

## Impacts of health insurance on healthcare in the poor and near-poor households in Vietnam



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### ABSTRACT

Improving health and reducing catastrophic healthcare expenditure for the poor and near-poor are the major concerns of the Vietnam Government. This research analyses the impacts of health insurance schemes for the poor and near-poor households in Vietnam on two aspects, including healthcare utilization and out-of-pocket expenditure. The study applies the zero-inflated model and pooled OLS regression on the data that is extracted from the Vietnam Household Living Standard Surveys in two years 2014 and 2016. The findings show that health insurance significantly increases the probability of having a doctor visit and the number of doctor visits for a health check or outpatient treatment. For inpatient treatment, insurance does not increase the probability of having a doctor visit or the number of doctor visits. Having insurance significantly reduces out-of-pocket expenditures for both inpatients and outpatients.

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### 1. Introduction

The study aims to investigate the impacts of the Vietnam government's health insurance that for the poor and near-poor households on general public health and catastrophic healthcare expenditures. Health insurance is expected to increase health care utilization and then improve the health status of people. With health insurance, people are more willing to do periodic health checks, which enables early diagnostics and early treatments. For those who are sick, insurance helps them reduce out-of-pocket expenditure and relieve the financial consequences of health events. This argument has been supported by a lot of theories and empirical research (Levine, 2008).

In Vietnam, since the 1980s, the country has implemented a series of policies on the liberalization and privatization of the healthcare system. However, this significantly increases the out-of-pocket expenditures on health care. By the 1990s, out-of-pocket payments represented more than 70% of total health expenditures. To mitigate the impacts of these expenditures on the public, the Vietnam

government introduced the plan of universal health insurance to expand the coverage up to 80% of the population by 2020. The government has also committed considerable budgetary resources for this plan with heavy subsidies to cover insurance premiums for the poor, near-poor, and other vulnerable groups. In 2014, the state contribution to health insurance funds reached the level of 50% (Somanathan et al., 2014). In 2014, more than 70% of the population was covered by insurance and prepayment, beneficiaries including formally employed, the poor, students, and children under 6 years old (Somanathan et al., 2014).

Currently, there are two main sub-schemes of health insurance, including compulsory and voluntary health insurance (HI). First, compulsory HI is applied to the poor and near-poor, all employees and workers in state and non-state sectors, state officers, teachers, students, pensioners, children under six, farmers and the dependents of laborers, and so on. The premium rate is calculated based on individual contributions. For instance, the rate for an employee is 4.5% of salary in which 3% is paid by his employer and 1.5% is paid by himself. For the poor, near-poor, students, and others, the premium equals 4.5% of the minimum salary that is equivalent to USD 30. However, the government has a subsidy policy for vulnerable groups. For example, the poor and children under six are fully sponsored by the State budget. The near-poor receive the support of at least 70% of the premium. Students are subsidized

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at the rate of at least 30% of the premium. Pensioners are fully subsidized by the Vietnam Social Security Agency. Second, voluntary health insurance targets the remainder of the population. This is provided by both the government agencies and private companies but the private insurance proportion is insignificant.

Thanks to a high subsidy from the government, the poor and near-poor groups have high enrolment rates. The core issue here is whether a high insurance coverage translates into effective coverage and the insured are benefited from the government's insurance policy in terms of improving healthcare utilization and avoiding catastrophic expenditures. The impacts of insurance on healthcare in Vietnam have been evaluated in some research. Most quantitative studies come to a compromise that health insurance increases the utilization of medical care. However, the effect of health insurance on out-of-pocket payments is the topic of controversy as in the studies of Wagstaff (2007), Nguyen (2008; 2012), and Jowett et al. (2003). Our study evaluates the impacts of the health insurance program for the poor and near-poor households on two aspects, including improving health care and reducing the financial burden, based on the Vietnam Household Living Standard Survey (VHLSS) in 2014 and 2016. The study expects the following contributions. Firstly, there is some criticism that the Government's policy of health insurance for poor and near-poor households has not been achieving its goals of healthcare improvement and financial sharing. Since the studies of Wagstaff (2007), Nguyen (2008; 2012), and Jowett et al. (2003), the HI scheme has been changed significantly in nature with a very rapid increasing proportion of fully or partially sponsored insured people. Using a more updated dataset and different methods (ZIP model), the study is expected to add more empirical evidence to clarify this issue, identify the strengths and weaknesses of the HI policy and system, and then make contributions to policy. Secondly, there is a limited number of quantitative studies on the impacts of HI and the conclusions are controversial. The topic with the latest data set and the scope of the nationwide research will give the most comprehensive and updated picture. The paper includes four parts. The second part gives an overview of social health insurance in Vietnam. The second part presents the data and methods employed in this study. The fourth part presents the empirical results, followed by the last with discussions and conclusions.

