

PRELIMINARY DRAFT - DO NOT QUOTE

The demand for voluntary health insurance in Vietnam

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Abstract

This paper examines the demand for voluntary health insurance in Vietnam, using a survey of 1,649 adults in three provinces. We explain the demand for voluntary insurance using a range of socio-economic variables, but also include social capital variables, which it is hypothesised, substitute for state-run voluntary health insurance. Our results indicate that farmers, the largest target group, are least likely to purchase insurance. Positive effects result from age and education, with individuals older than 65 years, and higher educated individuals, more likely to buy an insurance policy. Individuals who 'worry' more about future health are, as expected, more likely to buy insurance. The inclusion of two commonly used measures of social capital has contradictory effects. Individuals living in communities with low cohesion are more likely to purchase health insurance, supporting the hypothesis that social capital has a substitution effect. The measure of associational behaviour however has the opposite effect. The latter may simply result from insurance being marketed through voluntary associations. Alternatively this result may reflect a greater sense of duty amongst this group, towards government insurance, given its social goals. Altruism or 'moral' behaviour may also motivate this group. Further data on the supply of health services would improve specification of the model. Insufficient supply of insurance appears to be a fundamental problem, and is a function of institutional constraints.

Key words: *Demand; voluntary health insurance; social capital; Vietnam*

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1. Introduction

The health system in Vietnam, as in many transitional economies, is increasingly characterised by the dominance of out of pocket payments. Within this context the Government of Vietnam (GoV) introduced health insurance in 1992, an increasingly popular health financing mechanism in low and middle income countries. In this paper we analyse the demand for voluntary health insurance (VHI) among adults in Vietnam by using data from a household survey conducted in three provinces during 1999. Economic transition officially began in Vietnam in 1986 with the introduction of *doi moi* (renovation) policies, dismantling the agricultural co-operatives that formed the foundation of the economy. *Doi moi* has fundamentally changed the organisation of Vietnam's health system, with the introduction of official user charges and insurance. In many low-income countries the introduction of price-signals for publicly provided health services has led to a substantial reductions in demand, often with regressive distributional effects [1, 2]. A common response has been the development of non-profit health insurance.

In this paper we examine factors affecting the decision to purchase VHI adults in Vietnam. Most empirical studies on demand for health insurance have been performed in developed economies [3-7] using a range of socio-economic variables to explain variations in demand. In Vietnam informal risk sharing mechanisms are widespread, one of many phenomena that has led to increasing interest in the concept of social capital amongst development economists. The concept draws on the importance of horizontal linkages within communities, with informal financing mechanisms seen as one of the beneficial by-products [8-10]. We therefore include social capital variables as a possible explanation for the decision whether or not to purchase VHI. The next section of the paper presents background information on the health sector and health insurance in Vietnam, the data and preliminary analysis. Section 3 specifies the model and presents results. Section 4 discusses the findings and concludes.

2. Background, data and preliminary analysis

2.1 *The Vietnamese health sector*

Vietnam is one of the poorest countries in Southeast Asia with a population of just over 75 million and a GNP per capita of US\$ 250 in 1995. Having achieved enviable health gains since the 1950s, Vietnam performs well on a range of indicators such as life expectancy and infant mortality, equivalent to countries five times richer such as Ecuador and Morocco¹. This success resulted from the rapid expansion of health and education services in the north of the country following independence from France in 1954. Vietnam has 170 health centres per million population, compared with 63 in China (the country with which Vietnam had most in common with politically, socially and economically), and 0.84 doctors per 1,000 population, more than any other country in the region [11]. Extension of the system to the south of the country, following reunification in 1975, proved a financial burden during a period of economic instability and often-negative growth. As a result southern Vietnam has a less extensive public health system than in the north². Whilst data on private health providers is unavailable, it is generally accepted that private supply is greater in the south. This may also be a function of higher income levels in an area that forms the country's economic heartland, Ho Chi Minh City being the nexus of foreign investment.

Total health expenditure was estimated at \$2 per capita per annum in 1990, equivalent to 2.1% GDP. More recent estimates put the figure at 6% GDP, with over 80% coming from out of pocket sources [12]. This is slightly higher than most countries of similar income levels. The impact of *doi moi* on the health of the population is difficult to estimate though evidence

¹ For example in 1995 Vietnam had a per capita income of US\$ 240 and an infant mortality rate of 41 per 1,000 live births, compared with US\$ 1,110 and 55 infant deaths in Morocco.

