



Willingness to pay for voluntary community-based health insurance: Findings from an exploratory study in the state of Penang, Malaysia



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ABSTRACT

Health care in Malaysia is funded primarily through taxation and is no longer sustainable. One funding option is voluntary community-based health insurance (VCHI), which provides insurance coverage for those who are unable to benefit immediately from either a social or private health insurance plan. This study is performed to assess the willingness of Malaysians to participate in a VCHI plan.

A cross-sectional study was performed in the state of **Penang between August and mid-September 2009 with 472 randomly selected respondents**. The respondents were first asked to select their preferred health financing plan from three plans (out-of-pocket payment, compulsory social health insurance and VCHI). The extent of the household's willingness to pay for the described VCHI plan was later assessed using the contingent valuation method in an ex-ante bidding game approach until the maximum amount they would be willing to pay to obtain such a service was agreed upon.

Fifty-four per cent of the participants were female, with a mean age of 34 years (SD = 11.9), the majority of whom had a monthly income of Int\$1157–2312. The results indicated that more than 63.1% of the respondents were willing to join and contribute an average of Int\$114.38 per month per household towards VCHI. This amount was influenced by **ethnicity, educational level, household monthly income**, the presence of chronic disease and the presence of private insurance coverage ($p < 0.05$).

In conclusion, our study findings suggest that most Malaysians are willing to join the proposed VCHI and to pay an average of Int\$114.38 per month per household for the plan.

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Introduction

As is common elsewhere in the world, public health care services in Malaysia are experiencing mounting pressures because of increased demand and limited resources. The current service provides an almost universal health system in which risks are pooled across the entire population, and all civil servants, as well as their dependants and children, and lower income groups are entitled to health care in a public health care facility, whereas the remainder of the population is required to pay a minimal fee for health care. The collected fees constitute only 2% of the cost of the health service. Consequently, the system relies heavily on general taxation for financing. Such a financing plan is unsustainable, particularly in developing countries that have an inefficient tax collection system (only 10% of the Malaysian population pays taxes). Consequently, health service suffers from overcrowding, understaffing, a long waiting time, low accessibility, and a lack of quality and convenience,

which drives almost 60% of Malaysians to seek private primary care (Dyah Pitaloka & Rizal, 2006). Despite their preferences, most (73.2%) of the expenditures in private health care are out-of-pocket, and only 18.8% of adult Malaysians are covered by voluntary private health insurance (VPHI) (Yu, Whynes, & Sach, 2008). This trend creates a high risk of catastrophic medical events for Malaysians. The existing social health insurance in Malaysia is restricted to formal sector workers with regular employment, leaving the unemployed without coverage.

There are a number of health insurance options that pool the risks and avoid the catastrophic medical events usually associated with out-of-pocket payments. Generally, they can be categorised with respect to the scheme being voluntary, compulsory or based on individual risk assessments (International Social Security Association, 2008). National Health Insurance (NHI), which includes social and/or community-based plans, is usually compulsory for specific or entire segments of the community. On the other hand, Private Health Insurance (PHI), which includes employer-based plans and individually underwritten risks, are generally voluntary and based on individual risk assessments. Basically, the disadvantages of compulsory insurance are the following: i) they

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are typically not flexible, as they are geared towards certain conditions at their inception and depend on legislation and political expediency for their adjustment; ii) they have high administrative costs due to inefficiencies and bureaucratic structures; iii) there are difficulties in covering the informal sector because of problems in assessing their incomes; and iv) additional burdens fall on the government if the social insurance plan is inefficient. Voluntary health insurance has the potential disadvantage of not nurturing the principles of mutual support, which would cause it to be expensive for people in the vulnerable group. In addition, due to the motive for profit, the health care costs will increase, and some private plans avoid particular segments of the society who require care.

