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Abstract

This paper analyses the demand for Micro Health Insurance (MHI) in rural Bangladesh by estimating the Willingness to Join (WTJ) and the Willingness to Pay (WTP) behaviour for an expanded version of the existing Micro Health Insurance (MHI) package of Grameen Kalyan (GK). A survey was conducted on about 4,000 randomly selected households in 120 villages drawn from seven districts. We chose 20 locations consisting of 10 programme and 10 control areas, each of which was adjacent to a programme area. We used a variant of the bidding game approach with an open-ended follow up question to elicit WTP. The results show that overall WTJ is 54 per cent and average WTP on the part of households who expressed WTJ the package (BDT406±171) are both quite low. The multivariate results show that a number of individual, household and village attributes including gender, knowledge about health insurance, economic factors, an episode of child delivery in the household and flood in the village, and location of household influence respondents' decision to join the package as well as WTP. In view of the evident indifference to the GK type MHI coverage, and wider evidence cited in the recent literature, one inescapable conclusion may be that financial solvency for private heath insurance targeting the poor may remain a distant goal.

Key Words: Demand, Micro Health Insurance, Willingness to Join, Willingness to Pay, Bidding Game, Grameen Kalyan, Bangladesh.

JEL Classification: G22, J44, I12, H51, H52, and H53, and H75.

Demand for Micro Health Insurance in Rural Bangladesh*

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1. Introduction

Enormous financing gap is one of the major concerns in the health sector in many developing countries and the Bangladesh case is no exception.[1] Research reported in the Bangladesh National Health Accounts (BNHA) reveal that public share of Total Health Expenditure (THE) has been on a secular decline from 37 to 23 per cent over the period, 1997-2012 (MoHFW, 2015). The consequence has been that the share of private spending has been on the rise (from 57 to 68 per cent over the same period) with the Out-of-Pocket Payment (OPP) component having risen form 56 to 63.3 per cent of THE. Equally striking is the observation that the 'voluntary pre-payment', namely the private health insurance premium revenue, has been consistently stagnant at 0.1 per cent of THE between 1997 and 2012. The trend in the composition of THE emerges as the key crisis in financing healthcare in Bangladesh. The weakness of public spending growth mainly stems from the limitations of slow-moving national tax base, the mainstay of the financing system. The main implication of high OPP is that households are forced to pay at the point of service delivery when they are less able to do so (e.g., due to a fall in earnings on account of illness) and, thus, the poor often undertake costly coping strategies

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[1] According to figures compiled by Bangladesh National Health Accounts, Bangladesh spent about USD 27 per capita (BDT 2,167) on health in 2012 of which only 23 per cent (i.e., about USD 6.23) was provided by the government (MoHFW, 2015). Voluntary private payments contributed another 5.25 per cent while direct foreign transfers accounted for the remainder, namely 8.4 per cent. Earlier it was also the case that a significant part (about 35%) of the government healthcare expenditure had in turn been financed by donor sources (IMF, 2005); updated information on this score appears not readily available.

such as additional borrowing, depletion of saving and distress asset sales. In contrast, collectively households can in principle succeed in reducing OPP by spreading the costs of care across time and over the size of the risk-pool if these resources can be channelled via the contrivance of health insurance. In Bangladesh several NGOs/ microfinance institutions (MFIs) including Gano Shasthya Kendra, Grameen Kalyan and Sajida Foundation offer some form of health insurance, though in a limited scale. However, these schemes do not provide meaningful coverage to the clients (Ahsan *et al.*, 2012b and Ahsan *et al.*, 2013).

The concept of microinsurance products or services has been well probed in the literature. The key elements that characterise microinsurance are that this (1) be targeted at low-net worth households, (2) be designed to reflect *risk pooling* by the insured, (3) be priced following the *willingness to pay* criterion and the expected costs of the risks involved (Churchill, 2006), (4) be developed in close collaboration with potential stakeholders and beneficiaries, e.g., with *community participation* in its design (MIA, 2006), and (5) be of substantive value to the poor for *addressing vulnerability* to poverty (Ahsan, 2009).

When it comes to health, one may legitimately ask what is 'micro' about health coverage since the potential costs of treatment depend largely on the severity of the illness than the social background of the patient. A careful review of the definition advanced here reflects that if all the *five* features identified above were indeed satisfied, the end product would differ significantly from mainstream insurance products one is familiar with. In other words, these products need not be of low sum-assured in any absolute sense; instead these must of necessity be of substantive value to the poor in the context. Consequently health coverage that fulfils the above conditions may be termed 'Micro Health Insurance' (MHI) and it is in this holistic vision that we refer to MHI in this paper. By the same token the kind of part pre-payment heath financing experiments being conducted in rural Bangladesh do not qualify as examples of MHI as conceived here; (see Ahsan *et al*, 2013).

By exploring the demand for MHI and the willingness to pay for it, this paper contributes to the literature on the feasibility of MHI as an alternative mode of financing healthcare in a developmental setting. The issue is policy relevant even when one is agnostic about the medium-to-long-term viability of MHI; indeed in spite of the ambiguity, availability of contextual and up-to-date information on demand is of utmost value to the policy maker and policy advocacy groups, especially when there appear few effective means of financing comprehensive healthcare to the rural poor.[2]

Demand for MHI can be analysed in two critical steps, namely the demand for a given MHI scheme by the potential beneficiaries (namely the 'willingness to join', WTJ), and the maximum

[2] The jury is indeed out on the question whether MHI, however carefully designed, can be financially sustainable in a developmental context without permanent premium subsidy. Microinsurance Centre, upon examination of three-to-five years' financial data for several microinsurance schemes (e.g., India, Kenya, Philippines and South Africa), concludes that no business case can be made for comprehensive health or agricultural insurance (e.g., Covan, Chandani and Garand, 2013; Covan and McCord, 2014 and Hill, Magnoni and Zimmerman, 2014). This stance however is highly judgmental since it is not immediately clear how well designed these schemes were and also how comparable.

level of 'willingness to pay' (WTP) upfront as premium. Such knowledge is indispensable to determining the feasibility of the scheme, its design features (e.g., deductibles), assessing the premium and setting subsidies, if appropriate. Although there are a good number of studies of nascent MHI experiments in the developmental context, there has been little focus in this area of research in the Bangladesh context.[3]

In particular, here we analyse the WTJ and the WTP for an enhanced version of then existing micro health insurance scheme offered by Grameen Kalyan (GK) covering both the areas where the programme was in operation (i.e., 'programme areas') and where it was not ('control areas').[4] The choice of the health insurance scheme and location of study area was motivated by the fact that GK's existing MHI scheme was one of the largest of its kind (namely, benefits in kind) in terms of geographic coverage in Bangladesh.[5] For the present study about 4,000 households were randomly drawn from a census of 120 villages in rural Bangladesh. In order to elicit the WTJ and WTP decisions, we have used the bidding game approach with an open-ended follow up. The Heckman selection model was analysed to determine the factors influencing the decision regarding both WTJ and WTP. The overall willingness to join the proposed package was seen to be 54 per cent and the average willingness to pay was BDT 406, which may well be below the level requires for break-even, an issue we dwell on below. The analysis reveals that WJI is influenced by a number of individual, household and village-level attributes such as gender, knowledge about health insurance, economic factors, an episode of child delivery, location of household vis-à-vis the health centre and the incidence of any recent flooding in the village. These same factors also influence the WTP value.

[3] Various authors have analysed the demand for MHI, among others, in the context of Burkina Faso (Dong *et al*., 2003a, 2003b, 2003c, Dong *et al*., 2004a), Ghana (Asenso-Okyere *et al*., 1997), India (Dror *et al*., 2007), Iran (Asgary *et al*., 2004), Namibia (Wright *et al*., 2009), Nigeria (Onwujekwe *et al*., 2010) and Taiwan (Tang *et al*., 2007).

[4] Grameen Kalyan (GK), a social business organisation of the Grameen Bank family, has been operating its prepaid health insurance scheme for more than 15 years now. This scheme offers benefits to clients through its health centres in various rural locations. It would be useful to describe the older and the proposed packages (i.e., proposed for the express purpose of the present elicitation study) in this context:

Already existing package: BDT 20 for consultation fee with a doctor; 10 per cent discount on MRP of quality medicine; 30 per cent discount on the costs of blood, urine, stool and other pathological tests; 20 per cent discount on ECG and ultrasonography charges; BDT 30 for blood sugar test for a diabetic patient; maximum BDT 2,000 per household annually for hospitalization benefits in facilities external to GK (though it was rarely, if ever, made available); and free health check-up by health workers through domiciliary visits. The annual premium for a household of six members or less was BDT 250 and BDT 25 for each additional member.

Enhanced package: Free consultation with a doctor; 20 per cent discount on MRP of quality medicine; 50 per cent discount on the costs of blood, urine, stool and other pathological tests; 50 per cent discount on ECG, ultrasonography and other medical investigations; BDT 15 for blood sugar test for a diabetic patient; half of the hospitalization costs per household (but not more than BDT 10,000) annually; and free health check up by health workers through domiciliary visits. Each household was asked to pay BDT 500 annually as premium, which is double the price of the existing package as this entailed double the coverage for most elements, and in case of hospitalization, the benefits were 5-fold. For simplicity we did not ask any additional premium for households of more than six members.

[5] While the existing package may not have fulfilled all criteria for MHI as advanced above, the enhanced package would come closer. However for the sake of simplicity, we refer to both the schemes as 'MHI' in this paper.

The organisation of the paper is as follows. Section 2 explains the methodology of the study including data collection procedures, WTJ/WTP elicitation and the related analytical methods; section 3 presents the findings; section 4 provides a discussion of the findings in relation to the extant literature; while section 5 offers some conclusions.

2. Methodology

2.1 Survey Methods and Data

This paper uses data from the baseline survey of a longitudinal study project entitled 'Microinsurance Poverty and Vulnerability' carried out by the Institute of Microfinance (InM) during 2009-13. The survey covered ten programme areas spread over seven out of 14 districts in rural Bangladesh where GK had been operating its prepaid card-based micro health insurance (MHI) scheme at the time.[6] The survey used a programme-control design such that the ten care delivery centres were selected purposively taking into consideration a suitable mix of established and newer centres and the geographic variation among these locations. Each GK programme area physically comprises of an approximate radius of 8 km around the respective health centre.

One comparable union adjacent to each GK programme centre was then selected purposively to serve as the 'control' area in question. The control areas lay wholly outside the radius of GK operational boundary but shared similar characteristics in all other aspects. A sample of 7 villages were randomly selected from each of the 10 programme strata and 5 villages from each of the 10 control strata from a listing of all the villages in both these strata, thus yielding a total of 120 villages to be considered as primary sampling units (PSUs).

