

**Original article:**

**Willingness to Pay for Health Insurance among Urban Poor: An Evidence from Urban Primary Health Care Project in Bangladesh**

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**Abstract:**

**Background and Objective:** With the growing concern over treatment cost in health care and the desire to improve the effectiveness and equality of healthcare financing and the quality of the care, policy-makers have turned their attention to health insurance, especially, for the poor. This study attempted to determine the willingness to pay for health insurance among the mothers who utilized the urban primary health care clinic (UPHCC) for maternal and child health. **Methods:** This cross-sectional study was carried out in the working areas of UPHC Project in Bangladesh following two-stage cluster sampling technique to select the participants. Data were collected from 3949 women aged 15-49 years having at least one child aged two years or less. The data on willingness to pay for health insurance was collected using the contingent valuation method with bidding style. Data analysis was done by SPSS 22.0 version. Two generalized linear models with binary logit link function and normal identity link function were developed to identify the potential predictors for willingness to pay for monthly health insurance. **Results:** Three-fifths (67.5%) of the respondents agreed to pay for monthly health insurance. The median monthly premium for health insurance was BDT 15.5. Multivariate analysis revealed that utilization of UPHC clinic, quality of life, family size, age, wealth index, level of education, husband and respondent's occupation, ownership status of the house, religion and family income appeared to be potential predictors for health insurance ( $p < 0.05$ ). However, utilization of UPHC clinic and quality of life appeared to be important predictors across all the models. **Conclusion:** A large proportion of the community agreed to pay premium for health insurance. Based on the finding of the current study the policy makers might consider introducing a scheme for health insurance especially among the urban poor.

**Keywords:** Willingness to Pay; Health Insurance; Urban Poor; Bangladesh

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**Introduction**

There are many countries implementing health insurance systems, but they characteristically cover only civil servants and other formal-sector employees. Health insurance systems are then reviewed with the poor in attention<sup>1</sup>. Some initiatives have been involved to encompass coverage to the segment of

poor who are able to pay at least certain premiums, or whose care can be shielded by cross-subsidies using funds upraised from those who are less poor in Latin America. In Colombia and Mexico, to identify poor households, simplified forms of proxy mean testing are used. Seguro Popular, a motivated set of reforms that has been introduced by Mexico targets

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to enroll the majority of the poor by the middle of the next decade<sup>2-4</sup>. Dercon,<sup>5</sup> explained that to expand the access of the poor to the monies they need for health care, health insurance is not the only way. Options embrace improving capacity of the poor to deposit their savings in banks and other formal sector commercial institutions and mounting access to short-term credit. Financial institutions can have a vital role to play in improving the health of the poor not only viewed as outposts of the health sector. Uzochukwu et al.<sup>6</sup> had argued that willingness to pay for Maternal and Child Health (MCH) services if the quality of care to be improved. The study reported a positive attitude towards willingness to pay for readily available services. A study in Ethiopia, WTP for injectable contraceptives was assessed using a dichotomous yes/no response and the follow up question was open ended to inquire how much they wanted to pay. The study revealed at least \$0.65 spent for injectable contraceptives<sup>7</sup>. Lang and Lai<sup>8</sup> in Taiwan investigated the public willingness to pay for National Health Insurance (NHI) program by using contingent valuation method asking whether they would agree to pay at already fixed six price bids. The study found that the people were willing to pay NT\$66 for NHI and NT\$ 137 for added long-term care services per month. These referendum-like close ended questions were vulnerable to bias associated with the range of payment used in the study.

The introduction of social health insurance or co-pay proposal by the Ministry of Health would be inevitable. It was hoped that the reformation in funding would also bring an improvement in the service provided in term of quality, equity and timely accessibility. The issue of affordability would surely affect the acceptability of health care by the public. Therefore, one of the ways to roughly estimate the ability to pay by the public was by doing willingness to pay study<sup>9</sup>. Considering this view, this study attempted to assess the willingness to pay for health insurance among the urban mother attending the urban primary health care clinic and the factors associated with it.

## **Materials and Methods**

### ***Participants***

A total of 3949 women were interviewed. The mean (SD) age of the respondents was 25.49 (5.1) years with a minimum 15 and maximum 45 years.

