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Impact of Health Insurance on Health Care Treatment and Cost in Vietnam: A Health Capability Approach to Financial Protection

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We applied an alternative conceptual framework for analyzing health insurance and financial protection grounded in the health capability paradigm.

Through an original survey of 706 households in Dai Dong, Vietnam, we examined the impact of Vietnamese health insurance schemes on inpatient and outpatient health care access, costs, and health outcomes using bivariate and multivariable regression analyses. Insured respondents had lower outpatient and inpatient treatment costs and longer hospital stays but fewer days of missed work or school than the uninsured.

Insurance reform reduced household vulnerability to high health care costs through direct reduction of medical costs and indirect reduction of income lost to illness. However, from a normative perspective, out-of-pocket costs are still too high, and accessibility issues persist; a comprehensive insurance package and additional health system reforms are needed. (*Am J Public Health.* 2012;102:1450–1461. doi:10.2105/AJPH.2011.300618)

HEALTH INSURANCE REFORM is of utmost concern for low-income countries that rely on out-of-pocket payments to finance health treatment, but many new policies have not been sufficiently assessed for their impact on the health and economic stability of households. A review of the World Bank impact evaluation database found that of 41 health-related impact evaluations as of April 2005, health reform and financing studies were lacking.[1] Many studies focus on a particular change within a system, rather than changes affecting the entire system. For example, a Thai study[2] investigated the impact of subsidizing the Thai health card scheme on insurance coverage and utilization. A Chinese study[3] evaluated how changing hospital reimbursement from fee-for-service to prepayment affected health expenditure in China. Although these are important aspects of health insurance policy, they concern one change rather than system-wide reform. New insurance schemes constitute a major type of large-scale health care system reform, and require evaluation to determine whether they achieve their purpose. In this study, we employed a survey conducted in 2008 to assess the effects of reformed Vietnamese health insurance schemes on health care treatment and costs for households.

Vietnam is a developing country that relies extensively on out-of-pocket payments for health care. In 2005, 5% of Vietnam's gross domestic product was spent on health expenditure, and out-of-pocket payments accounted for 68% of health expenditure.[4] Following the privatizing *Doi Moi* ("New Era") economic reforms in the late 1980s, health care in Vietnam transitioned from a centralized system of free universal access to a user charge system at public health facilities and newly legalized private facilities. The

pharmaceutical industry also became privatized. Out-of-pocket health payments as a proportion of total national health expenditure increased from 59% in 1989 to 80% in 1998, posing a substantial burden to ill households, particularly poor ones.[5] In response to this problem, Vietnam instituted a health insurance system in 1993. At the time of its establishment, it consisted of compulsory health insurance (CHI) for employees of state institutions and of private businesses with more than 10 employees. A voluntary health insurance scheme was later added to cover the self-employed, informal-sector employees, dependents of CHI members, and employees at lower-level state institutions excluded by CHI.[5–7]

In 2002, Vietnam reformed the insurance system. The government targeted the low-income population with Free Health Care Cards for the Poor, enrolling low-income individuals in a social health insurance scheme (a component of CHI). However, service provision was challenging because of limited funds, difficulty of the application process, and lack of public awareness of the scheme itself.[8] The government addressed these problems through a decree called Decision 139, which required provincial governments to give free health care to disadvantaged populations.[8]

Currently, CHI comprises 3 programs that in 2007 covered 41% of the population: (1) social health insurance for the formally employed (9%), retirees, dependents of military and police officers, and meritorious people (3%; which include war "heroes" and "veterans" and others with substantial contributions to the socialist revolution[4]); (2) Health Care Fund for the Poor (HCFP), which replaced Free Health Care Cards for the Poor (18%); and (3) free health care for children younger than 6 years (11%). CHI covers the costs of inpatient treatment at state hospitals and outpatient treatment at outpatient clinics or departments within state hospitals.[6] It covers only inpatient drugs included on a Ministry of Health list. In most cases, it does not cover drugs for outpatient visits.[4] The social health insurance and HCFP components of CHI are designed to offer the same benefits to their respective beneficiaries.[6] Social health insurance is funded by a tax on payroll, pension, or salary not exceeding 3%, whereas HCFP receives three quarters of its funding from the central government and the rest from provincial government. Costs of health care for children younger than 6 are covered by the central government. Voluntary health insurance covered another 11% of the population in 2007 and is financed by individuals through private premiums, with costs dependent on financial capacity.[6]

