The Impact of Compulsory Health Insurance on Health Care Utilization and Out-of-pocket Payments: New Evidence for Vietnam

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PIERI4 - Other Proposals
The Impact of Compulsory Health Insurance on Health Care Utilization and Out-of-pocket Payments: New Evidence for Vietnam

RESEARCH PROPOSAL
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1. Abstract

There is no doubt that health insurance has a very important role in health care and financial protection, especially for the poor. Yet, there is a large proportion of population not having health insurance in Vietnam. According to the Vietnam Household Living Standard Survey, the uninsured people accounted for 46 percent of the population in 2006. The government of Vietnam aims to achieve full coverage of health insurance in 2015. People will be covered mainly by compulsory health insurance. Although there are many studies on the implementation of compulsory health insurance in Vietnam, little is known on the causal impact of compulsory health insurance. This study measures the impact of compulsory health insurance on health care utilization and out-of-pocket payments using the most recent Vietnam Household Living Standard Surveys in 2006 and 2008. Impact evaluation of compulsory health insurance can provide the government with helpful information to increase the effectiveness of compulsory health insurance.

2. Main research questions and core research objectives

The main objective of this study is to examine to what extent compulsory health insurance affects health care utilization and out-of-pocket health care expenses on the insured people in Vietnam. The study focuses on compulsory health insurance, since compulsory health insurance will be applied to cover a large proportion in the future. In addition, the endogeneity problem due to self-selection is not serious in the impact evaluation of compulsory health insurance, since enrolment in compulsory health insurance is based on a mandatory scheme instead of a voluntary scheme.

The study will answer the following research questions:

- How does compulsory health cover people during the period 2004-2006-2008? Is the coverage different or similar for different groups: male/female, poor/non-poor, and urban/rural people?
- What are the factors of individuals and households associated with enrolment in compulsory health insurances?
- To what extent does compulsory affect health care utilization and out-of-pocket health care spending of the insured? Are the effects different or similar for different groups: male/female, poor/non-poor, and urban/rural people?
• What are policy implications for health insurance and health care services in Vietnam?

3. Scientific contribution of the research

There are a large number of empirical studies measuring the impact of health insurance on health care utilization and spending in developing countries. However, empirical findings are still contradictory. Positive impacts of health insurance on health care demand and utilization have been found in several studies such as Newhouse (1993), Water (1999), Bertranou (1998), Ron (1999), Harmon and Nolan (2001), Yip and Berman (2001), Wagstaff and Pradhan (2005), Wagstaff et al. (2009). On the contrary, the effect of health insurance can be negligible if the coverage and benefit package of health insurance are limited. For example, Sapelli and Vial (2003) found a negligible impact of Chilean health insurance on hospitalization. Ekman (2007) found that health insurance did not help financial protection from the catastrophic spending on health care in Zambia. Carrin et al. (1999) found a very limited impact of health insurance on reduction of health care expenditure burden in China.

The impact of health insurance in Vietnam has been evaluated quantitatively in several studies. Again, the empirical results are not consistent. Wagstaff and Pradhan (2005) measured impact of all types of health insurance using Vietnam Living Standard Surveys 1993 and 1998. They found that health insurance increased the probability of using health care services and the number of hospital visits. Health insurance also helped reduction of annual out-of-pocket health expenditures. Sepehri et al. (2004) also used the same data sets to measure impact of health insurance on health care spending. They found that health insurance reduced the out-of-pocket expenditures by around 36 to 45 percent. Jowett et al. (2003) measured impact of health insurance using a small household survey in 1999. The findings were that health insurance decreased the average out-of-pocket expenditures by approximately 200 percent. The impact of free health insurance for the poor was assessed in Bales et al. (2007) and Wagstaff (2007) using data from VHLSSs 2002 and 2004. Although, Wagstaff (2007) found a positive impact of the health insurance on health care utilization, he did not find a significant impact on out-of-pocket health expenditures. On the contrary, Bales et al. (2007) did not find a significant impact of health insurance on health care utilization. In Bales et al. (2007), health insurance helped the insured reduce the inpatient treatment expenses but not the inpatient treatment expenses. Recently, when using three rounds of VHLSS in 2002, 2004 and 2006 and a
method called triple differencing with matching, Wagstaff (2009) found that the free health insurance reduces out-of-pocket spending significantly.

A main problem in impact evaluation of health insurance is the endogeneity of health insurance. In Vietnam, compulsory health insurance is currently applied for civil servants, state enterprise workers, and workers in private enterprises with more than 10 workers, and pensioners. For compulsory health insurance, which is based on a mandatory scheme rather than a self-selection scheme, the endogeneity problem is not serious. However, the insured people with compulsory and the uninsured people might have be different unobserved characteristics such as risk attitude, which can be correlated with both health insurance enrolment and health care utilization. A widely used method to deal with endogeneity of health insurance is the difference-in-differences with matching (e.g., Wagstaff and Pradhan, 2005; Wagstaff et al., 2009; Johar, 2009). However, this method requires panel data with baseline data before health insurance. Baseline data are not always available in reality. Instead, panel data with two time periods are often collected after health insurance begins. In this study, we will show that under certain assumptions the difference-in-differences with matching method can still be applied with two-period panel data after health insurance to measure health insurance impacts.