Most of the respondents were Muslim (90.4%) and remaining were Hindus (9.2%), Christian (0.2%) and Buddhist (0.2%). The mean (SD) family size was 4.71 (1.57) ranging from two to 15 members. About two-fifths of the respondents (38.2%) had completed primary education followed by secondary education (32%) and more than one-tenth (11.5%) had a higher secondary education. More than four-fifths (83.1%) were housewives. Only about 4.3% of the respondents were garment workers followed day labourers (3.1%). More than one-fourth (27.3%) of their husbands were engaged in small trade and 17.9% were engaged in private service followed by day labourer (16.5%). In Urban Primary Healthcare Project (UPHCP) working area, an entitlement cards (red card) were issued to the poor households to avail healthcare services free of charge from UPHCP facilities. Out of 3949 respondents, 20% entitlement card holder presented their cards to the interviewer. However, another 5% did not show a card, and they claimed to have.

### ***Sample and sampling procedure***

This was a cross-sectional study conducted in working areas of Urban Primary Healthcare Project (UPHCP) areas in seven divisions of Bangladesh. A two-stage cluster sampling technique was adopted to select the ever-married women aged 15-49 years having at least one child aged within two years. For determination of sample size, an anticipated population proportion of urban poor was considered as base criteria with 10% relative precision and 95% confidence interval. The initial sample size was 896. This was then inflated by multiplying non-response, design effect. Thus, the final sample size was 4124. However, 3949 completed questionnaires were collected with the response rate was 95.8%. The respondents who did not consent or unwilling to participate, visitor or guest residing in household were excluded from the study.

### ***Data collection instruments and procedure***

Willingness to pay is a methodological tool that seeks to estimate the capacity to pay for certain social groups in a search to find out the hypothetical monetary value for programs and specific medical interventions and treatment<sup>9</sup>. Willingness to pay in this study used contingent valuation method. There were two most common methods of eliciting willingness to pay which are conjoint analysis and contingent valuation method<sup>10</sup>. Contingent valuation

method with closed ended bidding technique was the most commonly used and easier to apply<sup>11-14</sup>. The approach asked respondents about how much they were willing to pay for the goods (usually public goods). To be able to elicit the willingness to pay value from the respondents, a description of the commodity or scenario needed to be given first. The nature of the description and the clarity of the information given could influence the willingness to pay pattern by the respondents and therefore, must have as minimum bias as possible<sup>15,16</sup>. There was a payment scenario describing the willingness to pay for monthly health insurance. After the explanation of the scenario and the payment methods, the question on whether they agree to pay would be asked first. If they agree, then the bidding process would commence. The answers to the bidding are close ended with four options ('yes', 'may be yes', and 'may be no' and 'no'). However, if the respondents answer 'no' or 'may be no', they would be asked about the reason and the interview stopped there. This is to differentiate the 'protest no' and the 'real no'. The bidding would start with the lowest value which would be obtained from the pre-test and afterward greater value and stopped if the participants opined that they were reluctant to pay the given amount. Again, the answer options are 'yes', 'may be yes', 'may be no' and 'no'. Once the respondents respond no or yes to the whole bidding, open ended question would ask about what the uppermost amount that they were willing to pay.

**Statistical analysis**

A completed data was entered into computer for analysis. Incomplete and inaccurate and missing information in the main components of the questionnaire was discarded. Before data analysis, data was cross-checked for any unusual findings, outliers and missing values<sup>17</sup>. Statistical analysis was done using Statistical Package SPSS, version 22.0<sup>18</sup>. A p-value less than 0.05 was considered as statistically significant.

In the present study, an econometric model for willingness to pay for health insurance was developed. The most preferred method was generalized linear model with binary logit link function<sup>19-21</sup>. A generalized linear model (or GLM) consists of three components:

1. A random component, specifying the conditional distribution of the response variable,  $Y_i$  (for the  $i$ th of  $n$  independently sampled observations), given the values of the explanatory variables

in the model. In the initial formulation of GLMs, the distribution of  $Y_i$  was a member of an exponential family, such as the Gaussian, binomial, Poisson, gamma, or Inverse-Gaussian families of distributions.