Several studies have assessed recent insurance reforms in Vietnam, revealing positive impacts. One study, which compared the out-of-pocket health payments for all health services of insured vs uninsured groups, found that health insurance decreased out-of-pocket expenses between 16% and 18%, with a more substantial decrease for lower-income residents.[5] The social health insurance scheme increased health service utilization and reduced levels of self-medication.[9] An evaluation of Vietnam's HCFP, a program initiated in 2003, showed more mixed results.[8] With insurance, poor households significantly increased utilization of inpatient treatments, with insured households 30% more likely to have inpatient treatment. However, the probability of utilizing outpatient services increased by only 16%, probably because of the limited insurance coverage of outpatient treatment. Moreover, poor households with insurance were still vulnerable to high health expenses. Nearly one third of HCFP beneficiaries were confronted with "catastrophic" out-of-pocket payments, defined as amounting to more than 10% of nonfood consumption. Another Vietnam study focused on the economic consequences of health shocks.[10]

Most studies of Vietnam's health insurance analyzed the Vietnam Living Standard Surveys (VLSS), a series of national household surveys in 1992 and 1993, 1997 and 1998, 2002, and 2004, but they did not include the 2006 wave. A more recent report by the World Bank included 2006 VLSS data, with conclusions similar to those of past studies. However, as the insurance system has undergone further changes since 2005, this analysis may not fully reflect the current insurance scheme and its impact on the Vietnamese population.

We applied an alternative conceptual framework for analyzing health insurance and financial protection grounded in the health capability paradigm. As opposed to the narrow metrics of catastrophic and out-of-pocket expenditures, we broadly construed financial protection as that which reduces individual's health and economic vulnerabilities and insecurities. We studied health insurance in terms of the effective rate of coverage and the extent to which that coverage results in better health care access, health outcomes, and financial security. Thus, health insurance was analyzed in the context of health and economic capabilities and security rather than the theory of the demand for health insurance or the narrow metrics of catastrophic, out-of-pocket payments.

We present the results of a 2008 household survey that we designed and conducted from a capability perspective to study the impact of the current insurance scheme on households in Dai Dong, a rural commune of Hanoi, with particular emphasis on the vulnerable poor population. Because the survey covered the time period July 2007 to July 2008, our study addressed the consequences of recent changes, as well as implications for future reform. Rather than comparing households before and after insurance coverage, we compared households with and without insurance. In addition, we examined households that have insurance but do not use it, to better describe the reasons for and consequences of insurance underutilization. Furthermore, we focused on the subpopulation with at least 1 episode of illness. Unlike previous

household surveys, in which the percentage of the sample population having an illness episode ranged from 35.1% to 62.4%,[11] 83.6% of our sampled households had at least 1 illness that warranted inpatient or outpatient treatment in the 12 months preceding the survey. Our study thus enabled us to more closely investigate the impact of insurance among ill individuals who need it most.

Unlike previous studies that considered single insurance schemes such as HCFP,[8] our study also compared the impact of HCFP with that of other types of insurance in Vietnam. Because studies have yet to adequately consider the impact of Vietnam's insurance of children younger than 6 years, we included this as a separate insurance type in our study. In addition, whereas previous studies have included poor populations, we extended the frame to also include "near-poor" households. This is because policy discussions have been under way to possibly cover the "near-poor" population under HCFP.[6] Our study evaluated the impact of health treatment costs on this particular group to better guide future policy.

Our study was guided by a health capability conception of health insurance. According to this theoretical perspective, besides economic reasons, there are also moral and ethical claims for providing universal health insurance, and an effective insurance system must be driven by 2 foundational principles.[12] The first is to ensure people's ability for health functioning. That is, an individual must be able to obtain health care when necessary, and thereby achieve positive health outcomes. We investigated health care accessibility and health outcomes by gathering data on use of different public and private health facilities, health outcomes after treatment, and missed days of school and work through illness.

The second goal is for insurance to enhance people's security by decreasing their vulnerability to the detrimental economic effects of illness and health care costs. When faced with the high costs of health treatment, households are forced to pursue coping strategies such as borrowing and reducing food consumption, which create or exacerbate financial and health problems. An effective insurance system should reduce health costs and prevent their harmful consequences. To fully illuminate the effects of these costs on well-being, we examined all health treatment and treatment-associated costs among insured and uninsured populations. Both principles are part of an alternative framework for analyzing health insurance and financial protection.[13a]

METHODS

Our data are from a survey of 706 households that we conducted in Dai Dong in July 2008. Dai Dong, located 35 kilometers west of Hanoi, comprises 2230 households and a population of 9678. With an average income of $1.73 a day per capita and more than half of the households living at or below the international poverty standard of $1.25 a day per capita, it represents a vulnerable population.

In the designing stage, we used the following sampling strategy. We selected all poor (n = 166) and near-poor (n = 184) households to survey, and randomly selected an equal number of other (nonpoor) households from each of the 11 villages of Dai Dong. The classification of households as poor, near poor, and nonpoor is determined by the commune administration according to national government policies and standards.