² Of the Provinces surveyed in this study, the density of health facilities and personnel in the south, is approximately 50% lower than in the north.

suggests growing inequalities in access to health services [13]. The average number of consultations in GoV facilities was 1.0 per person in 1993, falling considerably from 2.1 in 1987 [11], and low compared with an average of 2.5 contacts in government facilities in low-income countries. One reason for this decline was the end of subsidised pharmaceuticals from the former Soviet Union. The growth in private providers, together with the increased occurrence of individual financial arrangements between users and health providers in the public sector, may also have contributed to this downward trend [13, 14].

Table 1: Key indicators

Indicator	Amount
Income per capita	US\$ 250
Health expenditure as %GDP	6%
Life expectancy at birth	68 years
Infant mortality	41 per 1,000 live births

Source: World Development Report 1997, World Bank.

Broader economic transition has brought with it health sector reforms, the process of which has been disoriented. One researcher comments that “...decisions were being made at the central level *in principle* and later adapted at lower levels *in practice*” [15]. He adds that the lack of a coherent policy framework together with decision-making structures to guide what is fundamentally a decentralised system as “...preventing consumers from making rational choices within a calculable framework”. Any social science research in Vietnam must take account of the significant differences between society in the north and the south. In the north the Communist Party held power since 1954, whilst western influence remained strong throughout the south until the end of the Vietnam War. The commune-based agricultural system was subsequently extended to the south, only to be dismantled eleven years later. In the south there has thus been far greater exposure to a market economy, coupled with substantial foreign investment.

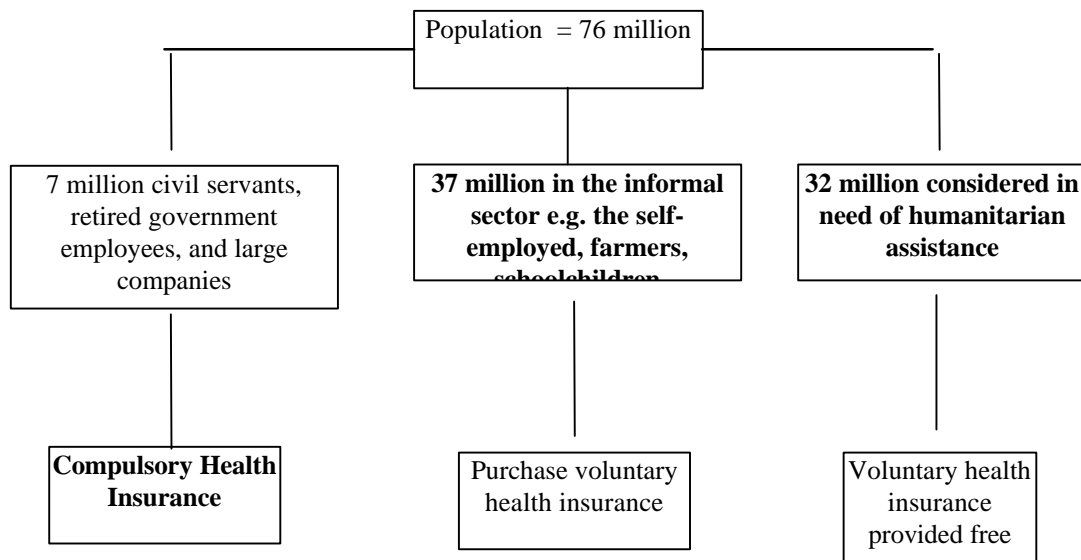
2.2 *Health insurance*

Many middle-income countries in transitional Asia have introduced compulsory health insurance (CHI) or are considering it [16]. In low-income transitional countries however, such as China and Vietnam, with largely subsistent agricultural economies, CHI typically covers only 10% of the population. Ensor estimates the feasibility of introducing such schemes in a range of countries based on population density, level of urbanisation, per capita income and percent of workforce in industry [17]. He concludes that Vietnam will find it difficult to extend insurance to the majority of its population.

