

Original article:

Willingness to Pay For Health Insurance in Sarawak, Malaysia: A Contingent Valuation Method

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Abstract

Background and objective: One of the suggested ways of financing health care is health insurance combined with general taxation. This study aimed to assess the willingness to pay for health insurance among the adult population and the factors thereof. **Methods:** A multi-stage cluster sampling with cross sectional study design was adopted to select the respondents. Data was collected by face to face interview. A total of 1018 data was analyzed with response rate of 84.3%. The data on willingness to pay for insurance was collected using the contingent valuation method with bidding style. Data entry and analysis was done by SPSS 22.0 version. A p-value of less than 0.05 was considered as statistically significant. **Results:** Data analysis revealed that about half (46.7%) of the respondents agrees to pay monthly health insurance premium. Among those who were unwilling to pay, 81.3% were unable to afford the monthly insurance. Logistic regression analysis revealed that occupation, level of education, gender, marital status, monthly family income and treatment preference appeared to be potential predictors for willingness to accept health insurance ($p < 0.05$). **Recommendation:** The key policy priority is to increase the awareness of the public regarding the benefits of health insurance, and to increase willingness to pay rate.

Keywords: Willingness to Pay; Contingent Valuation Method; Health Insurance; Sarawak

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Introduction

Willingness to Pay (WTP) is a methodological tool that used to evaluate the capacity to pay by certain social groups and also to estimate the hypothetical monetary value for programs and specific medical interventions and treatment.¹ In simpler words, it is defined as the maximum amount that an individual is willing to pay for goods or services. Insurance for health is largely used to finance market based health care system. Depending only on payment of out-of-pocket or government tax, however, may not be the best option available in current time and in the future. With rapidly increasing medical cost, there is a need to get a back-up from the health insurance

plan especially, to finance the expensive medical treatment, to ease the health system financial burden and also reducing catastrophic health expenditure for the patient.^{2,3} In Malaysia, the most utilized insurance plan is the conventional indemnity insurance plan. Others are employer provided health care insurance and social health insurance. The Ministry of Health proposes to set up a non-profit agency called National Health Financing Authority (NHFA) to become the coordinator of the National Health Insurance (NHI).⁴ Citizens have to contribute to monthly premiums according to their income levels. The government will also contribute to pay the premium of certain population groups. However, the details of the plan

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have yet to be finalized and approved.

One of the methods used under Willingness to Pay (WTP) is the Contingent Valuation Method (CVM). Contingent valuation method of willingness to pay theory was first introduced by S.V CiriacyWantrup in 1947 as a method for eliciting market valuation of a non-market good using the open ended protocol and brought into practice by Davis in 1963 and Randal in 1974.⁵ Since then, the technique evolved and the most popular use of contingent valuation method was the litigation surrounding the 1989 Exxon Valdez oil spill disaster.⁶ Contingent valuation method is commonly used to elicit willingness to pay in public, based on the hypothetical market situation⁷ and also usually used in cost benefit analysis in health economics. In developing countries, many studies have used CVM to elicit WTP for health insurance.⁸⁻¹⁵ This paper used close-ended dichotomy answer with bidding technique because the technique can generate more efficient estimates and reduced bias.⁶

With the proposal of One-Care by the Ministry of Health, Malaysia,¹⁶ the introduction of social health insurance or co-pay would be an inevitable choice. It is hoped that reformation in funding would bring an improvement in the service provided for instance, in term of quality, equity and timely accessibility. The issue of affordability would affect the acceptability of One-Care by general population. Therefore, one of the ways is to estimate the ability to pay by the general population for health care services. Considering this view, this study aimed to determine the amount of health insurance premium that the people of Sarawak are willing to pay and determine the factors associated with it.

