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# Willingness-To-Pay for Health Insurance: Protocol for a Comparative Study Between Formal and Informal Health-Workers

Md Fuad Al Fidah[1]

1 National Institute of Preventive and Social Medicine (NIPSOM)

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## Abstract

### Introduction

People in low- to middle-income countries (LMICs), such as Bangladesh, have less access to healthcare than those in wealthier nations with less than 1% of the population having access to social health protection, which is mostly limited to those who work in the formal sector (14.9% of all jobs). This comparative study aims to use the contingent valuation method (CVM) to determine the factors affection and compare the mean willingness-to-pay (WTP) for community-based health insurance (CBHI) between formal and informal health workers.

### Methods and analysis

This comparative study will be conducted among 250 doctors who will be selected by a convenience sampling technique from various formal and informal workstations in Dhaka City. Of the 250 participants, 125 will be from each group. To collect data, a semi-structured questionnaire will be used via face-to-face interviews. Data will be processed and analyzed using R (v4.3.0) and RStudio (v2023.03.1). WTP for CBHI will be estimated using the “DCchoice” package. The primary outcome is to estimate the proportion and mean WTP across the groups and compare it using double bound dichotomous choice (DBDC) method. Secondary outcomes include identifying the socio-demographic, job-related and healthcare seeking-related factors that influence the WTP.

### Ethics and dissemination

Ethics approval has been obtained from Institutional Review Board (IRB) of the National Institute of Preventive and Social Medicine (NIPSOM). Informed consent will be taken from each participant before data collection. The results of the study will be published in scientific, peer-reviewed journals.

### Strengths and limitations of this study

– The contingent valuation method is a well-established method of eliciting WTP for health insurance.
– The current study will be among the first of its nature as it will focus on formal and informal healthcare workers.

– Starting point bias may affect the result as this type of bias comes with the Double bounded dichotomous choice (DBDC) method used in this study.

Md. **Fuad Al Fidah**[a*]

[a*]*MBBS, MPH, MPhil (candidate), National Institute of Preventive and Social Medicine, Dhaka, Bangladesh*

[*]**Corresponding author:** Md. Fuad Al Fidah, MBBS, MPH, MPhil (candidate), National Institute of Preventive and Social Medicine, Dhaka, Bangladesh.

ORCID iD: 0000-0002-6695-6342

Phone number: +8801711113309

e-mail: fuad@bibliophilebd.org

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## Introduction

People in low- to middle-income countries (LMICs), such as Bangladesh, have less access to healthcare than those in wealthier nations. The lack of access to healthcare can be seen as part of a larger cycle in which poor health keeps people poor.[1] A population's health is a key factor in poverty reduction, economic growth, and long-term economic development. A well-planned healthcare system protects the public from the financial risks associated with illness. Healthcare costs are increasing at a faster rate than ever before due to an aging population, an increase in the prevalence of chronic diseases, and the availability of more technologically advanced, expensive treatments. Out-of-pocket (OOP) payments make up a significant portion of how LMICs pay for their health systems.[2]

About 800 million people worldwide spend more than 10% of their household income on health care, a financial burden that has left 100 million people extremely poor.[3] Bangladesh has the highest rate of catastrophic expenditures in the Asia-Pacific region at 17% (7% of Bangladeshi households spend more than 10% of their income on health care), who are forced to borrow money or sell household assets to pay for illness-related costs.[4] A study found that Bangladeshi households spent approximately Tk 103.46 billion (US $1.49 billion) on out-of-pocket medical costs per year, accounting for 64.3% of total health expenditures.[5] The average household spends 7.5% of its total income on health care, while the poorest 20% spend approximately 13.5%. These large out-of-pocket costs are both a burden and a barrier to getting health care.

All economic activity outside formal institutions makes up Bangladesh's informal sector. It employs 85.1% of the total workforce with limited to no health insurance. Less than 1% of Bangladesh's population, mostly those who work in the

formal sector, have access to social health protection,[6] which is 14.9% of all jobs.[7]

Health insurance facilitates the transfer of funds from a healthy state to an ill state in order to cover medical expenses. As a result, health insurance makes health services more affordable, increases access and use of healthcare, and mitigates the financial consequences of poor health.[8] The Willingness-to-pay is considered as the most a person is willing to pay for a product or service. WTP can be estimated using various methods. One such method is the Contingent Valuation Method (CVM). In this method, Individual preferences are determined by asking about WTP for public goods and services while prices are unavailable. According to some health economists, WTP is the best approach to developing health insurance schemes.[9]