The GoV introduced CHI and VHI simultaneously in 1992, following a pilot scheme in Hai Phong Province [18]. The GoV states the goals of VHI as raising extra resources, assisting in poverty alleviation efforts in particular for special merit groups, and increasing financial protection against future uncertain health care expenditure [19]. CHI is exclusively for state employees and employees of large organisations, who contribute 1% of their income, and employers 2%, into the fund. Approximately 7 million people are eligible for CHI, of which around 85% are currently enrolled following good progress in the early years [20] [21]. In certain Provinces however, government employees at the district level and below are incorporated into VHI.

Both CHI and VHI are implemented by Provincial Health Insurance offices, which retain considerable autonomy over premia levels and benefits packages. Policies apply to individuals rather than families. Contracts with hospitals apply similarly to both schemes, with provider reimbursement made on a fee-per-case basis. The target groups of the two schemes are summarised in Figure 1 and Table 2.

Figure 1: Target groups for compulsory and voluntary health insurance



VHI comprises three distinct groups. The largest of these is schoolchildren, which makes up 91% of current members. This group has been the primary focus of VHI being used as a vehicle for Health-Promoting Schools [22]. Teachers receive financial incentives to enrol children, and there is evidence that parent’s are pressurised into purchasing insurance. The second group comprises those in need of humanitarian assistance, around 32 million people. In the health sector this assistance is provided through free VHI policies³ paid for either by local government or non-governmental organisations such as the Red Cross. This group comprises 5% of current membership, or just over 210,000 individuals.

Table 2: Current membership details of health insurance in Vietnam

Scheme	Members	% target group
Compulsory health insurance	5,950,000	85.0%
Voluntary health insurance (for those who must purchase)	3,603,428	9.7%
Voluntary health insurance (provided free for the needy)	210,000	0.65%

³ The Government defines considers households in which per capita incomes are less than VND 70,000 or US\$ 5 per month as being poor, and hence eligible for subsidised or free health services.

The remaining 4% of members are employees of small organisations, and the self-employed including farmers and shopkeepers. The main challenge facing VHI is the extension of insurance to this group, which amounts to 143,000 individuals nation-wide, representing only a tiny proportion of potential membership.

Table 3: Summary of VHI scheme

Aspect of the scheme	Details
Main target group	Farmers
Basis of policy	Individuals
Premia	Community rated US\$ 2-10 per annum 20% co-payment
Benefit package	Either: a) inpatient services and medicines b) inpatients and outpatients services, and medicines

Source: Vietnamese Health Insurance Agency 1997

Premia are set by Provincial Funds within guidelines set by central government, and are typically in the region of US\$ 2-10 for a one year policy. Prices are community-rated in order to promote equity of access to the scheme, together with a ceiling on a patient's annual health expenditures of equivalent to 6 months of the minimum basic salary [19]. A 20% co-payment was introduced early in 1999. VHI policies are typically sold through organised campaigns conducted by Provincial and District Insurance offices. In Hai Phong for example, opinion polls concerning intention to purchase are conducted in target communes. Policies are only sold when over 50% of the commune's population states an intention to purchase. This strategy aims to reduce problems of adverse selection, whereby a disproportionate number of high-risk individuals join the scheme, but is only currently implemented in Hai Phong Province.

Provinces are allowed to vary benefit packages, with two types of policy commonly offered, one covering inpatient services, and a second covering both inpatient and outpatient services.

Medicines are officially covered under both policies, although often are unavailable. Benefits can only be accessed from a nominated government health facility, typically a District Hospital.

2.3 *The survey and data-set*

Table 4 summarises insurance membership in the three Provinces surveyed, Ninh Binh and Hai Phong in the north of the country, and Dong Thap in the south. Hai Phong is an industrial port and the third largest city in Vietnam, with one-third of its population classified as urban. Health insurance has been particularly successful here following the first pilot project in 1989. Ninh Binh and Dong Thap are predominantly agricultural Provinces with over 80% of the population defined as rural. VHI coverage has been less successful to date in these two Provinces, achieving 15% and 4% coverage of the respective populations.