This proposed study is expected to have two scientific contributions. Firstly, by assessing impact of compulsory health insurance in Vietnam, the study is expected to contribute empirical findings to the debate on impacts of general health insurance and compulsory health insurance. Secondly, the study will present and apply the difference-in-differences with matching method in the context of two-period panel data without baseline.

4. Policy relevance

Vietnam has achieved remarkable reduction of poverty during the past 10 years. However, the incidence of poverty remains rather high, especially in rural areas. According to Vietnam Household Living Standard Survey (VHLSS) in 2006, the incidence of rural poverty was around 20 percent. One of important reasons for poverty is health shocks. In all Participatory Poverty Assessment (PPA) studies, illness is always described by the poor as one of the main reasons for their severe difficulties (World Bank, 2000). Households affected by health shocks suffer from burden of medical expenses. According to VHLSS 2006, around 12 percent of households spent more than
16 percent of their consumption in health care. High out-of-pocket payments on health care are also found in several studies such as Narayan et al. (2000), World Bank (2001), Wagstaff (2002), Wagstaff and van Doorslaer (2003). Health shocks can lead to decrease in employment, thereby income and expenditure (e.g., Wagstaff, 2005b).\(^1\)

The adverse impacts of health shocks can be mitigated if people have health insurance. There is no doubt that health insurance has a very important role in health care and financial protection, especially for the poor. Health insurance helps insured people access expensive health care services. It also protects people from financial burdens and poverty caused by health shocks (e.g., see Whitehead et al., 2001; Wagstaff, 2005a; Wagstaff, 2005b).

In Vietnam, health insurance has been implemented by the government since 1992. Initially, health insurance included compulsory health insurance and voluntary health insurance. Nowadays, health insurance schemes consist of compulsory health insurance, free health insurance, student health insurance, and voluntary health insurance schemes. Compulsory health insurance is applied for civil servants, state enterprise workers, and workers in private enterprises with more than 10 workers, and pensioners. Free health insurance is provided free of charge for the poor and other targeted groups such as ethnic minorities and policy households. All the children under 6 years old also have free health insurance. School or student health insurance is applied for students in schools, colleges and university. People are also able to pay for voluntary health insurance.\(^2\)

Figure 1 shows that the proportion of the uninsured people reduced by 10 percentage points from 56 percent to 46 percent during the period 2004-2006. Student health insurance remained unchanged, at 15 percent. Other schemes of health insurance experienced an increase over this period. The percentage of people having compulsory health insurance increased from 6 to 10 percent.

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1 In other developing countries, health shocks are a burden to people, especially the poor (e.g., see Whitehead et al., 2001; Wagstaff, 2005a).

2 For more information on legal framework of health insurance in general and compulsory health insurance in Vietnam, see Government (1998, 2005).
Figure 1: Distribution of population by health insurance status in 2004 and 2006

Source: Author’s estimation from VHLSS 2004 and 2006.

The above figure shows that there is a large proportion of population not having health insurance in Vietnam. Like other developing countries, the government of Vietnam aims to achieve the full coverage of health insurance to protect people against catastrophic health spending. The government sets up a plan that by the year 2015 all the Vietnamese population will be covered by different types of health insurance including compulsory health insurance, student (school) health insurance, free health insurance for the poor and other beneficiaries, and voluntary health insurance. People who are currently uninsured will be covered by compulsory health insurance (Pham Anh, 2008; Le Phuc, 2009).

There are several arising issues in achieving a successful full coverage of health insurance. The first question is whether the current health insurance scheme is useful in increasing health care and reducing out-of-pocket health spending, and whether the impact of health insurance differs for different groups such as urban/rural people, male/female, poor/non-poor people. Health insurance is sometimes to blame for provision of poor health care services (e.g., Khiet Hung, 2008; Tien Hung, 2008). A large proportion of the insured people still do not use health insurance when using care services. If the current health insurance scheme is not effectiveness, it needs to be revised. Rural areas often have poor health care clinics and the impact of health insurance can be lower in rural areas than in urban areas. The second question is the level of health insurance premium and package benefit which will be applied for the uninsured people. The optimal premium will guarantee reasonable contribution from people and also prevent budget deficit for health insurance organization. In this study, we will address the first question regarding the impact of compulsory health insurance in Vietnam. Impact evaluation of compulsory health insurance can provide the government with helpful
information to increase the effectiveness of compulsory health insurance. The second question is certainly very important, but finding answers to this question requires substantial research and data. Thus it is beyond the scope of this study.

5. Methodology

Descriptive statistics can be used to investigate the coverage of compulsory health insurance to different groups, and logit models can be used to examine the factors associated with enrolment of compulsory health insurance. The most difficulty in this study is to estimate the impact of compulsory health insurance. Thus, this section focuses on the methodology used to measure the impacts of compulsory health insurance on health care utilization and out-of-pocket health care payment.