One option that has garnered increasing support in developing countries is voluntary community-based health insurance (VCHI). It provides insurance coverage for those who are unable to benefit immediately from either a social or private health insurance plan. It is a variant of private health insurance that is community-run, but the contributions are not risk-related. However, there is a lack of research concerning VCHI in upper-middle income countries such as Malaysia, particularly concerning the public's perception of the benefits of the plan.

This study's primary objective was to explore the willingness of Malaysians to pay for a VCHI plan and the factors that affect their willingness to pay (WTP).

Methods

An exploratory cross-sectional study was performed in Penang between August and mid-September 2009. Ethical approval was obtained from the departmental ethics committee of Universiti Sains Malaysia prior to the initiation of the study (USMPPSF122009). A sample size of 472 was calculated as optimal based on a 5% margin of error and a 95% confidence interval for a population of 1.5 million and was adjusted to accommodate an expected 80% response rate. The participants were randomly selected by two-stage cluster sampling. In the first stage, one local authority area was selected from each of the two administrative districts in Penang. In the second stage, a household was selected by a random walk, in which a

random pen spin would indicate the initial direction to walk from a central point to a predefined edge on the map. The household on the immediate right was subsequently chosen.

All consenting Penangites were asked to complete a self-administered questionnaire (with the researcher on site to answer questions) that considered their socioeconomic profile and their preferences concerning three different health insurance policies (Fig. 1).

Upon completion of the questionnaire, the participants were interviewed concerning the maximum amount they would be willing to pay for VCHI (Scenario C) for their household. The interview was performed using the contingent valuation method in a bidding game style. The initial value was randomly selected by the researcher from three possible starting points (Int\$29, Int\$87 and Int\$116). These values were selected based on the common premiums offered for private health insurance plans in Malaysia. Increments or decrements of Int\$29 were offered based on their response to each level. If a negative response was received, the highest positive amount accepted was taken as the household WTP for health insurance.

Data analysis

The occupation responses were unstructured and later categorised according to the International Standard Classification of Occupations (International Labour Organization, 2007). For the purposes of statistical analysis, Categories 4 to 8 were combined into the unskilled/semiskilled manual worker category.

Factors that affected the preferred insurance scheme were analysed using a multinomial logit regression model.

The probability of an individual i choosing a health insurance policy j is given by:

$$P_{ij} = \frac{\exp(x_i\beta_j + z_{ij}\gamma)}{\sum_k \exp(x_i\beta_k + z_{ik}\gamma)}$$

where x_i is a vector of the i th observation of all of the explanatory variables, and β_i is a vector of all of the regression coefficients in the j th regression. The Hausman test was used to check the

- A. Households pay the full cost for each visit to the Government Health Clinic/Hospital and for medicine prescribed by the doctor. Households that are not able to pay will not receive any services. A service is given at cost price – there is no profit. There is no exemption for payment.
- B. All households are **COMPULSORY** (obliged) to pay an annual premium to a local health care fund. There is no exemption for payment. The fee is based on how much income the households have. The higher income, the higher the fee. Thereby all members in the household are entitled to free health care at the Government Health Clinic/Hospital and free medicine if prescribed by the doctor. If care at higher levels is needed, the insured patient will be supported by an amount based on the cost per bed day at the Government Hospital.
- C. Each household can choose to **VOLUNTARILY** pay an annual premium to a local health care fund (community based health insurance). The fee is based on the number of people in the household and the fee is higher for children under five and elderly over 65 because they are expected to use more health care. All persons in the household paying the fee are entitled to free health care at the Government Health Clinic/Hospital and free medicine if prescribed by the doctor. If care at higher levels is needed, the insured patient will be supported by an amount based on the cost per bed day at the Government Hospital.

Fig. 1. Hypothetical health insurance plan and situations adapted from Lofgren, Thanh, Chuc, Emmelin, and Lindholm (2008).

independence of the irrelevant alternatives property assumption in the model. The reference point used in the analysis is Scenario A. The best model choice was made based on the likelihood-ratio test between models, with each independent variable entered and compared in a forward stepwise manner.