Table 4: Summary data for study provinces (1999)

	Hai Phong	Ninh Binh	Dong Thap
Population	1,667,600	891,500	1,556,667
Compulsory insurance members (as % total population)	231,000 (14%)	91,347 (10%)	43,850 (3%)
Voluntary insurance Members (as % total population)	418,100 (25%)	137,780 (15%)	65,898 (4%)
Adults members as % voluntary scheme	30%	27%	1%

Source: Voluntary Health Insurance Agency

The proportion of adults in VHI indicates how successful funds have been in extending the scheme beyond schoolchildren, the most difficult task facing Provincial Funds. Again Hai

Phong has been the most successful with adults representing 30% of all members, with Ninh Binh also performing well. However adults comprise only 1% of registered members in Dong Thap.

A household survey was conducted between April and June 1999. Sampling took place in three stages. First three Provinces were selected. The main criterion for selection was that a VHI scheme was operational at the time⁴. At least one Province in the north and south of Vietnam was selected in order to capture effects resulting from cultural and socio-economic differences [23] [24]. Three districts within each Province, and three communes in each district were then randomly selected. Stratified random sampling was used to select member and non-members within communes, using lists of members supplied by the Provincial Health Insurance Fund, and lists of all residents provided by the Commune People's Committee. Quotas were set to ensure that the sample included substantial numbers of adults who had paid for VHI. A total of 2,751 individuals were interviewed, of which 1,649 were adults. The following analysis focuses on demand for VHI amongst this group. Table 5 provides a comparison of membership between sample and actual populations.

Table 5: VHI membership in survey Provinces

	VHI members as % Provincial population		Adults as % VHI members	
	Actual	Survey	Actual	Survey
Hai Phong	25%	60%	30%	54%
Ninh Binh	15%	54%	27%	49%
Dong Thap	4%	50%	1%	57%

Source: Voluntary Health Insurance Agency 1998

2.4 Preliminary data analysis

⁴ Not all provinces have a functioning voluntary health insurance scheme. The latest information from the national Vietnamese Health Insurance office reports that six of the sixty-one provinces had no such scheme.

We begin by describing the data. Table 6 relates a range of individual characteristics to purchase of insurance. Income levels are slightly higher amongst members of the VHI scheme, with GoV employees the largest occupational group, which results from policies being sold to government officials at the sub-district level in Dong Thap. A greater number of VHI members, 41%, fall into the two highest education groups, compared with 23% amongst the non-member sample. There are few clear associations with membership amongst other socio-economic variables, although urban residents appear more likely to purchase VHI policies, perhaps reflecting the relative ease of marketing to this group. Respondents were also asked a general question concerning the extent to which they worried about the future in terms of their own and their family's health⁵. The data shows a positive relationship between worry and purchase of insurance with 56% of respondents in the 'high worry' category having purchased VHI, compared to 51% in the low worry category.

2.4.1 Social capital

Two of the questions reported in Table 6 relate to social capital, defined as a productive resource resulting from co-operation and co-ordination between individuals [25]. Hsiao has attempted to link the concept to health financing in the context of China, drawing on key theoretical writings [25, 26]. He suggests that community-based risk sharing schemes are more likely to succeed in community's that are rich in social capital, as a result of trust and co-operation between residents. We explore the possibility of a link between social capital and demand for VHI in Vietnam, using two measures employed in previous surveys [27, 28]. The first quantifies associational behaviour i.e. voluntary membership of organisations other than

⁵ This was measured using a five-point scale.

Table 6: Characteristics of voluntarily insured and uninsured in the sample population

	No voluntary insurance	Voluntary insurance
Number of adults % sample	455 37%	761 63%
<i>Income</i>		
Average annual income ⁶ Estimate in US dollars	3,226,000 VND 239	3,381,000 VND 250
<i>Region</i>		
Hai Phong	28.3%	22.3%
Ninh Binh	57.7%	36.9%
Dong Thap	49.7%	50.3%
<i>Occupation</i>		
Farmer	61.4%	28.2%
Government employee	3.1%	30.7%
Service worker	18.4%	17.5%
Hired worker	4.4%	9.9%
Other	12.7%	13.7%
<i>Religion</i>		
Ancestor worshipper	67.8%	57.6%
Buddhist	9.9%	11.2%
Catholic	9.6%	5.4%
Other	12.7%	25.8%
<i>Education</i>		
< 5 years education	13.8%	9.6%
5-9 years education	63.4%	49.0%
10-15 years education	19.7%	36.8%
>15 years education	3.1%	4.6%
<i>Health status</i>		
Good health status in last 12 months	30.9%	34.0%
Long standing limited illness	15.4%	10.4%
<i>Other characteristics</i>		
18-35 years old	37.9%	40.7%
35-50 years old	42.3%	37.8%
51-65 years old	10.5%	12.2%
Female	52.9%	42.2%
Married	83.6%	81.7%
Urban	29.4%	48.6%
<i>Social capital and risk aversion</i>		
Low level of worry about future health	61.6%	66.9%
Intermediate level of worry about future health	21.9%	18.7%
Average number of organisations a member of	0.76	0.94
Perceived cohesiveness of local community (scale from low = 1 to high = 5)	4.17	4.12