5.1. Parameter of interest

The main objective of the study is to measure the impact of compulsory health insurance on the health care utilization and health care spending of the insured people. Let $D$ be a binary variable indicating participation in compulsory health insurance, i.e. $D = 1$ if one has compulsory health insurance, and $D = 0$ otherwise. In addition, let $Y$ denote observed outcome, i.e. health care utilization and health expenditures. This variable can receive one of the two potential values depending on $D$. More specifically, $Y = Y_1$ if $D = 1$, and $Y = Y_0$ if $D = 0$. For a person $i$, the impact of health insurance on her outcome is measured by:

$$
\Delta_i = Y_{i1} - Y_{i0}
$$

The main problem of analyzing the causal effect of health insurance is that $Y_{i0}$ is unobservable for the insured. It is the value of $Y$ that person $i$ would have experienced had this person not have had health insurance. The most popular parameter in impact evaluation is the Average Treatment Effect on the Treated (ATT), which is defined as follows (Heckman et al., 1999):

$$
ATT = E(Y_1|D = 1) - E(Y_0|D = 1).
$$
This is the average impact of the health insurance on the insured people’s outcome. In (2), $E(Y_0 \mid D = 1)$ is not observed. Thus, estimation of $ATT$ is not straightforward. The next section discusses how to estimate $ATT$ using the matching method with panel data.

5.2. Propensity score matching using panel data

When panel data on insured and uninsured people are available before and after health insurance, $ATT$ can be estimated using a method of difference-in-differences with matching. In this study, we will use the panel data 2004-2006 VHLSSs to estimate the impact of compulsory health insurance during the 2004-2006 period and the panel data 2006-2008 VHLSSs to estimate the impact of compulsory health insurance during the 2006-2008 period. In this section, we illustrate the impact estimation method using the panel data 2006-2008 VHLSSs. This method is also applied for the panel data 2006-2008 VHLSSs.

Suppose that in our panel data of VHLSSs 2006-2008, the 2006 and 2008 outcomes are pre-health-insurance and post-health-insurance outcomes, respectively. More specifically, let $Y_0^{2006}$ denote outcome in 2006 (i.e., outcome before health insurance). Let $Y_1^{2008}$ and $Y_0^{2008}$ denote potential outcomes in states of health insurance and no health insurance in 2008 (i.e., outcome after health insurance), respectively. The difference-in-differences with matching method relies on an assumption that conditional on some observed variables $X$, difference in outcome expectations between people with health insurance and people without health insurance is time-invariant:

$$E(Y_0^{2006} \mid X, D = 1) - E(Y_0^{2006} \mid X, D = 0) = E(Y_0^{2008} \mid X, D = 1) - E(Y_0^{2008} \mid X, D = 0).$$

Then, we can identify the parameter $ATT$ conditional on $X$ (denoted by $ATT(X)$), since:

$$ATT(X) = E(Y_1^{2008} \mid X, D = 1) - E(Y_0^{2008} \mid X, D = 1)$$

$$= E(Y_1^{2008} \mid X, D = 1) - E(Y_0^{2008} \mid X, D = 1) - E(Y_0^{2006} \mid X, D = 1) + E(Y_0^{2006} \mid X, D = 0)$$

$$= E(Y_1^{2008} \mid X, D = 1) - E(Y_0^{2008} \mid X, D = 0) - E(Y_0^{2006} \mid X, D = 1) + E(Y_0^{2006} \mid X, D = 0).$$

As a result, $ATT$ is also identified, since:

$$ATT = \int_{X \mid D = 1} ATT(X) dF(X \mid D = 1).$$

It should be noted that the parameters refer to impacts in 2008.
The matching estimator is based on equation (4). After we construct a comparison (control) group that has similar distribution of $X$ as the treatment group, we can estimate the impact by computing the difference in differences in average outcomes between the treatment and control groups before and after the health insurance.\(^3\)

A problem in applying the difference-in-differences with matching method in the case of compulsory health insurance is that we do not have baseline data. In our panel data of VHLSSs 2006-2008, there were some people having compulsory health insurance in both 2006 and 2008. To apply the difference-in-differences with matching method straightforwardly, we have to drop observations with health insurance in the both years. However, dropping observations can lead to biased estimation of ATT for the year 2008.

To illustrate the issue more explicitly, let $D_{2006}$ and $D_{2008}$ denote the binary variables of compulsory health insurance in the years 2006 and 2008, respectively. In 2006, let $Y_{1,2006}$ and $Y_{0,2006}$ denote potential outcomes with and without compulsory health insurance, respectively. In 2008, let $Y_{1,2008}$ and $Y_{0,2008}$ denote the potential outcomes with and without health insurance, respectively. Recall that we are interested in $ATT$ in 2008, i.e.:

$$ATT_{2008} = E(Y_{1,2008} | D_{2008} = 1) - E(Y_{0,2008} | D_{2008} = 1).$$  \hspace{1cm} (6)

If we drop observations having health insurance in 2006, we are going to estimate the following parameter:

$$ATT'_{2008} = E(Y_{1,2008} | D_{2008} = 1, D_{2006} = 0) - E(Y_{0,2008} | D_{2008} = 1, D_{2006} = 0).$$  \hspace{1cm} (7)

$ATT'_{2008}$ will be equal to $ATT_{2008}$ under an assumption that the participation in health insurance in 2006 is uncorrelated with the participation in health insurance in 2008. If this assumption does not hold, we need to invoke other assumptions to identify $ATT_{2008}$.  