## 2. Social health insurance in Vietnam

Vietnam is located in Southeast Asia with a total area of more than 330 thousand square kilometers. The population in 2019 is estimated to be over 96.2 million, of which 50.6% are female. After 30 years of Doi Moi programs (renovation), Vietnam has shifted from one of the poorest countries in the world to a low middle-income country. According to the report of the World Bank (worldbank.org), from 2002 to

2018, more than 45 million Vietnamese people have escaped from poverty with the poverty rate dropping sharply from over 70% to 6%; the average GDP increased by 2.5 times to reach over US\$2500 in 2018. In this progress, social security has played an important role with significant changes in orientation and systematic reform. Before Doi Moi, Vietnam devoted most of its resources to overcome the aftermath of the war, so the social security system at that time focused only on workers in state-owned enterprises, officials in government agencies, and military personnel. After Doi Moi, thanks to economic growth and social development, the social security approach has shifted to a more comprehensive orientation, including (i) basic health care; (ii) ensure a minimum income for vulnerable employees; (iii) ensure a minimum income for people outside the labor force; (iv) ensure essential social services for people such as basic health care, water, housing, education. The goals of social security are to ensure income to maintain the minimum quality of life of the people, to increase access to basic services, and to ensure decent work. The three main components of social security include (i) labor market, (ii) insurance, and (iii) social assistance and poverty reduction. Social health insurance (SHI) is considered one of the most critical mechanisms of the social security system in Vietnam. In addition to the social health insurance system, the private health insurance system is gradually developing, however, it occupies a negligible proportion. In this paper, we focus on the social health insurance system (HI for short) towards the goal of universal health care.

Before 1986, free health care was provided under a centrally-planned economy. In 1989, recognizing the importance of access to health care for people who could not afford to pay for medical services, the Government piloted the first voluntary non-commercial health insurance program in several provinces across the country. In 2002, Vietnam established a Health Care Fund for the Poor and ethnic minorities. In 2005, Decree 63 was issued stipulating that the poor are subject to compulsory insurance and are fully subsidized. By 2008, the Law on Health Insurance was launched with the formation of the national health insurance program. In line with Clause 1, Article 2 of the Law on Health Insurance 2008, "HI is a form of insurance applied in the field of health care, not for profit purposes, organized by the State and who is responsible for participating in accordance with this law". By 2014, towards universal health insurance, the definition of health insurance has been revised to "HI is a form of compulsory insurance applied to the subjects prescribed by this law for health care, not for profit purposes, organized by the State". Therefore, health insurance is legalized into a mandatory requirement for those specified in the law. Continuing to accelerate the roadmap towards universal health insurance, the Prime Minister issued Decision No. 1167/QĐ-TTg on assigning targets for implementation of health insurance for the 2016-

2020 period, in which the percentage of the population participating in health insurance is 79% in 2016 and will be 90.7% by 2020. Resolution 20-NQ/TW on strengthening protection, health care, and improving the health of the entire population has set a goal by 2025 that the percentage of health insurance coverage will reach 95% of the population and the rate of Out-of-pocket (OOP) spending will be less than 35% of household income.

In general, there are 6 groups of groups in health insurance, including:

- Group that is paid by the employee and the employer
- Group that is paid by the social insurance agency
- Group that is paid by the state budget
- Group that is supported by the state budget
- Group that participates in health insurance according to family
- Group that is paid by employers

For compulsory health insurance, premiums are calculated on the individual's contribution. Specifically, the rate of employees is 4.5% of the monthly salary, of which 3% is paid by the employer and 1.5% is paid by the employee himself. For the poor, the near-poor, students, and some others, the premium is determined to be equal to 4.5% of the base salary (about US\$30) but the Government also provides some subsidies. Specifically, the poor and children under 6 years old are fully funded by the state budget. Near-poor households receive minimum support of 70% of premiums and students receive a minimum of 30%. Retirees are fully funded by Vietnam Social Insurance. If the household has many participants, the fee will be reduced. For voluntary health insurance, due to the non-profit nature, the participation fee is not determined based on risk and all participants pay the same fee. The fee is about \$30.

The health insurance payment depends on the type of the insured as well as the hospital route that the insured chooses to use medical services. The percentage of insurance payment ranges from 40% to 100%, in which if the medical examination is conducted at the right level, the insured will be paid from 80 to 100% of the medical examination and treatment expenses. For the poor and ethnic minorities, the entitlement is 100%. For members of near-poor households, the payment rate is 95% of the cost of health care at the right level. In cases of improper levels examination, the rates of 40% for inpatient treatment at central hospitals, 60% for provincial, and 100% for district levels. Particularly for the poor, ethnic minorities are still entitled to the same rate of coverage.

Using the Vietnam Household Living Standard Survey (VHLSS) in 2004, Wagstaff (2007) studied the impacts of health insurance, funded by the government and provinces, for the poor and ethnic minorities. He found that the program's impacts, obtained by using the propensity score matching method, showed a significant increase in service

utilization, especially for inpatient care, and reduced the risk of catastrophic expenditure. However, the insurance did not reduce average out-of-pocket spending and had an insignificant effect on usage among the poorest.

Nguyen (2008), using VHLSS 2006, compared the effects of health insurance among insurance schemes and different groups of the insured. The study showed that under-utilization in health insurance happened in some groups of beneficiaries. The poor and ill outpatients used health insurance cards more often than the rich and healthy ones and health insurance was more beneficial for the poor and the ill than for the rich and healthy ones. The wealthy people still relied on health insurance for more expensive treatments. The research also suggested that cumbersome procedures affected the utilization of health insurance. He described that using insurance to pay for outpatient treatment was perceived as an inferior good. When money was restricted, paying with the health insurance cards became more palatable, but when the money was more abundant than time was, more rapid treatment received on the private money basis was preferred. Income had no impact on the use pattern of the health insurance card in inpatient treatment. The insured with more information in outpatient used the health insurance card more often in outpatient treatments but not in inpatient treatments. Ill people had higher utilization rates than healthy people. Utilization rates varied by types of insurance schemes and care providers.