2. A linear predictor—that is a linear function of regressors,

$$\eta_i = \alpha + \beta_1 X_{i1} + \beta_2 X_{i2} + \dots + \beta_k X_{ik} \dots \dots \dots (1)$$

3. A smooth and invertible linearizing link function  $g(\cdot)$ , which transforms the expectation of the response variable,  $\mu_i = E(Y_i)$ , to the linear predictor:

$$g(\mu_i) = \eta_i = \alpha + \beta_1 X_{i1} + \beta_2 X_{i2} + \dots + \beta_k X_{ik} \dots \dots \dots (2)$$

The binomial distribution for the proportion  $Y$  of successes in  $n$  independent binary trials with probability of success  $\mu$  has probability function

$$p(y) = \binom{n}{ny} \mu^{ny} (1 - \mu)^{n(1-y)} \dots \dots \dots (3)$$

Here,  $ny$  is the observed number of successes in the  $n$  trials, and  $n(1-y)$  is the number of failures; and

$$\binom{n}{ny} = \frac{n!}{(ny)![n(1-y)]!} \dots \dots \dots (4)$$

In our first model, generalized linear model with binary logit link function was used. In the scenario 1, the respondents were asked whether they want to participate for maternal health care coverage with monthly premium. In the first scenario, whether they agree or disagree for health insurance as a dichotomous variable, i.e. yes vs. no. Significant independent variables were fed into the model one by one and the best fitted ones were chosen. Assumptions of adequate sample size, multicollinearity and absence of outliers were examined. A total of 164 data were removed due to extreme outliers. In this analysis, robust estimation was choose to minimize the potential outliers and to produce stable model<sup>22</sup>. Finally, the estimated marginal means were calculated for the mean response for each factor, adjusted for any other variables in the model that is the estimated marginal means adjust for the covariate by reporting the means of  $Y$  for each level of the factor at the mean value of the covariate. Pairwise comparison with Bonferroni adjustment was done to

minimize the type I error. The data were interpreted into non-poor and poor strata to compare the results.

In the second model, generalized linear model was developed with normal identity link function. Initially, it was assumed that the dependent variable was coded into count variable such as ‘0’ as zero premium or not willingness to pay and 10-20 as 1, 21-30 as 2, 31-40 as 3 and so on. However, when entered the variables into Poisson regression model analysis with log link function, the model fitting information was not satisfactory over linear regression model. Because the comparative analysis of Akaike’s Information Criterion (AIC) was smaller in linear model than the Poisson model was indicating a better fitted model. In this situation, the link function is the random component with the systematic component of linear function was chosen. More specific if  $\mu$  is the mean of Y, then the link function relates the  $\mu$  with the linear predictor.

$$g(\mu) = \alpha + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_k X_k \dots \dots \dots (5)$$

In multiple linear regression  $g(\mu) = \mu(\text{identity})$

$$\mu = \alpha + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_k X_k \dots \dots \dots (6)$$

because the mean error is assumed to be zero.

However, after removal of ‘0’ from the data set, the model fitting information (value/df) of Pearson Chi-Square and Deviance was much smaller than 0.05 which indicate poor fitting model in zero truncated Poisson regression. Categorical and continuous independent variables were fed into the model one by one and the best fitted one was chosen. Assumptions of adequate sample size, multicollinearity and absence of outliers were examined. Finally, 445 data were removed from the due to extreme outliers.

**Ethical issues**

The ethical approval was obtained from ethics committee of Universiti Malaysia Sarawak (UNIMAS) (ref: UNIMAS/NC.21.02/03-02(42), dated: 07/01/2015) and Bangladesh Medical Research Council (BMRC), Bangladesh (Ref: BMRC/NREC/2013-2016/1265, dated: 30/06/2015). Before data collection, an informed written consent was obtained and they were briefed about a) the objectives, steps and estimated result of the study, b) welfares of the research, in term of welfares to the subject and benefits to others; c) absolute confidentiality of facts gained; and e) the right to take away from the study at any time wanting any way upsetting her current situation.