First, let’s write $ATT_{2008}$ conditional on $X$ as follows:

$$ATT_{2008,X} = \Pr(D_{2006} = 1 | X, D_{2008} = 1)\left[E(Y_{1,2008} | X, D_{2006} = 1, D_{2008} = 1) - E(Y_{0,2008} | X, D_{2006} = 1, D_{2008} = 1)\right]$$

$$+ \Pr(D_{2006} = 0 | X, D_{2008} = 1)\left[E(Y_{1,2008} | X, D_{2006} = 0, D_{2008} = 1) - E(Y_{0,2008} | X, D_{2006} = 0, D_{2008} = 1)\right]$$  \hspace{1cm} (8)

Then, two identification assumptions are:

$$\left[E(Y_{0,2008} | X, D_{2006} = 0, D_{2008} = 1) - E(Y_{0,2008} | X, D_{2006} = 0, D_{2008} = 0)\right]$$

$$= \left[E(Y_{0,2008} | X, D_{2006} = 0, D_{2008} = 1) - E(Y_{0,2008} | X, D_{2006} = 0, D_{2008} = 0)\right].$$  \hspace{1cm} (9)

\(^3\) To find the comparison group, we require a so-called common support assumption, i.e., $0 < \Pr(D = 1 | X) < 1$. This assumption means that there are non-participants who have the $X$ variables similar to those of the participants in the health insurance program.
\[ E(Y_0^{2008} \mid X, D_{2006} = 1, D_{2008} = 1) - E(Y_1^{2008} \mid X, D_{2006} = 1, D_{2008} = 1) \]
\[ = E(Y_0^{2008} \mid X, D_{2006} = 1, D_{2008} = 0) - E(Y_1^{2008} \mid X, D_{2006} = 1, D_{2008} = 0) \]  
(10)

The first assumption means that difference in the no-health-insurance outcome (conditional on \( X \)) between people uninsured in both the years and those insured only in the year 2008 is unchanged overtime. This assumption is similar to the assumption of the method of difference-in-differences with matching. The second assumption means that difference between the no-health-insurance outcome in the year 2008 and the health-insurance outcome in the year 2006 is the same for people insured in both the years and those insured in the year 2006 but not in the year 2008.

Substitute (9) and (10) into (8) and rewrite (8) as follows:

\[
ATT_{2008,X} = \Pr(D_{2006} = 1 \mid X, D_{2008} = 1) \left\{ E(Y_1^{2008} \mid X, D_{2006} = 1, D_{2008} = 1) - E(Y_0^{2008} \mid X, D_{2006} = 1, D_{2008} = 0) \right\} 
\]
\[ - \left\{ E(Y_1^{2006} \mid X, D_{2006} = 1, D_{2008} = 1) - E(Y_1^{2006} \mid X, D_{2006} = 1, D_{2008} = 0) \right\} 
+ \Pr(D_{2006} = 0 \mid X, D_{2008} = 1) \left\{ E(Y_0^{2008} \mid X, D_{2006} = 0, D_{2008} = 1) - E(Y_0^{2008} \mid X, D_{2006} = 0, D_{2008} = 0) \right\} 
\]
\[ - \left\{ E(Y_0^{2006} \mid X, D_{2006} = 0, D_{2008} = 1) - E(Y_0^{2006} \mid X, D_{2006} = 0, D_{2008} = 0) \right\} \]
(11)

\( ATT_{2008,X} \) is identified since all terms in (11) are observed. The unconditional parameter is also identified by (5). \( ATT \) can be also identified for different groups such as male/female, poor/non-poor, urban/rural people.

Based on (11), \( ATT_{2008} \) conditional on \( X \) and \( D_{2006} \) is expressed as follows:

\[
ATT_{2008,X,D_{2006}} = \left\{ E(Y_1^{2008} \mid X, D_{2006}, D_{2008} = 1) - E(Y_0^{2008} \mid X, D_{2006}, D_{2008} = 0) \right\} 
\]
\[ - \left\{ E(Y_0^{2006} \mid X, D_{2006}, D_{2008} = 1) - E(Y_0^{2006} \mid X, D_{2006}, D_{2008} = 0) \right\} \]
(12)

where \( Y^{2006} \) is observed outcome in 2006.

Equation (12) is rather similar to equation (5). Matching can be performed according to (12). The treatment group is people who had health insurance in 2008. The comparison group includes people who did not have health insurance in 2008 but had the observed characteristics (the \( X \) variables) and health insurance status in 2006 (the \( D_{2006} \) variable) similar to those of the treatment group.\(^4\) In other words, we have to control not only \( X \) but also \( D_{2006} \).