The analysis of the amount willing to pay for VCHI was estimated on a non-zero case only. Factors affecting the amount willing to pay for VCHI (lnwtp) were estimated using ordinary least squares linear regression.

$$\ln WTP = \beta_0 + \beta_1 \text{income} + \beta_2 \text{marital} \\ + \beta_3 \text{current health insurance} + \beta_4 \text{ethnics} \\ + \beta_5 \text{household size} + \beta_n X_n$$

The empirical model was fitted based on previous literature using the STATA interaction expansion function (x_i), which expands terms containing categorical variables into a dummy variable set. The independent variables explored in both the multinomial and OLS models include gender, ethnicity, marital status, employment status, occupation category, working sector, monthly household income, health status and household size.

All analyses were performed in STATA v11 (StataCorp. 2009. *Stata Statistical Software: Release 11*. College Station, TX: StataCorp LP).

Results

A total of 492 households were approached, and 20 refused to participate in the research, resulting in a response rate of 95.9%. Of the 472 participants, 255 (54%) were female and 217 (46%) were male, with a mean age of 34 years ($SD = 11.9$), the majority of whom had a monthly income of Int\$1157–2312 (Table 1). The mean household size was 2.5 ($SD = 0.7$).

Fifty-seven per cent of the participants were covered by voluntary private health insurance (VPHI). The premiums were mostly self-paid (71.2%); 7.3% of the premiums were paid for by employers, and 7.7% of the premiums were paid for by both the

employer and the insured. The mean monthly premium for VPHI was Int\$109.36 ($SD = 109.05$).

Slightly more than half of the respondents ($n = 289$; 63.1%) preferred VCHI (Scenario C), whereas 27.5% ($n = 126$) preferred Compulsory Social Health Insurance (Scenario B) and 9.4% ($n = 43$) preferred Scenario A (Table 2).

Model II was selected to explain the factors that affected their choice of health insurance plans based on the LR test (Table 3). Factors that were found to significantly affect their choices were marriage, current VPHI subscription and educational level. The odds for those married to choose VCHI (Scenario C) rather than the total out-of-pocket (Scenario A) are 2.95 times greater than those who are not married, adjusting for the current VPHI subscription and educational level (Table 3).

The premium (price) was found to be the key determining factor that affects the demand for VCHI. The average maximum amount of the willingness to pay (WTP) for VCHI was Int\$114.38 per month per household ($SD = 99.75$; median = 86.71), and this was shown to be positively influenced in a univariate analysis ($p < 0.05$) by factors such as ethnicity, educational level, household monthly income, types of chronic disease and current VPHI subscription (Table 4).

The adjusted grand mean in the OLS was Int\$51.94/month. Having a high income (Int\$3468) would increase the amount by 79.6%, and having a current VPHI subscription would increase the amount by 20.3% (Table 5).

Discussion

The primary objectives of this study were to estimate the demand and the willingness to pay (WTP) for VCHI plans among Malaysian households. Second, this study explored the factors that contribute to households' willingness to pay for these health insurance plans.

Most (63%) Malaysians in Penang preferred VCHI compared with a health financing system that is entirely out-of-pocket or Compulsory Social Health Insurance (CSHI). This preference is higher than is found in Vietnam (20%) (Lofgren et al., 2008). Other studies did not compare the preferences between financing plans, and none were conducted in an upper-middle income country such

Table 1
Sociodemographic characteristics of the sample.