Out-of-pocket (OOP) payments continue to be the primary source of funding for healthcare in Bangladesh. A recent study found that around 25% of people had catastrophic health expenditures (CHE), while 14% of the population ignored treatment for any reason. The most common reason for forgoing healthcare was the cost of treatment (17%).[10] Bangladesh has a goal of achieving universal health care coverage. Despite making great strides in public health during the past two decades, the country still lags behind countries like China, Vietnam, Thailand, etc. in achieving Universal Health Coverage. The World Health Organization (WHO) has stated that health insurance is crucial to achieving universal health coverage.[11]

The majority of the population (85.1%) of Bangladesh depends on work in the informal sector. However, the informal sector is fragile and segmented. Each segment of the informal economy has similar but unique needs. Low, irregular, and unstable employment, as well as a lack of fair credit, frequently lead to a financial crisis among informal workers. In Bangladesh, the number of people who have got some sort of social health protection coverage is less than 1%.[12]

Previously, there has been a few studies conducted on the WTP for health insurance in Bangladesh. One study found that on average, government employees are willing-to-pay a lower amount (mean: 241.2, SD: ±196.5 Bangladeshi Taka (BDT)) for health insurance than private employees (mean: 282.4, SD: ±194.5 BDT).[13] Similarly, another study reported that 86.7% of informal workers expressed WTP for a CBHI scheme which was conducted in urban setting.[14] Finally, a study conducted on the southwest region of Bangladesh estimated the household WTP to be 315 BDT per month.[15] Unfortunately, no literature was found that compared both formal and informal doctors WTP for CBHI. Doctors in Bangladesh fall into two categories: formal and informal, differentiated by employment type, legal protections, and access to benefits. Previously, doctor shortages were a concern, with a ratio of only 0.7 doctors per 1,000 people in 2020, below the recommended 1:1000. However, the landscape has shifted dramatically. By 2016, the doctor pool of 74,924 already exceeded the demand of 64,395, resulting in a surplus. Projections suggest this surplus could swell to around 125,000 doctors by 2026.[16] This oversupply vastly outpaces Bangladesh's healthcare needs and job market capacity within the formal and informal medical sectors. With an influx of new medical graduates each year exceeding available openings, absorbing such a large pool of doctors into formal employment poses a significant challenge.

Although, doctors' need for CBHI is of paramount importance due to their long working hours, exposure to pathogens, work-related stress etc. As the doctors can also influence patients health-related decision, understanding their WTP for

CBHI can further shed light on general population's WTP for health insurance.

The promotion of health insurance coverage to formal and informal doctors should begin with a sound understanding of their WTP and the factors affecting it. Very few studies compare WTP for health insurance between formal and informal health-workers. This study will determine the WTP for health insurance and associated factors between formal and informal health workers of Bangladesh using the contingent valuation method (CVM).

## Literture review

### *Health insurance*

Health insurance is widely recognized as the most effective means to achieve universal health coverage (UHC). Unfortunately, in many low- and middle-income countries (LMICs), out-of-pocket (OOP) payments are one of the major sources of funding for healthcare, amounting to almost 40% in some cases.[17] This situation poses substantial challenges to ensuring that healthcare services are accessible and affordable for all. In LMICs individuals often have to pay for their own healthcare at the point of delivery. This can be a major barrier to accessing essential medical care, especially for people with limited financial resources. The need to pay out-of-pocket can force individuals and families to make difficult choices, such as prioritizing medical treatment over food, shelter, or education. However, Health insurance provides peace of mind and improved health. Health insurance typically covers a wide range of medical services, including preventive care, primary healthcare, specialized treatments, hospitalizations, and medications. This comprehensive coverage can help to promote early detection and management of health conditions, which can lead to improved health outcomes for the population at large. Furthermore, health insurance plays a crucial role in facilitating timely access to healthcare. By removing financial barriers, individuals are more likely to seek medical attention promptly, preventing the exacerbation of illnesses and reducing the need for expensive treatments in the future.

### *The CVM*

The contingent valuation method (CVM) is a survey-based method that is used to elicit people's willingness to pay (WTP) for a good or service that is not currently available. The CVM has been extensively used in public decision-making in recent years, including in the field of health economics and health insurance. The CVM was first developed in the 1970s, and it has been used to assess the WTP for a wide range of goods and services, including environmental amenities, public goods, and healthcare. The CVM has several advantages over other methods of eliciting WTP, such as the fact that it can be used to value goods and services that are not currently available.