We developed this sampling strategy to ensure 3 attributes. The first was that households in the low-income category (poor and near-poor households) were sufficiently represented. In the Dai Dong villages we studied, poor and near-poor households were underrepresented. We therefore sampled all the poor and near-poor households. Although surveying all the nonpoor households might be more informative, such a strategy would significantly increase study cost. The second was that all villages were sufficiently represented. Our previous investigation suggested only small variations (in terms of demographic and economic conditions) among the 11 villages. Thus, there was no need to oversample any specific village. The third was that the samples were representative of all residents, which is achieved with random sampling and a close-to-perfect response rate.

We conducted all statistical analyses using *S*-Plus 8 (Insightful Corporation, Seattle, WA). We examined the data and found that records on 9 (out of 706) households had inconsistent measurements. Those records were removed from downstream analysis, leading to an effective sample size of 697. Otherwise, there was no obvious sign of outliers or unreasonable measurements. We investigated the bivariate associations between various costs, treatment information, and insurance status. We classified people into 3 categories of insurance status: (1) insured, (2) uninsured, and (3) insured but who, for various reasons, do not use the insurance. Our preliminary investigation suggested that the behaviors of individuals in category 3 were significantly different from those in the other 2 categories; this category therefore could not be combined with either of the preceding 2.

To provide a more comprehensive understanding of the impact of insurance status (as well as different types of insurance), we conducted multivariable analyses. In the analyses, we recorded costs as continuous variables, and we adopted the ordinary least squares estimate and used the robust sandwich variance estimate. We coded health facility utilization as binary variables. We adopted the logistic regression. In multivariable regression analyses comparing different groups of patients (uninsured, insured, insured but not using insurance), we used the uninsured as a comparator for insured and for insured but not using insurance.

In our multivariable analyses, we adjusted for relevant demographic variables, including information of the household head

(age, gender, marital status, occupation, years of education), number of household members, presence of members younger than 18 years, and number of members older than 65 years. We considered adjusting for duration of treatment, type of facility, and reason for visit; however, we elected not to because such attempts led to fewer degrees of freedom and little improvement in model fitting. We also conducted multivariable subset analysis for households with different economic status, but the smaller sample sizes led to insufficient power. We conducted no further analysis of those models that failed to converge.

For all multivariable statistical models, we conducted extensive model diagnosis. More specifically, with linear regression models, we considered the median regression as an alternative to the ordinary least squares and considered the nonparametric transformation models as an alternative to the linear regression models. With logistic regression models, we considered alternative link functions including log, log-log, and probit. We also considered a nonparametric ROC (receiving operator characteristic) approach as an alternative. Model fitting did not improve significantly with alternative modeling. We therefore chose more parsimonious and simpler models for their interpretability.

RESULTS

We collected demographic data for all household members. The mean annual income per capita in 2008 was US $890, which is substantially lower than the $8613 national average.[13b] Mean annual income per capita was $428.10 for poor, $531.00 for near-poor, and $776.90 for nonpoor households. Living at a mean rate of $1.73 a day places the overall sample population in the range of the international standards for extreme poverty of $1.25 and $2.00 a day, with the poor and near-poor households below the standard ($1.17 a day and $1.45 a day, respectively) and nonpoor households slightly above ($2.13 a day).[14]

Data and Descriptive Statistics

Our household questionnaire included illness and treatment within the past 12 months: total number of illness episodes, inpatient treatments, and outpatient treatments for all household members. More than one fifth of households reported at least 1 inpatient treatment. Fifty-eight percent of households reported a total of 0 to 4 outpatient treatments for all household members, 25.0% had 5 to 10 treatments, and 16.5% had more than 10 treatments (data not shown).

For each inpatient and outpatient health treatment, we collected information regarding insurance status. People are enrolled in the compulsory scheme on the basis of their eligibility, which may change. Because insurance status for an individual may differ from treatment to treatment, respondents indicated insurance status (insured or uninsured) for each episode of treatment rather than for each household member (Table 1). Of total inpatient treatments reported by households, 45.1% were uninsured and 54.9% were insured (45.1% actually using the insurance for the treatment and 9.8% not using the insurance). Of total outpatient treatments reported by households, 45.9% were uninsured and 54.1% were insured (17.6% actually using insurance for treatment and 36.5% not using insurance).

If the member was insured, the respondent indicated the insurance scheme in which the member was enrolled at time of treatment (compulsory, voluntary, poor, meritorious, or children younger than 6 years; data not shown). Although meritorious insurance is part of the compulsory scheme, we placed it in a separate category because its benefits exceed those for other compulsory beneficiaries. HCFP and children younger than 6 years accounted for more than half of insured inpatient treatments (35.8% and 27.6%, respectively) and outpatient treatments (31.5% and 24.3%, respectively). Voluntary insurance accounted for a significantly greater proportion of insured outpatient treatments (27.2%) than inpatient treatments (13.8%).