In the next stage, a census was conducted in all PSUs and about 30,000 households were listed in total. In the programme villages, the listed households were divided into two groups: GK health insurance card holders (GCH) and non-card holders (NCH). In each programme stratum 150 households were randomly selected from the non-card holder group and 105 from the cardholder group except in one case where only 65 cardholders were available. A total of 2,510 households (1,010 card holders and 1,500 non-card holders) were then selected from the programme areas. In each control stratum 150 households were randomly selected from the listed households resulting in a total of 1,500 households for all control areas. Thus, 4,010 households were finally targeted for the survey interview, all of whom belonged either to programme (both GCH and NCH groups) or control areas and all observations were included in the analysis. This is a complex multi-stage, stratified sampling design which obliges us to take sampling weights into account, thereby adjusting for the complex survey design, non-response and over-sampling of GCH group to get the correct standard error.

Prior to offering the MHI packages and asking WTJ/P questions, the concept of health insurance was explained to the respondents in detail including the provision of prepayment of

[6] The GK scheme offered benefits in kind to its clients through its health centres in various rural locations. As of November 2010, GK had 13,890 insurance cardholders in 53 health centres drawn from 14 districts.

premium, eligibility of benefits, and further that the prepayment amount (i.e., the premium) was not refundable even to the non-claimants. Then the respondents were asked whether they had understood the concept and its terms of provision. Those providing negative response were offered further consultations and asked the same questions all over again. The procedure was continued until the subject gave the affirmative response. Then the interviewers read out the packages to the respondents. Prior to asking the WTJ/P questions, the respondents were made aware that they would have to reduce the expenditure allocated to non-health items in order to purchase health insurance. In addition to WTJ/P issues, we collected information about demographic condition, occupation, education, income, expenditure, assets, borrowing, disease pattern etc from the households. Household heads were the principal respondents for both WTJ and WTP components.

We also conducted a village survey which covered details of physical, educational and health infrastructure, literacy rate, village-level macro shocks (floods, droughts, cyclones, river erosions, pest attack and so on) and the type of insurance products available locally. The key informants were interviewed in this regard.

2.2 Elicitation Methods

Contingent Valuation (CV) method has been used to elicit WTP particularly in the healthcare field.[7] In the context of CV several methods have been used, such as open ended, take-it-or-leave-it, TIOLI (dichotomous), dichotomous with open-ended follow-up, payment card (PC) and bidding games. In the open-ended approach, respondents are directly asked the maximum amount of money they would like to pay for a proposed product. In the dichotomous choice format (TIOLI), subjects are asked whether they would pay the price offered for a given product. Note that the bid amount is typically varied among the respondents since the idea is to offer each respondent a bid randomly drawn from a menu of bids. The information yielded from this method indicates whether a respondent's maximum WTP is above or below the bid offered to her. The main concern about the dichotomous choice format is the 'yea saying' bias (Dong et al, 2003b). In the payment card approach, respondents are asked to circle the bid, which represents the maximum WTP from a range of bids. This method is well suited for self-administered survey conducted via say postal questionnaires. The concerns about the PC method are range bias and mid-point bias (Cookson, 2003). In the bidding game approach the respondents are asked whether they would like to pay a certain amount for a projected product. Interviewers increase the bid until saying no if the answer is 'yes' and lower the bid until saying yes if the answer is 'no'. The main concern of all close-ended methods of eliciting the willingness to pay is the 'starting point bias'.

There is a large volume of literature on the pros and cons on each method (Klose, 1999; Cookson, 2003; Ryan, 2004; Whynes, 2004; and Smith, 2005). However, methods utilising starting price appear to yield better results than open-ended questions (Donaldson *et al*, 1997).

[7] Replies are contingent on the scenario offered for a proposed product. In this procedure, questions are asked to obtain the maximum willingness to pay for the product under consideration. Choice experiments (conjoint analysis) approach has also been used especially in developed countries.

Bidding game, payment card and TIOLI are most commonly used methods in the developed countries (Diener *et al*., 1998; Klose, 1999; Smith, 2005; Blumenschein *et al*., 2001; Berg *et al*., 2005; Costa-Font and Rovira-Frons, 2008; Martín-Fernández, 2010). However, PC method may not be suitable for developing countries because this method is usually designed for self-administered questionnaire that may not be properly implemented in a rural setting due to poor educational background of the respondents. TIOLI method requires a very large sample size for reliable results (Alberini, 1995). In addition, TIOLI was found less reliable than bidding game in a study in West Africa (Dong *et al*., 2003b).

Consequently many studies end up using the bidding game approach to elicit maximum willingness to pay for rural health insurance schemes in developing countries (Asenso-Okyere *et al*., 1997; Dong *et al*., 2003b, 2003c; Dong *et al*., 2004a; Asgary *et al*., 2004; and Dror *et al*., 2007; Tang *et al*., 2007; Wright *et al*., 2009; Onwujekwe *et al*., 2010). Asenso-Okyere *et al*. (1997) asked the household head of the family's WTP for a projected National Health Insurance scheme in Ghana through the bidding game approach. Dong *et al*. (2003b) elicited individual WTP and household head's WTP in Burkina Faso for a projected community-based health insurance scheme using both bidding game and TIOLI methods. The motive behind eliciting individual level WTP was to identify the factors associated with opting out of the scheme if premiums are set on an individual basis. Dong *et al*. (2003c) also used bidding game approach in another study in Burkina Faso, which examined the gender effect on the willingness to pay for community based health insurance.

In a further study in Burkina Faso, Dong *et al*. (2004b) used bidding game approach to elicit willingness to pay. In India Dror *et al*. (2007) elicited WTP for seven micro health insurance units using the bidding game approach.[8] This study used unidirectional bidding game starting from a relatively high opening bid and lowered the bid by INR 20 until acceptance of the bid. Tang *et al*. (2007) used a bidding game approach (where they doubled the biding price for the positive response in the first bid and halved the bidding price for negative response) to elicit WTP for a drug abuse treatment programme in Taiwan. Wright *et al*. (2009) used a variant of the bidding game approach with an open-ended follow up after the second bid to elicit WTP for low-cost health insurance in Namibia. Habbani *et al*. (2006) used the TIOLI method in a study in Sudan due to the fact that the poor Sudanese disliked bargaining over prices. Asfaw *et al*. (2005) used a double-bounded dichotomous method to elicit WTP for the community based health insurance schemes in rural areas of Ethiopia.

Following WTP studies in developing countries and taking into account the reliability issue, we have chosen the bidding game approach to elicit the maximum WTP for the MHI package analysed in the paper. The benefits and price of the package, as already stated above, were determined in light of discussions between the research team and GK management. Given that the educational background of the respondents is poor (i.e., average education of the household head being 3.2 years), they may be confused if the interviewers offer higher bid or

[8] In an earlier Indian study Mathiyazhagan (1998) had elicited WTP for different types of medical benefits using the open-ended method.

lower bid indefinitely until rejection or acceptance of the bid. Thus, instead of using the bidding game in its pure form we have used a variant with an open-ended follow up by giving the open-ended option to express the WTP straight after the second bid.

As a starting bid we asked whether the households were willing to pay the amount (BDT 500) assigned to the package. Those replying 'yes' in the starting bid was offered a higher bid (BDT 550); and those replying 'no' were offered a lower bid (BDT 450) in the next round.[9] Those replying 'yes' in the 'higher bid' were asked the maximum amount they would be willing to pay for enrolling in the insurance programme; and those replying 'no' in the 'lower bid' were asked the highest amount of money they could be persuaded to pay (see Fig.1). There was also an option for allowing the respondents to say 'not willing to purchase insurance'. The WTP was determined exactly as above. In addition to the capability question as mentioned above, we checked the validity of the amount of money the respondents would like to pay by asking a certainty question: fully confident, moderately confident, neither certain nor uncertain, partly uncertain, and fully uncertain. In calculating WTP we have only considered those replying that they were 'fully confident to pay' and 'moderately confident to pay' the articulated amount. In this paper we have reported the mean WTP of the households.

Broadly, we have five possible outcomes for each respondent: (i) the respondent says 'yes' to both the starting bid and the higher bid, and mentions an amount in the open-ended follow up; (ii) the respondent says 'yes' to the starting bid and 'no' to the higher bid; (iii) the respondent says 'no' to the starting bid and 'yes' to the lower bid; (iv) the respondent says 'no' to both the starting bid and the lower bid, and mentions an amount in the open ended follow up; and (v) the respondent says 'no' to both the starting bid and the lower bid, and appears willing to pay 'nothing' for the package (i.e., not WTJ? see below).

2.3 WTJ and WTP: The Estimation Methodology

Given our method of elicitation, it may be tempting to agree that the maximum WTP is zero for those who were not willing to join and estimate the model using the full sample by OLS methods. But this is tantamount to a violation of the linearity assumption required for the application of the OLS approach. Therefore OLS is not an appropriate technique in this context and would lead to biased and inconsistent parameter estimates (Amemiya, 1985).

Assuming that the dependent variable is continuous with censoring at zero and follows a censored normal distribution, one could apply the standard Tobit model. This is also based on the assumption that the censoring function and the uncensored function (in this case for positive WTPs) share the same coefficients (Duan *et al*., 1983). The Tobit model also assumes that these zeros are true zeros, but some of these zero values may correspond to negative WTP for the offered package (Donaldson *et al*., 1998 and Gyldmark and Morrison, 2001). The problem is that the zero responses may have several explanations: some of these responses may be true zeros, i.e., for those who do not consider the scheme valuable and show no interest to pay;

[9] One US dollar was equivalent to about BDT 69 in 2009.

protest zeros, e.g., where respondents may not believe in the concept of insurance in general or MHI in particular. Given that the lowest price we had offered was BDT 400, it is plausible that some respondents would have actually valued it at a much lower level, but due to various reasons, refrained from saying so, though some did so. Some respondents may have misunderstood the scheme and hence showed reluctance to join the scheme.

At yet another level, some of the respondents may have showed interest to join the programme at a positive price but not sure whether they would buy the scheme with certainty. The point is that standard Tobit model may not be an appropriate technique for the estimation of maximum WTP in a study like the present one and we therefore need to modify the estimation procedures by adopting a more flexible censoring technique. As shown below, a large proportion of households in this study showed no interest to join the offered MHI package. One would suspect that the decision to join the programme with positive WTP is generated by a non-random selection process.