Variable	n (%)
Gender	
Female	255 (54)
Male	217 (46)
Ethnicity	
Malay	174 (36.9)
Chinese	251 (53.2)
Indian	37 (7.8)
Other	10 (2.1)
Marital status	
Single/Divorced/Widowed	230 (48.7)
Married	242 (51.3)
Employment status	
Employed	332 (70.3)
Unemployed	140 (29.7)
Category of occupation	
Administration & management	46 (13.9)
Professional	52 (15.7)
Technician & associate professional	45 (13.6)
Un/Semi-skilled manual workers	112 (33.7)
No response	77 (23.2)
Working sector	
Public	96 (29.1)
Private	234 (70.9)
Highest qualification	
Lower secondary	33 (7)
Upper secondary	129 (27.3)
Tertiary	310 (65.7)
Estimated monthly household income (Int\$)	
<578	75 (15.9)
579–1156	109 (23.1)
1157–2312	174 (36.9)
2313–3468	52 (11)
>3469	62 (13.1)
Health Status	
Have chronic disease	35 (7.4)
No chronic disease	437 (92.6)

Table 2
Distribution of respondents' choices of the different types of health insurance plans (Scenario A, B and C).

Demographic criteria	Choice of health insurance plan			P
	A	B	C	
Overall	3 (9.4%)	126 (27.5%)	289 (63.1%)	0.496
Age				
18–24	12 (9.2%)	40 (30.1%)	78 (60%)	
25–44	19 (9.1%)	59 (28.2%)	131 (62.7%)	
45–64	11 (9.4%)	27 (23.1%)	79 (67.5%)	0.065
>65	1 (50%)	–	1 (50%)	
Marital status				
Single/Divorced/Widowed	26 (11.9%)	66 (30.1%)	127 (58%)	0.117
Married	17 (7.1%)	60 (25.1%)	162 (67.8%)	
Highest qualification				
Lower secondary	4 (12.5%)	7 (21.9%)	21 (65.6%)	
Upper secondary	17 (13.7%)	27 (21.8%)	80 (64.5%)	0.036*
Tertiary	22 (7.3%)	92 (30.5%)	188 (62.3%)	
Estimated monthly household income (Int\$)				
<578	6 (8.7%)	15 (21.7%)	48 (69.6%)	0.036*
579–1156	17 (15.9%)	24 (22.4%)	66 (61.7%)	
1157–2312	13 (7.6%)	50 (29.2%)	108 (63.2%)	
2313–3468	3 (5.8%)	23 (44.2%)	26 (50%)	
>3469	4 (6.8%)	14 (23.7%)	41 (69.5%)	

All analyses were performed using the Chi Square test; * $p < 0.05$.

Table 3

Factors affecting the preference for Scenario B (Compulsory social health insurance) and C (VCHI).

Model	I				II				III			
	Scenario B		Scenario C		Scenario B		Scenario C		Scenario B		Scenario C	
Independent variables	RRR	P	RRR	P	RRR	P	RRR	P	RRR	P	RRR	P
Married	1.669	0.394	1.127	0.026	1.806	0.126	2.946	0.003	1.270	0.510	0.942	0.855
	SE 1.002		SE 1.602		SE 0.697		SE 1.056		SE 0.461		SE 0.309	
Current VPHI subscription	2.011	0.131	0.886	0.777	2.084	0.045	0.841	0.602	2.345	0.018	2.125	0.025
	SE 0.931		SE 0.379		SE 0.763		SE 0.280		SE 0.848		SE 0.712	
Highest education level												
Upper secondary	0.910	0.886	1.198	0.753	0.916	0.893	1.190	0.761				
	SE 0.598		SE 0.689		SE 0.601		SE 0.683					
Tertiary	2.889	0.101	3.179	0.046	2.920	0.097	3.145	0.047				
	SE 1.871		SE 1.841		SE 1.882		SE 1.812					
Married*Current VPHI subscription	1.097	0.902	0.893	0.868								
	SE 0.830		SE 0.606									
Pseudo R-sq	0.042				0.042				0.029			
P	0.0002				<0.0001				0.0001			

VPHI = Voluntary Private Health Insurance, LR Test I vs II (LR 0.20, $P = 0.907$), LR Test II vs III (LR 10.09, $P = 0.039$).

as Malaysia. However, the difference between Malaysia and Vietnam might dispel earlier beliefs that the plan is more attractive in lower income countries (International Social Security Association, 2008). Furthermore, the lower preference for out-of-pocket payments compared with Vietnam (52%) might suggest a higher aversion to risk in Malaysia. This is reflected by 90.5% showing a preference for either VCHI or CSHI. A stronger preference for VCHI compared with CSHI also contrasts with the Vietnam study, which might suggest stronger consumer sovereignty in Malaysia, as is commonly found in higher income groups. VCHI may be the most preferred choice due to its voluntary option that allows individuals to choose whether to participate in the plan. Preferences were influenced by marital status (after adjusting for current health insurance and educational level), as married individuals were almost three times more likely to choose VCHI compared with an out-of-pocket plan.