Regarding the general impact on the out-of-pocket expenditure, Jowett et al. (2003) and Nguyen (2012) found that health insurance reduced out-of-pocket expenditures on health care and the level of impact was variant to geography, ethnicity, economic status, and education level, and so on. In contrast, other researchers gave evidence of insignificant impacts. For instance, Somanathan et al. (2014), Wagstaff (2007), and Do et al. (2014) indicated persistent high out-of-pocket payments among the group of beneficiaries as the result of high prices of medical services, poor understanding of insurance entitlement, and inefficiency of the health insurance system. They also pointed out the weaknesses of the universal coverage plan such as high subsidization, adverse selection, unattractive benefit packages, and low quality of services covered by insurance. This severely affected the ultimate goal of improving public health.

### 3. Methodology

#### 3.1. Research questions

The study focuses on answering the following two research questions:

**First**, does health insurance have a positive impact on the use of medical services by poor and near-poor households, including inpatient and outpatient care?

**Second**, does health insurance reduce out-of-pocket costs (self-payment medical costs) by poor and near-poor households?

### 3.2. Dataset

The study uses the data from the Vietnam Household Living Standard Survey (VHLSS) in two years 2014 and 2016. These surveys were conducted by the General Statistical Office of Vietnam with the technical support of the World Bank. The sampling frame was based on the 2009 Population and Housing Census of Vietnam. Each survey covered 9,399 households, which were representatives of the national, regional, and rural, and urban levels. From the above samples, we can also extract a sub-sample that includes poor and near-poor households. The research uses the poverty classification that was applied by the Ministry of Labor, Invalids, and Social Affairs (MOLISA) for targeting social programs. Accordingly, in 2014, the thresholds for poor households were VND 400,000 per capita per month in rural areas and VND 500,000 in urban areas. The caps for near-poor households were 520,000 and 620,000. In 2016, the government set a new multi-dimensional poverty line, which classified households as poor if they have an income per capita below VND 700,000 in rural areas or VND 900,000 in urban areas and are “deprived” in at least three of 10 dimensions of nonmonetary poverty. And the income caps for near-poor households were VND 1,000,000 in rural areas and 1,300,000 in urban areas.

The VHLSS provides detailed information on households and members, including demography, income, expenditure, education, health, employment, assets, and participation in poverty programs. Regarding the topic of research, the surveys contain data on the enrollment in health insurance, healthcare utilization, the number of health care visits during 12 months (before the interview), out-of-pocket expenditures on health care for all sampled individuals. Besides, the research also employed data on the provincial healthcare system such as the number of doctors, nurses, and hospitals per 1000 people from the source of General Statistics Office of Vietnam.

### 3.3. Econometric models

The impacts of health insurance are analyzed through two models. The first model focuses on the utilization of healthcare services among the poor and near-poor households. The second model is about the effect of health insurance on out-of-pocket expenditures on health care. The key problem in estimating the impacts of health insurance is the endogeneity of insurance status (e.g. insured or uninsured) to utilization decisions (Levine, 2008). This refers to adverse selection in health insurance that happens when people with poor health are more likely to enroll in health insurance. This may lead to overestimating the impact of health insurance. For the poor and near-poor people in the

sample, 91% of them had insurance and 79% of them had free or sponsored compulsory insurance. Only 9.7% of the poor and near-poor had voluntary insurance. Therefore, the adverse selection problem here is considered insignificant.

### 3.4. Healthcare utilization

The effects on the healthcare utilization of the poor and near-poor are analyzed through the zero-inflated Poisson (ZIP) model. ZIP is used to measure the impacts of health insurance ownership on the number of doctor visits for inpatient and outpatient cares because the number of doctor visits has an excess of zero counts. The ZIP model has two parts, a Poisson count model and the logit model for predicting excess zeros.

$$\Pr(Y_i = 0) = \pi + (1 - \pi)e^{-\gamma} \tag{1}$$

$$\Pr(Y_i = h_i) = (1 - \pi) \frac{\gamma^{h_i} e^{-\gamma}}{h_i!} \text{ with } h_i > 0 \tag{2}$$

$$\gamma = \exp(\ln(t) + I\beta_D + X\theta_D + T\mu_D) \tag{3}$$

$$\begin{aligned} \pi \text{ is the logistic link function, } \pi &= \frac{\delta}{1 + \delta} \text{ and } \delta \\ &= \exp(\ln(t) + I\beta'_D + X\theta'_D + T\mu'_D) \end{aligned}$$

in which  $Y_i$  is the number of doctor visits, which is measured by the number of annual healthcare visits for inpatient care or outpatient care.  $I$  is a dummy variable in which the value 1 means being insured.  $X$  is a vector of characteristics of households, individuals, and provincial healthcare systems.  $T$  is a time dummy variable.

### 3.5. Out-of-pocket expenditures on healthcare

To estimate the impact of health insurance on the out-of-pocket health expenditures of the poor and near-poor, the study uses the two-part model in the context of pooled data as below:

$$D_i = \alpha_D + I_i\beta_D + X_i\theta_D + T_i\gamma_D + \varepsilon_{it} \tag{4}$$

$$\ln(E_i) = \alpha_Y + I_i\beta_Y + X_i\theta_Y + T_i\gamma_Y + v_i \text{ for } E_i > 0 \tag{5}$$

in which  $E_i$  is out-of-pocket expenditures per visit.  $D_i$  is a binary variable which equals 1 if  $E_i$  is positive.  $I$  is a dummy variable in which the value 1 means being insured.  $X$  is a vector of characteristics of households, individuals, and provincial healthcare systems.  $T$  is a time dummy variable.  $v_i$  is unobserved terms. For the first model, we use the logit probability model. The second model is the pooled OLS.