The observed positive willingness to pay for the MHI scheme can be modelled as a two-step decision process. In the first stage, respondents decide whether to join the programme at any positive price or not. In next stage, they decide their maximum WTP if they had said 'yes' in the first stage. Let the WTJ decision be determined by the following equation (selection mechanism):

$D_i^* = Z_i'\gamma + v_i$, $D_i = 1$ if $D_i^* > 0$ and zero otherwise (1)

Here $D_i = 1$ when a household responds to join the programme at a positive price and $D_i = 0$ when the household decides not to join the programme.[10] The maximum WTP for the MHI scheme is determined by the following regression equation:

$WTP^*_i = X_i'\beta + \varepsilon_i$, observed only when $D_i=1$. (2)

The model comprising of equations (1) is (2) is called the Heckman (1979) selection model, also known as 'Heckit' model or Type-II Tobit model. Here equation (1) is generally estimated as a Probit model to predict WTJ and equation (2) is a linear regression model conditional on household's replying 'yes' to the participation decision. The latter can be estimated by the Maximum Likelihood Estimator or the two-step Heckman procedure. It is assumed that D_i and Z_i are always observed for a randomly selected sample of households but WTP is observed only when $D_i = 1$. Therefore WTP is assumed to be missing when $D_i = 0$. Here β and γ are vectors of unknown parameter to be estimated; the error terms v_i and ε_i are independent of Z and X and follow a bivariate normal distribution with mean zero. The variance of ε_i is σ_ε and that of v_i is set to unity in the selection equation and the correlation between ε_i and v_i is ρ. Therefore the conditional mean for positive values of WTP is

$$E(\text{WTP}|\, D_i^* > 0) = X_i'\beta + \rho\sigma_\varepsilon\lambda(Z_i'\gamma) = X_i'\beta + \rho\sigma_\varepsilon \text{Ø}(Z_i'\gamma)/\Phi(Z_i'\gamma), \quad (3)$$

[10] As mentioned earlier, a certainty question was attached to each of the positive replies. A small number of households were not certain to pay the price and these observations were treated as zeros in the selection equation and were deleted in the WTP equation.

where the term $\lambda(.)$ $[=\emptyset(.)/\Phi(.)]$ is the inverse Mills ratio (IMR) and $\emptyset(.)$ and $\Phi(.)$ represent, respectively, the probability density and cumulative distribution function of the standard normal function. If we omit $\lambda(Z_i'\gamma)$ and use the positive WTP sample to estimate equation (3), then there would be an omitted variable bias. The estimated parameters would be biased and inconsistent whenever the two errors terms were correlated. The selectivity bias can be tested under the null hypothesis of 'no selection bias' using a standard t-test on the coefficient of IMR in the second stage regression. Identification of the coefficients in the level equation (i.e., maximum WTP) can be relied upon to find some explanatory variables that influences household's decision to 'join' the programme but not the decision of 'how much to pay' (Jones, 2007). That is, we need at least one explanatory variable that enters the set of variables (Z) included in the Probit equation but not in the set (X) included in second-stage regression. As it is often quite difficult to find such explanatory variables in practice, separate identification may rely on the non-linearity of IMR that enters into the second-stage regression. But the latter approach is also problematic due to collinearity between the regressors (X) in the second-stage regression and IMR, which may lead to imprecise coefficient estimates from the level equation.

3. Empirical Analysis

3.1 Sample Properties

A total of 3,941 (out of the targeted 4,010) households were successfully interviewed in this study. Household heads were the respondents in most cases (83%) and spouses in another 15 per cent of cases (Table 1). Most of the households (about 88 %) were male-headed. Average education level of the household head was seen to be 3.2 years and the average age about 46 years. The average household size was 4.45. The mean of per capita daily consumption (both food and non-food) was about BDT 66 (as of summer/autumn 2009). About 30 percent of household heads were absorbed by the agriculture sector followed by day-labour (about 16%) and small business (about 14%, not shown in the table).

Overall about 53 per cent respondents were found willing to join the proposed MHI scheme (Table 2). However, as shown in Figure 1, only 27 per cent of the respondents had WTJ at the starting bid (BDT 500). A majority (about 58 per cent) of those who expressed WTJ at the starting bid also OK with the higher bid (BDT 550). On the other hand, only about 3 per cent of those who had declined the starting bid agreed to join the scheme at the lower bid (BDT 450). In the open-ended follow up questions, only 35 per cent of those who expressed WTJ at the higher bid were also willing to pay more than the bid amount; and 35 per cent of those who did not have WTJ at the lower bid were willing to pay something positive below the lower bid amount.

Depending on the availability of the MHI programme, WTJ is significantly ($p \leq 0.01$) higher in control area (61.5%) compared to programme area (47.7%, not shown in Table 2). Overall WTP of the respondents who had WTJ and were capable as well as confident to pay the articulated amount was BDT 406 ±171 (mean ± sd, n = 2082, Table 2).[11] The average WTP for the control

[11] Overall the average WTP for the entire sample including those who are not willing to join was BDT 218 ± 238 (± sd).

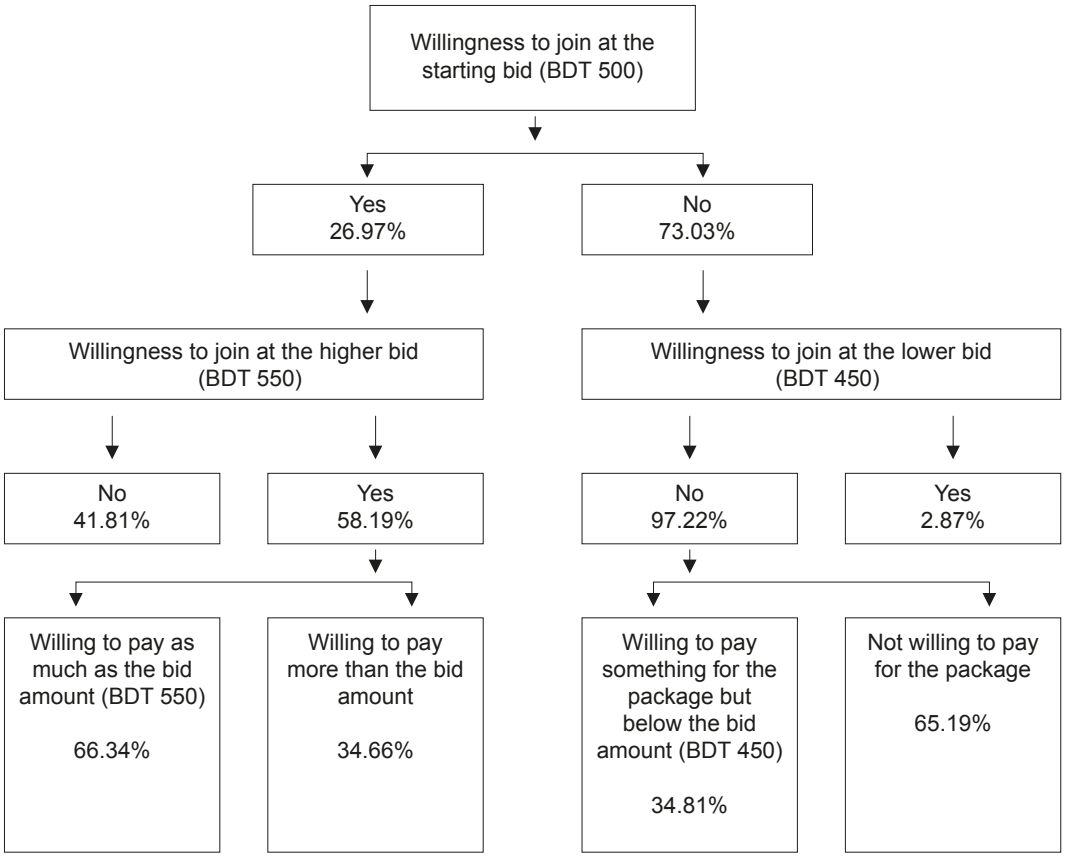
Table 1
Respondent and Household Characteristics

Indicators	Total	Programme Area			Control Area
		Card Holder	Non Card Holder	Total	
(i) Category of respondents (%)					
Household head	83.02	80.86	83.20	82.32	84.22
	(3,272)	(756)	(1,283)	(2,039)	(1,233)
Spouse	15.12	17.75	15.05	16.07	13.52
	(596)	(166)	(232)	(398)	(198)
Other adult members	1.85	1.39	1.75	1.61	2.25
	(73)	(13)	(27)	(40)	(33)
(ii) Gender of the household head (%)					
Male	87.67	91.66	85.47	87.81	87.43
	(3,455)	(857)	(1,318)	(2,175)	(1,280)
Female	12.33	8.34	14.53	12.19	12.57
	(486)	(78)	(224)	(302)	(184)
(iii) Other indicators:					
Average educational level of the household head	3.20 [4.04] (3,941)	3.18 [4.12] (935)	3.22 [4.10] (1,542)	3.20 [4.11] (2,477)	3.19 [3.92] (1,464)
Average age of the household head	46.16 [13.81] (3,941)	46.92 [12.51] (935)	46.07 [14.28] (1,542)	46.39 [13.64] (2,477)	45.77 [14.09] (1,464)
Average household size	4.45 [1.82] (3,941)	4.63 [1.78] (935)	4.33 [1.89] (1,542)	4.45 [1.85] (2,477)	4.45 [1.78] (1,464)
Male female ratio	52:48	52:48	51:49	51:49	52:48
Average per capita daily consumption (BDT)*	65.74 [37.97] (3,937)	71.17 [40.43] (934)	63.49 [39.96] (1,540)	66.39 [40.30] (2,474)	64.64 [33.64] (1,463)

Notes: Figure in round parentheses is the number of observations and squared parentheses is the standard deviation. *4 observations were dropped due to missing data on household consumption.

population (BDT 436 ±172, n = 900) is significantly ($p \leq 0.01$) higher compared to that for the programme population (BDT 382 ±167, n = 1181, not shown in Table 2). A likely explanation is that the programme population, given their prior experience of with some form of MHI expressed WTP more accurately in light of expected benefits.

Fig 1: Summary Statistics



Next, we checked the 'warm glow' bias (that may exist when respondents accept an amount closer to the opening bid than they actually would in reality) as a way of part validating the WTP exercise described above. In doing so, we compared the reported WTP figure with the starting bid as in Dror *et al*. (2007). For a start, results show that a significant percentage (about 46%) of the respondents were not willing to join the scheme. There is also a wide range of variation in WTP for those who were indeed willing to join. The poorest quintile was willing to pay between BDT 50-800 (10% and 160% of the starting bid) and the richest quintile between BDT 100-1000 (20% and 200% of the starting bid). Rejection of the schme by a significant number of respondents and the wide range of responses among those who were WTJ indicate that warm glow was not an important feature in this study.

