

Willingness-to-pay for Health Insurance: A Comparative Study between Formal and Informal Health-Workers

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Abstract

Introduction

People in low- to middle-income countries, such as Bangladesh, have less access to healthcare than those in wealthier nations. 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. Bangladesh's informal sector 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, which is 14.9% of all jobs. The current comparative study will determine the willingness-to-pay (WTP) for health insurance and associated factors between formal and informal health workers using the contingent valuation method.

Methods and analysis

This comparative study of WTP and associated factors between formal and informal health workers using the contingent valuation method (CVM) will be conducted over a twelve-month period, from August 2022 to July 2023. A total of 250 health workers will be selected by a purposive sampling technique from various formal and informal work stations in Dhaka City. Out of 250 participants, 125 will be from the formal sector and 125 will be from the informal sector. To collect data, a semi-structured questionnaire will be used via face-to-face interviews. Data will be processed and analyzed using R (version 4.3.0), RStudio (2023.03.1 Build 446) using *jmv* and *DCchoice* packages. WTP for social health insurance will be estimated using the *DCchoice* package. This study will employ a logit model that will consist of a binary dependent variable with follow-up dichotomous choice. Different premium levels will be offered to each participant at different premium levels, to estimate the factors associated with joining the compulsory health insurance scheme.

Ethics and dissemination

Ethical clearance was obtained from the Institutional Review Board (IRB) of the National Institute of Preventive and Social Medicine (NIPSOM) (Memo no: NIPSOM/IRB/2022/14 (1)) on 29 December 2022. Informed consent will be taken from each participant before data collection. Privacy and confidentiality of data will be maintained strictly.

Participants will have full freedom to refuse to participate at any point in the study. The results of the study will be published in scientific, peer-reviewed journals.

Strengths and limitations of this study

1. The contingent valuation method is a well-established method of eliciting WTP for health insurance.
2. The current study will be among the first of its nature as it will focus on formal and informal healthcare workers.
3. 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.

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Introduction

Background

People in low to middle-income countries, such as Bangladesh, have less access to healthcare than those in wealthier nations. Access to health care and being poor 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 big part of how middle-income and low-income countries pay for their health systems.^[2]

About 800 million people spend more than 10% of their household income on health care. As a result, catastrophic health expenditures (CHE) have left 100 million people around the world extremely poor.^[3] Bangladesh has the highest rate of catastrophic expenditures in the Asia-Pacific region at 17%, with 24% of the poorest households and 7% of the richest households forced to borrow money or sell household assets to pay for illness-related costs.^[4] According to a study, 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]

In Bangladesh, out-of-pocket (OOP) payments continue to be the primary source of funding for healthcare. According to a recent study, around 25% of people had CHE, whereas 14% of the population ignored treatment for any reason. The cost of treatment was the most common reason for forgoing healthcare (17%).^[10] Bangladesh wants 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. According to the WHO, health insurance is crucial to 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%. So, the promotion of HI coverage to formal and informal workers 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. Therefore, this study will be conducted to determine the WTP for health insurance and associated factors between the formal and informal health-workers of Bangladesh using the contingent valuation method (CVM).

Conceptual framework

Figure 1 depicts the conceptual framework of the current study.