The unadjusted mean amount to pay for VCHI per household was Int\$114.38. This is far higher than the amount reported in other studies (Asenso-Okyere, Osei-Akoto, Anum, & Appiah, 1997; Binam, Nkama, & Nkendah, 2004; Dong, Kouyate, Cairns, Mugisha, & Sauerborn, 2003; Dror, Radermacher, & Koren, 2007; Lofgren et al., 2008; Onwujekwe et al., 2009) but comparable to the national average premium of VPHI, which is Int\$109.36. Assuming that the probability of health care use is 0.5 and the annual

expenditure per capita is Int\$1360.37 (World Bank, 2012), this amount might be sufficient to cover the health care cost per 1000 individual population with a minimum of 25% paying participants. This is comparable to the median coverage for similar plans worldwide (Carrin, Waelkens, & Criel, 2005). This is encouraging, as VCHI is commonly associated with low uptake, and coverage by some plan must be salvaged, even with 40% coverage (Asenso-Okyere et al., 1997). It is important to note, however, that the willing to pay amount should not be equated with the premium, as it is only reflective of the respondent's financial acceptability.

Price is an important signal of the uptake of VCHI. The uptake is positively affected by a higher income, having VPHI and being ethnic Chinese. With a higher income than the other ethnicities in Malaysia, the Chinese are expected to be willing to pay more. However, interestingly, even after adjusting for income, the Chinese are still willing to pay 18.9% more. This suggests a higher aversion to risk in this ethnic group, echoing findings in the business field (Cheng, 2010). Nevertheless, this is an important observation in a multi-ethnic country such as Malaysia.

Our results also indicated that insured people are more willing to pay for VCHI compared with uninsured people. This may be due to their experience with the benefits of having insurance and their familiarity with its value. This willingness is reflected in the close semblance between the average premium of VPHI and the average amount that individuals are willing to pay for VCHI in this study.

Table 4

Univariate analysis of maximum amount willing to pay for household VCHI.

Demographic criteria	Willingness to pay (WTP), Int\$		P
	Median	Mean (SD)	
Overall	86.71	114.38 (99.75)	—
Ethnicity			<0.01
Chinese	115.61	115.85 (71.09)	
Non-Chinese	86.71	91.65 (71.09)	
Highest qualification			<0.01
Lower secondary	57.80	87.21 (66.87)	
Upper secondary	86.71	89.15 (76.62)	
Tertiary	86.71	127.02 (107.95)	
Estimated monthly household income (Int\$)			<0.01
<578	150.00	170.89 (181.07)	
579–1156	100.00	140.20 (136.85)	
1157–2312	150.00	180.49 (113.50)	
2313–3468	200.00	224.39 (150.88)	
>3469	275.00	337.07 (254.88)	
Current chronic disease			0.011
No chronic disease	150.00	200.10 (175.20)	
Have chronic disease	100.00	166.00 (127.25)	
VPHI Coverage			<0.001
Yes	200.00	232.20 (189.67)	
No	100.00	149.31 (130.88)	

Table 5

The OLS regression of the amount of WTP on marriage status, current health insurance coverage, current VPHI subscription, income, and ethnic group.

