

# Factors Influencing the Vietnamese Older Persons in Choosing Healthcare Facilities

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## ABSTRACT

**BACKGROUND:** The rapidly growing aging population poses major challenges for health systems in Vietnam. This study was therefore aimed to examine factors influencing the choices of healthcare facilities among older patients in Vietnam, using a national survey on older people.

**METHODS:** We applied multinomial logistic regression models based on Andersen's Behavioral Model with various predisposing factors, enabling factors and healthcare-needs factors associated with different types of healthcare facilities where older patients utilized services.

**DATA:** We used data from the Vietnam Aging Survey (VNAS) in 2011. This was the first-ever nationally representative survey on older persons in Vietnam.

**RESULTS:** Among those who used healthcare services, 15.1% visited central hospitals; 23.6% visited provincial hospitals; 28.0% visited district hospitals; 8.8% visited commune health centres; 18.3% visited private hospitals/clinics; and 6.2% visited other facilities. The results showed that "having to pay cost" and "having sufficient income" were strong predictors for using commune health centres, district hospitals, and private facilities, while "having health insurance" was not a significant predictor for using these facilities. Also, we showed that apart from enabling factors (such as age, gender, educational levels, employment status, living region and place of residence), predisposing factor (such as health insurance, perceived sufficient income, household wealth and having to pay medical cost) as well as need factors (such as self-rated health and chronic disease) were also associated with the choice of healthcare facilities.

**CONCLUSIONS:** Based on the findings, we discussed the implications of the results for organizing healthcare finance and delivery to achieve efficiency and equity for older people in Vietnam.

**KEYWORDS:** aging, Andersen's behavioral model, health care, patient choice, Vietnam

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## Introduction

Vietnam is one of the most aging populations among Southeast Asian countries, as a result of declining fertility rate and increased life expectancies (Goodkind, 1995).<sup>1,2</sup> At the same time, Vietnam is facing the challenge of health issues with diseases changing from traditional infectious diseases to non-communicable diseases, and this poses rapidly increasing needs and heavy financial burden on healthcare services.<sup>3</sup> Thus, improving equity in accessing healthcare facilities in Vietnam is an increasingly crucial task, especially in the context of population aging.

It seems obvious that older populations generally have greater health care demands than the younger people, leading to a higher proportion of patients in almost types of healthcare facilities.<sup>4</sup> Specifically, it was estimated that the average healthcare cost for a Vietnamese older person was about 7 to 8 times higher than that of a child. Older persons were also mainly dependent on state healthcare systems, which accounted for 53% of health checkup cases.<sup>4</sup> At the same time, access to healthcare services is still restricted due to a heavy reliance on out-of-pocket payments.<sup>5</sup> As a result, this poses long-term challenges for the national government to implement policies in terms of healthcare services utilization for older persons.<sup>4</sup>

The healthcare system in Vietnam is a combined of both public and private hospitals. Hospital care services are mainly delivered by the public sector, whereas the small-scaled care services in regard of ambulatory care and pharmaceuticals distribution are mainly provided by private sector.<sup>6</sup> The public healthcare facilities consist of commune health centers (CHCs), district hospitals, provincial hospitals, and central hospitals.<sup>7</sup> CHCs are considered as the first choice for those who are enrolled in the public health insurance to register. However, most of CHCs are lack of the availability of special drugs, medical equipment, and professional doctor for diagnoses and treatments (World Bank, 2016).<sup>8</sup> Therefore, patients tend to access high-levels healthcare facilities even with long distance and high costs. This leads to some extent challenges for the overwhelming predominance of provincial and central hospitals, which has been a critical concern in regard of resource allocation for the healthcare system in Vietnam.

Reducing inequity in healthcare utilization has become one of the most crucial objectives of health system performance for over the world.<sup>9</sup> To provide appropriate health-care policy in response to such situations, there is a need for an accurate understanding of the factors influencing healthcare facilities



among different older patients group. Several studies in term of patient choice of healthcare facilities (see, for instance, Ikumi et al.<sup>10</sup> and Vuong and Nguyen<sup>11</sup>) were conducted in Vietnam. These studies have only surveyed a small number of medical institutions in a region, making it difficult to generalize findings. Besides, there is a lack of comprehensive studies on the factors affecting the use of healthcare services using Andersen's Behavioral Model. The current study, therefore, was aimed to examine factors associated with the use of both public and private healthcare facilities among older patients in Vietnam. Findings from this study could provide useful information to health planners and policymakers to design the appropriate healthcare system to meet the needs of older adults.