Materials and Methods

Study Design and Sampling Procedure

This was a cross sectional study using a multi-stage cluster sampling technique to select the respondents. Data were collected from 1200 respondents' randomly selected from three divisions in Sarawak. These three divisions were Kuching, Sibul and Limbang. Kuching is located in the southern region of Sarawak, Sibul is the central part while Limbang is from the northern part. Four districts were randomly selected from each division. Then four enumeration blocks were randomly selected from each district with the help of the Department of Statistics, Sarawak. The total number of enumeration blocks were 64. Out of the 1200 households approached, only 1018 respondents agreed to participate in the study. Thus the response rate was 84.3%. Malaysians who lived in Sarawak, aged 18 years old and above, who understood English

or Malay language and consented to participate were recruited for this study. Only one family member who knew the most about the family expenses was chosen to become the respondents even if there is more than one in a household was eligible.

Instrument Development and Data Collection Procedure

A structured questionnaire was developed keeping the objectives in mind. The questionnaire was divided into 4 sections. The first section was the socio-demographic questionnaire, followed by a second section which is the peoples' perception of the health care delivery system. The third section was the level of satisfaction for primary health care services and the last section was the willingness to pay questions. For this study, Contingent Valuation Method (CMV) with the dichotomous bidding technique was used. First, the participants were given explanation on the condition of the current health delivery and financing in Malaysia. Then the hypothetical situation was explained to the respondents and then they were expected to choose the amount of money if they were in the situation. After the explanation of the scenario and the payment methods, the question on whether they agree to pay was asked first. If they agree, then the bidding process was commenced. The answers were close ended with four options ('yes', 'may be yes', 'may be no' and 'no'). However, if the respondents answered 'no' or 'may be no', they were asked to give the reason and the interview stopped there. This was to differentiate the 'protest no' and the 'real no'. The bidding started with the lowest value obtained from the pre-test and subsequently higher and stopped once the respondents stated they were unwilling to pay the given amount. Again the answer options were 'yes', 'may be yes', 'may be no' and 'no'. If the respondents said no or yes to the entire bidding, open ended question was asked about what the highest amount that they were willing to pay. A pre-test of the questionnaire was done in a non-sample area with translated Malay language. Minor changes were made following pre-test of the questionnaire. Before data collection, informed consent was taken from the respondents. The respondents were assured of the data confidentiality.

Data Processing and Analysis

A total of 1018 completed questionnaires were analyzed. Data entry and analysis was done using SPSS Software 22.0 version.¹⁷ After initial data cleaning, missing values were identified and was imputed using standard technique.¹⁸ Exploratory data analysis was done first to obtain descriptive

information. As for willingness to pay, each scenario had three models that represented the cut-off value of money the respondents were willing to pay. Model 1 had the option of willing to pay and not willing to pay. Model 2 and Model 3 were using the increasing range of the amount that the respondents were willing to pay as the cutoff value. The situation had binary options i.e. pay less or equal to 'x' or more than 'x'. Binary logistic regression (logit model), was used to analyze the willingness to pay with selected independent variable's in each model. Binary logistic regression was chosen for the analysis for willingness to pay in this study, because it was the simplest, easy to explain and was commonly used.^{19, 20} Finally, the results were compared across the models and the factors which significantly influence the willingness to pay were identified.

Ethical Considerations

The study proposal was approved by the Technical Review Committee of the Faculty of Medicine and Health Science (FMHS), Universiti Malaysia of Sarawak (UNIMAS) and the National Medical Research Registry (NMRR). Ethical clearance was also obtained from the Institutional Review Board (IRB) of the Faculty of Medicine and Health Sciences, UNIMAS and Institute of Public Health (IPH), Malaysia.

Results

Sociodemographic Characteristics

Table 1 shows the socio-demographic characteristics of the respondents in frequency with corresponding confidence interval. The mean (SD) age for the respondents was 36.61 (13.30) years with minimum of 18 years and maximum of 79 years old. Two-thirds (64.8%) of the respondents were engaged in gainful job. About three-fifths of the respondents were female (58.2%) and the rest were male (41.8%). Two-thirds (67.8%) were married and the rest (32.2%) was either living single or divorced. The mean (SD) family size was 3.35 (1.99) ranging from single living to 13 family members. About half (48.1%) of the respondents had family size 3-5. One-third (32.2%) had family size 1-2 members and 15.9% had a family size six and above. About half of the respondents had completed secondary level of education (47.7%) followed by 20.7% who had a tertiary level of education and another one-fifth (19.7%) had a primary level of education. However, 11.8% had no formal schooling. The median family income was MYR 900 with a maximum income of MYR 13,000 and a minimum income of MYR 50. Almost half (48.1%) of the respondents had family

incomes less than MYR 800. Two-fifths (40.7%) of the respondents had a family income varies from MR 801 to 3,000. However, 11.2% had income more than MYR 3,000. Almost 90% of the respondents prefer seeking treatment at government primary care facilities while another 13.2% prefer to get treatment at private primary care facilities.