**Results**

**Willingness to pay for insurance**

The respondents were informed by giving a scenario of improved service and facilities in PHC setting for MCH services with health insurance as the financial resources. They were asked whether they agree to pay for the monthly insurance or not and the amount they were willing to pay. Three-fifths of the respondents (67.5%) agree to pay for monthly health insurance. Among the respondents those who disagree, 29.3% were unable to afford the payment while 25.7% put the responsibility to the government. More than half of them agreed to pay around BDT 10-20 but the highest value that the 0.1% respondents were willing to pay was BDT 1000. The median monthly premium for health insurance was BDT 15.5 (Table 1).

**Table 1 Descriptive analyses of willingness to pay for MCH service using health insurance**

Variables	Frequency	%
<b>Paying health insurance monthly (n=3949)</b>		
Agree	2667	67.5
Disagree	1282	32.5
<b>Reasons of refusing to pay (n=1282)</b>		
Unable to afford	376	29.3
It’s government responsibility	329	25.7
It’s for well off family	82	6.4
Didn’t answered	495	38.6
<b>Amount WTP for insurance (BDT)</b>		
10-20	2195	82.3
21-30	82	3.1
31-40	39	1.5
41-50	14	0.5
51-100	155	5.8
101-150	80	3.0
151-300	90	3.4
<b>Other amounts (BDT)</b>		
500	6	0.2
800	2	0.1
1000	4	0.1

**Generalized linear model with binary logit link function**

**Table 2 Factors affecting the WTP for monthly health insurance premium: Generalized linear model with binary logit link function**

Parameters	Non-poor					Poor				
	$\beta$	SE	AOR	95% CI		$\beta$	SE	AOR	95% CI	
				LL	UL				LL	UL
<b>Occupation (husband)</b>										
Small trade	0.16	0.47	1.17	0.46	2.97	0.94***	0.30	2.55	1.42	4.59
Service	-0.61	0.47	0.55	0.22	1.37	0.58	0.30	1.78	0.99	3.21
Manual job	0.08	0.47	1.08	0.43	2.74	0.73**	0.27	2.07	1.22	3.52
No specific job (RC)	0.0	.	1.00	.	.	0.0	.	1.00	.	.
<b>Family income (BDT)</b>										
< 10000.0	-0.62**	0.25	0.54	0.33	0.88	-1.04***	0.33	0.36	0.19	0.68
10000.0 - 19999.9	-0.05	0.19	0.95	0.65	1.39	-0.69*	0.33	0.50	0.26	0.96
20000.0 - 29999.9	-0.38*	0.19	0.68	0.47	0.98	-0.98*	0.41	0.37	0.17	0.83
$\geq$ 30000 (RC)	0.0	.	1.00	.	.	0.0	.	1.00	.	.
<b>Wealth index</b>										
Poorest	0.48	0.30	1.62	0.90	2.92	0.66	0.36	1.93	0.96	3.88
Poor	0.66**	0.25	1.94	1.19	3.16	0.51	0.35	1.66	0.84	3.28
Middle class	0.79***	0.22	2.21	1.43	3.42	0.32	0.35	1.37	0.69	2.73
Rich	0.36*	0.16	1.44	1.05	1.96	0.97**	0.37	2.64	1.28	5.44
Richest (RC)	0.0	.	1.00	.	.	0.0	.	1.00	.	.
<b>Utilization of UPHCC</b>										
No utilization	2.74***	0.34	15.47	7.91	30.27	2.69***	0.23	14.77	9.44	23.12
Partial utilization	0.86**	0.32	2.36	1.27	4.41	0.79***	0.18	2.20	1.56	3.11
Full utilization	0.0	.	1.00	.	.	0.0	.	1.00	.	.
<b>Family size</b>										
<4	-0.09	0.22	0.92	0.60	1.40	0.52***	0.18	1.68	1.18	2.38
4	-0.07	0.19	0.94	0.65	1.36	0.31*	0.15	1.37	1.01	1.85
5	-0.38*	0.19	0.68	0.47	0.99	0.04	0.16	1.04	0.76	1.43
$\geq$ 6(RC)	0.0	.	1.00	.	.	0.0	.	1.00	.	.
<b>Ownership status</b>										
Own	-0.46	0.48	0.63	0.25	1.63	0.34	0.18	1.41	0.99	2.01
Rent	-0.43	0.48	0.65	0.25	1.68	0.80***	0.17	2.23	1.61	3.10
Shelter (RC)	0.0	.	1.00	.	.	0.0	.	1.00	.	.
<b>Having entitlement card</b>										
No	0.49*	0.19	1.63	1.12	2.38	0.66***	0.12	1.94	1.53	2.47
Yes (RC)	0.0	.	1.00	.	.	0.0	.	1.00	.	.
Age in years	-0.15***	0.01	0.86	0.84	0.88	-0.08***	0.01	0.92	0.90	0.94
Quality of life	0.63***	0.16	1.87	1.36	2.57	1.16***	0.13	3.20	2.46	4.16
(Intercept)	2.15*	1.01	8.54	1.19	61.37	-3.34*	0.72	0.04	0.01	0.15
N	1886					1899				
Deviance (df)	1547.426(1843);0.840					1899.302(1850);1.027				
Pearson Chi-Square	1545.315(1843);0.838					1715.896(1850);0.928				
Likelihood Ratio Chi-Square	482.710(20);p<.001					579.538(20);p<.001				

\* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$ 

Dependent variable: WTP for health insurance (yes (1) vs. No (0)).

AOR= Adjusted odds ratio

95% CI: 95% confidence interval; LL=Lower limit 95% confidence interval,

UL=Upper limit 95% confidence interval, RC= Reference category

Analysis revealed that occupation of the husband, family income (BDT), wealth index, utilization of UPHCC, family size, ownership status of the house, having an entitlement card, age in years and quality of life index appeared to be important predictors for willingness to pay for health insurance ( $p < 0.05$ ) for both the non-poor and poor catchment areas, however, family size and ownership status of the house did not significantly influence willingness to pay for the non-poor catchment area ( $p > 0.05$ ). Analysis revealed that household income negatively influences the WTP for health insurance premium as with income BDT less than 10000 less likely to pay health insurance in both the poor and non-poor catchment area, but it was more among the respondents from poor catchment areas. Based on wealth index, poorest respondents not necessarily willing to pay for health insurance, but the respondents with poor 1.94 (95% CI: 1.19, 3.16) and middle class 2.21 (95% CI: 1.43, 3.42) times likely to pay premium from non-poor catchment area. On the contrary, it was 2.64 times (95% CI: 1.28, 5.44) among the rich in poor catchment area and 1.44 times (95% CI: 1.05, 1.96) in non-poor catchment area. It was found that WTP was 15.47 times (95% CI: 7.91, 30.27) in non-poor and 14.77 times (95% CI: 9.44, 23.12) in poor catchment area those were never utilized UPHCC compare to fully utilization of UPHCC. However, partial utilization was 2.36 times (95% CI: 1.27, 4.41) in non-poor and 2.20 times (95% CI: 1.56, 3.11) likely to pay health insurance in poor catchment area. Among the non-poor catchment area, family size had negative influence in WTP for health insurance, but the low family size with four members in poor catchment area 1.68 (95% CI: 1.18, 2.38) times likely to pay health insurance and 1.35 times (95% CI: 1.01, 1.85) likely to pay among the family of 5 members. Similarly, entitlement (privilege) card had negative influence on WTP for health insurance, for example, those who had no card were 1.63 times (95% CI: 1.12, 2.38) in non-poor and 1.94 times (95% CI: 1.53, 2.47) in poor catchment area likely to pay health insurance. Analysis revealed that one-unit increase of quality of life 1.87 (95% CI: 1.36, 2.57) times in non-poor and 3.20 (9% CI: 2.46, 4.16) times in poor catchment area likely to increase the WTP for health insurance, whereas with one-unit increase in age in years, the WTP decrease in 0.86 times (95% CI: 0.84, 0.88) in non-poor and 92 times (95% CI: 0.90, 0.94) in

poor catchment area. Among the poor catchment area, those who were engaged in small trade 2.55 times (95% CI: 1.42, 4.59) and doing manual job 2.07 times (95% CI: 1.22, 3.52) likely to pay health insurance compared to non-specific job. It was also found that those who were living in rented house, 2.23 times (95% CI: 1.61, 3.10) likely to pay health insurance. However, occupation of the husband and ownership status in the non-poor catchment area had no influence on WTP for health insurance ( $p > 0.05$ ) (Table 2).