⁶ At the time of the survey US\$1 = approximately VND 13,500.

VHI⁷. The second measure quantifies perceived trust or level of cohesion in the respondent's community. Putnam cites the presence of rotating savings and credit associations in Southeast Asia as a manifestation of organisations that could not operate without high levels of internal trust or social capital [26]. We are interested in the possibility of a substitution effect here i.e. the more social capital an individual can draw on, for example in the form of private transfers (which constitutes an informal risk-sharing mechanism), the less likely they are to demand formal state health insurance. Whilst not conclusive, Table 6 shows that membership of voluntary associations is greater amongst those individuals who have purchased VHI, contradicting the hypothesis. The second dimension however supports the hypothesis, with members of communities with lower levels of cohesion (albeit only slightly), more likely to purchase VHI.

3. The model and results

3.1 Empirical evidence from other countries

Little empirical analysis of the demand for health insurance in low-income countries has been conducted. Most studies in developed countries focus on the influence of purchasing insurance on demand for health care, the most important of which is the RAND experiment in the USA [29]. A number of studies focus specifically on demand for health insurance in developed countries. Besley finds that, as inflexibilities in the UK public health sector increase, proxied by length of waiting lists, demand for private health insurance increases [3]. Cameron models demand for health care and health insurance in Australia, concluding that health status is more important in determining utilisation levels than choice of insurance plan, and that income is a better predictor of demand for health insurance than health status [4]. A further study found that income and price were most important in explaining choice of insurance plan, rather than

⁷ Respondents were prompted using a list of common associations in Vietnam such as the Farmers Union, Elderly Union, Funeral Groups, and were then asked to name any other groups of which they

health-related factors [30]. Research in the UK confirms the significance of income on demand [5, 6], with political beliefs and health status having some, but less, impact.

The only studies concerned with demand for health insurance in low-income countries look specifically at willingness to pay, and use contingent valuation techniques. In Ghana willingness to pay for social health insurance increases with income, households with high recent health expenditures and difficulties in making payments, having more years of education, and being male [31]. In India rural health insurance is linked to private providers, and willingness to pay is found to be a function of consumer perceptions of greater inaccessibility and lower quality of government services [32].

3.2 *Model specification*

We draw on the modelling used by Besley [5] and Propper [7], based on a random utility model. Consumers face a discrete choice between purchasing and not purchasing insurance. Let us assume that an individual has a utility, V_1 , associated with protection resulting from VHI. We apply the random utility framework, which states that only the individual knows the total utility, some of which is observable to the researcher, and some unobservable. Hence, we may write the utility associated with VHI in the following form:

$$V_1 = Z_1 + \mathbf{e}_1, \tag{1}$$

where Z is the observable part and \mathbf{e} is the random component reflecting the unobservable part. In a similar way we can state an individuals utility from not having VHI as:

$$V_0 = Z_0 + \mathbf{e}_0, \tag{2}$$

were a member.