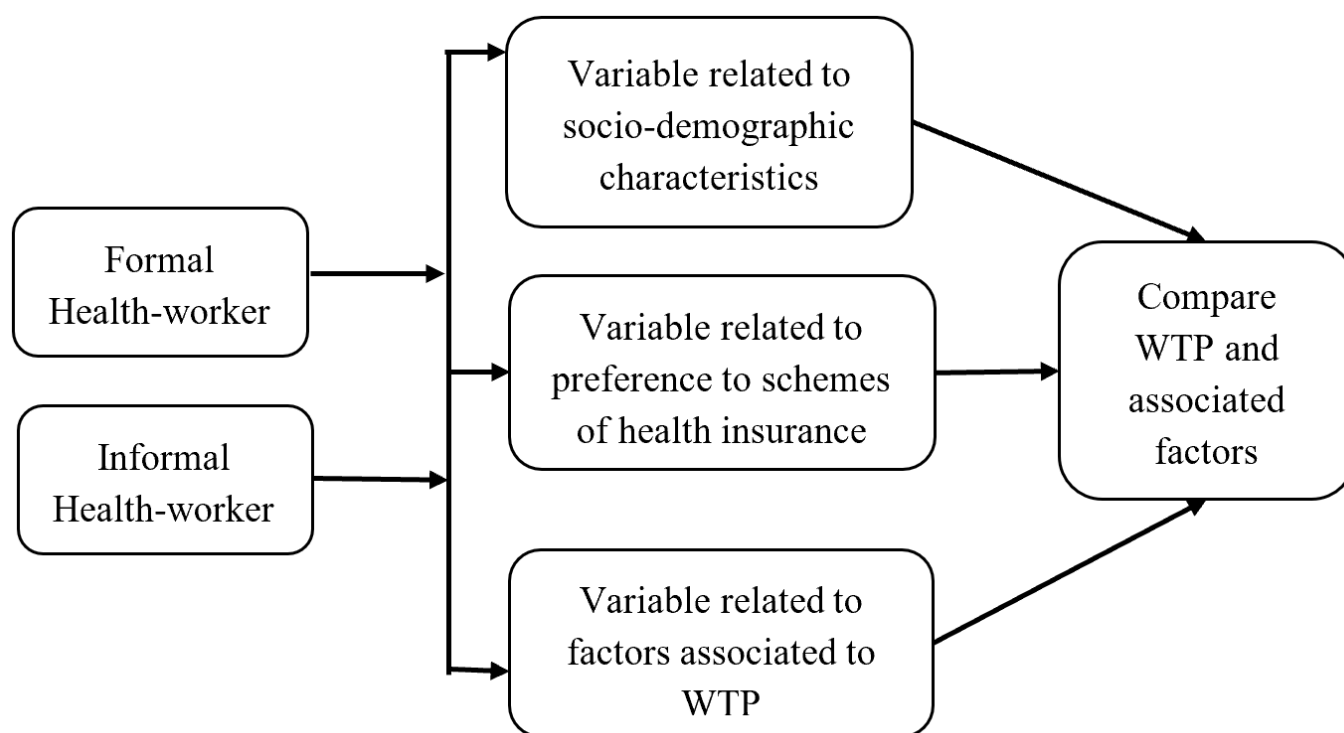


Figure 1. Conceptual framework for a comparative study between the WTP for health insurance among formal and informal health-workers.

Methods and Analysis

Aims and Objectives

The following study aims to estimate the Willingness-to-pay for health insurance of formal health-workers differs from informal health-workers and compare. The objective of the study is:

- To compare the WTP for health insurance between formal and informal health-workers.
- To compare preference to schemes of health insurance between formal and informal health-workers.
- To compare factors associated with WTP for health insurance among formal and informal health-workers.
- To compare the socio-demographic characteristics of the formal health-workers and the informal health-workers.

Operational Definitions

Catastrophic health expenditure: It is a situation where after meeting subsistence needs i.e. food, a household spends over 40% of its income on health care.

Health-workers: A healthcare worker is an individual who provides care and services to the sick and ailing, either directly as physicians and nurses or indirectly as aides, laboratory technicians etc.^[12] In the current study, health workers with at least 6 months of experience will be considered.

Primary job: In this study, primary job will be defined as the job in which the longest hours are usually worked. Only the

status of the primary job will be considered in determining whether the participant is a formal or an informal worker.

Formal workers: Formal employees are hired by a company in accordance with an established employment contract.^[13] In this study, we will consider all those health workers who receive compensation, health benefits, and set work hours. For example, health workers who are working at various establishments as fixed-term or permanent, and contractual (at least 1 year) employees.

Informal workers: It refers to workers whose jobs don't offer basic social or legal protections or employment benefits. In this study, we will consider those health workers as informal workers who do not receive compensation, health benefits and set work hours and who don't receive an established employment contract or have a contract of <1 year. Examples include: Employees hired on a day-to-day basis, doctors and nurses working in private chambers, etc.

Contingent Valuation Method: Contingent valuation is a survey technique used to determine the highest WTP for a product. The respondent is first provided with a description of the product and a fictitious market where it can be purchased (the contingency). The respondent is then asked to specify the highest price at which they would be willing to purchase the item (the valuation).^[14] CVM employs the Double bounded dichotomous choice (DBDC) as one of its elicitation procedures. The participant in DBDC responds "yes" or "no" to a stated amount and is then asked to respond "yes" or "no" to higher or lower bids (usually to a double or a half amount, respectively).