		Coef	P
Cons	β	3.950	—
Married	β	−0.174	0.037
	SE	0.083	
Current Health Insurance	β	0.203	0.083
	SE	0.117	
Income			
Int\$1157–2312	β	0.312	0.001
	SE	0.095	
Int\$2313–3468	β	0.412	0.004
	SE	0.144	
>Int\$3469	β	0.796	<0.001
	SE	0.127	
Current voluntary private health insurance	β	0.168	0.144
	SE	0.114	
Chinese	β	0.189	0.023
	SE	0.083	
R-Sq		0.205	
P		<0.0001	
N		387	

Similar findings was found in a study in India (Dror et al., 2007). Furthermore, the average unadjusted amount (Int\$114.38) was also quite close to the higher anchor used in this study (Int\$116), which may indicate a ceiling effect of the low anchor that we used or a familiarity with insurance plans.

Apart from ethnicity and marital status, there is no other association found between demographics and the amount that individuals are willing to pay. This is in contrast to studies conducted in Burkina Faso and Ghana that showed that male respondents were willing to pay a higher amount (Asenso-Okyere et al., 1997; Dong, Kouyate, Snow, Mugisha, & Sauerborn, 2003). A study in Cameroon suggested that this might be caused by the tendency of males to be the sole breadwinners of the family in Cameroon, thus having the ultimate decision-making power concerning participation in a prepaid health plan (Binam et al., 2004). This effect might not be apparent in Malaysia, where both parents typically work.

This study is an important exploratory study that could provide indications of the Malaysian population's preference for health financing options. It shows that in a middle income country with existing universal health care access such as Malaysia, society still prefers VCHI compared with SHI or an out-of-pocket financing system. VCHI is more attractive to Malaysians, possibly because of the voluntary nature of its financing plan and the higher importance placed by Asians on their family over society (Shiroiwa et al., 2010). This attitude is reflected in this study, in which married people have a higher WTP amount and a preference for VCHI. These results could be used by policymakers to formulate an optimum mix of health care financing in Malaysia and to consider VCHI as a potential option, particularly as compelling financial protection.

However, it is important to note that the success of VCHI depends on many other factors, some of which are not investigated in this exploratory study. Although the option for VCHI has received increasing attention as a possible alternative to extend social protection and the resources for public health care (International Social Security Association, 2008), existing literature has noted issues of feasibility in ensuring its viability (Carrin et al., 2005). The feasibility factors may be exogenous, in the form of external support from the government and the ability to attract sufficient community subscriptions. Without sufficient subscriptions, the pool of funds might be insufficient to cover the subscribers' medical events and might require guaranteed support from the government. Feasibility factors can also be endogenous, including the depth of coverage, breadth of coverage, or the costs of illness. These factors would determine the appropriate premium level and whether the pooled fund would be sufficient to cover medical eventualities. Coverage that is too broad, including very high-cost medical events, would deplete the fund quickly.

The contingent valuation's construct was found to be valid, with the amount willing to pay statistically increasing with higher incomes. However, caution must be exercised before generalising this study to the entire Malaysian population, as Penang is a highly urbanised state with a higher number of ethnic Chinese compared with the rest of Malaysia (Department of Statistics, 2011). This is reflected in the higher percentage of ethnic Chinese and VPHI subscriptions in the samples compared with the national average. Therefore, even though this study is representative and valid for the Penang population, a lower estimate might be expected for the general Malaysian population.

Conclusions

This study suggests that VCHI may be an attractive health financing option acceptable to Malaysians. Those who are married

and have attained higher education levels would be more likely to choose VCHI than others. The WTP amount is higher for those who have current health insurance, higher incomes and are of Chinese ethnicity but decreases for those who are married. The average monthly amount they were willing to pay was estimated to be Int\$114.38 per household, an amount sufficient to cover moderate community health care. This would make it attractive to an urban impoverished community that lacks ready access to public health care services. Despite reservations concerning its viability, we believe that its long-term viability could be enhanced by strong support from the government in terms of technical managerial input and guaranteed financial backing. More information about the costs of illness, more transparency and offering a controlled benefit package would also allow the plan to be more sustainable.

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