Factors affecting the willingness to Pay for Health Insurance: Logistic Regression Analysis

A binary logistic regression was done to identify the potential predictors for willingness to pay for health insurance. There were three models developed based on their payment option. The first model was dichotomized into yes vs. no; the second model Premium RM 20 and less with 'no payment' and third model was RM 50 and less vs. more than 50. In each model, all the variables entered into the model and checked the significant predictors. Any variables that were not statistically significant, were removed from the model. Finally, a better fitted model was chosen for interpretation. Assumptions of adequate sample size, multicollinearity and absence of outliers were checked.²⁰ The model statistics are presented below each model.

In Model 1, current marital status, monthly family income, level of education and occupation appeared to be potential predictors for willingness to pay for health insurance ($p < 0.05$). Analysis revealed that the likelihood of farmer not willing to pay for health insurance was 70.3% while people with tertiary education was 2.42 times more likely willing to pay. Similarly, monthly household income of MYR 3,000 and above were 3.59 times likely to agree in paying health insurance. Single respondents were 2.35 times likely to agree to pay for health insurance. In Model 2, a similar pattern of insurance premium of MYR 20 or less was found. However, those who were taking treatment from private health care facilities were 1.77 times more likely to agree to a monthly health insurance premium of MYR 20 or less. For the third model, gender appeared to be a predictor where the likelihood of male respondents not willing to pay MYR 20 and above were 16.9%. However, those who were taking treatment at private facilities were 3.36 times more likely to agree to pay more than MYR 20 and above per month.

When the three models were compared, farmers and unemployed were not willing to pay health insurance, whereas, level of education appeared to be an important predictor for health insurance at certain level such as premium of less than MYR 20. Similarly, monthly income MYR 3000 and above

agreed to pay MYR 20 or below, but did not agree to pay more than MYR 20 or above. The respondents who were taking treatment from private health care facilities are agree to pay more than MYR 20 per months.

Table 1 Socio-demographic characteristics of the respondents (n=1018)

Characteristics	Frequency	Percentage/ Mean	95% CI	
			Lower limit	Upper limit
<i>Age (SD) in years</i>	1018	36.61(13.3)	35.8	37.4
Gender				
Female	592	58.2	55.3	61.3
Male	426	41.8	38.7	44.7
Ethnicity				
Iban	490	48.1	38.2	44.5
Malay	420	41.3	45.2	51.4
Other Bumi	60	5.9	4.4	7.4
Chinese	48	4.7	3.4	6.0
Residence				
Rural	670	65.8	31.0	37.2
Urban	348	34.2	62.8	69.0
Marital Status				
Single	328	32.2	29.4	35.0
Married	690	67.8	65.0	70.6
Level of education				
Not schooling	120	11.8	9.9	13.8
Primary	201	19.7	17.3	22.2
Secondary	486	47.7	44.6	50.8
Tertiary	211	20.7	18.4	23.5
Occupation				
Unemployed	358	35.2	32.0	38.2
Farmer	113	11.1	9.2	13.4
Government	225	22.1	19.6	24.8
Private	199	19.5	17.1	22.0
Others	123	12.1	10.1	14.1
Monthly Family Income (MYR)				
≤800	490	48.1	45.3	51.3
801-3000	414	40.7	37.7	43.6
>3000	114	11.2	9.3	13.3
Median	1018	900.0	800	990
Family size				
1-2	366	36.0	33.2	39.0
3-5	490	48.1	45.1	51.2
>5	162	15.9	13.7	18.2
Mean (SD)	1018	3.55(1.99)	3.44	3.68
Treatment preference				
Government	884	86.8	84.9	88.8
Private	134	13.2	11.2	15.1

Willingness to Pay

More than half (53.3%) of the respondents did not agree to pay health insurance premium. The most common reasons were 'cannot afford it' (81.3%) followed by its government responsibility to bear treatment cost (14%). However, 5.2% of the

respondents were willing to pay only less than MYR 10, but most of the respondents were willing to pay around MYR 11 to MYR 20 (66.6%). The highest bid was MYR 350. Those who agreed to pay but did not state the amount that they were willing to pay (yeah-saying phenomenon) were only 2%.