In recent years, there has been a trend towards using the double-bounded dichotomous choice (DBDC) approach to the CVM. The DBDC approach is a more robust method than the traditional CVM, and it has several advantages, including higher response rates, more realistic than other tratitional methods, lower likelihood of strategic biases, less opportunity for starting-point bias,[18] and statistical efficiency.[19][20]

## Methods and Analysis

### *Study desing*

This comparative cross-sectional study will estimate and compare the mean WTP for CBHI and associated factors between formal and informal doctors using the contingent valuation method (CVM). Only a quantitative approach will be used. The study will be conducted from September 2022 to September 2023. The activities during this period is presented in Table 1.

**Table 1.** Study activities

| Activity | Date |
|---|---|
| Protocol development, appproval and ethical clearance | September 2022 to January 2023 |
| Development of research instrument, pretesting and modification | February 2023 to April 2023 |
| Data collection, processing and analysis | May 2023 to August 2023 |
| Report writing and manuscript preparation | September 2023 |

### *Study place and population*

The study will be conducted at various formal and informal work-stations in Dhaka City, including medical colleges, hospitals, private institutions, and research organizations on formal and informal doctors. The inclusion criteria for study population include:

- Formal and informal doctors as fixed-term or permanent employees (for formal group) or contractual employees (for informal group), and employeed for at least 12 months.
- Formal and informal doctors will be enrolled irrespective of sex.
- Formal and informal doctors who will provide informed written consent will.

### *Primary aim*

- To compare WTP for CBHI among formal and informal doctors

### *Secondary aims*

- To compare mean WTP for CBHI among formal and informal doctors
- To compare factors associated with WTP for CBHI among formal and informal doctors
- To compare socio-demographic, work-related and healthcare seeking-related factors associated with WTP for CBHI among formal and informal doctors

*Conceptual freamework*

Figure 1 depicts the conceptual framework of the current study.

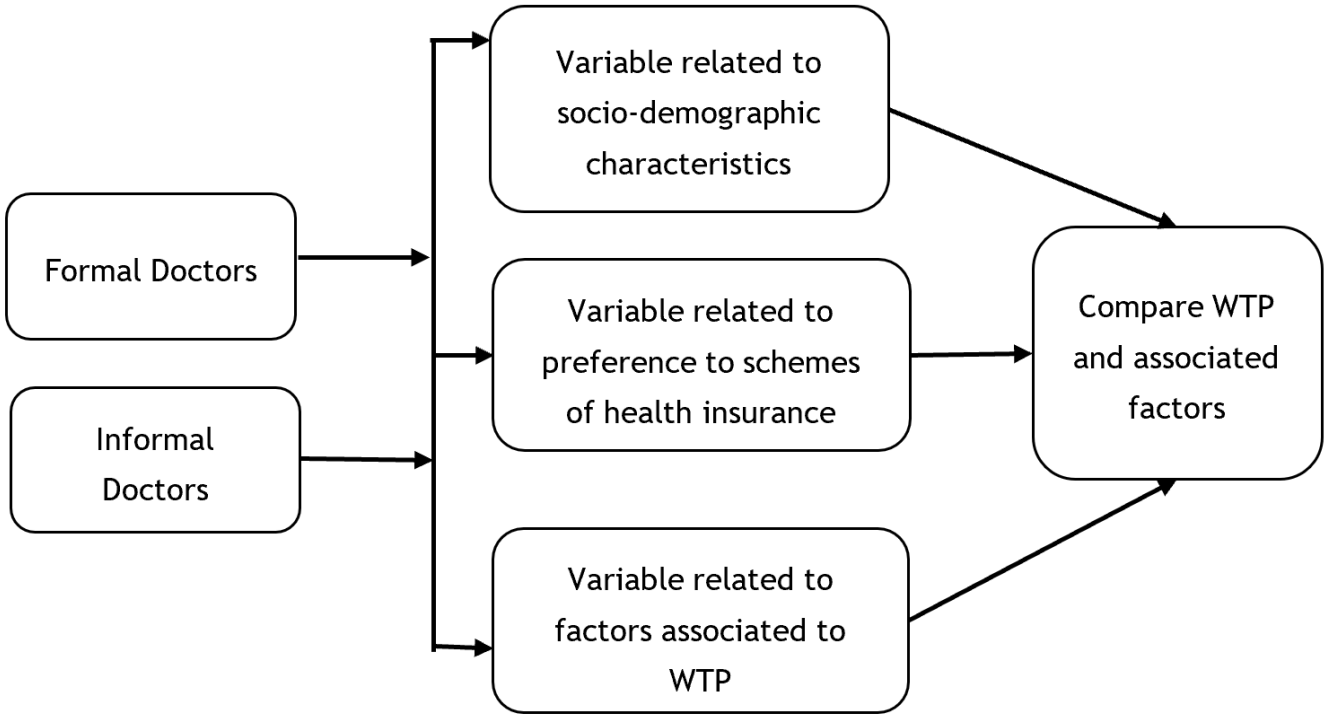


**Figure 1.** Conceptual framework for a comparative study between the WTP for health insurance among formal and informal health-workers.