A remaining problem is how to match the uninsured with the insured. Since a paper by Rosenbaum and Rubin (1983), the matching is often performed based on the

\(^4\) To find the control group, we also require a common support assumption: 
\( 0 < P(D_{2008} = 1 \mid X, D_{2006}) < 1 \)
probability of being assigned into the program, which is called the propensity score.\textsuperscript{5} The propensity score is used to balance the covariates $X$ between the participants and matched non-participants. In this study, the matching based on the propensity score is employed, and the propensity score is the probability of being insured in 2008 given variables $X$ and $D_{2006}$. The propensity scores are estimated using a logit (or probit) model. In addition, depending on the number of non-participants are matched with a participant, we can have different matching estimators. In this research project, we use nearest-neighbors, kernel matching, and local linear regression matching to examine the sensitivity the impact estimates.\textsuperscript{6} The standard errors are calculated using bootstrap techniques.\textsuperscript{7}

As mentioned, compulsory health insurance is applied for civil servants, state enterprise workers, and workers in private enterprises with more than 10 workers, and pensioners (these people can be regarded as those in the formal sector). The selection of compulsory health insurance is based on occupation. It might be difficult to find a comparison group of uninsured people who have similar occupations as the insured people, since most of the uninsured people can work in informal sectors which are not eligible for compulsory health insurance. The endogeneity bias can result if there are unobserved variables affecting both occupation and health care utilization. However, for most people, the main reason for occupation selection is income incentive. Thus, controlling for income can mitigate the bias due to unobserved variables which affect occupation selection and health care utilization. It is possible that some people decide to work in the formal sector where compulsory health insurance is applied, since they expect that the formal sector is more stable than the informal sector. These people can have risk attitude different from the uninsured people in the formal sector. Although risk attitude is unobserved and more likely to affect both health insurance enrolment and health care utilization, it is often stable and can be removed using the difference-in-differences estimators.

It should be noted that the coverage of compulsory health insurance tends to increase overtime. Figure 1 shows that the percentage of people enrolled in compulsory health insurance increased from 6 percent in 2004 to 10 percent in 2006. However,

\textsuperscript{5} Other matching methods can be subclassification and covariate matching (Rubin, 1979).
\textsuperscript{6} Another estimator which is also based on the propensity score semi-parametric difference-in-differences estimators proposed by Abadie (2005). In this study, we can also try to apply this method in the context of panel data without baseline.
\textsuperscript{7} Abadie and Imbens (2006) show that bootstrap can give invalid standard errors for the nearest neighbor matching estimator. However, there has not evidence on the validity of standard errors for other matching estimators using bootstrap. Most of empirical studies rely on the bootstrap to estimate standard errors of matching estimators.
eligibility criteria for compulsory health insurance have been unchanged during 2000s. The main reason for the increasing coverage of compulsory health insurance is the expansion of the formal sector. It is expected that socio-economic factors which affect the expansion of the formal sector do not influence health care utilization, and as a result they do not lead to a endogeneity bias.

6. Data requirements and sources

The study relies on data from the three most recent Vietnam Household Living Standard Surveys (VHLSS), which were conducted by the General Statistical Office of Vietnam (GSO) with technical support from the World Bank (WB) in the years 2004, 2006 and 2008. Each VHLSS cover around 9,186 households, respectively. The samples are representative for the national, rural and urban, and regional levels. The 2004 and 2006 VHLSSs result in a panel of 4,216 households, for which data is available for both years. At the individual level, the panel data cover 16,685 people. The 2006 and 2008 VHLSSs result in a panel of 4,088 households, for which data is available for both years. At the individual level, the panel data cover 15,471 people. There are less than 2000 households who were covered by the three round surveys 2002, 2004 and 2006.

The sample selection of VHLSSs 2004, 2006 and 2008 follows a method of stratified random cluster sampling. GSO selected households in all rural and urban provinces of Vietnam, i.e. rural and urban areas of all provinces are strata. Among each stratum, communes were selected randomly as a primary sampling unit. The number of communes per stratum is proportionate to the population proportion of the strata over the total population. The number of selected communes in each VHLSS is 3,061. In each commune, about 3 households were selected randomly.