Table 2 Percentage distribution of respondents by their willingness to pay for monthly health insurance

Variables	Frequency	(%)	95% CI	
			Lower bound	Upper bound
<i>Agree to pay premium (n=1018)</i>				
No	543	53.3	50.4	56.7
Yes	475	46.7	43.3	49.6
<i>Reasons for not agree to pay (n=563)</i>				
Can't afford	458	81.3	77.8	84.4
It's govt. responsibility	79	14.0	11.2	16.9
Not fair for people who rarely get treatment	6	1.1	.4	2.0
Others	20	3.6	2.1	5.2
<i>Amount WTP for insurance (RM) (n=455)</i>				
11-20	303	66.6	62.2	70.5
21-30	63	13.8	10.8	17.1
31-40	30	6.6	4.4	9.0
41-50	26	5.7	3.5	7.9
51-100	23	5.1	3.1	7.0
101-150	6	1.3	.4	2.4
151-300	1	0.2	0.0	0.7
350	3	0.7	0.0	1.5
<i>Other amounts (RM)</i>				
≤ 10	53	5.2	3.8	6.6
350	3	0.3	0.0	0.7
Yea-saying	20	2.0	1.2	2.8

Discussion

Despite being widely used, the contingent valuation method was highly criticized of its hypothetical situation, therefore, must be used with caution. The most common bias involved in this method was question order bias, anchoring bias, protest answer and 'yeah' saying.^{21, 22}The high percentage of these biases will render the method inaccurate. In this study, asking first the willingness to pay with closed ended answer and later, bidding the amount and lastly asking an open ended question if none of the bid was accepted can reduce the bias. Asking the reason as to why the respondents refused to pay can identify 'protest no' answer. The low percentage of 'yeah saying' will render the estimation to be more accurate.

Willingness to pay for health insurance in Sarawak is quite low. Slightly less than half of the respondents were willing to pay a certain amount. However, more than half of the respondents who were willing

to pay agreed to pay MYR20 or less. The highest bid was MYR 350. People living in urban area and higher level of education were more willing to pay. Furthermore, income more than MYR800 and preference of private health care provider were the positive predictors of willingness to pay.

In Namibia, 81% of the respondents were willing to join health insurance, but not all of them were willing to pay.⁸This might be due to their intention to join something that benefitted them, but they could not commit to pay any amount of money. The reason might be poverty or they simply refuse to pay. The study noted that the average amount that they were willing to pay was around NAD 47.50 (MYR14.94). As income increases, the mean WTP value also increase up to Namibian Dollar (NAD)84.45 (MYR 26.56). Level of education positively influenced the willingness to pay while age was inversely related. The higher level of education aid in understanding of how much to pay for health insurance. Furthermore,

Table 3 Factors Associated with Health Insurance Payment: Logistic Regression Analysis