What can one say about the adequacy of the premium that the respondents had agreed to offer? First note that the sum-assured figure is not easy to calculate for a number of reasons. First is that all entitlements under the older pre-paid GK-card system were those that were available in-house only (i.e., the health centre, its drug counter, and the limited number of diagnostics and in-patient services, e.g., cataract surgeries, depending on the capacity of the centre). Though the proposed scheme was presented as a major departure from the past and, in particular, offered a substantial in-patient component, some may not have taken these on

face value. Hence it is arguable to what extent the survey data evidence on the average spending by households on drugs and other components of OPP would be relevant in this case. In any event, as proposed and based on the substantial survey evidence presented by Ahsan, 2012a, the expected benefit embedded in the proposed package would have come to about BDT 1400 as of the survey date.[12]

Table 2
WTJ and WTP Behaviour and Income

	WTJ % (n)			Mean WTP (household average)	WTP as(%) of annual food consumption	WTP as(%) of annual non-food consumption	WTP as(%) of annual household's consumption	WTP as(%) of annual healthcare expenditure
	Yes	No	Total					
Poorest quintile	49.05 (387)	50.95 (402)	100 (789)	367.65 [164.76] (387)	1.57	4.19	1.09	15.15
Second quintile	52.03 (410)	47.97 (378)	100 (788)	378.83 [175.91] (410)	1.09	2.62	0.77	10.58
Middle quintile	53.55 (422)	46.45 (366)	100 (788)	401.73 [165.62] (422)	0.89	1.88	0.60	9.16
Fourth quintile	55.33 (436)	44.67 (352)	100 (788)	409.43 [168.47] (436)	0.73	1.37	0.48	7.33
Richest quintile	54.19 (427)	45.81 (361)	100 (788)	465.50 [160.11] (427)	0.54	0.76	0.32	4.47
Total	52.83 (2,082)	47.17 (1,859)	100 (3,941)	405.58 [170.29] (2,082)	0.83	1.51	0.52	7.75

Note: Figure in round parentheses is the number of observations and squared parentheses is the standard deviations.

In view of the above figures, the expected outlays to be incurred by the insurer for the proposed MHI (and then again not allowing for any administrative overhead), the offered premium of roughly BDT 400 is seen to be even below 30 per cent of the expected cost of services to be rendered. At another level, a figure of one per cent of annual non-health household consumption is often flagged as a plausible amount that poor households may be expected to offer as premium (e.g., Dror *et al*, 2007). Here it is seen that only 16 per cent of those who

[12] As per 'back of the envelope' arithmetic, in 2009 the average OPP per sampled household came to about BDT 4K, of which roughly 50% was incurred on account of drugs (Ahsan *et al*, 2012a). Thus the cash rebate of 20% on drugs amounts to a benefit of BDT 400 per household, which when added to the roughly 50% discount on the remainder, namely diagnostics and in-patient care, i.e., another BDT 1,000, the total expected value of the proposed MHI scheme comes to BDT 1.4K per household. The sum-assured, i.e., the maximum liability for the insurer, of course would be much higher (just 5K on in-patient care alone).

demonstrated WTJ were willing to contribute that much (figures not shown in Figure 1).[13]

Table 2 shows that there were some variations in WTJ across the expenditure quintiles. Proportion of households willing to join the programme was the lowest in the poorest (about 49%) but the highest in the fourth (about 55 %), which was virtually the same (about 54%) in the richest quintile. Recall that the mean WTP consistently increased from about BDT 367 in the poorest to BDT 465 in the richest quintile. Although the average WTP (say BDT 400) was very small relative to annual food consumption, non-food consumption or healthcare expenditure, all the ratios tended to fall from the poorest to the richest quintile.[14]

Table 3
WTJ and WTP Behaviour and Household Size

Household size	WTJ % (n)			Mean WTP
	Yes	No	Total	
1-2 members (small household)	38.95 (111)	61.05 (174)	100 (285)	401.98 [172.23] (111)
3-4 members (medium household)	52.9 (820)	47.1 (730)	100 (1,550)	412.70 [177.90] (820)
5-6 members (large household)	53.7 (769)	46.3 (663)	100 (1,432)	398.49 [165.18] (769)
> 6 members (very large household)	56.68 (382)	43.32 (292)	100 (674)	406.88 [169.68] (382)
Total	52.83 (2,082)	47.17 (1,859)	100 (3,941)	405.58 [170.29] (2,082)

Note: Figure in round parentheses is the number of observations and squared parentheses is the standard deviations.

Household size appears to be systematically related with the willingness to join decision. As reflected in Table 3, the proportion of 'yes' responses jumps from about 39 to 53 per cent as the size of the household increases from 1-2 to 3-4 and gradually increases thereafter. In contrast, there is no systematic variation in mean WTP with the household size. The mean WTP is the highest for the 3-4 person households (about BDT 413) while it is the lowest for 5-6 member households (about BDT 398). The above pattern on WTJ/WTP may be viewed as rational from several perspectives. For one, larger households may decide more readily to join in the knowledge that the chance of MHI benefit utilisation is higher for them on account of the greater likelihood that some of its members may be afflicted by a health shock ('value for money'). But

[13] Ahsan *et al* (2012a) estimated average non-health consumption in the sample to be about BDT 95K (USD 1,375) per household, or about BDT 21,350 (or, USD 309) per capita, well below the dollar-a-day level.

[14] These figures were less than one percent of annual average food consumption; 1.5 % of the annual average non-food consumption; and about 8% of annual average healthcare expenditure (Table 2).

at the same time, they are typically poorer in per-capita terms than the rest and thus less able to pay (and also true for this survey).

Table 4 depicts WTJ and WTP against the education level of the respondents. While there is not a great deal of variability either in WTJ or in WTP along the education indicator, there appears to exist a systematic positive relationship between the level of education and the mean WTP. The latter figure rose secularly from about BDT 385 to 442 with the 'years of completed education'. Particularly noticeable is that from BDT 385 among the totally illiterate, the figure jumped to 419 among those with 1-2 years of schooling. Given the usual correlation between education (e.g., via the comprehension/awareness channel) and income, each of which is likely to have exerted a positive influence on WTP.

Table 4
WTJ and WTP Behaviour and Education

Completed years of Education of respondents	WTJ % (n)			Mean WTP
	Yes	No	Total	
0 years	51.46 (1,058)	48.54 (998)	100 (2,054)	384.8 [166.4] (1058)
1-5 years	54.14 (497)	45.86 (421)	100 (918)	419.2 [183.3] (497)
6-10 years	54.85 (447)	45.15 (367)	100 (815)	434.2 [166.5] (447)
>10 years	52.63 (80)	46.37 (73)	100 (152)	442.8 [153.7] (80)
Total	52.83 (2,082)	47.17 (1,859)	100 (3,941)	405.8 [171.5] (2082)

Note: Figure in round parentheses is the number of observations and squared parentheses is the standard deviations.

There is some indication of a gender differential in WTJ. As shown in Table 5, only 49 per cent of female respondents were willing to join the programme compared to 54 per cent for their male counterparts. Such gender differential is also reflected to an extent in the mean WTP, which is higher for male (BDT 413) relative to females (BDT 385). This may be understood in terms of the lower education and income status of female- than male-headed households or in terms of the often-heard sociological claim that women were more careful and/or more conservative with financial commitments. WTJ was also significantly higher among those who had prior knowledge about health insurance (i.e., were familiar with the term 'health insurance') compared to those who did not (see Table 5). However this knowledge variable failed to translate into higher WTP. The latter is consistent with the view that the extant knowledge could not have been firm enough to lead to a greater intensity of demand, or, simply that the income status of the household trumps all other factors insofar as WTP s concerned.

Table 5
WTJ and WTP Behaviour: Scope of Gender, Prior Health Shocks, MHI Knowledge and MFI Membership

	WTJ % (n)			Mean WTP		WTJ % (n)			Mean WTP
	Yes	No	Total			Yes	No	Total	
Gender of the respondent					Knowledge about health insurance				
Male	54.17 (1,539)	45.83 (1,302)	100 (2,841)	413.2 [173.1] (1,539)	Prior knowledge of health insurance	56.83 (857)	43.17 (651)	100 (1,508)	404.19 [170.57] (1,225)
Female	49.36 (543)	50.64 (557)	100 (1,100)	385 [165] (543)	No knowledge of health insurance	50.35 (1,225)	49.65 (1,208)	100 (2,433)	407.56 [169.97] (857)
Total	52.83 (2,082)	47.17 (1,859)	100 (3,941)	405.8 [171.5] (2,082)	Total	52.83 (2,082)	47.17 (1,859)	100 (3,941)	405.58 [170.29] (2,082)
MFI membership					Health shocks in the households				
No	49 (884)	51 (920)	100 (1,804)	424.5 [175.3] (884)	Prior health shocks in the households	55.06 (653)	44.94 (533)	100 (1,186)	407.2 [166.4] (1429)
Yes	56.06 (1,198)	43.94 (939)	100 (2,137)	392 [167.4] (1198)	No health shocks	51.87 (1,429)	48.13 (1,326)	100 (2,755)	402.8 [182.2] (653)
Total	52.83 (2,082)	47.17 (1,859)	100 (3,941)	405.8 [171.5] (2082)	Total	52.83 (2,082)	47.17 (1,859)	100 (3,941)	405.8 [171.5] (2082)

Note: Figure in round parentheses is the number of observations and squared parentheses is the standard deviations.

Ex-ante, experiencing at least one health shock (e.g., death or illness) in the last two years would be expected to induce the affected household to join the MHI scheme more than others; however the descriptive statistics does not provide a strong indication. The share of households who experienced a health shock exhibited WTJ of 55 per cent, barely three percentage points higher than 52 per cent among those who had not (Table 5). The WTP figures also do not reveal any discernible (i.e., statistically significant) pattern between these two groups. This may again indicate either the lack of comprehension that MHI may be an efficient way of dealing with the shock or dis-belief in the insurance promise.

Predictably members of microfinance institutions (MFI), possibly on account of their greater familiarity with the scheme, were more likely to join the scheme than non-members. However in terms of the prior GK scheme participation, this was only true for Grameen borrowers. While WTJ was about even among non-MFI borrowers, the tendency was significantly higher within the MFI group (56 vs. 44 per cent).

Would the borrowers be willing to pay a larger amount for MHI? The borrowing-induced liquidity in the household was actually distributed more diffusely since even though a majority had borrowed from MFIs, many also borrowed from miscellaneous sources (including friends and family) so that only about a quarter were non-borrowers. Table 5 indicates that the mean amount of WTP was 8.6 per cent less for MFI member than the non-member households. Without further analysis, it hard to find a rationale behind such a finding, except perhaps for the negative correlation between MFI membership and the income/asset level. It remains to be seen whether the latter assertion may be borne out by econometric investigation (see below).

Table 6
WTJ and WTP Behaviour: Role of the nearest care provider

Type of health providers	WTJ (%) (n)			Mean WTP
	Yes	No	Total	
Informal providers	50.63 (719)	49.37 (701)	100 (1,420)	410.74 [177.33] (719)
Govt. service providers	50.27 (850)	49.73 (841)	100 (1,691)	408.88 [157.67] (850)
Private service providers	68.07 (113)	31.93 (53)	100 (166)	498.41 [183.64] (113)
NGO service providers	62.59 (358)	37.41 (214)	100 (572)	371.45 [172.92] (358)
Others	45.65 (42)	54.35 (50)	100 (92)	303.33 [170.83] (42)
Total	52.83 (2,082)	47.17 (1,859)	100 (3,941)	405.82 [171.48] (2,082)

Note: Figure in round parentheses is the number of observations and squared parentheses is the standard deviations.