An individual makes a dichotomous choice on whether or not to purchase VHI and we observe the purchase if:

$$Z_1 + \mathbf{e}_1 \geq Z_0 + \mathbf{e}_0, \quad (3)$$

The presence of the random component in equation 3 allows us to analyse the purchase decision in the following probability model:

$$\Pr(\text{'purchased'}) = \Pr(Z_1 + \mathbf{e}_1 \geq Z_0 + \mathbf{e}_0) = \Pr(\mathbf{h} \geq \Delta Z) = F_{\mathbf{h}}(\Delta Z), \quad (4)$$

where $\mathbf{h} = \mathbf{e}_1 - \mathbf{e}_0$ and $F_{\mathbf{h}}(\Delta Z)$ is the cumulative distribution function of the stochastic variable \mathbf{h} . Thus, the latter expresses the probability of observing 'purchased' VHI. Let us assume a linear model in which only one VHI scheme is available, resulting in:

$$\Pr(\text{'buy'}) = \alpha + \gamma s + \mathbf{h}, \quad (5)$$

where α and γ are the parameters to be estimated and s is a vector of socio-economic characteristics described in Table 6. In the estimations we assume that \mathbf{h} is normally distributed. This model estimates the probability of buying VHI conditional on the socio-economic and social capital characteristics of the individual, as all individuals are offered the same insurance. Different Provinces may promote the scheme in different ways, or target different groups, so we use 'ever heard of VHI' as a proxy for this. For this we use a sample selection model where we first regress the probability of having heard of VHI on a battery of socio-economic variables (see Table 6) which generates probabilities⁸. We insert these predicted probabilities into an Inverse Mills Ratio (IMR), or hazard rate, to form an instrumental

⁸ It should be noted from Table 5 that individuals with VHI are oversampled. In the estimations we have controlled for this by weighting using official membership data (also from Table 5).

variable. We use the instrumental variable as an additional covariate in a second probit regression, which examines the main question of demand for VHI. The IMR then assesses and, if necessary, corrects for selection bias. We find that selection bias is not a problem in this model, as reported by the insignificance of the IMR (p-value = 0.49). Thus we cannot reject the hypothesis of no sample selection.

Cultural differences across provinces may also be picked up in the Provincial variables, but we do not expect any differences between Ninh Binh and Hai Phong Provinces, but do expect a north-south difference. To test for this we create interaction terms combining living in a northern Province with key explanatory variables (e.g. religion, income and worry). We test the hypothesis that there are no cultural differences in a likelihood ratio test, and we cannot reject the hypothesis no cultural north south difference. Given that we have controlled for differences in promotion activities, and taste differences resulting for example from culture, we are left with differences in the details of the insurance scheme offered. Thus the final model consists of only socio-economic and social capital variables.

3.3 Results

The results from the estimation are reported in Table 8 and the model presented passes the RESET test, which tests for omitted variables and incorrect functional form. In terms of a test of goodness of fit, we report the number of outcomes correctly predicted by the model (see Table 7). The model correctly predicts 45% of observations.

Table 7: Number of correctly predicted outcomes

	Predicted not purchased	Predicted purchased
Actual not purchased	422	37
Actual purchased	641	128

Farmers

Farmers are less likely to buy VHI than adults with other occupations. Given that farmers represent the predominant occupational group in the target population, this result gives cause for concern. One further possible explanation for this result relates to payment flexibility. Farmers have far greater seasonal variations in income across the year than other occupation groups. To date VHI cards for rural populations have been sold through short intensive campaigns, limiting access to the scheme. Indeed according to the survey 50% of farmers said that once they had decided to buy a card, they had not done so immediately due to unavailability. Only 32% of non-farmers gave the same reason. Hence the quantity of supply of voluntary insurance to farmers appears to be an important factor.

Level of worry about future health of respondent and dependants

This variable gives some insight into the respondent's aversion to risk, specifically with regard to their own and their dependants future health. Given that risk averse individuals gain greater utility from certain prospects than uncertain ones, and will pay for the privilege, it is expected that the more risk averse an individual is, the more likely she is to purchase health insurance. The data confirms this expectation with respondents scoring low on the 'worry' scale being significantly less likely to purchase insurance than those scoring high.

Membership of a voluntary organisation

This variable measures the quantity of associational life, and is one dimension of social capital as defined in section 2.4.1. The data shows that individuals not a member of a voluntary association, or only a member of one, are significantly less likely to purchase VHI than those who are a member of two or more. This could signify several things. First it may be a function of marketing strategies i.e. that insurance is promoted through such associations. Secondly there may be some characteristic of these individuals that makes them more likely to purchase VHI. Despite *doi moi* the non-state sector is relatively underdeveloped in Vietnamese society.