#### ***Generalized linear model with normal identity link function***

Analysis revealed that occupation of the husband, utilization of urban primary health care clinic and age of the respondents appeared to be the important predictors for willingness to pay for health insurance ( $p < 0.05$ ) for both non-poor and poor catchment areas, however, level of education, family income (BDT) appeared to be significantly influence WTP for health insurance among the non-poor whereas, religion, ownership status of house, having a red card and quality of life significantly influence willingness to pay for the poor catchment area ( $p < 0.05$ ). Respondent having primary and secondary level of education in both non-poor and poor catchment area more likely to WTP for health insurance however, non-formal education and higher secondary level of education among poor likely to pay health insurance, but not among the non-poor ( $p > 0.05$ ). Similarly, those who never or partially utilized urban health care clinic were likely to pay health insurance premium compared to full utilization in both non-poor and poor catchment areas. Among the poor catchment area, the non-Muslim respondents were more likely to pay health insurance, similarly, those were engaged in small trade and manual job were more likely to WTP for health insurance ( $p < 0.05$ ). Those who were living in their own house or a rented house were also more likely to pay health insurance ( $p < 0.05$ ). But those who had no entitlement card (red card) were likely to pay health insurance premium in the poor catchment area. Analysis revealed that with increasing quality of life among the respondents, they were more likely to pay health insurance. In contrast to the family income, respondents with family income less than BDT 10,000 to 30,000 were less likely to pay health insurance premium among the non-poor catchment area ( $p < 0.05$ ) (Table 3).

**Table 3 Factors affecting the WTP for monthly health insurance premium: Generalized linear model with normal identity link function**

Parameters	Non-poor					Poor				
	$\beta$	SE	AOR	95% CI		$\beta$	SE	AOR	95% CI	
				LL	UL				LL	UL
<b>Religion</b>										
Non-Muslim	0.06	0.04	1.06	0.97	1.15	0.13***	0.04	1.14	1.06	1.24
Muslim (RC)	0.0	.	1.00	.	.	0.0	.	1.00	.	.
<b>Level of education</b>										
No formal	0.13	0.07	1.13	0.99	1.30	0.24**	0.08	1.27	1.07	1.49
Primary	0.20***	0.05	1.22	1.10	1.36	0.23***	0.08	1.26	1.08	1.48
Secondary	0.13*	0.05	1.14	1.04	1.25	0.20**	0.08	1.22	1.04	1.44
Higher Secondary	0.02	0.06	1.02	0.92	1.14	0.20*	0.10	1.23	1.01	1.49
Graduate and above (RC)	0.0	.	1.00	.	.	0.0	.	1.00	.	.
<b>Occupation (husband)</b>										
Small trade	-0.08	0.08	0.93	0.79	1.10	0.17**	0.07	1.19	1.04	1.36
Service	-0.12	0.09	0.89	0.75	1.05	0.12	0.07	1.12	0.99	1.28
Manual job	0.00	0.08	1.00	0.85	1.18	0.15**	0.06	1.17	1.04	1.31
No specific job (RC)	0.0	.	1.00	.	.	0.0	.	1.00	.	.
<b>Family income (BDT)</b>										
< 10000.0	-0.20***	0.05	0.82	0.75	0.91	-0.08	0.07	0.93	0.81	1.07
10000.0 - 19999.9	-0.12***	0.04	0.89	0.82	0.96	-0.04	0.07	0.96	0.83	1.10
20000.0 - 29999.9	-0.12***	0.04	0.89	0.82	0.96	-0.01	0.08	0.99	0.84	1.17
≥30000 (RC)	0.0	.	1.00	.	.	0.0	.	1.00	.	.
<b>Ownership status</b>										
Own	-0.02	0.08	0.98	0.83	1.15	0.09**	0.04	1.10	1.02	1.18
Rent	-0.06	0.08	0.95	0.80	1.11	0.14***	0.03	1.16	1.09	1.23
Shelter (RC)	0.0	.	1.00	.	.	0.0	.	1.00	.	.
<b>Having entitlement card</b>										
No	0.06	0.05	1.06	0.96	1.16	0.14***	0.03	1.15	1.09	1.22
Yes (RC)	0.0	.	1.00	.	.	0.0	.	1.00	.	.
<b>Utilization of UPHCC</b>										
No utilization	0.42***	0.08	1.52	1.29	1.79	0.38***	0.05	1.46	1.33	1.60
Partial utilization	0.24**	0.08	1.27	1.07	1.49	0.17***	0.04	1.18	1.09	1.28
Full utilization (RC)	0.0	.	1.00	.	.	0.0	.	1.00	.	.
Age in years	-0.02***	0.00	0.98	0.97	0.98	-0.01***	0.00	0.99	0.98	0.99
Quality of life	0.04	0.03	1.04	0.97	1.11	0.19***	0.02	1.21	1.15	1.27
(Intercept)	0.92***	0.20	2.50	1.69	3.70	-0.34*	0.16	0.71	0.52	0.98
N	1680					1828				
Deviance (df)	465.402(1661); 0.280					447.589(1805); 0.248				
Pearson $\chi^2$	465.402(1661); 0.280					447.589(1805); 0.248				
Likelihood Ratio Chi-Square	219.791(18); p<0.001					347.720(18); p<0.001				

\* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$ 

AOR= Adjusted odds ratio, 95% CI: 95% confidence interval,

LL=Lower limit of 95% confidence interval; UL=Upper limit of 95% confidence interval

RC= Reference category

## **Discussion**

In our study, more than three-fifths of the respondents (67.5%) agreed to pay for monthly health insurance. About 29.3% were unable to afford the payment while 25.7% put the responsibility to the government. More than half of them agreed to pay around BDT 10-20 (USD 0.12- 0.24). The higher the bid was made, the lower number of respondents who were willing to pay.

In Bangladesh, Ahmed et al.<sup>23</sup> found out a higher percentage of the respondents were willing to pay for Community Based Health Insurance (CBHI) an average amount of BDT 22.8 (US\$ 0.286) weekly per household compared to this current study. Similarly, the estimates varied across the geographical location and occupation. There was a worthy number of publications on WTP for health insurance in low-and middle-income countries both in Asia and Africa<sup>24,25</sup>. An Indian study showed that median WTP was 55 INR (US\$ 1.09) per month<sup>20</sup>. Another study reported that people in rural India were willing to pay 1500 INR (US\$ 27) annually for CBHI<sup>26</sup>. In Ghana, almost 64% of respondents were willing to pay about Cedi 5000 ( US\$ 3) per month for a National Health Insurance scheme by the informal sector<sup>19</sup>. Two studies in Iran, willing to pay an average of US\$ 2.77 per month in the rural area for health insurance<sup>27</sup> and the average WTP for social health insurance per person per month was found US\$ 5.5<sup>28</sup>. In West Malaysia, Almualm et al.<sup>29</sup> found a higher percentage of the respondents were willing to pay for National Health Insurance (NHI) compared to this current study. Malaysia, a middle-income country, using Contingent Valuation approach revealed that more than 63.1% of the respondents were willing to join CBHI with an average payment of US\$ 114.38 per month per household<sup>30</sup>. However, Aizuddin et al.<sup>31</sup> reported positive results on the willingness to pay for National Health Insurance among farmers in Selangor. The median amount that they were willing to pay was MYR 2.00(US\$ 0.5) per month which was slightly higher than the present findings. In St. Vincent and the Grenadines, an upper-middle-income Caribbean country, 72.3% respondents were willing to join with WTP 77.83 EC\$ (US\$ 28.83) per month per person to enroll in the National Health Insurance plan<sup>32</sup>. The uninsured individual in the Greater Windhoek Area of Namibia was willing to pay 47.50 NAD (US\$ 6.60) per month for individual health insurance in a past Namibian study<sup>33</sup>. Total utilization of MCH services was 1.18 times more likely increase the amount of WTP in poor areas compared to non-