There is some variation in both WTJ and WTP with the type of nearest healthcare provider (Table 6). Those closest to private or NGO health service providers had a significantly ($p < 0.01$) higher rate of WTJ compared to the rest. However in terms of WTP, there was a dichotomy of sorts; those closest to private providers had significantly ($p < 0.01$) higher WTP (BDT 498) compared to NGO providers (BDT 371). One very plausible explanation would be that the relatively costlier private service provides an incentive to opt for the proposed MHI scheme. However those enjoying already existing NGO services, presumably subsidised, while still keen to experiment with further NGO services (such as the proposed GK MHI) were reluctant to pay that well.

3.2 Econometric Estimation

We employed a single equation probit regression for exploring the determinants of the WTJ decision and the maximum likelihood approach to jointly estimate the WTP equation and probit selection equation. In each case we estimated the standard model (M1) and an alternative (M2). In the alternative model we included some additional variables and/or use different structure (level vs. categorical representation) of some variables. A set of respondent attributes, household attributes and location factors are also included as explanatory variables.

Age, gender, education, occupation, health status and knowledge about health insurance of the respondent were included in the estimation. Age was measured in years, gender was a dummy variable (1= female, 0 = male), and the education level was measured by years of completed schooling. In the alternative model, by contrast, 'completed years of schooling' was replaced by three dummies (1-5 years, 6-10 years and more than 10 years) setting 'zero year of schooling' as the reference category. Similarly the respondent's occupation was represented by seven dummy variables: agriculture, small service, transport-sector, service, small business, medium-business, others (including housewives) dummy, while day-labour was set as the reference category.

Health status of the respondent relative to people of their own age was also made a categorical variable in model-1 by assigning a numeral from the menu: 5, 4, 3, 2 or 1 if the respondent considered his/her health status as 'very good', 'good', 'average', 'bad' or 'very bad' respectively. In the alternative model, we replaced the health variable with four dummy variables by setting the 'average' as the reference category.

Household specific variables include household consumption expenditures, annual medical expenditure (food and non food), operated land (inclusive of leased-in) under agricultural use and its square, household size and its square, number of expatriates, number of internal migrants, health shock and the event of pregnancy. Health shocks is constructed as a dummy variable that takes the value equal to 1 if there were any adverse incidence in the household such as death or illness of a member over the past two years and zero otherwise. An event of pregnancy was also treated as a dummy variable taking the value of 1 if there was any pregnancy over the last one year and zero otherwise.

Membership status in the existing GK micro health insurance scheme (i.e., GCH/NCH) is one of the key variables of interest. Since a large proportion of the GHC households also held membership in different MFIs (particularly the Grameen Bank, GB), the variable would confound the joint effects of membership in GCH and MFIs. So existing members of GCH were separated by creating a dummy variable: one comprising those who were also MFI members and those comprising non-MFI members (1= if GCH and member of any MFI, 0 if only GCH). To investigate the impact of MFI membership status in isolation, again a separate dummy variable are created: one is membership in GB without being a GCH and the other is membership in other-MFIs and still an NHC (1= if GB but NHC, 0 if other MFI but NHC).

Another variable that also interacts with the membership status in GK is 'knowledge about health insurance', since most existing GCH households were found to be acquainted with the term 'health insurance'. Given these members also possessed first-hand experiences about the scheme, their evaluation about the proposed package would be different than those who were just familiar (or claimed to have been) with the term 'health insurance'. Thus the insurance knowledge dummy variable was created that took the value 1 only when the non-GK households were found to be familiar with health insurance or zero otherwise.

Location specific factors are taken into account by including district level dummy variables and a dummy variable for control area (1 = control, 0 = programme). Area level shocks were taken into account by including a dummy variable for natural catastrophe (e.g., flood). The effect of proximity to different healthcare providers was also considered in the alternative model only by introducing four dummy variables for different types of providers: government, private, informal and other, while NGO-providers were set as the reference category.

3.2.1 Determinants of the Willingness to Join

Table 7 reports the coefficients estimates and average partial effects from alternative specifications of single equation probit models of WTJ. The coefficient estimates and their corresponding average partial effects appear with the same sign in both the models with slight differences in magnitudes. According to the regression error specification test (RESET) there is no evidence of model misspecification in either of the single equation probit models, where the F-statistics for M1 is zero with p-value 0.99 and for M2 it is 0.01 with p-value 0.93. There are some positive supports for model-1 based on Bayesian information criterion (BIC) and Akaike information criterion (AIC), which are slightly smaller for model-2.

In the main model (M1), individual characteristics of the respondents such as age and years of schooling were found statistically significant (1% and 5% level respectively) and both negatively correlated with WTJ. It is fairly common in similar studies to find that older persons are often more conservative in accepting innovative ideas, and in the health context, perhaps be more inclined to leave contingencies to fate.

Table 7
Determinants of WTJ: Probit Estimation

		Model-1 (Main model)			Model-2 (Alternative model)			
	Coeff.	se	APE	se	Coeff	se	APE	se
Respondent's attributes								
Age (years)	-0.007***	(0.002)	-0.003***	(0.001)	-0.007***	(0.002)	-0.002***	(0.001)
Gender (=1 for Female, 0 otherwise)	-0.193*	(0.103)	-0.070*	(0.037)	-0.192*	(0.102)	-0.069*	(0.037)
Schooling (years)	-0.015**	(0.008)	-0.006**	(0.003)				
Schooling dummies (0-year is the reference)								
1 to 5 Years					-0.041	(0.069)	-0.015	(0.025)
6 to 10 Years					-0.070	(0.071)	-0.025	(0.025)
More than 10 years					-0.306**	(0.149)	-0.110**	(0.053)
Health Insurance Knowledge (=1 if a non-GK hh has this knowledge, 0 otherwise)	0.156**	(0.070)	0.056**	(0.025)	0.154**	(0.070)	0.055**	(0.025)
Health Status (= 1 for very bad, ..., 5 for very good)	-0.019	(0.036)	-0.007	(0.013)				
Health Status dummies (average is the reference								
Very bad					0.010	(0.220)	0.004	(0.079)
Bad					0.093	(0.082)	0.033	(0.029)
Good					0.020	(0.062)	0.007	(0.022)
Very Good					-0.014	(0.107)	-0.005	(0.038)
Occupation dummies (Day Labour is the reference)								
Agriculture	0.105	(0.090)	0.038	(0.032)	0.087	(0.087)	0.031	(0.031)
Small Service	-0.322	(0.301)	-0.114	(0.104)	-0.340	(0.297)	-0.120	(0.102)
Transport service	0.166	(0.130)	0.060	(0.046)	0.144	(0.131)	0.052	(0.047)
Small Business	0.090	(0.097)	0.032	(0.035)	0.076	(0.096)	0.027	(0.035)
Medium Business	-0.268*	(0.154)	-0.096*	(0.054)	-0.282*	(0.153)	-0.100*	(0.054)
Service (salaried workers)	0.307**	(0.145)	0.110**	(0.051)	0.317**	(0.147)	0.113**	(0.051)
Others	0.140	(0.123)	0.050	(0.044)	0.117	(0.121)	0.042	(0.043)
Household (hh) attributes								
Agricultural Land (per hh)	0.078	(0.066)	0.024	(0.021)	0.069	(0.066)	0.021	(0.021)
Square of Agricultural Land	-0.014	(0.009)			-0.013	(0.009)		
Log of Consumption (per capita per day)	0.305***	(0.079)	0.110***	(0.028)	0.297***	(0.082)	0.107***	(0.029)
Log of Annual medical expenses	0.027**	(0.011)	0.010**	(0.004)	0.025**	(0.012)	0.009**	(0.004)
Household Size	0.224***	(0.045)	0.031***	(0.007)	0.225***	(0.045)	0.032***	(0.007)
Square of Household Size	-0.015***	(0.004)			-0.015***	(0.004)		
Total No. of Expatriates					0.048	(0.051)	0.017	(0.018)
Total No. of internal migrants					-0.009	(0.041)	-0.003	(0.015)

Table 7 (Cont.)
Determinants of WTJ: Probit Estimation

		Model-1 (Main model)			Model-2 (Alternative model)			
	Coeff.	**se**	**APE**	**se**	**Coeff**	**se**	**APE**	**se**
Event of pregnancy (=1 for Yes, 0 otherwise)	0.090	(0.084)	0.033	(0.030)	0.094	(0.084)	0.034	(0.030)
Health Shock (=1 for Yes, 0 otherwise)	0.027	(0.049)	0.010	(0.018)	0.027	(0.048)	0.010	(0.017)
Membership in MFI_s and GK								
GB membership (=1 if GB and NCH, 0 if only NCH)	-0.014	(0.083)	-0.005	(0.030)	-0.009	(0.080)	-0.003	(0.029)
Other-MFI_s membership (=1 if non-GB MFI_s and NCH, 0 otherwise)	0.169***	(0.063)	0.061***	(0.023)	0.177***	(0.062)	0.064***	(0.022)
GCH-MFI_s joint membership (=1 if hh is both GCH and MFI_s member, 0 if only GCH)	0.455***	(0.095)	0.164***	(0.034)	0.453***	(0.096)	0.163***	(0.034)
GCH status (=1 if a hh is only a GHC, 0 otherwise)	0.117	(0.152)	0.042	(0.055)	0.121	(0.150)	0.044	(0.054)
Location factors								
Proximity to provides								
Proximate to Government provider (=1 for Yes, 0 otherwise)					-0.081	(0.101)	-0.029	(0.036)
Proximate to private provider (=1 for Yes, 0 otherwise)					0.209	(0.165)	0.075	(0.058)
Proximate to informal provider ((=1 for Yes, 0 otherwise)					-0.043	(0.111)	-0.016	(0.040)
Proximate to other providers ((=1 for Yes, 0 otherwise)					0.153	(0.266)	0.055	(0.094)
Flood (=1 for occurrence of flood, 0 otherwise)	-0.107	(0.110)	-0.038	(0.040)	-0.099	(0.112)	-0.036	(0.040)
Control Area (=1 for Yes, 0 otherwise)	0.471***	(0.064)	0.172***	(0.023)	0.474***	(0.065)	0.172***	(0.023)
Area dummies (area 7th was the reference)								
Area dummy 1	-0.201*	(0.115)	-0.072*	(0.041)	-0.204*	(0.113)	-0.073*	(0.040)
Area dummy 2	0.530***	(0.107)	0.188***	(0.036)	0.537***	(0.138)	0.190***	(0.046)
Area dummy 3	-0.262**	(0.113)	-0.095**	(0.041)	-0.232	(0.146)	-0.084	(0.053)
Area dummy 4	0.462***	(0.145)	0.165***	(0.049)	0.488***	(0.150)	0.174***	(0.051)
Area dummy 5	-0.404***	(0.103)	-0.145***	(0.036)	-0.414***	(0.107)	-0.148***	(0.037)
Area dummy 6	0.199**	(0.093)	0.071**	(0.033)	0.185	(0.127)	0.066	(0.045)
Constant	-1.873***	(0.401)			-1.912***	(0.413)		
Observations	3,937		3,937		3,937		3,937	
Reset F(1,100)	0				0.01			
Prob > F =	0.9975				0.9314			

Notes: Standard errors in parentheses; p*** < 0.01, **p < 0.05, *p < 0.10

The negative correlation between schooling and WTJ is reconfirmed in the alternative model (M2) where we replaced this variable with the dummy variables for different level of schooling years, but statistically significant (5% level) only for the years of schooling over 10 years or more. Weak correlation between schooling and WTJ was observed earlier in the analysis of Table 4 above. However counter-intuitive it may appear, one may reconcile this finding with the intuition that controlling for all other factors, relatively more educated respondents (households) may have access to better healthcare facilities than the one proposed in the scheme and thereby less interested in joining the scheme.