Health insurance schemes: In this study, 3 schemes will be considered:

- *Scenario A—No insurance (out-of-pocket model):* The participant will pay the full cost for each visit to health institutions and for the medicine prescribed to the individual and the individual's family members. If the participant is not able to pay, he or she will not receive any service. A service is given at cost price.
- *Scenario B—Compulsory health insurance:* All employees are compulsorily obliged to pay and contributed a monthly premium (fee) to a health care fund. The fee is based on deducting a specified percentage of their monthly salary determined by the insurance agency. Thereby the employees' spouse and family members of less than 18 years are entitled to free health care at a nearby health center and free medicine if prescribed by a doctor. The fund will be managed through an independent healthcare fund. If care at a higher level is needed, the insured patient will be supported and entitled to free health services in these facilities.
- *Scenario C—Voluntary health insurance:* Each individual can choose to voluntarily pay a monthly premium (fee) to an insurance organization. For a household, the fee is based on the number of beneficiaries in the household and the number of health facility visits. All persons in the household paying the fee are entitled to free health care at a nearby health facility and free medicine if prescribed by a doctor. If care at a higher level is needed, the insured patient will be supported by an amount based on the cost per day at the nearby health center.

Study Design

It will be a comparative cross-sectional study between formal and informal health-workers on WTP and its associated factors. Only a quantitative approach will be used.

Study Duration and Period

The study will be conducted from August 2022 to July 2023. The activities in the study period will include preparatory activities, protocol and research instrument development, pretesting, data collection, data processing and analysis, and quality control check followed by report writing.

Study Place

The study will be conducted at Medical college hospitals and private institutions in Dhaka city.

Study Population

Formal and informal health-workers working at Medical college hospitals and private institutions of Dhaka city:

Selection Criteria

Selection Criteria for Formal Health-worker

Inclusion Criteria

- Formal health-workers working as fixed-term or permanent, and contractual (for >1 year) employees.
- Formal health-workers will be enrolled irrespective of sex.
- Formal health-workers who will provide informed written consent will only be included in the study.

Exclusion Criteria

- Years in service > 6 months.
- Formal health-workers who are unwilling to participate in the study.

Selection Criteria for Informal Health-worker

Inclusion Criteria

- Informal health-workers who haven't received an established employment contract or have a contract of <1 year.
- Informal health-workers will be enrolled irrespective of sex.
- Informal health-workers who will provide informed written consent will only be included in the study.

Exclusion Criteria

- Years in service > 6 months.
- Informal health-workers who are unwilling to participate in the study.

Sample Size

The sample size has been determined by using the following formula^[15]

Sample size, n =	$(Z_{\alpha/2} + Z_{\beta})^2 \times \{P_1(1 - P_1) + P_2(1 - P_2)\}^2$
	$(P_2 - P_1)^2$

Where:

n = sample size for each group

$Z_{\alpha/2}$ = the Z-value for the level of confidence (in this case, 1.96)

Z_{β} = the Z-value for the power (in this case, 0.84)

P_1 = prevalence of the first group (in this case, 0.83^[11])

P_2 = prevalence of the second group (in this case, 0.68^[16])

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

$$= 124.987 \approx 125.$$

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

Sampling Technique

The study will use a convenience sampling technique to enroll the participants.

Data Collection Instruments

A pre-tested semi-structured questionnaire will be used for data collection.

Data collection technique

Face-to-face interviews will be conducted for data collection with the help of a semi-structured questionnaire.

Pre-testing

The data collection instrument was pre-tested among 26 participants (both formal and informal) who work in hospitals and chambers in Dhaka City. According to the findings of pre-testing, necessary modifications will be done to the questionnaire.

Data 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 analysis

Data will be edited and analyzed according to the objectives and variables by R (R version 4.3.0)^[17] RStudio (2023.03.1 Build 446) using `jmv`^[18] and `DCchoice` packages.^[19]

There will be two types of analysis: Descriptive statistics like frequency distribution, mean, median, mode, range, standard deviation etc. will be calculated by the SPSS program. For inferential statistics, a Chi-square test and independent t-test will be done to find out the association between categorical variables. Logistic regression models will be developed with all significant variables identified by chi-square tests. 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.