The surveys collected information by means of household and community level questionnaires. Information on households includes basic demography, employment and labor force participation, education, health, income, expenditure, housing, fixed assets and durable goods, and participation of households in poverty alleviation programs. Especially, expenditure and income per capita are collected using detailed questions. The surveys also contain information on health insurance of household members, the number of annual outpatient and inpatient visits to hospitals and clinics, out-of-pocket expenses for outpatient and inpatient services. VHLSSs contain data on both treatment and control groups, i.e., people with compulsory health insurance and people without compulsory health insurance.
VHLSSs contain detailed data on household and individual characteristics, which allow for a large set of control variables in the matching. Table 1 presents the mean and standard deviation of several household and individual characteristics for the treatment and control groups in 2006.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Type</th>
<th>With compulsory health insurance</th>
<th>Without compulsory health insurance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>Std. Dev.</td>
<td>Mean</td>
</tr>
<tr>
<td><strong>Health care variables</strong></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Have sickness during the past 4 weeks</td>
<td>Binary</td>
<td>0.188</td>
<td>0.391</td>
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<tr>
<td>Have sickness during the past 12 months</td>
<td>Binary</td>
<td>0.363</td>
<td>0.481</td>
</tr>
<tr>
<td>Number of not working days due to sickness</td>
<td>Discrete</td>
<td>4.532</td>
<td>15.121</td>
</tr>
<tr>
<td>Number of annual outpatient contacts</td>
<td>Discrete</td>
<td>1.400</td>
<td>3.174</td>
</tr>
<tr>
<td>Number of annual inpatient contacts</td>
<td>Discrete</td>
<td>0.141</td>
<td>0.515</td>
</tr>
<tr>
<td>Out-of-pocket spending on outpatient care (thousand VND)</td>
<td>Continuous</td>
<td>160.7</td>
<td>1225.7</td>
</tr>
<tr>
<td>Out-of-pocket spending on inpatient care (thousand VND)</td>
<td>Continuous</td>
<td>139.2</td>
<td>1019.2</td>
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<tr>
<td><strong>Individual variables</strong></td>
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<td></td>
<td></td>
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<td>Per capita income (thousand VND)</td>
<td>Continuous</td>
<td>12290.6</td>
<td>11644.0</td>
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<tr>
<td>Per capita expenditure (thousand VND)</td>
<td>Continuous</td>
<td>9014.0</td>
<td>6800.7</td>
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<td>Age</td>
<td>Discrete</td>
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<td>Ethnic minorities (yes = 1)</td>
<td>Binary</td>
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<td>Highest degree of education</td>
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<td><strong>Main occupation</strong></td>
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<td>Leaders/Managers</td>
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<td>Professionals/Technicians</td>
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<td>Clerks/Service Workers</td>
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</tr>
<tr>
<td>Agriculture/Forestry/Fishery</td>
<td>Binary</td>
<td>0.175</td>
<td>0.380</td>
</tr>
<tr>
<td>Skilled Workers/Machine</td>
<td>Binary</td>
<td>0.128</td>
<td>0.334</td>
</tr>
<tr>
<td><strong>Household variables</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Household size</td>
<td>Discrete</td>
<td>4.482</td>
<td>1.608</td>
</tr>
<tr>
<td>Variable</td>
<td>Type</td>
<td>With compulsory health insurance</td>
<td>Without compulsory health insurance</td>
</tr>
<tr>
<td>----------------------------------------------</td>
<td>------------</td>
<td>-----------------------------------</td>
<td>-------------------------------------</td>
</tr>
<tr>
<td>Ratio of children in household (under 15 years old)</td>
<td>Continuous</td>
<td>0.167 0.177</td>
<td>0.194 0.190</td>
</tr>
<tr>
<td>Ratio of elderly in household (above 60 years old)</td>
<td>Continuous</td>
<td>0.112 0.203</td>
<td>0.107 0.206</td>
</tr>
<tr>
<td>Ratio of female members in household</td>
<td>Continuous</td>
<td>0.510 0.179</td>
<td>0.503 0.176</td>
</tr>
<tr>
<td>Housing types (yes = 1)</td>
<td>Binary</td>
<td>0.389 0.488</td>
<td>0.219 0.414</td>
</tr>
<tr>
<td>Semi-permanent</td>
<td>Binary</td>
<td>0.535 0.499</td>
<td>0.630 0.483</td>
</tr>
<tr>
<td>Temporary</td>
<td>Binary</td>
<td>0.075 0.264</td>
<td>0.151 0.358</td>
</tr>
<tr>
<td>Sources of drinking water (yes = 1)</td>
<td>Binary</td>
<td>0.403 0.491</td>
<td>0.201 0.401</td>
</tr>
<tr>
<td>Tab water</td>
<td>Binary</td>
<td>0.501 0.500</td>
<td>0.695 0.461</td>
</tr>
<tr>
<td>Clean water</td>
<td>Binary</td>
<td>0.096 0.294</td>
<td>0.105 0.306</td>
</tr>
<tr>
<td>Other water</td>
<td>Binary</td>
<td>0.574 0.495</td>
<td>0.310 0.463</td>
</tr>
<tr>
<td>Type of toilet (yes = 1)</td>
<td>Binary</td>
<td>0.369 0.483</td>
<td>0.592 0.491</td>
</tr>
<tr>
<td>Flush toilet</td>
<td>Binary</td>
<td>0.057 0.232</td>
<td>0.098 0.297</td>
</tr>
<tr>
<td>Other toilets</td>
<td>Binary</td>
<td>2007.6 4736.0</td>
<td>3325.8 7004.7</td>
</tr>
<tr>
<td>Land of annual crops (m2)</td>
<td>Continuous</td>
<td>1017.0 4901.5</td>
<td>1478.0 6569.8</td>
</tr>
<tr>
<td>Land of perennial crops (m2)</td>
<td>Continuous</td>
<td>1150.5 8260.0</td>
<td>841.6 12343.2</td>
</tr>
<tr>
<td>Land of forestry (m2)</td>
<td>Continuous</td>
<td>120.8 1289.8</td>
<td>519.8 4260.8</td>
</tr>
<tr>
<td>Aquaculture surface (m2)</td>
<td>Continuous</td>
<td>0.500 0.500</td>
<td>0.239 0.426</td>
</tr>
<tr>
<td>Live in urban areas (yes = 1)</td>
<td>Binary</td>
<td>0.237 0.425</td>
<td>0.223 0.416</td>
</tr>
<tr>
<td>Regional variables</td>
<td>Binary</td>
<td>0.222 0.415</td>
<td>0.101 0.302</td>
</tr>
<tr>
<td>Red River Delta</td>
<td>Binary</td>
<td>0.030 0.171</td>
<td>0.017 0.128</td>
</tr>
<tr>
<td>North East</td>
<td>Binary</td>
<td>0.080 0.271</td>
<td>0.095 0.294</td>
</tr>
<tr>
<td>North West</td>
<td>Binary</td>
<td>0.084 0.277</td>
<td>0.091 0.287</td>
</tr>
<tr>
<td>North Central Coast</td>
<td>Binary</td>
<td>0.074 0.262</td>
<td>0.050 0.217</td>
</tr>
<tr>
<td>South Central Coast</td>
<td>Binary</td>
<td>0.152 0.359</td>
<td>0.157 0.364</td>
</tr>
<tr>
<td>Central Highlands</td>
<td>Binary</td>
<td>0.122 0.327</td>
<td>0.266 0.442</td>
</tr>
<tr>
<td>Mekong River Delta</td>
<td>Binary</td>
<td>3497</td>
<td>15287</td>
</tr>
</tbody>
</table>