## 4. Results and discussions

### 4.1. Health insurance coverage

Table 1 shows the coverage of health insurance over the sample of VHLSSs 2014 and 2016. There are four statuses of insurance, including uninsured, free compulsory insurance (for children aged six or less, the poor, policy beneficiaries, and others), partially or non-sponsored compulsory health insurance (for

the near-poor, employees, students, and so on), and voluntary health insurance.

**Table 1: Summary statistics on enrolment in health insurance**

	Year 2014						Year 2016					
	No HI	Free HI	Partially or Non-sponsored HI	Voluntary HI	More than two HI	Total	No HI	Free HI	Partially or Non-sponsored HI	Voluntary HI	More than two HI	Total
Total	10,619	11,506	4,938	8,854	164	36,081	7,688	12,600	5,032	10,333	135	35,788
	29.43	31.89	13.69	24.54	0.45	100	21.48	35.21	14.06	28.87	0.38	100
Gender												
Female	5,214	5,744	2,523	4,799	83	18,363	3,716	6,290	2,643	5,530	71	18,250
	28.39	31.28	13.74	26.13	0.45	100	20.36	34.47	14.48	30.3	0.39	100
Male	5,405	5,762	2,415	4,055	81	17,718	3,972	6,310	2,389	4,803	64	17,538
	30.51	32.52	13.63	22.89	0.46	100	22.65	35.98	13.62	27.39	0.36	100
Ethnicity												
Kinh and Hoa	10,030	6,002	4,564	8,523	112	29,231	7,014	7,195	4,644	9,795	119	28,767
	34.31	20.53	15.61	29.16	0.38	100	24.38	25.01	16.14	34.05	0.41	100
Ethnic Minorities	589	5,504	374	331	52	6,850	674	5,405	388	538	16	7,021
	8.6	80.35	5.46	4.83	0.76	100	9.6	76.98	5.53	7.66	0.23	100
Urban Status												
Rural	7,698	9,576	2,489	5,563	134	25,460	5,423	10,525	2,552	6,504	114	25,118
	30.24	37.61	10	21.85	0.53	100	21.59	41.9	10.16	25.89	0.45	100
Urban	2,921	1,930	2,449	3,291	30	10,621	2,265	2,075	2,480	3,829	21	10,670
	27.5	18.17	23	30.99	0.28	100	21.23	19.45	23.24	35.89	0.2	100
Age												
Under 6	161	3,172	30	54	20	3,437	100	3,225	39	59	14	3,437
	4.68	92.29	0.87	1.57	1	100	2.91	93.83	1.13	1.72	0.41	100
6-18	720	1,850	233	4,132	49	6,984	446	2,049	227	4,158	32	6,912
	10.31	26.49	3.34	59.16	0.7	100	6.45	29.64	3.28	60.16	0.46	100
18-60	9,006	4,726	4,169	3,858	75	21,834	6,530	5,249	4,219	5,076	66	21,140
	41.25	21.65	19.09	17.67	0.34	100	30.89	24.83	19.96	24.01	0.31	100
Above 60	732	1,758	506	810	20	3,826	612	2,077	547	1,040	23	4,299
	19.13	45.95	13.23	21.17	0.52	100	14.24	48.31	12.72	24.19	0.54	100
Poverty Status												
Non-poor	10,411	9,709	4,847	8,728	159	33,854	6,979	8,129	4,799	9,644	117	29,668
	31	29	14.32	26	0.47	100	24	27	16.18	33	0.39	100
Near-poor	118	984	58	87	3	1,250	452	2,084	159	527	12	3,234
	9.44	78.72	4.64	6.96	0.24	100	13.98	64.44	4.92	16.3	0.37	100
Poor	90	813	33	39	2	977	257	2,387	74	162	6	2,886
	9	83	3	4	0.2	100	9	83	3	6	0.21	100

Table 1 shows that 29.43% of sampled individuals were uninsured in 2014 but the figure significantly decreased to 21.48% in 2016. In 2014, about 31.89% of the sample had free health insurance. The figures for other compulsory HI and voluntary HI were 13.69% and 24.54% respectively. Only 0.45% possessed more than two types of insurances. In 2016, all enrolment rates across insurance schemes increased, especially for free HI and voluntary HI. By gender, males and females each accounted for approximately equal shares in every type of insurance status. In terms of ethnicity, 34.31% of Kinh and Hoa were uninsured in 2014. The rate quickly fell to 24.38% in 2016. Voluntary HI was the most popular among Kinh and Hoa people, followed by free HI and other compulsory insurance. In contrast, among ethnic minority people, in 2016, only 9.6% were uninsured and 76.98% had free HI.

In either urban area or rural area, about one-third of sampled individuals in each area were uninsured in 2014. The situation was improved in 2016 with the uninsured rate falling to 21.4%. Free compulsory HI was dominant in rural areas with the participants accounting for 37.61% of the rural population in 2014 and 41.9% in 2016. Partially or non-sponsored compulsory HI was the least popular with 10% of the rural people enrolling in these schemes. About 26% of people in rural areas had voluntary insurance in 2016. On the other hand, voluntary and partially or non-sponsored compulsory HI was more popular in urban areas than in rural areas. In 2016, 35.89% and

23.24% of urban dwellers participated respectively. By age, people in the working-age had the lowest insured rate. The insurance enrolling rate for people aged 18-60 was 41.25% in 2014 and 30.89% in 2016. Children under 6 and the elderly had the highest rate of enrolment thanks to the government insurance policy.