Variables	Model 1		Model 2		Model 3	
	β	Adj OR (95% CI)	β	Adj OR (95% CI)	β	Adj OR (95% CI)
Occupation						
Unemployed	-0.130	0.878(0.559,1.378)	0.057	1.059(0.634,1.767)	-1.089**	0.337(0.158,0.717)
Farmer	-1.215***	0.297(0.150,0.587)	-0.869*	0.419(0.199,0.883)	-0.792	0.453(0.128,1.607)
Government	0.270	1.311(0.786,2.184)	0.053	1.054(0.586,1.897)	0.265	1.303(0.656,2.590)
Private	0.091	1.095(0.672,1.786)	0.333	1.395(0.798,2.437)	-0.401	0.670(0.319,1.404)
Others (RC)		1		1		1
Level of education						
Not schooling (RC)		1		1		
Primary	-0.164	.848(0.492,1.463)	-0.006	0.994(0.537,1.839)		
Secondary	0.434	1.544(0.956,2.493)	0.507	1.661 (.961,2.871)		
Tertiary	0.807**	2.242(1.246,4.034)	0.735*	2.086(1.074,4.052)		
Monthly Family income (MYR)						
≤800 (RC)		1		1	<i>NI</i>	
801-3000	0.619***	1.858(1.346,2.564)	0.582*	1.789(1.244,2.574)		
>3000	1.280***	3.595(2.106,6.139)	1.363*	3.907(2.207,6.914)		
Marital status						
Single	0.855***	2.351(1.715,3.221)	0.882***	2.415(1.709,3.414)	<i>NI</i>	
Married (RC)		1		1		
Treatment Preference						
Private	<i>NI</i>		0.574*	1.776(1.063,2.969)	1.213***	3.362(1.975,5.722)
Government (RC)				1		
Gender						
Female (RC)	<i>NI</i>					1
Male					-0.831***	0.436(0.277,0.686)
Constant	-1.104***		-2.239***		0.272	
N		1011		863		452
Model Chi square (df)		218.599(10);p<0.001		140.706(11); p<0.001		62.017(7); p<0.001
Goodness of Fit(df)		12..468(8);p>0.05		7.815(8);p>0.05		4.311(7); p>0.05
Classification		69.1%		69.9%		71.5%
Cox & Snell squared		19.4%		15%		12.8%
Nagelkerke R2		0.260		0.207		0.178
Model		Yes vs. No (RC)		≤ RM 20 vs.No (RC)		≤ RM 50 (RC) vs.>RM 50

*p<0.05; **p<0.01; ***p<0.001; NI= Not included

higher education equated better pay in their daily job. However, family size did not have significant influence in the study, unlike the finding in a study in Vietnam, where they noted that the bigger the family size the higher the willingness to pay besides greater income and higher education level.¹² This might be due to the fact that respondents with large family size are usually within the poverty level and hence unable to pay at all.

Additionally, in Malaysia, a research done on willingness to pay for social health insurance among staff in a public university revealed that age, educational level and monthly income were significant association, similar to this current study.⁹ The study was done in a small university staff community compared to this study but it showed almost similar pattern in which conforming each other. One factor that was not significant in both studies but found to be influencing willingness to pay for health insurance in another study in Penang was ethnicity.¹⁰ The two studies showed that more than half of the numbers of respondents were willing to pay for health insurance which was different in this current study. Comparing to the location of the research, both were done in more urban area while the current study were done involving whole Sarawak which majority of the area is still considered rural.

In a willingness to pay study in Tanzania, 12% was not willing to pay for health fees.¹¹ However, they did not investigate further to know the percentage of 'protest no' answer or merely could not afford to pay. The highest bid was 16000 Tanzanian Shilling (TZS) (MYR 32.10) and more, where only 12% of them agreed. The majority of the respondents were willing to pay 999 TZS (MYR2) or less. From all these studies, including the current study, the amount of money willing to be paid by the public

fell within the almost similar range. The uniform factors that positively predict willingness to pay is higher level of education and income. In other words, socioeconomic status of the individual highly predicted their willingness to pay.

By using contingent valuation method, one have to be aware that the existence of nay-saying or yea saying that can affect the accuracy of the result.¹⁹ Therefore in this study, the reason of refusing to pay was elicited to rule out protest no answer and the number was minimal. Yea-saying can be identified if the respondent answered yes to all bid options and the percentage was low in this study. Anchor bias was minimized by asking the bidding amount randomly.⁵ The under and over estimation in willingness to pay study was known and can only be minimized.¹

Conclusion

Less than half of Sarawak people were willing to pay and the stated amount was quite low which was RM20 and below. The findings in this study might help the policymakers to decide on formulation of health insurance, eligibility to pay and the suitable amount. The key policy priority is to increase the awareness of the public regarding the benefits of health insurance and to increase willingness to pay rate and allay their misconception about health insurance. Different methods of payment would be explored through qualitative research on reasons of stated WTP would be analyzed.

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Conflict of Interests

No potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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