The average partial effect for the female dummy in both the models is around (-) 0.07, implying that probability of WTJ the scheme is -0.07 less (significant at the 5% and the 10% level for M1 and M2, respectively) for a female respondent relative to their male counterparts, which too mirrors a similar qualitative impression gleaned from the correlation analysis reported in Table 5 above. For the occupation dummies, the average effects are statistically significant for the salaried employees (i.e., 'service' at the 5% level) and the 'medium business' (10% level, but negative impact) categories. Salaried employees of course benefit from a more predictable earning profile and possibly would also be more likely to be familiar with some ideas of insurance, though not necessarily of MHI. As expected, household size is positively and square of household size is negatively correlated with the WTJ and coefficients of both variables were statistically significant at the 1% level. For an additional member in the household probability of reporting WTJ=1 increases by more than 3 percentage points on average in both models.

Prior knowledge of MHI on the part of NCH hhs appears to have a positive and significant (5% level) impact on WTJ confirming the correlations reported in Table 5. The coefficients of the health related factors have the signs as expected. Annual medical expenditure shows positive and significant (5% level) association with the WTJ. One per cent increase in the annual medical expenses increases the probability of reporting WTJ=1 by one percentage point on average. The sign of the coefficients of pregnancy event and health shock variables are positive while this is negative for health status, but none is statistically significant. The sign of health status variable is mostly though statistically insignificant in most cases.

It is seen that prior GK MHI membership alone does not affect willingness to join, but GK and MFI_s joint membership has a statistically significant (1% level) positive effect. It is also seen that GB membership in isolation does not affect WTJ while membership in other MFI_s have significant (1% level) positive effect on WTJ. Since we include a dummy variable representing the sample from the control area, the sign of the coefficient for a GCH indicates that these members were more willing to join than the respondents who lived in a programme area but were not already members of the MHI programme. Location factors (flood and proximity to providers) do not affect WTJ; however, interestingly WTJ is higher among the respondents of control area. The average effect for the control area is slightly higher relative to existing GCH (plus MFI) members, when both are compared with respect to GCH/non-MFI members living in the programme area.

Some of these findings are not immediately evident from intuition and further work is necessary to disentangle the nexus among MFI membership, prior GCH experience, and WTJ. GB

members who were NHC appear not excited about the proposed MHI scheme may be explained by their self-selection, namely that they, in spite of the knowledge about MHI previous efforts to persuade them, had chosen not to participate. And the new scheme failed to convince them otherwise. However for non-GB MFI members the information provided by survey staff proved informative for many of them to act (i.e., opted to join the proposed MHI scheme).

3.2.2 Determinants of Willingness to Pay

Table 8 shows the regression results of WTP based on Heckman Selection model (HM) and OLS. The coefficient estimates of the level equation for the HM was based on the joint estimation of the probit selection equation and level equation by the Maximum likelihood approach.[15] The Heckman model was estimated with two exclusion restrictions: size and size square of the household, therefore these variables were absent from the results of the level equation. The application of Heckman selection approach as opposed to OLS approach (on positive WTP observations) was well justified here, given that the correlation coefficient between the probit selection equation and the level equation was quite high and statistically significant in both the Heckman models ($\rho = 0.58$, se = 0.13 and $\rho = 0.57$, se = 0.15. The likelihood ratio statistics for $\rho = 0$ can be rejected at the 1% level in both the models.

Among personal attributes, the respondent's age was negatively signed and statistically significant in the level equations, which was not significant the OLS-1 and significant at 10% level in the OLS-2. Schooling effect was positive but statistically insignificant in most specifications (years of schooling or as categorical variables), except HM-1 where it was significant at the 10% level. Similar to that encountered while analysing the WTJ regression above, health status, when included as an ordered explanatory variable appeared to be negatively signed in both HM-1 and OLS-1, but when expressed as dummy variables, WTP was higher for all categories of health status relative to the reference category, 'average'. However, the effect was significant at 10% level for the bad health status category only.

[15] The WTJ coefficient estimates for the selection equation under this approach are very close to those estimated in the single equation probit specification reviewed above (Table 7), and hence the details are not presented here (see Appendix, Table A1).

Table 8
Determinants of the Willingness to Pay (Heckman Level and OLS)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Heckman1	**se**	**Heckman2**	**se**	**OLS_1**	**se**	**OLS_2**	**se**
Age (Resp.)	-0.85**	(0.326)	-0.89***	(0.327)	-0.48	(0.302)	-0.54*	(0.313)
Gender (Resp. Female)	-81.64***	(17.160)	-82.45***	(16.915)	-67.75***	(16.126)	-68.95***	(15.886)
Years of Schooling (Resp.)	1.42	(1.500)			2.08	(1.368)		
Health Status (1 to 5)	-3.73	(5.492)		-2.96	(4.754)			
Schooling (1 to 5 Years)			14.59	(11.227)			16.60	(11.357)
Schooling (6 to 10 Years)			14.95	(13.926)			17.07	(12.944)
Schooling (More than 10 years)			0.31	(24.597)			14.25	(22.489)
Very bad (Health Status)			12.72	(35.032)			13.63	(33.536)
Bad (Health Status)			23.60*	(13.183)			19.95	(12.246)
Good (Health Status)			5.17	(9.853)			3.88	(9.026)
Very Good (Health Status)			12.12	(20.480)			14.60	(18.821)
Agriculture (Resp. Occup.)	34.90**	(16.680)	29.86*	(16.346)	26.84*	(14.627)	22.93	(14.688)
Petty Service (Resp. Occup.)	118.70**	(51.101)	104.41*	(55.853)	130.05**	(51.198)	115.72**	(55.551)
Transport service (Resp. Occup.)	8.53	(19.730)	5.09	(19.694)	-2.39	(18.969)	-4.10	(18.885)
Small Business (Resp. Occup.)	39.83**	(17.115)	35.54**	(16.188)	32.21**	(16.157)	28.96*	(15.677)
Medium Business (Resp. Occup.)	71.50**	(27.945)	67.80**	(28.095)	84.30***	(26.301)	80.60***	(26.379)
Service (Resp. Occup.)	32.74	(23.424)	36.08	(22.055)	14.20	(19.331)	17.50	(17.889)
Others (Resp. Occup.)	76.27***	(22.168)	70.32***	(22.465)	65.51***	(19.596)	61.26***	(20.195)
Area of Agricultural land (HH)	24.09***	(8.992)	22.09**	(8.781)	16.77**	(8.009)	15.61*	(7.954)
Square of Agricultural land (HH)	-2.20*	(1.160)	-1.86	(1.123)	-1.12	(1.077)	-0.87	(1.046)
Log of Consumption per capita per day	76.37***	(10.522)	73.96***	(10.637)	66.37***	(8.862)	64.73***	(8.929)
Log of Annual medical expenses	1.49	(1.783)	1.11	(1.778)	-0.27	(1.676)	-0.49	(1.697)
Total no. of Expatriates			17.98**	(7.554)			14.15**	(6.458)
Total no of internal migrants			-1.04	(6.593)			0.07	(6.195)
Nearest provider (others)			51.29*	(29.526)			46.99	(28.729)
Nearest provider (Informal)			12.55	(19.332)			18.77	(18.505)
Nearest provider (Government)			26.76	(20.872)			33.23*	(18.647)
Nearest provider (Private)			75.46***	(24.293)			68.26***	(21.908)

Table 8 (Cont.)
Determinants of the Willingness to Pay (Heckman Level and OLS)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Heckman1	**se**	**Heckman2**	**se**	**OLS_1**	**se**	**OLS_2**	**se**
Flood	-23.69	(14.898)	-21.98	(14.315)	-18.16	(11.905)	-16.99	(11.273)
Event of pregnency	34.11***	(12.731)	33.68***	(12.648)	27.01**	(11.839)	26.85**	(11.813)
Health Shock	1.98	(10.175)	1.62	(10.322)	0.82	(10.141)	0.38	(10.368)
Health insurance Knowledege (KNG)	28.21***	(10.315)	29.17***	(10.587)	19.21*	(9.928)	20.56**	(10.096)
MFI member (GB but NCH)	-13.87	(13.508)	-12.19	(13.518)	-14.69	(12.178)	-13.66	(12.330)
MFI member (non-GB but NCH)	15.31	(10.629)	17.16	(10.930)	3.55	(9.192)	5.11	(9.338)
Member of GCH $(MFI)_s$	36.62**	(15.717)	39.88**	(17.116)	7.99	(11.732)	12.47	(12.671)
Member of GCH $(Non\text{-}MFI)_s$	-29.15	(30.035)	-20.10	(29.622)	-37.01	(29.477)	-27.20	(29.149)
Dummy for Control Area	75.27***	(13.910)	64.84***	(14.614)	48.22***	(10.613)	37.88***	(10.811)
Area dummy 1	7.47	(20.860)	-3.04	(20.374)	23.20	(19.146)	12.11	(18.791)
Area dummy 2	-5.47	(24.780)	-7.62	(27.625)	-33.84	(21.303)	-33.92	(22.245)
Area dummy 3	39.79**	(15.230)	29.22	(18.981)	57.28***	(13.273)	46.05***	(16.571)
Area dummy 4	53.75**	(25.050)	52.71**	(22.263)	30.75	(22.317)	29.66	(18.592)
Area dummy 5	-159.28***	(18.773)	-176.95***	(19.984)	-136.44***	(19.073)	-153.75***	(20.597)
Area dummy 6	64.09***	(15.931)	35.89*	(19.979)	50.32***	(14.022)	24.97	(17.149)
Constant	-6.35	(63.438)	-23.75	(69.438)	121.92***	(41.289)	97.85**	(40.386)
Observations	3,937		3,937		2,081		2,081	
R-squared					0.191		0.200	
athrho	0.66***	(0.194)	0.64***	(0.214)				
lnsigma	5.12***	(0.069)	5.11***	(0.074)				
rho	0.5795	0.1286244	0.5678	0.1451				
sigma	167.79	11.66	166.08	12.29				
lambda	97.244	28.09	94.299	30.848				
Wald chi2(1) (rho = 0)	19.00		14.02					
Prob > chi2 =	0.00		0.00					

Notes: Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.10

There was clear evidence of a large gender differential in WTP in all the models. For example, in HM-1 the gender coefficient was significant at the 1% level, implying that other factors remaining constant, a female respondent's maximum WTP was approximately BDT 82 less than her male counterpart. The latter was much larger than the actual observed figures reviewed in Table 5 (just BDT 28). Moving on to a respondent's occupation, unlike the WTJ behaviour, the coefficients for all categories were positively signed in Heckman level equations, implying positive difference in WTP relative to the reference category, 'day labour'. The difference was statistically significant for agriculture, small business, petty services, small business, medium business and 'other' sector. Interestingly, the difference was very high for the 'petty service' sector and statistically significant in all the regressions.