poor areas in the present study. Similar findings were found in Rwanda<sup>34,35</sup>, Nigeria<sup>36,37</sup>, Mali and Senegal<sup>38</sup> and India<sup>39</sup>. The possible explanation might be that the benefit of total utilization of MCH services assured the respondents for willingness to pay for the increasing amount of monthly premium of health insurance. The present study explored that lower level of socio-economic status had a negative influence on WTP for monthly health insurance premium. Here, respondents possessing health entitlement card/red card were less likely to WTP which mirrors several previous findings related to voucher scheme holder in Kenya<sup>40-42</sup>. In another study conducted by Kanya et al.<sup>43</sup> identified WTP for RH services among poor women enrolling voucher scheme and non-voucher clients. Voucher clients were significantly less likely to manifest WTP for ANC, delivery and FP services compared with non-voucher clients respectively pay for various RH services. Voucher clients were willing to pay significantly lower amounts for delivery and PNC services. Due to financial constraint and lower socio-economic status in above past studies and respondents having red card in this study had negative influence on WTP. In Nigeria, WTP for MCH services was significantly related to education, income and occupation of the respondents like the present study findings<sup>44</sup>. A study in Burkina Faso and Iran explored that higher WTP for community-based insurance was gained for higher income level, higher education and younger people consistent with the present study<sup>28,45</sup>. In Iran, WTP decreased with increasing the family size as in the present study<sup>28</sup>. In contrast, a systematic review in the past found that increases in family size were correlated with higher WTP for insurance, but similar with the present study with education level and income were consistently correlated with higher WTP for insurance and increases in age were correlated with reduced WTP<sup>46</sup>. On the effect of age on WTP, Oyekale<sup>47</sup> showed a strong negative correlation, but Babatunde et al.<sup>48</sup> found a significant influence of age on WTP for health insurance. The current study is in line with Oyekale's findings but inconsistent with Babatunde's assessment. Increase quality of life significantly influenced WTP and ownership of house had no significant effect on WTP which agreed with Smith and Cunningham<sup>49</sup>, although the purpose for WTP was not the same. On the other hand, respondents who resided in their own house or in rented house in the poor catchment area had a positive influence on WTP which might be due to living security they want to pay for monthly HI premium.



Our results are based on urban population and our study sample was not representative of the national population. Given that our sample was relatively poor and that the amount of willingness to pay perhaps may not reflecting the wealth and the characteristics of our sample limit the generalizability of the results. The sample population of general population may result in different values WTP. Next, the range of response choices for the payment of WTP question may have influenced participant responses to the open-ended question. However, since we pre-tested our WTP questions to choose ranges for the payment-scale question, it may also be that the payment-scale ranges accurately captured the range of values respondents had in mind for WTP. But it might be a response like nodding the head of “Ya Ya” distort the results.

### **Conclusions**

Analysis revealed that utilization of urban primary healthcare clinic, occupation of the husband, family income (BDT), age in years appeared to be important predictors for willingness to pay for health insurance in both models. However, other variables such as wealth index, family size and ownership status of the house, entitlement card and quality of life varied in significance across the model. The goal for the Bangladesh government is to ensures quality of health service with equity. Thus, reaching the goal, the findings of this study might hold the key to strategic planning. Though Our findings on the determinants of WTP are, in this light, somewhat encouraging. WTP increase with increasing age

and rises with more education. Respondents with higher education may be more encouraging to pay. A key task for policymakers is to implement a health insurance scheme on a pilot basis, particularly among the urban poor with low education.

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### ***Conflict of interest***

The authors declare that they have no competing interests.

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### ***Author’s contribution***

Md Mizanur Rahman and Sharmin Mizan developed the concept and contributed to design, analysis, interpretation of data, and manuscript writing of the study. Sharmin Mizan organized and collected data. All authors helped in the editing and refining of the manuscript. All authors read and approved the final manuscript.

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