The current study will apply the DBDC model to estimate the WTP of the formal and informal health-workers. In the DBDC model, the participants will be offered an initial bid (b^i) 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 02):

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

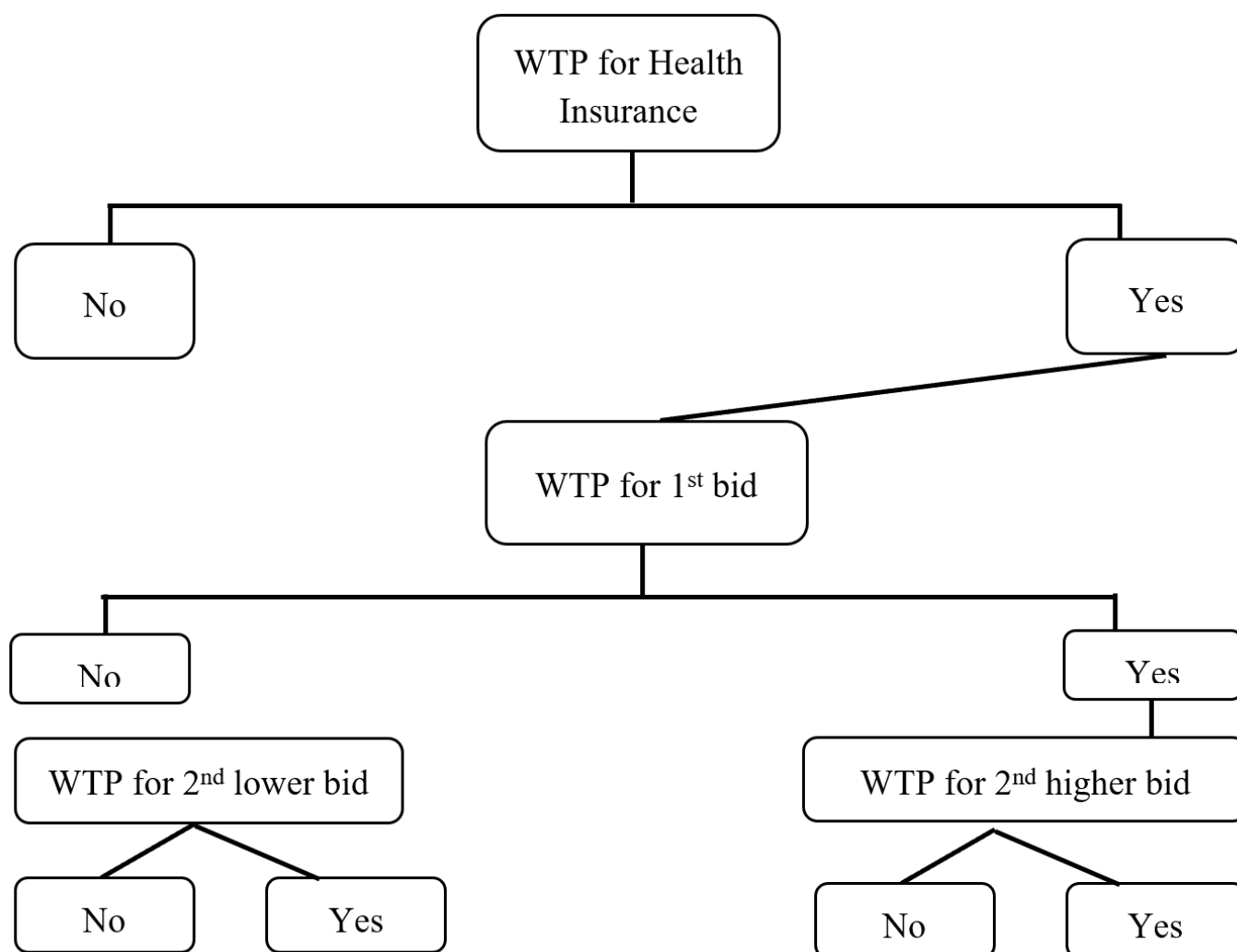


Figure 2. Summary of answers in the DBDC method

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.

Discussion

Health insurance is known to be the best way to achieve Universal Health Coverage (UHC). Unfortunately, in the case of many low- and middle-income countries (LMICs), OOP is one of the major sources of funding for healthcare amounting to almost 40% in some cases.^[20] So by providing financial protection to the whole population, authorities can help in reducing barriers to healthcare services.

The contingent valuation method (CVM) has been extensively used in public decision-making in recent years. Its application in health economics and health insurance started in the 1970s and has spread rapidly in recent years, with a trend towards the double-bounded dichotomous choice (DBDC) approach. The DBDC approach adds strength to the

study, as it has several benefits, including higher response rates, greater realism, lower likelihood of strategic biases, less opportunity for starting-point bias,^[21] and the most significant statistical efficiency.^{[22][23]}

The study also has some limitations. Results elicited using the CVM method may be affected by bias, especially starting-point bias.^[24] A second limitation is related to the health literacy rate. In Bangladesh, around 0.5% of people are covered by health insurance.^[25] 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.

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Competing interests statement

None

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