For inpatient treatment, the greatest proportion of the uninsured was from nonpoor households (60.0%; Table 1). Nonpoor households also constituted the greatest proportion of the insured who used insurance. By contrast, the poor accounted for the greatest proportion of those who were insured but did not use insurance (50.0%). For outpatient treatment, the proportions of poor and nonpoor households that were insured and used insurance were similar (40.2% and 43.2%, respectively; Table 1); however, the near poor represented a much lower proportion of those insured and using insurance (16.6%), and they constituted a much greater proportion (30.7%) of the uninsured than did the poor (15.0%). This finding highlights the lack of insurance coverage among the near poor. Nonpoor households still made up the greatest proportion of the uninsured in outpatient treatment (54.3%), suggesting that households that can afford voluntary insurance may not be purchasing it.

Respondents also indicated insurance use for each episode of treatment (used or did not use). For inpatient treatment, insurance was accepted only at the specific facility at which an individual was registered. Insurance covers outpatient treatment primarily at outpatient departments or clinics within hospitals, not at other facilities like commune health clinics. If insurance was available but not used, respondents chose from a list of reasons (data not shown). The most common reason for not using insurance for both inpatients and outpatients was that treatments were given at facilities not covered by their insurance—this was especially the case for outpatient treatments (75.4%, vs 36.4% for inpatient treatments). Three quarters of outpatient treatments were given in private facilities, the majority of which did not take insurance. Other significant reasons were special

TABLE 1—Inpatient and Outpatient Treatment Variables by Insurance Status: Vietnam, 2008

Variable	All Episodes	Uninsured	Insured but Did Not Use Insurance	Insured and Used Insurance
Inpatient treatment				
No. of treatments, total	224	101	22	101
No. of d in hospital, mean	10.1	7.4	9.9	12.7
No. of missed school or work d, mean	16.6	24.8	13.8	9.2
Cost of treatment, US $				
Direct medical facility fees (visit and treatment)	197.4	315.4	153.2	95.2
Other direct medical costs (medicine, supplies)	19.9	20.7	7.0	21.9
Unofficial (payment to employees of health facility)	11.3	12.3	7.7	11.1
Gifts (for escorts and caretakers)	2.0	1.1	0.8	3.2
Transportation (to and from facility for patient and caretaker)	11.8	12.1	21.2	9.5
Food (for patient and caretaker during visit)	31.9	30.2	35.2	32.7
Indirect lost income	85.5	117.6	70.0	57.0
Total out-of-pocket costs of visit and treatment	359.7	509.3	295.0	230.7
Type of facility, %[a]				
Commune health clinic	3.6	6.9	4.5	0.0
District hospital	31.3	20.8	9.1	46.5
Provincial or city hospital	35.3	40.6	18.2	33.7
Central hospital	25.0	25.7	54.5	17.8
Other state facility	0.4	0.0	0.0	1.0
Private health facility	3.1	4.0	13.6	0.0
Other	1.3	2.0	0.0	1.0
Poverty level, %[a]				
Poor	26.5	17.0	50.0	30.7
Near poor	21.5	23.0	22.7	19.8
Nonpoor	52.0	60.0	27.3	49.5
Outpatient treatment				
No. of treatments, total	3614	1659	1320	635
No. of missed school or work d, mean	3.1	4.1	1.7	3.4
Cost of treatment, US $				
Direct medical facility fees (visit and treatment)	10.6	16.4	7.8	1.3
Other direct medical costs (medicine, supplies)	4.0	4.8	3.2	3.5
Unofficial (payment to employees of health facility)	0.1	0.1	0.1	0.1
Gifts (for escorts and caretakers)	0.0	0.0	0.0	0.0
Transportation (to and from facility for patient and caretaker)	0.7	0.9	0.5	0.7
Food (for patient and caretaker during visit)	0.6	0.7	0.3	0.8
Indirect lost income	8.8	10.5	6.8	8.8
Total out-of-pocket costs of visit and treatment	24.9	33.4	18.7	15.1

Continued

TABLE 1—*Continued*

Type of facility, %[a]				
Commune health clinic	10.6	7.4	3.9	32.8
District hospital	12.7	6.2	1.8	52.3
Provincial or city hospital	5.8	8.3	3.0	5.4
Central hospital	8.8	11.9	5.9	6.9
Regional polyclinic	0.1	0.2	0.0	0.0
Other state facility	4.6	5.2	5.8	0.6
Private health facility	54.6	57.1	76.9	1.4
Village health worker	2.4	3.6	1.7	0.6
Other	0.4	0.1	1.0	0.0
Poverty level, %[a]				
Poor	26.4	15.0	34.1	40.2
Near poor	22.9	30.7	16.2	16.6
Nonpoor	50.7	54.3	49.7	43.2