By poverty status, the poor and near-poor were two groups with the highest rates of having insurance. 91% of the poor people were insured and 83% of them had free insurance. Vietnam experienced the phenomenon that is called the “missing middle” problem with a high rate of enrolment in the low and high-income class and persistently low rate in the middle class. Free HI was the most popular in low-income and lower-middle-income groups. Voluntary health insurance was preferred by the upper-middle and high-income groups.

#### 4.2. Healthcare usage and expenditure

Table 2 summarizes the average of the variables related to the health care utilization and out-of-pocket payments across the different insurance statuses over two years. In general, healthcare utilization (number of doctor visits and having doctor visits) and out-of-pocket expenditure per visit showed slight increases from 2014 to 2016. Uninsured people had the lowest frequency of doctor

visits that was around 0.7 times per year. About 28% of uninsured people visited doctors.

**Table 2: Healthcare utilization across the health insurance schemes**

	Number of Visits	Having Doctor Visits	Out-of-pocket Expenditure per Visit ('000 VND)	
			Year 2014	
No HI	0.697	0.275	1169.260	
Fully Sponsored Compulsory HI	1.261	0.327	724.874	
Partially or Non-Sponsored Compulsory HI	1.094	0.338	1087.501	
Voluntary Health Insurance	1.256	0.353	939.520	
More than two types	1.220	0.384	933.144	
			Year 2016	
No HI	0.729	0.283	1247.778	
Fully Sponsored Compulsory HI	1.332	0.330	692.745	
Partially or Non-Sponsored Compulsory HI	1.058	0.332	1124.977	
Voluntary Health Insurance	1.234	0.362	1114.512	
More than two types	1.837	0.400	1144.335	

Those who had free or voluntary healthcare insurance had a slightly higher visit frequency than partially or non-sponsored compulsory insurance. The participants in voluntary insurance were most likely to have at least one healthcare visit each year. In terms of healthcare expenditures, except for free health insurance, the average payments for all

insurance categories increased. Uninsured people paid the most and free insurance holders paid the least. Uninsured people are paid approximately 10% higher than those in voluntary and other compulsory insurances.

Table 3 shows healthcare Usage and Expenditure.

**Table 3: Healthcare usage and expenditure**

	Inpatient Treatments			Outpatient Treatments		
	Number of visits	Having Doctor Visits	OOP Expenditure per Visit ('000 VND)	Number of visits	Having Doctor Visits	OOP Expenditure per Visit ('000 VND)
				Year 2014		
Non-poor	0.09	0.06	4517.18	1.01	0.28	489.14
Uninsured	0.05	0.04	5958.69	0.66	0.25	614.07
Insured	0.11	0.07	4185.37	1.16	0.29	442.27
Near-poor	0.11	0.08	2003.08	0.58	0.15	386.70
Uninsured	0.05	0.03	3116.67	0.27	0.14	488.44
Insured	0.12	0.09	1968.64	0.61	0.15	376.9
Poor	0.10	0.06	1787.35	0.59	0.13	303.89
Uninsured	0.16	0.04	4352.5	0.29	0.12	310
Insured	0.09	0.06	1590.03	0.62	0.13	303
				Year 2016		
Non-poor	0.09	0.06	5417.66	1.08	0.30	548.31
Uninsured	0.04	0.03	7301.46	0.70	0.26	672.62
Insured	0.11	0.07	5152.95	1.20	0.32	516.811
Near-poor	0.12	0.07	2065.06	0.88	0.22	295.99
Uninsured	0.06	0.04	3897.42	0.52	0.22	525.93
Insured	0.13	0.08	1901.61	0.94	0.22	259.03
Poor	0.12	0.07	1726.104	0.73	0.16	268.43
Uninsured	0.06	0.05	3485.71	0.75	0.25	388.80
Insured	0.12	0.07	1584.52	0.73	0.16	249.84

Table 3 provides statistics on the usage of health services for inpatient and outpatient care as well as the average out-of-pocket spending of the three target groups: non-poor, near-poor, and poor. For outpatient care, the non-poor had the frequency and proportion of having outpatient treatment much higher than those of the poor and near-poor households. In 2014, the average number of outpatient visits for the non-poor group was 1.01, nearly double the level of 0.58 for the near-poor and 0.59 for the poor. This gap was narrowed in 2016 due to an increase in the frequency of outpatient visits among poor and near-poor groups. On average, a non-poor person in 2016 outpatient visited 1.08 times, compared with 0.88 of the near-poor and 0.73 of the poor. The percentage of people with at least one outpatient visit of the non-poor group was the highest, around 30% in 2016, compared to 22% for the near-poor and 16% for the poor. In contrast to outpatient treatment, inpatient treatment did not

show very large differences between groups. However, the poor and the near-poor took more frequent inpatient treatment than the non-poor group.

The statistics also show an improvement in the use of services for all groups in 2014-2016. In 2016, 30% of non-poor people had at least one outpatient medical examination and treatment, an increase from 28% in 2014. The proportion of near-poor people using outpatient medical services also increased from 15% in 2014 to 22% in 2016. The ratio for the poor also increased from 13% to 16% over the same period. Similarly, the numbers of health care visits positively rose, especially for the poor and near-poor groups. The average number of outpatient visits of the poor increased from 0.59 in 2014 to 0.73 in 2016, while the number for the near-poor rose from 0.58 to 0.88. For inpatient examination and treatment, the level of usage was not much changed. In 2016, 7% of the poor and near-

poor had inpatient treatment and 6% of non-poor people had inpatient treatment.