Sample size calculation and sampling techniques:

The sample size has been determined by using the following formula[21]:

$$\text{Sample size, n} = \frac{\left(Z_{\alpha/2} + Z_{\beta}\right)^2 \times \left[\left\{P_1\left(1 - P_1\right)\right\} + \left\{P_2\left(1 - P_2\right)\right\}\right]^2}{\left(P_2 - P_1\right)^2}$$

Where:

- n = sample size for each group
- $Z_{\alpha/2}$ = the Z-value for the level of confidence (in this case, 1.96)
- $Z_{\beta}$ = the Z-value for the power (in this case, 0.84)
- $P_1$ = prevalence of the first group (in this case, 0.83[13])
- $P_2$ = prevalence of the second group (in this case, 0.68[22])

$$\text{So, sample size, n} = \frac{(1.96 + 0.84)^2 \times \{(0.83 \times 0.17) + (0.68 \times 0.32)\}}{(0.83 - 0.68)^2}$$

$$= 124.987 \approx 125.$$

So, the sample in each group (formal and informal workers) would be 125.

*Sampling Technique:* As no sample frame is available, the study will use a convenience sampling technique to enroll the participants residing in Dhaka city. The data collection instrument was pre-tested among 26 participants (13 formal and 13 informal doctors) recruited according to the inclusion criteria and necessary modifications were done.

### *Data collection*

Data will be collected using the modified and finalized questionnaire form selected participants by the authors via face-to-face interview. The questionnaire will consist of several sections:

- Section 1: Particulars of the participants
- Section 2: Work-related information
- Section 3: Healthcare seeking-related information
- Section 4: WTP related information including the DBDC choice for estimation of mean WTP.

Data management and processing:

Collected data will be checked and verified thoroughly to reduce inconsistency. Data will be coded, categorized cleaned and entered into software. Quality of data will be ensured. Collected data will be transferred to the master table as per specific objectives and key variables. Data will be edited and analyzed according to the objectives and variables by R (v4.3.0), RStudio (v2023.03.1) the DCchoice packages.[23]

There will be two types of analysis: Descriptive statistics like frequency distribution, mean, median, mode, range, standard deviation etc. will be calculated. For inferential statistics, Chi-square test, fisher's exact test, independent t-test and Mann-Whitney U test will be conducted as per requirement. Logistic regression models will be developed with all significant variables identified by tests of associations. The discrete choice analysis will be conducted using the DCchoice package. Data will be presented in the form of tables, graphs and charts etc. as per requirement.

### *Estimation of WTP*

The current study will apply the DBDC model to estimate the WTP of the formal and informal doctors. In the DBDC model, the participants will be offered an initial bid ($b^t$) to estimate the WTP for the compulsory health insurance package as a percentage of the participants' gross monthly salary. In case of a positive answer, participants are presented with a second bid ($b^h$) which will be double the initial bid. On the other hand, in case of a negative answer, participants will be offered a second bid ($b^l$) which will be half of the initial bid. Hence, there can be a total of four possible outcomes (also shown in Figure 2):

1. Yes-yes, implying that the participant is willing to accept higher bid prices. Hence, the WTP > $b^h$.
2. Yes-no, implying that the participant is willing to accept the initial bid price but not the doubled amount. Hence, the

$b^t$>WTP > $b^h$.

3. No-yes, implying that the participant is not willing to accept the initial bid price but the amount if halved. Hence, the $b^t$<WTP > $b^l$.
4. No-no, implying that the participant is not willing to accept the initial bid price as well as the amount if halved. Hence, the $b^t$< $b^l$< WTP.