Turning now to household specific control variables such as log of consumption expenditure (per capita per day) and area of agricultural land, both positively affected WTP and were highly significant in both types of models. Number of expatriate members in the household also had a clear positive effect on the WTP decision, though it did not effect WTJ decision above. Respondents, for whom the nearest healthcare provider was private, clearly wanted to pay more relative to those who had an NGO provider nearby. Knowledge about health insurance was also statistically significant and positively influenced WTP.

Continuing with hh-level attributes, unlike the WTJ decision, log of annual medical expenditure per capita was statistically not significant in any of the regressions. Though the health shock variable appeared to play no role in determining both WTP and WTJ decisions, an event of pregnancy in the household played a significant role in determining WTP decision. Households who reported to have a pregnancy event in the preceding one-year of the survey period clearly wanted to pay more relative to those who did not face the contingency.

The membership effect in the membership in the existing MHI scheme was different than what was observed in the WTJ analysis reviewed above. Here the GCH variable (who also had membership of MFIs) was found positive statistically significant at the 5% level in Heckman level equations relative to GCH households who were MFI non-members in the programme area. The difference in WTP varied between BDT 36 and 40. Interestingly, the OLS specifications were unable to capture the membership effect in GHC/MFI_s. As with the WTJ evidence, WTP was also higher and statistically significant for the respondents in the control area. Such a large positive effect (between BDT 65 and 75) in the control area on WTP (and duly backed up by strong positive preference for WTJ) highlighted the fact that the appeal for GHC was strong in view of the weak status of heath infrastructure in the control unions.

4. Discussion

We estimated WTJ and WTP for MHI using a variant of the bidding game approach with an open-ended follow up. We proposed a modified version of the existing subsidy driven MHI package of Grameen Kalyan (footnote 5). Although, compared to the existing one, the new package was more comprehensive; however on a 50:50 co-payment basis, the insured's share of risk still remained very high. Hence the proposed scheme would not, strictly speaking, qualify

as 'insurance'. Such levels of co-payment may have lead to a false sense of security if the former was not within reach and the 'insurance' would then be of much less appeal. But that too was arguable since it might not be apparent to the respondent what the size of the co-payment may range to since most were used to low-cost care

Overall willingness to join the package (54%) was quite low compared to the evidence found in other developing contexts (Asenso-Okyere *et al*., 1997; Asgary *et al*., 2004; Wright *et al*., 2009). The willingness to join at the starting bid was particularly low (27%). Asfaw *et al*. (2005) and Wright *et al*. (2009) found that 43 per cent and 42 per cent of the respondents had WTJ at the first bid in Ethiopia and Namibia, respectively.[16] Note that WTJ (and by the same token, WTP) decisions were inherently hard to compare since it was not immediately evident how much of a subsidy might have been implicit in a particular experiment, i.e., in the opening bid proposed by the researcher.

Descriptive results showed that the scheme was less popular among the poor (Table 2). Multivariate results (Table 7) showed that non-land asset and the household income positively affected WTJ, while Wright *et al*. (2009) found no significant effect of household income in Namibia. Qualitative information showed that lack of affordability was reported as the main reason for declining to join the packages by 43 per cent of the respondents who did show any WTJ. Multivariate results also showed that general awareness about health insurance (i.e., familiarity with the term) affected the decision to join. The ability-to-pay question that we included to nudge the respondents to face budget realities might also have been a reason for low WTJ.

The other important determinants of WTJ were: age and gender of the respondents, household size, proximity to informal and government providers, and location of the household. The age coefficient (negative here) was of the opposite sign of what Wright *et al*. (2009) had found for Namibia, but they found the gender variable (also negative here) to be not significant. We had hypothesised above that the size variable indicates the scope of risk pooling within the household making more likely that insured services would actually be utilised.

Proximity to informal and government providers each had significant negative influence on WTJ. This was easily explainable in view of the substitutability between MHI and the former providers on the range or services and the subsidy-driven fee structure (at least on paper). This proposition in part matched field observations that the GK health centres which were not closer to government providers had better performance in terms of number of enrolees and patient volume. The bias against programme areas has already been explained; these respondents were not fascinated by the proposed MHI scheme that they were already somewhat familiar with. On the ground, we found that a large proportion (about 43%) of the currently insured did not exhibit any WTJ the enhanced scheme.

While an episode of child delivery in the household during last 12 months had some influence (p-value <0.10) on WTJ, past health shocks in the household did not influence WTJ. The

[16] This is the only published source that modelled WTJ rigorously.

possible rationale is perhaps that in the event of event of a shock, the insured would incur large OPP in cash for services to be obtained from yet unknown external providers. Flood had some negative influence (p-value <0.10) on WTJ. Although the package was designed mainly targeting the MFI members, surprisingly, membership in MFIs did not affect WTJ. Education, health status and occupation of the respondents also did not affect WTJ while Wright *et al*. (2009) found significant effect of education on WTJ.

Focussing on WTP behaviour, results showed that overall average WTP of those who had some WTJ the scheme to be BDT406±171 (mean ± sd). These estimates cannot be compared directly with the studies of other developing countries because the proposed package and elicitation methods were different. Only 5.13 per cent of the total sampled respondents were willing to pay 1.2 per cent of non-health annual household consumption. In India, Dror *et al*. (2007) found as much as two thirds of the respondents had been willing to pay the same fraction of non-health household expenditure for insurance. Compared to the starting bid, the average WTP was about 19 per cent lower. Average WTP was very low compared to both food and non-food consumption; it was even a negligible percentage (about 8%) of annual healthcare expenditure (Table 2).

We found per capita annual household expenditure to be an important determinant of WTP like other studies in developing countries (Asenso-Okyere *et al*., 1997; Dong *et al*., 2003b, 2003c; Dror *et al*., 2007; Bärnighausen *et al*., 2007; Lofgren *et al*., 2008; Wright *et al*., 2009). It may be noted that Onwujekwe *et al*. (2010) found significant positive effect of socio-economic status (based on consumer durables and food consumption) on WTP while Asgary *et al*. (2004) found no effect of 'wealth and income'. Ceteris paribus, WTP increased by about BDT 49 due to one per cent increase in per capita income. Thus, MHI assuredly seems to be a normal good. The amount of agricultural land currently under cultivation, a wealth proxy, was also an important determinant of WTP. Another economic factor (non-land asset) also positively affected WTP.

The other important determinants of WTP were: gender, knowledge about insurance, an episode of child delivery, and location of the household. The female respondents have significantly (p-value <0.05) lower WTP, which coincides with the evidence of developing countries (Asenso-Okyere *et al*., 1997; Dong *et al*., 2003c; Dror *et al*., 2007; Wright *et al*., 2009; Onwujekwe *et al*., 2010) while Bärnighausen *et al*.(2007) found that male respondents had significantly lower WTP. Those who have knowledge about health insurance have significantly (p-value <0.05) higher WTP. An episode of child delivery during the last 12 months in the household led to higher WTP while the respondents in the programme areas had lower WTP. Flood affected households had significantly (p-value <0.05) lower WTP.

Surprisingly, however, household size did not influence WTP as found by Asgary *et al*. (2004), Wright *et al*. (2009) and Dong *et al*. (2003b) in Iran, Namibia and Burkina Faso respectively. It may be noted that Dror *et al*. (2007) and Lofgren *et al*., (2008) found significantly positive association of household size with WTP in India and Vietnam respectively, while Onwujekwe et al. (2010) found significantly negative association in Nigeria. Like WTJ, WTP did not vary with the level of education (as found by Bärnighausen *et al*., 2007), occupation and health status of

the respondents. However, some studies had found significantly positive association with the level of education (Asenso-Okyere *et al*., 1997; Dong *et al*., 2003b; Lofgren *et al*., 2008; Wright *et al*., 2009; Onwujekwe *et al*., 2010). WTP also did not vary with past health shocks in the household, MFI membership and proximity to informal or government healthcare providers. Although the literature showed that age affected WTP negatively (Dong, *et al*., 2003b, 2004b; Dror *et al*., 2007; Bärnighausen *et al*., 2007; Lofgren *et al*., 2008) we did not find any effect of this variable.[17]

5. Conclusion

The acceptability of the modified version the existing MHI package of Grameen Kalyan was fairly low. The package was averted by the poor and non-poor alike, though it was even less attractive for the poor. Average WTP for the package was also rather low given standard comparators. Among possible explanations, one can note the inherent difficulty on the part of the poorly educated in comprehending the concept of insurance, the genral lack of trust in the insurer/ provider, the 'value for money' for services proposed, cash-flow difficulties and the preparedness of the respondent to be able to foresee/think of future contingencies and a rationale approach to dealing with that. Often poor households were believed not keen to think of large future shocks in the belief that their means did not permit them to adopt coping measures. Future studies are called for to disentangle the above and find evidence if indeed MHI may be a part of the solution to the financing crisis in healthcare in a developmental context. The evidence cited from various experiments that have been carried out in the last decade or so (including that presented above) indicate that financial solvency for private heath insurance targeting the poor may remain a distant goal.

[17] However, Asgary *et al*. (2004) found positive significant effect of age of the household head on WTP.