Comparing the uninsured group and the insured group, the insured group generally had a higher frequency and a higher proportion of people having medical examination and treatment than those numbers of the uninsured group. This discrepancy is increasing with inpatient treatment. In 2016, the average number of health checkups for insured people is at least twice the number of uninsured people in all income groups. In terms of out-of-pocket health costs, the average cost per visit for insured patients is significantly lower than that for patients without health insurance in all three non-poor, near-poor, and poor groups. In 2016, in the non-poor group, the outpatient on average pays 23.5% less than the uninsured patient does. The insured inpatient also pays 29.5% less than the uninsured does. Out-of-pocket savings on medical expenses are even higher for patients who are poor or near-poor, from 30% to 50%.

Among the three income groups, the average out-of-pocket expenditure for the poor is lowest, followed by the near-poor. The non-poor have the

highest out-of-pocket spending. Out-of-pocket spending of the non-poor group also increases significantly over two years with an increase of 12% for outpatient care and 18.5% for inpatient care. In contrast, for the poor and near-poor, the average out-of-pocket payment for outpatient treatment decreases, and the inpatient expenditure is unchanged. Specifically, the reduction is 10% for outpatients who are poor and 23.5% for the near-poor.

**4.3. Impacts of health insurance among poor and near-poor people**

Table 4 presents the estimated effects of insurance for the sample of poor and near-poor people. The results of the models show that having insurance significantly increases the probability of having at least one doctor visit for outpatient care but also increased the probability of having out-of-pocket expenditure. For outpatients, having insurance significantly increases the number of doctor visits.

**Table 4:** Estimated results

	Inpatient treatment				Outpatient treatment			
	Having a doctor visit	Number of doctor visits	Having OOP expenditure	Log of OOP expenditure	Having a doctor visit	Number of doctor visits	Having OOP expenditure	Log of OOP expenditure
Being sick or injured during the past 12 months	48.7157*** (2.5136)	0.4429* (0.1726)	3.9006*** (0.1196)	0.4456*** (0.1125)	0.6702*** (0.1160)	0.1924* (0.0874)	0.3800*** (0.1075)	0.6250*** (0.1259)
Insured, yes=1	0.0941 (0.2879)	0.2212 (0.1982)	0.3464 (0.2069)	-0.9582*** (0.1751)	0.5307*** (0.1066)	0.2781** (0.0970)	0.2177* (0.0947)	-0.5493*** (0.1135)
Poor=1, near-poor=0	-0.2764 (0.1612)	0.1199 (0.1060)	-0.0259 (0.1094)	-0.1447 (0.1111)	-0.0957 (0.0650)	0.0425 (0.0617)	-0.1282* (0.0624)	0.0174 (0.0744)
Employed, yes=1	0.3316 (0.1922)	-0.3163** (0.1060)	0.0055 (0.1251)	-0.0936 (0.1224)	-0.0093 (0.0796)	-0.1799* (0.0780)	-0.0217 (0.0728)	0.0365 (0.0912)
Male, yes=1	-0.5960*** (0.1655)	0.0885 (0.1031)	-0.2782* (0.1101)	0.3878*** (0.1128)	-0.2360*** (0.0640)	-0.0516 (0.0600)	-0.1605** (0.0619)	0.1560* (0.0747)
Age	-0.0045 (0.0045)	0.0055* (0.0022)	0.0016 (0.0029)	0.0074** (0.0028)	0.0061** (0.0019)	0.0076*** (0.0019)	0.0138*** (0.0018)	0.0122*** (0.0022)
Years of Schooling	0.0175 (0.0242)	-0.0135 (0.0162)	0.0309 (0.0161)	0.0235 (0.0159)	-0.0975*** (0.0099)	-0.0036 (0.0097)	-0.0516*** (0.0096)	0.0332** (0.0120)
Urban, yes=1	0.5171 (0.2722)	-0.4246** (0.1442)	0.0862 (0.2016)	-0.0886 (0.1956)	0.0285 (0.0963)	0.0799 (0.0873)	0.0242 (0.0955)	-0.1982 (0.1142)
Ethnicity, yes=1	-0.0503 (0.2164)	0.1280 (0.1402)	-0.0466 (0.1531)	-0.4092** (0.1523)	0.0203 (0.0842)	-0.416*** (0.0694)	-0.4539*** (0.0816)	-0.0294 (0.0959)
Household Size	-0.0001 (0.0453)	0.0370 (0.0239)	0.0319 (0.0312)	0.0546 (0.0292)	-0.1490*** (0.0192)	0.0196 (0.0157)	-0.1510*** (0.0205)	-0.0030 (0.0246)
Proportion of Children	-1.0657* (0.5319)	-0.3175 (0.3893)	-1.0383** (0.3356)	-0.3567 (0.3182)	-0.1347 (0.1842)	-0.0040 (0.1778)	0.0135 (0.1752)	-0.2033 (0.2164)
Proportion of Elderly	0.6829 (0.3779)	-0.0406 (0.2346)	0.1504 (0.2764)	-0.8511** (0.2666)	0.2134 (0.1626)	-0.1894 (0.1359)	-0.2993* (0.1480)	-0.6155*** (0.1738)
Sex of Household Head	-0.1565 (0.2380)	-0.1240 (0.1432)	-0.4280** (0.1494)	0.0285 (0.1296)	-0.1169 (0.0823)	-0.0439 (0.0698)	-0.0498 (0.0803)	-0.0030 (0.0934)
Head's Years of Schooling	-0.0027 (0.0978)	0.1855*** (0.0558)	0.1530* (0.0689)	0.1758* (0.0691)	0.1734*** (0.0420)	-0.0027 (0.0378)	0.0793* (0.0403)	0.1195* (0.0524)
No. of Doctors per 1000	-0.8368 (0.6606)	0.3494 (0.3458)	0.4161 (0.4445)	-0.1511 (0.5002)	-0.8857** (0.2910)	-0.1867 (0.2503)	-0.0925 (0.2844)	0.2792 (0.3142)
No. of Nurses per 1000	0.2765 (0.3229)	-0.2809 (0.2241)	-0.6902** (0.2369)	-0.2182 (0.2257)	0.4660*** (0.1402)	0.2778* (0.1260)	-0.3631* (0.1469)	-0.0747 (0.1722)
No. of Hospitals per 1000	1.9343 (1.8506)	0.4585 (1.2213)	1.6226 (1.3246)	2.1222 (1.2985)	-1.1021 (0.7036)	-2.1464** (0.6561)	-3.9407*** (0.6932)	0.1051 (0.8303)
year=2016	0.0969 (0.1775)	-0.0624 (0.1066)	-0.2951* (0.1243)	-0.1786 (0.1236)	0.4383*** (0.0754)	0.0235 (0.0641)	0.2595*** (0.0768)	-0.2167* (0.0951)
Constant	-2.2031*** (0.5568)	-1.1173** (0.4102)	-3.4905*** (0.3570)	6.8316*** (0.3808)	-0.1007 (0.2098)	0.7568*** (0.1749)	0.1486 (0.2155)	4.3570*** (0.2604)
Observations		8329		8329		8329		8329