Note. For costs of treatment, "unofficial" refers to under-the-table payments that are unapproved by the state but required to receive treatment. "Gifts" refers to the cultural practice of thanking people who have assisted households in receiving health treatment. The "poor" had a mean annual income per capita of $428 and numbered 166 households; the "near poor" had a mean annual income per capita of $531 and numbered 184 households; the "nonpoor" had a mean annual income per capita of $777 and numbered 350 households. For facility, regional polyclinics and village health workers offer only outpatient treatment and are not options for inpatient treatment.
[a]Percentages may not add to 100 because of rounding.

exemptions (31.8%) and excessively complex claims procedures (also 31.8%) for inpatient treatments; the latter was not an important factor for outpatient procedures. HCFP patients accounted for large percentages of both inpatient and outpatient treatments for which the patient was insured but did not use insurance (40.9% and 29.1%, respectively). Patients with voluntary insurance made up a large proportion of outpatient treatments for which insurance was not used (33.2%), indicating that households with fewer resources under HCFP as well as households with more resources who could purchase voluntary insurance were sometimes not using their insurance.

In addition, our survey collected information on episodes of inpatient and outpatient health treatment by insurance status (Table 1). For inpatient treatment, the hospital stay was more than 70% longer for those using insurance than for those without insurance. For treatments in which the patient had insurance but did not use it, the hospital stay was longer than for uninsured treatments but shorter than for insured treatments. Although insured individuals who used insurance had longer inpatient stays, they experienced fewer days of missed work and school because of illness than did the uninsured. The insured who did not use insurance missed less time than did the uninsured but more than did the insured who used insurance, suggesting an effect of having insurance even when it was not used. These data suggest that the insured (both those who used it and those who did not) may have recovered from illness to a greater degree during their longer inpatient treatment, whereas the uninsured continued to be ill longer after their treatment. For outpatient treatment, there was not much difference in missed work and school between the uninsured and the insured who used insurance, consistent with the less severe illnesses covered by outpatient treatments.

Impact Estimates

The impact estimates from multivariable analysis of insurance status on health treatment costs are shown in Table 2. For inpatient treatment, compared with uninsured treatments, insured treatments showed significant decreases in total health costs for all households, with the most substantial decrease in poor households. Insured individuals who did not use insurance also saw a great decrease in total treatment cost; however, this was not statistically significant. Findings were similar for outpatient treatment, for which total costs decreased among the insured who used insurance compared with the uninsured, for all poverty levels. Poor households again had the largest savings. Insured poor and nonpoor households that did not use insurance also had lower total costs relative to uninsured outpatient treatments.

The decrease in direct medical facility fees accounted for most of the decrease in total inpatient treatment costs for all poverty levels, with the poor experiencing the greatest change. The pattern was repeated for outpatient treatments. The uninsured saw more lost income from outpatient treatment than did both the insured

TABLE 2—Multivariable Analyses Comparing Mean Differences in Treatment Costs by Type of Treatment, Insurance Status, and Household Poverty Level: Vietnam, 2008

Type of Cost, US $, and Household Poverty Level	Inpatient Treatment		Outpatient Treatment	
	Insured but Did Not Use Insurance	Insured and Used Insurance	Insured but Did Not Use Insurance	Insured and Used Insurance
Direct medical facility costs				
All	−179.5	−203.9**	−7.1**	−16.0***
Poor	−123.1	−246.6*	−27.1**	−39.1***
Near poor	−188.3	−126.7	−1.2	−7.1**
Nonpoor	−95.6	−204.9*	−2.5*	−13.2***
Other direct medical costs				
All	0.9	13.0	−0.7	−0.9
Poor	2.2	−2.9	−1.7	−0.9
Near poor	3.2	14.9	−0.3	0.2
Nonpoor	1.3	24.5*	−0.5	−1.7
Unofficial costs				
All	−2.0	4.2	0.0	0.0
Poor	−5.3	−4.3	0.0	0.0
Near poor	−22.5	−3.3	0.0	0.1
Nonpoor	4.8	6.7	0.0	−0.1
Gifts				
All	−0.6	2.7	0.0	0.0
Poor	3.1	9.3	0.0	0.0
Near poor	−2.1	−0.8	0.0	0.1
Nonpoor	−0.8	0.7	0.0	0.0
Transportation				
All	8.1	−0.2	−0.2*	−0.2
Poor	−9.0	−9.6	−0.6**	−0.5**
Near poor	19.8	3.7	−0.2	0.8**
Nonpoor	19.2**	0.8	−0.1	−0.5**
Food				
All	0.3	3.3	−0.5**	0.0
Poor	−13.1	−23.7	−0.6	−0.1
Near poor	20.9	3.1	−0.2	0.7
Nonpoor	−20.9	12.6	−0.6**	−0.5
Lost income				
All	−37.2	−11.7*	0.3	0.6
Poor	−35.4	−35.4	−2.7	1.8
Near poor	−43.6	37.0	15.1*	−0.7
Nonpoor	−41.1	−39.7*	−2.3	0.0