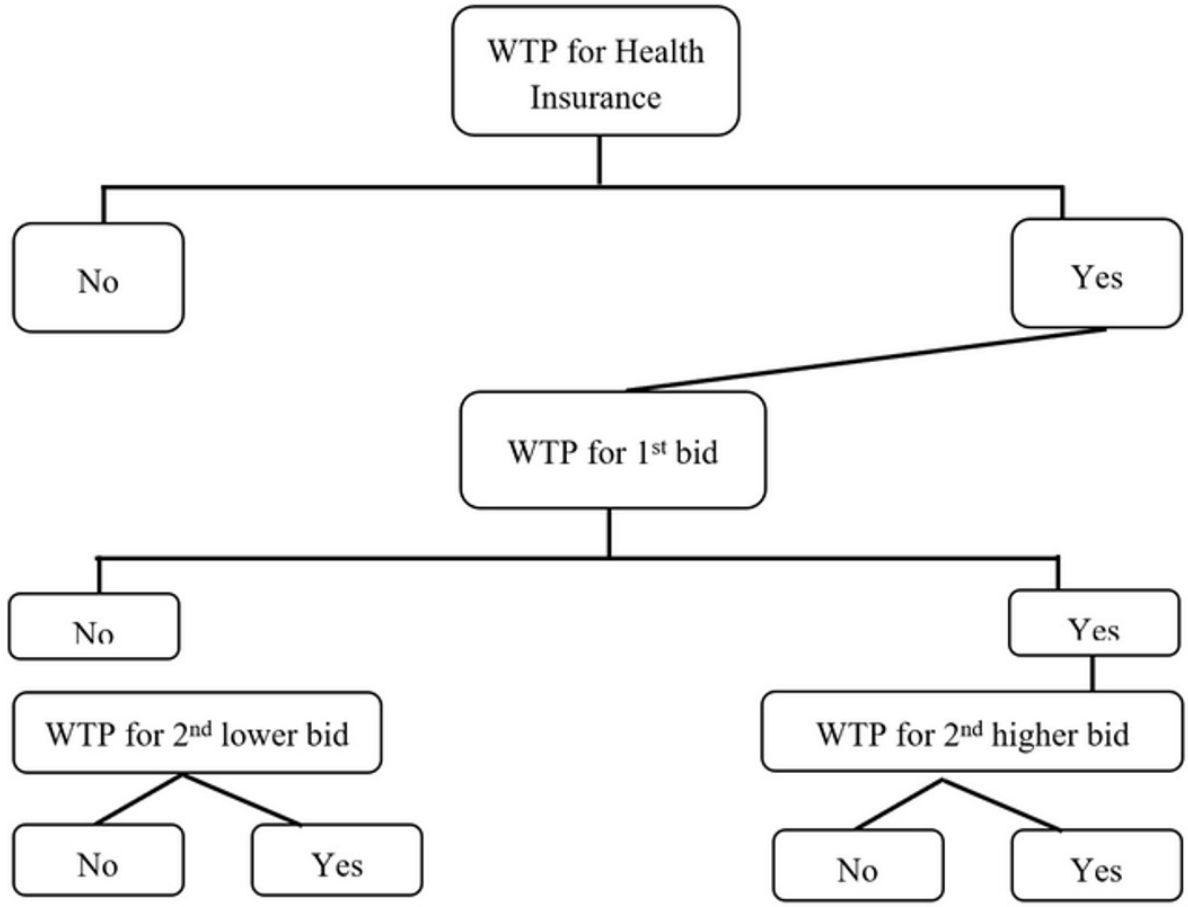


**Figure 2.** Summary of answers in the DBDC method

Using data from pre-testing, 4 initial bids were selected: 6%, 4%, 2% and 1%. To minimize the starting point bias, we will use the RANDBETWEEN(1,250) command of Microsoft Excel to randomize participants based on the participant's id into 4 unequal groups (the last two groups respectively will have one fewer participant) to select the starting bid.

## Limitations of the study

The study also has some limitations. Results elicited using the CVM method may be affected by bias, especially starting-point bias. A second limitation is related to the health literacy rate. In Bangladesh, around 0.5% of people are covered by health insurance.[24] As such, responses may not indicate the actual scenario. As a comparative cross-sectional design will be used, further research will be necessary to determine the process of change from willingness to pay to actually

enrolling in health insurance.

## Possible Policy implications

The current study will estimate and compare the willingness-to-pay (WTP) for health insurance among formal and informal health workers, as well as the associated factors. The findings can then be used to determine the necessary steps required to promote HI in Bangladesh and to help policy makers consider expanding the scope of coverage offered by health insurance plans to include more preventive and chronic care services.

## Statements and Declarations

### Ethics and dissemination

Ethics approval has been obtained from Institutional Review Board (IRB) of the National Institute of Preventive and Social Medicine (NIPSOM). Informed consent will be taken from each participant before data collection. The results of the study will be published in scientific, peer-reviewed journals.

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### Competing interests statement

No competing interest to declare.

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