of the research will also be presented to the domestic community through the traditional ruler of Nsukka community and similar neighbouring communities; to the Nsukka local government department of health and neighbouring local government health authorities; to the Enugu state ministry of health; to the federal ministry of Health in Nigeria; to non-governmental organisations (NGOs) and other agencies involved in health care financing issues and how they are related to poverty alleviation and cushioning of households from the excruciating effects of forced health care payments.

The findings from the research will also be made available to researchers and policy makers involved in the area of feasibility of alternative sources of financing health care via community arrangements in Nigeria and any developing country and will be published in reputable journals with all the sources of funding and assistance gratefully acknowledged.

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APPENDIX

Appendix I (Sample of the Dichotomous choice design)

Most of the time when people fall sick, they tend to adopt various way of coping with such an event this includes selling off personal belongings such as animals, electronic gadgets, and if intense, land and landed property. Sometimes also, households tend to resort to borrow money from their neighbours, the church or religious organization or friends. This is because there is always a desire to get better again and if possible, quickly. If the individual or household fails in obtaining financial help, often times the sick individual has no option than to remain in the state and begin to deteriorate. Others decide at this point to go for cheaper alternatives, which might not be efficacious such as the use of traditional healers and medical practitioners. The scenario is also worse if the family finally obtains financial assistance only to discover at that point that the sick individual has given up.

Now, considering the financial burden and other risks you (household and individuals) might face, a non-governmental organisation is deciding on the establishment of a scheme (insurance) for this community which will help solve the problem of sourcing money especially when an individual falls ill. When this scheme is instituted, and you join, you will then be expected to pay a certain amount as premium quarterly for a year. If you pay the premium, you will not pay for the following services offered you/your household at any designated public health centre nearest hospital for the period of a year. These include: Diagnosis and laboratory tests carried out in Bishop Shanahan hospital or any other public health care facility, cost of drugs, cost of in-patient days for up to 30 days for any member of your family, minor surgeries such as appendectomy and caesarean sections. This will help to (1) increase access to health care services at the time of need, (2) reduce the effect of poverty amongst community, (3) increase community ownership of such scheme and reduce fund misappropriation and (4) increase productivity of rural workers (including farmers) from the effect of sick days and need to cater for the sick rather than engaging in productive activities.

Considering the importance of the scheme mentioned, will your household be willing to pay ___ Naira per annum to obtain the prescribed minimum benefits of the scheme? (Yes/No)

What is the most your household can afford quarterly for the scheme? _____

If no WTP amount is reported, why will your household not be WTP for the scheme?

- i) The programme has no value to my household
- ii) We cannot afford to pay
- iii) Government should pay for such a programme
- iv) Other members of the society should pay
- v) Out-of-pocket payment is better
- vi) I am not clear about the proposed programme
- vii) I am not comfortable with this particular question
- viii) Other (specify).....

If there is an option of paying in kind (commodities), will your household contribute? (Yes/No)

If yes, what quantity of yam, rice, beans, cassava, etc can your household afford quarterly? _____

Start Prices will be: (200, 400, 600, 800, and 1,000) Naira.

Appendix II (Sample of the Stochastic Payment Card Design)

Now consider your monthly income and your expenditure before you vote for a particular price. If the price you are going to choose will re-arrange your expenditure pattern, probably by increasing it, how probable are you to pay each of the following prices quarterly in order to obtain the benefits of the scheme in the community?

Quarterly cost to the household in Naira	Definitely no	Probably no	Not sure	Probably yes	Definitely yes
0	0%	25%	50%	75%	100%
200	0%	25%	50%	75%	100%
400	0%	25%	50%	75%	100%
600	0%	25%	50%	75%	100%
800	0%	25%	50%	75%	100%
1000	0%	25%	50%	75%	100%

[Note: Enumerator/Interviewer, present the respondent each of the prices and circle the probability that corresponds to the action of the respondent during response].