Continued

TABLE 2—*Continued*

Total				
All	−216.5	−213.2**	−8.6*	−19.6***
Poor	−155.4	−292.3	−41.1**	−43.8**
Near poor	−233.0	−102.4	21.5	−1.0
Nonpoor	−151.2	−208.5	−7.2**	−21.0***

Note. This table shows results after we controlled for household size, age, gender, marital status, occupation and education of household head, and presence of household member younger than 18 years or older than 65 years. The "poor" had a mean annual income per capita of $428 and numbered 166 households; the "near poor" had a mean annual income per capita of $531 and numbered 184 households; the "nonpoor" had a mean annual income per capita of $777 and numbered 350 households. Comparison group is the uninsured.
*$P < .05$; **$P < .01$; ***$P < .001$.

who used and the insured who did not use insurance.

In examining specific types of insurance, HCFP appeared to yield the greatest decrease in total out-of-pocket payments for inpatient treatment among the different types of insurance (Table 3). Most of this decrease came from a reduction in direct medical facility costs. Every other category of cost also decreased except for gifts (made to people escorting patients to a health facility and to caretakers within a facility), in which there was a slight increase. All

TABLE 3—Multivariable Regression Analyses of Mean Differences in Adjusted Inpatient and Outpatient Treatment Under Specific Insurance Schemes: Vietnam, 2008

	Type of Insurance					
Type of Cost, US $	Compulsory	Voluntary	Poor (HCFP)	Meritorious[a]	Children Younger Than 6 Years	Other[b]
Inpatient Treatment						
Direct medical facility costs	37.0	−161.2	−246.9**	−138.0	−176.0*	. . .
Other direct medical costs	43.6*	−16.4	−11.6	26.1	4.0	. . .
Unofficial costs	26.9**	4.1	−4.9	−2.7	−4.1	. . .
Gifts	3.6	−0.3	2.9	0.4	2.7	. . .
Transportation	5.9	−7.0	−1.3	3.0	−6.2	. . .
Food	7.6	6.1	−14.4	12.5	13.6	. . .
Lost income	−41.4	26.1	−40.7	−71.7	−69.1*	. . .
Total	111.1	−142.2	−293.3**	−173.3	−224.0*	. . .
Outpatient treatment						
Direct medical facility costs	−13.9	−15.3*	−12.7**	−11.4	−5.0	−9.0
Other direct medical costs	−1.9	−0.7	−0.6	−2.6	1.3	−4.5
Unofficial	−0.1	−0.1	0.1	−0.1	0.1	−0.1
Gifts	−0.1	0.0	0.0	0.0	0.0	0.0
Transportation	−0.9**	0.0	0.4*	−0.6*	0.0	−0.6
Food	−0.6	−0.3	1.3***	−0.3	−0.4	−0.5
Lost income	−8.3	1.1	0.8	−5.9	7.4	5.8
Total	−27.4**	−18.0	−8.7	−19.6	−7.1	−13.8

Note. HCFP = Health Care Fund for the Poor. "Lost income" includes amount of income that patients and caretakers within household would have earned during missed days of work for illness and treatment. Results shown are after we controlled for household size, age, gender, marital status, occupation and education of household head, and presence of household member younger than 18 years or older than 65 years. Comparison group is the uninsured.
[a]Meritorious people include war "heroes" and "veterans" and others with substantial contributions to the socialist revolution.[4]
[b]For inpatient treatment, all respondents for "other" insurance were for "children younger than 6," so that there was no additional "other" category.
*$P < .05$; **$P < .01$; ***$P < .001$.

TABLE 4—Multivariable Regression Analyses Comparing Use of Health Facilities for Inpatient and Outpatient Treatment, by Household Poverty Level: Vietnam, 2008