Table 8: Probability of purchasing a voluntary health insurance

	Coefficient	Standard error
Constant	-0.194*	0.106
<i>Income</i>		
Income per capita	-0.000084	0.000016
<i>Region</i>		
Hai Phong	1.266***	0.211
Ninh Binh	0.926***	0.207
<i>Occupation</i>		
Farmer	-0.269*	0.151
Government employee	0.527**	0.223
Service worker	0.059	0.149
Hired worker	0.028	0.245
<i>Religion</i>		
Ancestor worshipper	-0.073	0.129
Buddhist	-0.357	0.222
Catholic	0.204	0.194
<i>Education</i>		
5-9 years education	0.363**	0.158
10-15 years education	0.707***	0.183
>15 years education	0.810***	0.256
<i>Health status</i>		
Good health status in last 12 months	-0.194*	0.106
Long standing limited illness	-0.052	0.121
<i>Other characteristics</i>		
18-35 years old	-0.430**	0.181
35-50 years old	-0.441**	0.176
51-65 years old	-0.039	0.180
Female	0.154	0.092
Married	0.174	0.124
Urban	0.338***	0.121
<i>Risk aversion and social capital</i>		
Low level of worry about future health	-0.479***	0.138
Intermediate level of worry about future health	-0.506***	0.122
Member of zero organisations	-0.368***	0.131
Member of one organisation	-0.435***	0.120
Low level of perceived cohesiveness of local community	0.661**	0.274
Intermediate of perceived cohesiveness of local community	0.186	0.124
RAMSEY'S RESET TEST	P value =	0.75
Inverse Mills Ratio	P value =	0.49

* significant at 10% level ** significant at 5% level *** significant at 1% level

Whilst individuals may join associations voluntarily, they may be more likely to join as a result of loyalty to the communist party or government, or even for personal political ambitions. These individuals may be more likely to purchase VHI, which is government implemented, out of a sense of duty. The concept of duty to the state, which is rooted in Confucian doctrine, is still a strong motivating force for many Vietnamese.

Region

The data shows that individuals living in one of the two northern Provinces are more likely to purchase VHI than those living in the south. This may result from a premium effect, as VHI policies are significantly cheaper in the two northern Provinces. A number of other effects could also be hidden within this variable, in particular those reflecting the supply of services. The model would be enhanced by the inclusion of data on the quantity of supply of health service both government and privately owned, but these data are currently unavailable. The positive signs associated with Ninh Binh and Hai Phong relative to Dong Thap may indicate a significant price effect. Premia are higher in the south and people living here are less likely to purchase VHI. In addition there is no significant difference between Ninh Binh and Hai Phong indicating internal consistency as prices are almost identical across the two Provinces.

Other socio-economic variables

One of the strongest effects, significant at the 1% level, is that individuals with more than five years schooling are more likely to purchase VHI than those with less than five years. People over 50 years of age are also more likely to buy VHI, which might be expected as need for care tends to increase over this age. People with good health in the past 12 months are also, unsurprisingly, less likely to purchase VHI. The regression confirms the indication from Table 6 that there is a strong positive effect resulting from living in an urban area.

4. Discussion and conclusions

Finding innovative strategies to promote VHI to rural populations, is a priority policy question for the Vietnamese Health Insurance Agency. Through analysing demand for state-implemented VHI, this paper aims to provide useful information to further this goal. The two-part sample-selection model controls for potential supply-side effects resulting from the different promotion performance of Regional VHI funds. This was not found however to have a significant effect and so the first part of the model is not reported here. A second supply-side factor relates to the availability of VHI, or the quantity of supply, which may explain low demand amongst certain groups. Rural farmers are the least likely to have purchased insurance despite being the key target group. Insufficient data is available to incorporate supply into the model. The supply of health services, both government and private, is also likely to have an impact on demand for VHI, given that benefits can only currently be accessed from GoV facilities, but detailed information is currently unavailable.

Certain results are counterintuitive and contradict findings in other studies. For example income is negatively related to demand, though not significantly. Higher income groups are more likely to self-insure i.e. by paying direct user charges, particularly if there is a direct link between payment method and quality of service. Indeed not all members actually use their cards when accessing health care, which also indicates that service quality is an important factor. If the suggestions that informal payments have increased during transition are correct, patients paying fees directly to providers, rather than using insurance, might receive preferential treatment. Indeed there is evidence that providers were dissatisfied with the level of reimbursement under the insurance scheme, relative to user charges, which adds weight to this argument [19].