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Appendix

Table A.1
WTJ and WTP based on Heckman Selection Model

	(1)	(2)	(3)	(4)	(3)	(4)	(11)	(12)
	Heckman1	**se**	**wtj_pc2**	**se**	**Heckman2**	**se**	**wtj_pc2**	**se**
Age (Resp.)	-0.85**	(0.326)	-0.01***	(0.002)	-0.89***	(0.327)	-0.01***	(0.002)
Gender (Resp. Female)	-81.64***	(17.160)	-0.20*	(0.102)	-82.45***	(16.915)	-0.19*	(0.101)
Years of Schooling (Resp.)	1.42	(1.500)	-0.02**	(0.008)				
Health Status (1 to 5)	-3.73	(5.492)	-0.02	(0.036)				
Schooling (1 to 5 Years)					14.59	(11.227)	-0.04	(0.068)
Schooling (6 to 10 Years)					14.95	(13.926)	-0.07	(0.070)
Schooling (More than 10 years)					0.31	(24.597)	-0.30**	(0.148)
Very bad (Health Status)					12.72	(35.032)	0.03	(0.221)
Bad (Health Status)					23.60*	(13.183)	0.09	(0.082)
Good (Health Status)					5.17	(9.853)	0.01	(0.061)
Very Good (Health Status)					12.12	(20.480)	-0.00	(0.108)
Agriculture (Resp. Occup.)	34.90**	(16.680)	0.09	(0.088)	29.86*	(16.346)	0.08	(0.086)
Small Service (Resp. Occup.)	118.70**	(51.101)	-0.32	(0.292)	104.41*	(55.853)	-0.34	(0.286)
Transport service (Resp. Occup.)	8.53	(19.730)	0.15	(0.129)	5.09	(19.694)	0.13	(0.130)
Small Business (Resp. Occup.)	39.83**	(17.115)	0.08	(0.096)	35.54**	(16.188)	0.07	(0.096)
Medium Business (Resp. Occup.)	71.50**	(27.945)	-0.26*	(0.154)	67.80**	(28.095)	-0.28*	(0.153)
Service (Resp. Occup.)	32.74	(23.424)	0.30**	(0.144)	36.08	(22.055)	0.31**	(0.144)
Others (Resp. Occup.)	76.27***	(22.168)	0.13	(0.122)	70.32***	(22.465)	0.11	(0.120)
Area of Agricultural land (HH)	24.09***	(8.992)	0.08	(0.065)	22.09**	(8.781)	0.07	(0.065)
Square of Agricultural land (HH)	-2.20*	(1.160)	-0.01*	(0.009)	-1.86	(1.123)	-0.01	(0.009)
Log of Consumption per capita per day	76.37***	(10.522)	0.30***	(0.077)	73.96***	(10.637)	0.29***	(0.081)
Log of Annual medical expenses	1.49	(1.783)	0.02**	(0.011)	1.11	(1.778)	0.02*	(0.012)
Total no. of Expatriate					17.98**	(7.554)	0.05	(0.049)
Total no of internal migrant					-1.04	(6.593)	-0.01	(0.040)

Table A.1 (Cont.)
WTJ and WTP based on Heckman Selection Model

	(1)	(2)	(3)	(4)	(3)	(4)	(11)	(12)
	Heckman1	**se**	**wtj_pc2**	**se**	**Heckman2**	**se**	**wtj_pc2**	**se**
Nearest provider (others)					51.29*	(29.526)	0.16	(0.264)
Nearest provider (Informal)					12.55	(19.332)	-0.02	(0.114)
Nearest provider (Government)					26.76	(20.872)	-0.08	(0.103)
Nearest provider (Private)					75.46***	(24.293)	0.20	(0.161)
Flood	-23.69	(14.898)	-0.11	(0.108)	-21.98	(14.315)	-0.10	(0.110)
Event of pregnency	34.11***	(12.731)	0.10	(0.082)	33.68***	(12.648)	0.10	(0.082)
Health Shock	1.98	(10.175)	0.04	(0.049)	1.62	(10.322)	0.04	(0.048)
Health insurance Knowledege (NGK)	28.21***	(10.315)	0.16**	(0.069)	29.17***	(10.587)	0.16**	(0.070)
MFI member (Grameen NGK)	-13.87	(13.508)	-0.01	(0.082)	-12.19	(13.518)	-0.00	(0.080)
MFI member (Others NGK)	15.31	(10.629)	0.17**	(0.064)	17.16	(10.930)	0.17***	(0.063)
Member of GK-MHI $(MFI)_s$	36.62**	(15.717)	0.46***	(0.096)	39.88**	(17.116)	0.46***	(0.098)
Member of GK-MHI $(Non\text{-}MFI)_s$	-29.15	(30.035)	0.14	(0.156)	-20.10	(29.622)	0.14	(0.153)
Dummy for Control Area	75.27***	(13.910)	0.48***	(0.064)	64.84***	(14.614)	0.48***	(0.066)
Area dummy 1	7.47	(20.860)	-0.21*	(0.115)	-3.04	(20.374)	-0.21*	(0.112)
Area dummy 2	-5.47	(24.780)	0.55***	(0.115)	-7.62	(27.625)	0.57***	(0.146)
Area dummy 3	39.79**	(15.230)	-0.28**	(0.112)	29.22	(18.981)	-0.24	(0.144)
Area dummy 4	53.75**	(25.050)	0.46***	(0.144)	52.71**	(22.263)	0.49***	(0.148)
Area dummy 5	-159.28***	(18.773)	-0.41***	(0.101)	-176.95***	(19.984)	-0.41***	(0.106)
Area dummy 6	64.09***	(15.931)	0.19*	(0.095)	35.89*	(19.979)	0.19	(0.126)
			0.21***	(0.045)			0.21***	(0.045)
			-0.01***	(0.004)			-0.01***	(0.004)
Constant	-6.35	(63.438)	-1.78***	(0.395)	-23.75	(69.438)	-1.84***	(0.403)
Observations	3,937				3,937			
R-squared			3,937				3,937	
athrho	0.66***	(0.194)			0.64***	(0.214)		
lnsigma	5.12***	(0.069)			5.11***	(0.074)		

Notes: Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.10

Table A2
Main occupations of the household heads

Occupations of the household heads	Total %(n)	Programme Area			Control Area %(n)
		The Insured %(n)	The uninsured %(n)	Total %(n)	
Agriculture	29.94 (1,180)	26.63 (249)	30.42 (469)	28.99 (718)	31.56 (462)
Day Labour	15.91 (627)	16.47 (154)	16.02 (247)	16.19 (401)	15.44 (226)
Transportation	6.62 (261)	9.09 (85)	5.32 (82)	6.74 (167)	6.42 (94)
Small business	14.36 (566)	18.93 (177)	11.02 (170)	14.01 (347)	14.96 (219)
Medium business	4.52 (178)	6.63 (62)	4.67 (72)	3.41 (134)	3.01 (44)
Service	9.13 (360)	7.91 (74)	10.83 (167)	9.73 (241)	8.13 (119)
Housewife	9.36 (369)	5.99 (56)	11.02 (170)	9.12 (226)	9.77 (143)
Other	10.15 (400)	8.34 (78)	10.7 (165)	9.81 (243)	10.72 (157)
Total	100 (3,941)	100 (935)	100 (1,542)	100 (2,477)	100 (1,464)

Note: Figure in parentheses is the number of observations.

Table A3
Structural, water and sanitary related features of the households

	Total %(n)	Programme Area			Control Area %(n)
		The Insured %(n)	The uninsured %(n)	Total %(n)	
% of household having electricity connection	60.72 (2,393)	62.57 (585)	61.74 (952)	62.05 (1,537)	58.47 (856)
Main materials of the main dwelling					
-Floor (Mud)	87.64 (3,454)	87.27 (816)	86.71 (1,337)	86.92 (2,153)	88.87 (1,301)
-Wall (Tin)	58.54 (2,307)	60.86 (569)	54.73 (844)	57.04 (1,413)	61.07 (894)
-Roof (Tin)	97.56 (3,845)	98.82 (924)	96.82 (1,493)	97.58 (2,417)	97.54 (1,428)
Type of latrine					
No latrine	5.33 (210)	5.67 (53)	5.84 (90)	5.77 (143)	4.58 (67)
Kacha latrine	13.20 (513)	9.2 (86)	10.83 (167)	10.21 (253)	17.76 (260)
Slab latrine	62.80 (2,475)	64.71 (605)	63.42 (978)	63.91 (1,583)	60.93 (892)
Pucca latrine	18.85 (743)	20.43 (191)	19.91 (307)	20.10 (498)	16.73 (245)
Total	100 (3,941)	100 (935)	100 (1,542)	100 (2,477)	100 (1,464)
% of households drink arsenic free water	83.15 (3,277)	85.35 (798)	83.85 (1,293)	84.42 (2,091)	81.01 (1,186)

Note: Figure in parentheses is the number of observations.

Table A4
Health status of the respondents

Indicators	Total %(n)	Programme Area			Control Area %(n)
		The Insured %(n)	The uninsured %(n)	Total %(n)	
Very good	5.92 (233)	4.6 (43)	5.91 (91)	5.41 (134)	6.76 (99)
Good	48.97 (1,929)	54.76 (512)	51.23 (789)	52.57 (1,301)	42.9 (628)
Average	31.02 (1,222)	29.09 (272)	29.68 (457)	29.45 (729)	33.67 (493)
Bad	12.77 (503)	10.7 (100)	11.95 (184)	11.47 (284)	14.96 (219)
Very bad	1.32 (52)	0.86 (8)	1.23 (19)	1.09 (27)	1.71 (25)
Total	100 (3,939)	100 (935)	100 (1,540)	100 (2,475)	100 (1,464)
Note: Figure in parentheses is the number of observations.					

Table A5
Closest healthcare facilities to the households

Indicators	Total %(n)	Programme Area			Control Area %(n)
		The Insured %(n)	The uninsured %(n)	Total %(n)	
Informal providers	38.36 (1511)	34.44 (322)	42.01 (647)	39.15 (969)	37.02 (542)
Govt. service providers	42.93 (1,691)	34.22 (320)	37.6 (579)	36.32 (899)	54.1 (792)
Private service providers	4.21 (166)	1.82 (17)	1.88 (29)	1.86 (46)	8.2 (120)
NGO service providers	14.5 (571)	29.52 (276)	18.51 (285)	22.67 (561)	0.68 (10)
Total	100 (3,939)	100 (935)	100 (1,540)	100 (2,475)	100 (1,464)
Note: Figure in parentheses is the number of observations.					

Table A6
Variable Description

Variable (as in regression models)	Description	Construction
Age	Age of the respondent	Measured in years
Gender	Gender of the respondent	Dummy variable (1= female, 0 = male)
Education level	Education level of the respondent	Measured by completed years of schooling. In the alternative model, this is replaced by three dummy variables: 1-5 years, 6-10 years and more than 10 years of schooling.
Health status	Health status of the respondent	A categorical variable that takes a number from the list: 5, 4, 3, 2 or 1 if the respondent consider her/his health status as 'very good', 'good', 'average', 'bad' or 'very bad' respectively. In the alternative model it was replaced by four dummy variables by setting the 'average' as the reference category.
Occupation	Occupation of the respondent	Occupations of the respondents are represented by seven dummy variables: agriculture, petty-service, transport-sector, service, small-business, medium-business, others (including housewives) dummy, while day labour is set as reference category.
Agricultural land and its square	Quantity of land cultivated	Measured in decimals
Consumption expenditure (per day per capita)	Household consumption (food and non-food) expenditure	Per day per capita
Medical expenditure (per capita)	The amount money spent on medical care during one-year time.	Per capita
Household size and its square	Number of members in the household	Actual size
No. of expatriates	Number of members of the households living abroad and contributed to the household by sending foreign remittances	Actual number
No. of internal migrants	Number of members of the households living elsewhere in the country for earning and contributed to the household by sending domestic remittances	

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