\* p<0.05; \*\* p<0.01; \*\*\* p<0.001

The average marginal effect of insurance on the number of doctor visits for outpatient care is 0.36, which is statistically significant at a significant level of 1%. For outpatients who have out-of-pocket

expenditure, having insurance reduces payments by 54.94%. For inpatient care, having insurance had no significant effects on the probability of having at least one doctor visit, the number of doctor visits,

and the probability of having out-of-pocket spending. The average marginal effect of insurance on the number of visits for inpatient treatment is 0.026, which is not statistically significant at a significant level of 10%. However, for inpatients who had out-of-pocket expenditures, having insurance, on average, remarkably reduce their payments by 95.82%, given others fixed.

Fig. 1 demonstrates the predicted number and a 95% confidence interval of the number of doctor

visits across insurance status and poverty status, given other factors at means. For both inpatient treatment and outpatient treatment, insured people have a higher expected number of doctor visits than uninsured people in both poor and near-poor groups. The expected demand for outpatient treatment or health check is higher than that for inpatient treatment.

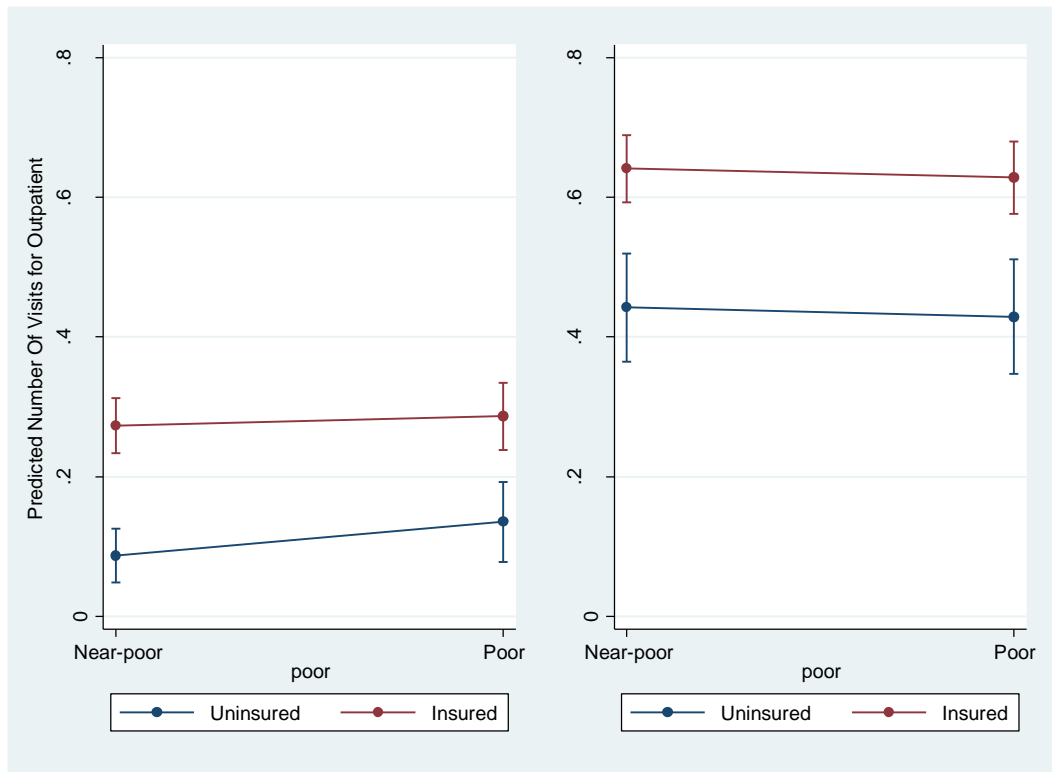


Fig. 1: Predicted number of doctor visits

Several other factors also influence the level of use of health services and out-of-pocket health spending, including income, gender, employment status, education level, ethnicity, and household size, percentages of old people and children in the household, education of household's head, number of doctors, nurses and hospitals per 1,000 people. Specifically, the members of poor households have out-of-pocket costs for outpatient care 12.82% less than those of the near-poor object. The employed patient has a lower frequency of doctor visits compared to the unemployed for both inpatient and outpatient treatments.