Modelling the quality of services as a factor explaining demand is complex, and is not within the scope of this paper. Further analysis of available data however is revealing. Many patients claimed they only used their health insurance card for urgent cases, when expenditure tends to be higher. Whilst this is in part due to benefit packages that only cover inpatient care, there is also a suggestion that patient's trade-off the cost and quality of health services. As described earlier, using VHI results in a range of restrictions for the patient e.g. the facility at which care can be accessed, and the pharmaceuticals prescribed. It may also affect how soon a patients is treated, and the attitudes of the staff.

Public health services in Vietnam appear to operate to a large extent as a private market, with rationing based on ability to pay. In this system individuals with higher incomes can guarantee a higher quality of service, and are more likely to self-insure, making out of pocket payments. Those on lower incomes may find the necessary funds to make out of pocket payments by drawing on private transfers. The use of VHI appears to create greater inflexibility in, and possibly lower quality of, health services. When costs are low individuals are prepared to make payments in order to access better quality care. When costs are higher, however, the savings to be made by using insurance are also higher, and individuals are prepared to accept the constraints of VHI, together with lower quality care.

Despite some of the negative effects associated with VHI, the scheme remains popular. A substantial number of current members (89%) said they wanted to renew their policy, with 51% of non-members saying they would be interested in purchasing one for the first time. This fact may reflect the increase in uncertainty of future health expenditures under economic transition. Some effects are similar to those found in other studies with individuals less likely to purchase VHI in the south, where they 'worry' less, and price of VHI is higher. Finally whilst one of the social capital variables is positively correlated to purchasing VHI, the other is negatively

correlated. More information on the way in which VHI is promoted is necessary to understand whether or not there is a more significant effect at play here, in terms of characteristics that motivate some Vietnamese to purchase VHI.

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Appendix 1: Description of variables

Variables	Description	Reference Group
<i>INCCAP</i>	Per capita income in respondents household	N/A
<i>FARMER</i>	Main occupation is farming	Non-farmers
<i>GOVEM</i>	Main occupation is government employee	Non government employees
<i>SERVICE</i>	Main occupation is service worker	Non service workers
<i>HIRED</i>	Main occupation is hired labourer	Non hired labourers
<i>ANCESTOR</i>	Consider self an ancestor worshipper	All non-ancestor worshippers
<i>BUDDHIST</i>	Consider self a Buddhist	All non-Buddhists
<i>CATHOLIC</i>	Consider self a Catholic	All non-Catholics
<i>LOWEDUC</i>	5-9 years education	< 5 years education
<i>MEDEDUC</i>	10-15 years education	< 5 years education
<i>HIGHEDUC</i>	>15 years education	< 5 years education
<i>GOOD</i>	Good health in past 12 months	Poor health in past 12 months
<i>LLI</i>	Have a long-standing limiting illness	Do not have a long-standing limiting illness
<i>MARRIED</i>	Married	Not married
<i>WORRYLOW</i>	Worry only a little about future health of self and family	Worry a lot about future health of self and family
<i>WORRYMED</i>	Worry a medium amount about future health of self and family	Worry a lot about future health of self and family
<i>AGE1</i>	18-35 years	Over 65 years
<i>AGE2</i>	36-50 years	Over 65 years
<i>AGE3</i>	51-65 years	Over 65 years
<i>FEMALE</i>	Female	Male
<i>URBAN</i>	Live in urban community	Live in rural area community
<i>HAIPHONG</i>	Resident in Hai Phong (north Vietnam)	Resident in Dong Thap (south Vietnam)
<i>NINHBINH</i>	Resident in Ninh Binh (north Vietnam)	Resident in Dong Thap (south Vietnam)
<i>COHLOW</i>	Low cohesion perceived in local community	High cohesion perceived in local community
<i>COHMED</i>	Medium level of cohesion perceived in local community	High cohesion perceived in local community
<i>MEMBER0</i>	Member of no associations	Member of more than one association
<i>MEMBER1</i>	Member of only one associations	Member of more than one association
<i>MILLS</i>	Inverse Mills Ratio	N/A

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