	Inpatient Treatment		Outpatient Treatment	
Facility	Had Insurance But Did Not Use, AOR	Used Insurance, AOR	Had Insurance But Did Not Use, AOR	Used Insurance, AOR
Community health clinic				
All	0.639	NA	0.421***	6.412***
Poor	NA	NA	0.267***	6.579***
Near poor	1.000	1.000	0.912	10.209***
Nonpoor	NA	NA	0.396**	6.138***
District hospital				
All	0.322	2.734**	0.392***	24.978***
Poor	0.357	3.125	0.357*	27.502***
Near poor	0.367	2.161	0.609	31.790***
Nonpoor	NA	3.136*	0.153***	18.080***
Provincial or city hospital				
All	0.305	0.819	0.486***	0.719
Poor	0.354	0.442	1.202	1.841
Near poor	NA	2.835	0.286*	0.217*
Nonpoor	NA	0.804	0.336***	0.560
Central hospital				
All	5.428**	0.738	0.402***	0.530**
Poor	1.916	0.854	0.240***	0.494*
Near poor	1.753	0.069	0.429*	0.229*
Nonpoor	21.341*	1.257	0.632*	0.568
Regional polyclinic				
All	. . .	. . .	NA	NA
Poor	. . .	. . .	1.000	1.000
Near poor	. . .	. . .	2.222	12.910
Nonpoor	. . .	. . .	NA	0.000
Other state facility				
All	NA	120.663	1.427	0.071***
Poor	1.043	NA	2.021	NA
Near poor	1.000	1.000	2.076*	0.251
Nonpoor	1.000	1.000	0.854	0.000
Private health facility				
All	5.018	NA	2.050***	0.008***
Poor	NA	NA	2.684***	NA
Near poor	1.000	1.000	1.621*	0.005***
Nonpoor	2.414	0.000	2.302***	0.017***
Village health worker				
All	. . .	. . .	0.658	0.140***
Poor	. . .	. . .	0.547	0.261*
Near poor	. . .	. . .	NA	NA
Nonpoor	. . .	. . .	1.855	0.184

Continued

TABLE 4—*Continued*

Other				
All	NA	0.529	8.457	NA
Poor	NA	NA	NA	NA
Near poor	1.000	1.000	1.000	1.000
Nonpoor	NA	NA	289.455**	NA

Note. AOR = adjusted odds ratio; NA = not applicable (models failed to converge, most likely because of excessively small sample sizes resulting from subset analysis of households of different economic levels). Results shown are after we controlled for household size, age, gender, marital status, occupation and education of household head, and presence of household member younger than 18 years or older than 65 years. Comparison group is the uninsured. Ellipses indicate that the facility only offered outpatient treatment, and so inpatient treatment was not an option.
*$P < .05$; **$P < .01$; ***$P < .001$.

other types of insurance except compulsory exhibited decreases in total inpatient treatment costs. Compulsory insurance showed sizable increases in other direct medical costs (nonfacility fees such as medicine and supplies), unofficial fees, and direct medical facility costs, although the latter category was not statistically significant. This may reflect the relative affluence of those under the compulsory scheme, which allowed them to spend more for supplies and better services. All insurance types except voluntary insurance showed a decrease in lost income, with the largest decreases for meritorious and children younger than 6 years.

All insurance types showed a decrease in total cost of outpatient treatment compared with cost of treatment for those who did not have or use insurance (Table 3). In contrast to the results for inpatient treatment, compulsory insurance for outpatient treatment experienced the greatest decrease compared to other insurance schemes. The difference between the changes for compulsory insurance seen in inpatient and outpatient treatment were resulted mainly from the reduced role of other direct costs and unofficial payments in outpatient treatment.

For inpatient treatments, the insured who did use insurance were more likely to receive care at the district hospital to which they were assigned; this also applied to outpatient treatments for this group for all poverty levels (Table 4). The insured who did not use insurance were more likely to receive inpatient treatment at a central hospital or at a private health facility (after central hospital, private health facility had the largest odds ratio, but it was not statistically significant); they were more likely to receive outpatient treatment at private facilities. In addition, 95.5% of inpatient treatments for those who had insurance but did not use it had "better" or "cured" outcomes, compared with 84.1% of treatments for those with insurance who used it (not shown). This lends support to the idea that private health facilities provide better-quality inpatient treatment services. For outpatient treatment, the insured who used insurance were much more likely than were the uninsured to use district hospitals. This was true for all poverty levels, and is consistent with the assignment of insured individuals to this venue. Compared with the uninsured, insured near-poor and nonpoor individuals who used insurance were much less likely to go to private health facilities.

DISCUSSION

By employing an alternative framework for analyzing health insurance and financial protection, we were able to examine a number of relevant factors unavailable to narrow conventional measures of financial protection.[13a] In several respects, the insurance reforms in Vietnam met the moral obligations of health insurance[12] by reducing the vulnerability of rural households to high costs and increasing their security. Poor households under HCFP and those insured by the children-younger-than-6-years scheme experience the greatest positive effects. Insurance lowers treatment costs directly by decreasing medical costs (particularly direct facility costs). It also lowers costs indirectly by reducing days of missed work for ill household members and their caretakers, which means less lost income. This finding has several implications for the health and economic well-being of households. Recovering more quickly from illness may protect households from the financial and health consequences of reduced productivity. This is particularly important to consider in assessing insurance for children younger than 6 years because household members often have to stay at home to take care of ill children; an individual's illness can have negative consequences for the entire household.