Men are less likely than women to have inpatient/outpatient visits during the year and to incur out-of-pocket costs. However, for male patients who have out-of-pocket payments, the average payment is usually higher than that for women, particularly 15.6% for outpatient care and 38.78% for outpatient treatment.

Older people are more likely to have at least one outpatient visit per year and higher numbers of outpatient and inpatient visits. The average cost of outpatient visits and the average cost of inpatient visits for the elderly are higher than those for young

people. Education does not affect inpatient treatment but does affect outpatient visits. People with more years of schooling are less likely to have an outpatient visit and the probability of out-of-pocket costs. However, for every additional year of schooling, the outpatient examination cost increased by 3.32%.

Living areas, urban or rural, only affect the number of inpatient treatments. Accordingly, poor and near-poor people in rural areas have more inpatient care than in urban areas. Ethnicity influences the number of outpatient visits, the probability of out-of-pocket outpatient costs, and the cost of inpatient treatment. Ethnic minorities have fewer outpatient visits and are likely to incur lower out-of-pocket expenses than Kinh and Hoa do. Inpatient treatment cost for ethnic minorities is also 40.92% lower than those for Kinh and Hoa. Household size affects the probability of having at least one outpatient medical treatment during the year and the probability of outpatient costs incurred: the larger the scale, the lower the probability.

As the proportion of children in the household increases, the probability of having inpatient treatment increases, and the probability of having



inpatient/outpatient payments decreases. As the proportion of the elderly increases, both the cost of inpatient treatment and the cost of outpatient treatment per visit decrease. The higher the education level of the household head, the higher the probability that members have an outpatient visit and outpatient expenses and the higher treatment costs. The numbers of doctors, nurses, and hospitals have heterogeneous impacts.

## 5. Discussions and conclusions

The results of the study have shown the positive impacts of health insurance on the usage of health care services and the OOP payments of poor and near-poor households. However, there are still significant differences in access to and usage of health services between the non-poor and the poor and near-poor. The poor and near-poor groups have a lower level of outpatient health care compared to the non-poor group in two aspects: the proportion of people having outpatient visits and the frequency of visits. In contrast, for inpatient care, the poor and near-poor have a higher frequency and a higher demand for inpatient treatment than the non-poor group. These results suggest that the poor and near-poor still face barriers in accessing and using health services. Inequity in the use of health care services could lead to inequity in health outcomes. Moreover, it is likely that the limited access of the poor and near-poor leads to serious health problems that require high inpatient care. Although treatments and drugs are covered by health insurance, there are other OOP payments than medical costs such as transportation, food, and rent expense that the family of the patient has to pay.

The study also suggests that for outpatient care, participation in health insurance significantly increases the probability that a person has at least one outpatient visit during the year and that being insured also increases the likelihood of out-of-pocket payments. This has become an obstacle for poor and near-poor households to access health services even though they have health insurance. Another finding is that for outpatients, having health insurance increases the number of health care visits and significantly reduces out-of-pocket costs, an estimated reduction of approximately 55%. Currently, the health insurance coverage rate for the poor and ethnic minorities is 100%. For members of near-poor households, the payment rate is 95% of the cost of medical examination and treatment if they follow the right route of health care. In the case that they go to a higher-leveled hospital than they should, the insurance coverage rates are 40% for inpatient treatment at central hospitals, 60% for provincial, and 100% for district levels. Particularly for the poor and ethnic minorities, they still enjoy the same level of payment. Thus, with such an insurance policy, the saving rate of 55% seems to be quite low. This evaluation is supported by the findings of some studies, including:

- A high rate of going to a higher-leveled hospital: According to [JICA \(2017\)](#), this situation, especially in rural areas, was due to the low capacity of local health facilities. The district health station only met 70% of the total number of required technical services. Patients had to move to big hospitals in the big cities and then they had to pay higher rates or use private services that were not covered by health insurance. According to the Ministry of Health's assessment, the quality of medical examination and treatment in remote areas remains weak due to the lack of health workers, about 20% of communes in Vietnam have not yet had a doctor. If conditions at local health facilities do not meet the needs of patients or hinder people's access to health services, especially the poor and near-poor, it will significantly reduce the effectiveness of using health insurance in health care or cause financial pressure on poor and near-poor households.
- Health insurance was not being used effectively in medical examination and treatment due to a lack of understanding of participants about benefits or due to time-consuming and complicated administrative procedures ([JICA, 2017](#)).
- Unreasonable benefit packages: According to [JICA \(2017\)](#), the current benefit packages have not attracted patients to health care services at lower-level hospitals. The regulations on the number, dosage, and types of drugs that discriminated against local healthcare facilities made the quality of health care available weak ([Somanathan et al., 2014](#)).

In inpatient treatment, participating in health insurance does not affect the likelihood of having at least one doctor visit, the number of treatments, and the probability of out-of-pocket payments. However, for inpatients who incur out-of-pocket costs, having insurance helps reduce payments by up to 95.82%. Other factors also affect access to health and care services by the poor and near-poor, including sex, employment status, education, ethnicity, family size, and proportion of elderly and children, education level of the household head. To promote the effectiveness of health insurance, when designing the benefit package for health insurance, it is necessary to consider these factors.

## Compliance with ethical standards

## Conflict of interest

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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