Source: Estimation from the 2006 VHLSS

At the time of writing this proposal, the team has access to VHLSSs 2004 and 2006. The 2008 VHLSS will be available since June 2010.

7. Consultation and Dissemination Strategy

One of the main objectives of the study is to provide the policy makers with understandings and information on the coverage and impacts of compulsory health insurance. The study also aims to shares empirical findings as well as methodology of
impact evaluation of health insurance to researchers. To achieve this dissemination objective, all the team members will try to consult and discuss research findings from the project with policy makers and researchers in the fields of impact evaluation and health insurance during the project implementation. Meetings between the team members with experts in Ministry of Health will be arranged during the project to get comments and suggestions for the research findings. After the research, the findings from the study are expected disseminated to a wider range of interested audiences via seminars, training, and papers. The strategy of dissemination is summarized in the following table.

Table 2: Dissemination Strategy

<table>
<thead>
<tr>
<th>Audience</th>
<th>Dissemination objectives</th>
<th>Format of Information</th>
<th>Means of Dissemination</th>
</tr>
</thead>
<tbody>
<tr>
<td>Policy makers in government, Ministry of Health, Vietnam Social Insurance</td>
<td>To provide information on impact assessments of compulsory health insurance; To provide policy implications and suggestions on modifications of the current health insurance</td>
<td>Full reports, PEP working paper, policy briefs of study findings, presentation slides</td>
<td>National seminars conferences, and mass media such television and press.</td>
</tr>
<tr>
<td>Developing countries, International organizations such as World Bank and UN agencies, PEP networks, International Initiative for Impact Evaluation (3ie)</td>
<td>To share empirical findings on the assessments of compulsory health insurance; To share policy implications and suggestions on health insurance</td>
<td>Full report, PEP working paper, academic papers, policy briefs, presentation slides</td>
<td>Conferences, journals and PEP website</td>
</tr>
<tr>
<td>Researchers in universities, institutes and international organizations</td>
<td>To provide empirical findings on the impact of health insurances</td>
<td>Full report, PEP working paper, academic papers, presentation slides</td>
<td>International conferences, PEP website, an international journal, e.g., <em>Journal of Development Studies</em>, <em>Health Economics</em> or <em>Journal of Health Economics</em>.</td>
</tr>
</tbody>
</table>

8. **List of team members**

8.1. Nguyen Viet Cuong (34 years old, male)

Working experiences:

• Sep 1999 - now: Lecturer of course “Business administration in trade firms”, Faculty of Trade and International Economics, National Economics University.

• From October 2008: Researcher in project “Impact evaluation of minimum wage policies on employment, inflation, and enterprise performance” for Ministry of Labor, Invalid and Social Affair of Vietnam (Part-time work).


• January - March 2009: Researcher in project “Impact evaluation of the ADB rural road project in Vietnam”. The research is funded by the Asian Development Bank in Manila, Malaysia (Part-time work).

8.2. Nguyen Thi Hanh (27 years old, female)

Training and experiences:

• December 2008 - March 2009: Consultant in research project “Improvement of access to health care service in Mekong Delta” for Ministry of Health of Vietnam.


• Experiences in reviewing and preparing legal documents related to health and health insurance in Vietnam.

8.3. Pham Minh Nguyet (32 years old, female)

Training and experiences:

• 2006-2007: Researcher in the project “Impact Evaluation of Governmental Micro-Credit Program in Vietnam”. The project is funded by the Poverty and Economic Policy Network, Canada.
• From 2006: Master student in Master Programme in Development Economics conducted by Institute of Social Science, the Hague, the Netherlands and National Economics University, Hanoi, Vietnam in Hanoi.