Although using insurance correlates with lower health treatment costs, much more could be accomplished in this area to increase individual and household security. One inpatient treatment, or the accumulation of several outpatient treatments, constitutes a significant proportion of mean annual income per capita, even for the insured. Costs for 1 inpatient treatment is equivalent to 81% of mean annual income per capita for the uninsured and 37% for the insured who use insurance. Five outpatient treatments equal 26% of mean annual income per capita for the uninsured

and 12% for the insured who use insurance. With one quarter of our sample population experiencing 5 to 10 outpatient treatments, it is not surprising that one half of health payments for Vietnamese households are for outpatient treatments. Out-of-pocket payments may be covered by coping strategies (e.g., draw down savings, borrow from relatives/friends, take out loans)[15] and may also relate to changes in consumption patterns of other household categories (e.g., education, food, production means, transportation, utilities, daily goods; K. T. N. et al., unpublished data, 2012).[16] Moreover, insurance has less of an effect on other direct costs of health treatment, which account for much of total treatment costs. A comprehensive insurance package and additional health system reforms are needed.[17] Unofficial costs need to be eliminated or strictly regulated.

For the 40% of the Vietnamese population currently insured, insurance accounts for only 13% of total health expenditures,[4] leaving the majority of the population with a disproportionate amount of health expense. Universal health coverage with a comprehensive standardized insurance package should be a priority.[18] One analysis[4] suggests that it may be feasible to establish a system whereby formal-sector employees contribute to an insurance scheme and the rest of the population is funded through taxes. If this system were in place, it might be possible to increase the amount of contributions to further fund the health system and decrease out-of-pocket payments. This would entail ensuring that formal-sector employees are contributing to the system. Currently, 37% of formal-sector employees in Vietnam who should be enrolled in the compulsory scheme are not.[4]

In addition, insurance is not used for a significant proportion of inpatient and outpatient treatments for individuals who have insurance. This results in large part from the use of private health facilities, most of which do not accept insurance. The question then arises as to why the insured choose to go to private facilities rather than to public facilities at which their insurance is accepted. A rural household study found that people often choose private facilities before public ones, and that low-income households use public services less than higher-income households, likely for reasons of quality, cost, and availability.[19] Studies regarding the willingness to pay for rural insurance in Vietnam and other resource-poor countries point to several reasons for this. For example, one study[20] found that a perception in rural India of state health facilities as poor in quality and inaccessible and of public facilities as not cost-effective was associated with decreased willingness to pay for insurance.

A study of the willingness to participate in insurance among another rural population in the same province as Dai Dong noted skeptical attitudes toward insurance.[21] Problems associated with insurance include decreased quality of health treatment, a longer wait to receive care, and increased unofficial payments. Such concerns may account for the preference for private facilities where insurance is generally not an issue. The rise of the private sector may also make private facilities a more convenient option. If private health facilities continue to be perceived as preferable options, as they were for many of the insured in our study who did not use insurance, the government may contract to private providers, as it has already begun to do. Additional health system reforms are needed.

There are several limitations to our study. First, there may be a selection bias in examining the impact of insurance among people who received health treatment. This precluded us from drawing conclusions concerning the uninsured population who did not seek treatment. Such information would be valuable in investigating the role of insurance on health outcome.

Another limitation related to the data collection is the reporting of the costs of health care treatment as multiple items. Out-of-pocket payments for health care include costs for a variety of items, which we asked about individually. A study on the limitations of methods for measuring out-of-pocket payments found that reporting all health costs as multiple items yielded higher estimates of the actual total cost compared with single-item methods.[22] As such, the costs we report may be greater than in actuality. However, the same overestimation may apply to listing household income from multiple sources. If income and health care treatment costs are similarly overestimated, their ratio may remain the same and thus offer a relatively accurate estimation of the economic impact of health treatment.

Finally, because the results represented households from only 1 rural commune, they are not generalizable to the Vietnamese rural population as a whole. Differences in proximity to urban areas, the number and quality of accessible health facilities, farming resources, and many other characteristics may affect the results reported here. The study may, however, be applicable to other rural communes with demographic characteristics similar to Dai Dong. In a country like Vietnam whose population is primarily rural and low income, the moral foundational principles of health insurance must be considered to ensure economic and health security for vulnerable individuals.

In conclusion, we found that insurance reform in Vietnam reduced household vulnerability to high health care costs through direct reduction of medical costs and indirect reduction of income lost to illness. From a normative perspective, however, out-of-pocket costs are still too high and accessibility issues persist; a comprehensive insurance package and additional health system reforms are needed. ■

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K. T. Nguyen, O. T. H. Khuat, and J. P. Ruger led study conceptualization and data management, analysis, and writing. S. Ma also led the data analysis, interpretation of the data, and writing of methods. D. C. Pham and G. T. H. Khuat assisted with data collection and management. K. T. Nguyen and J. P. Ruger led the drafting of the article with S. Ma and reviewed and revised the article for important intellectual content.

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