• 2005-now: Project Manager Assistant of Marine Ships Management System Project of Joint Venture VietsovPetro (VSP).

8.4. Nguyen Thi Nga (26 years old, female)

Training and experiences:

• January 2009 - June 2009: Consultant in research project “Determinants of willingness to pay for voluntary health insurances”, University of Social Sciences and Humanities, Vietnam National University, Hanoi.

• June 2007: Participant in a course “Management of projects/programs” that was arranged by Center for Research and Consultancy in Economics, NEU.

• April-May 2007: Survey supervisor and researcher in a study of impact evaluation of irrigation plants that was funded by WB and ADB.

9. Expected capacity building

Econometrics and quantitative impact evaluation are new areas for young team members. Some team members are not very familiar with research designs as well as research paper writing. During the project, all the team members are expected to learn and deepen the knowledge of econometrics, quantitative impact evaluation, and health insurance. The team leader will help other team members increase skills in research design, data analysis and report writing. The research network is also improved during and after the project.

9.1. Nguyen Viet Cuong

Tasks in the proposed project:

• Review the literature of impact evaluation of health insurance.

• Review the literature of impact evaluation.

• Write the methodology section.
• Construct models to estimate impact of health insurance.
• Write the empirical section of impact evaluation of health insurance.
• Guide other team members in impact estimations and data processing.

Capacity building:
• Improve research skills, skills of report and paper writing
• Deepen knowledge of microeconomics and health insurance.
• Enhance knowledge of statistics, impact evaluation theory to better the course “Impact Evaluation” that he teaches in university.
• Improve relationship with other State organizations, and international agencies, and other research institutes during the research.

9.2. Nguyen Thi Hanh

Tasks in the proposed project:
• Collect legal documents on general health insurance and compulsory health insurance in Vietnam.
• Review the literature of impact evaluation of health insurance.
• Write the section of literature review of impact evaluation of health insurance.
• Process the VHLSS data.
• Estimate the coverage of health insurance.
• Estimate impacts of health insurance.
• Write policy implications on health insurance.

Capacity building:
• Improve research skills, English language, skills of report and paper writing.
• Gain data process skills, knowledge of causal impact, and impact evaluation of a project/program.
• Improve relationship with other State organizations and other research institutes during the research.
9.3. Pham Minh Nguyet

Tasks in the proposed project:

- Help manage the project management and local seminar.
- Help collect documents on health insurances and review the literature of impact evaluation of health insurance.
- Write the section of literature review.
- Process the VHLSS data.

Capacity building:

- Improve research skills, English language, skills of report and paper writing, and presenting in seminars.
- Gain data process skills, knowledge of causal impact, and impact evaluation of a project/program, and health insurance.
- Improve relationship with other State organizations and other research institutes during the research.

9.4. Nguyen Thi Nga

Tasks in the proposed project:

- Review the literature of determinants of health insurance.
- Process the VHLSS data.
- Estimate household and individual factors associated with health insurance enrollment using logit models.
- Document the estimation results of factors associated with health insurance.
- Estimate impacts of health insurance with other team members.

Capacity building:

- Improve research skills, English language, skills of report and paper writing, and presenting in seminars.
- Deepen knowledge of health insurance and econometrics.
- Gain data process skills, knowledge of causal impact, and impact evaluation of a project/program.
• Improve relationship with other State organizations and other research institutes during the research.

10. Any ethical, social, gender or environmental issues or risks that should be noted.

The research project will not conduct new surveys to collect data. Instead, the main data used in the research are from the Vietnam Household Living Standard Surveys. These surveys allow for analysis representative at the national and regional levels. These data and other data sources are secondary and made available for popular use. It is impossible to identify any interviewee from these data sets, since all identification information are deleted.

11. List of past, current or pending projects in related areas involving team members

• From October 2008: Researcher in project “Impact evaluation of minimum wage policies on employment, inflation, and enterprise performance” for Ministry of Labor, Invalid and Social Affair of Vietnam. The team member involved is Nguyen Viet Cuong.


• January 2009 - June 2009: Consultant in research project “Determinants of willingness to pay for voluntary health insurances”, University of Social Sciences and Humanities, Vietnam National University, Hanoi. The team member involved is Nguyen Thi Nga.

• January - March 2009: Researcher in project “Impact evaluation of the ADB rural road project in Vietnam”. The research is funded by the Asian Development Bank in Manila, Malaysia. The team member involved is Nguyen Viet Cuong.

• December 2008 - March 2009: Consultant in research project “Improvement of access to health care service in Mekong Delta” for Ministry of Health of Vietnam. The team member involved is Nguyen Thi Hanh.
• April-May 2007: “Impact Evaluation of Irrigation Plants” funded by WB and ADB. The team member involved is Nguyen Thi Nga.


• 2005: “Marine Ships Management System Project of Joint Venture VietsovPetro” funded by VietsovPetro company. The team member involved is Pham Minh Nguyet.

References