### The Conceptual Framework

Many studies have reported that hospital choice is determined by patient socio-economic characteristics.<sup>12,13</sup> The most widely known model for hospital choice is the Andersen's Behavioral Model.<sup>14</sup> The initial research goal was to find out the conditions that enable (or delay) medical use. The first determinants were socio-demographic factors, including age and gender. The second factors were socio-economic ones, including race/ethnicity and income. The third factors were psychological ones, including attitudes toward health, values, and knowledge regarding one's own health and available wellness services. These factors were identified as affecting future awareness regarding healthcare service use. To date, the Andersen's Behavioral Model has been used in many studies to examine the use of general health services, primary health care services, tertiary care, mental health services, and local health services.

### Data, Variables, and Methods

#### Data

This research used the data from the Vietnam Aging Survey (VNAS) in 2011, which was the first-ever nationally representative survey on older people in Vietnam. The VNAS utilized the sampling based on the Population and Housing Census in 2009 to draw a multi-stage stratified random probability sample of 4007 respondents aged 50 and over from 400 villages in 200 communes of 12 provinces representing for 6 ecological regions in Vietnam. Data were collected by face-to-face interviews using a structured questionnaire. The VNAS covered a wide range of individuals' information on socio-demographic characteristics, household assets, and health conditions. The response rate of the survey was 96.3%.

In this study, we used only the sample of older people (defined as those aged 60 and over) with 2789 people. Furthermore, this research included only older patients who had received treatment for an illness or injury during the last 12 months prior to interview. Thus, we had the final sample of 834 older patients for analyses.

#### Variables—definitions and measures

**Dependent variable.** Older people's utilization of healthcare services—was derived from the following question to a respondent "The last time you received treatment for an illness or injury during the last 12 months, where did you go?" For this, an older patient's response could be (i) central hospitals; (ii) provincial hospitals; (iii) district hospitals; (iv) commune health centers (CHCs); (v) private hospitals/clinics; and (vi) others (such as drug stores). This question was a multiple-choice one, so that an older patient might have different choices, meaning that they might use different healthcare facilities in the last 12 months.

**Other covariates.** In this study, we followed the Behavioral Model by Andersen<sup>15</sup> with various factors associated with the choices of healthcare facilities, which could be categorized into 3 groups: (i) predisposing factors; (ii) enabling factors; and (iii) health needs factors.

- **Predisposing factors** included demographic characteristics and health behaviors. Demographic characteristics included *age* (60-69 years = 0; 70-79 years = 1; and 80 and above = 2); *gender* (women = 0; men = 1); *marital status* (currently married = 0; currently unmarried (single, divorced, separated, widowed) = 1); *educational levels* (no schooling/uncompleted primary school = 1; primary school = 2; secondary school = 3; high school = 4; and college and above = 5); *employment status* (currently not working = 0; currently working = 1); *living arrangements* (living alone = 1; living with spouse only = 2; living with spouse and children only = 3; and living with others with or without spouse and children = 4); *area of residence* (urban = 0; rural = 1); and *region of residence* (Northern = 0; Central = 1; Southern = 2). Measures of health behaviors were used as indicators of health attitudes: *alcohol consumption* (no = 0; yes = 1); *smoking status* (no = 0; yes = 1).
- **Enabling factors** included "having social health insurance," "living arrangements," "social participation," "perceived sufficient income," "household wealth," and "paid healthcare costs." Respondents' *having social health insurance* (no = 0; yes = 1); *social participation* (no = 0; yes = 1); *perceived sufficient income* (insufficient = 0; sufficient = 1); *households* (poor = 0; average = 1; rich = 2); *paid healthcare cost* (no = 0; yes = 1).
- **Health needs** were assessed by respondents' *self-rated health* (good = 0; poor = 1); *chronic conditions* (no disease = 0; one disease = 1; two diseases = 2; three or more = 3).

### Methods

First, we used Pregibon's<sup>16</sup> link test to check the specification of explanatory variables. The link test results showed that explanatory variables used here were well specified. Then, we used

variance inflation factor (VIF) to check for multicollinearity. The VIF results showed that all VIF values were smaller than 3 which indicated no evidence of nearly perfect linear combinations of 1 another among explanatory variables.

We presented descriptive statistics of the studied sample by Chi-square tests to examine the differences in categorical variables with respect to place of residence. The Chi-square tests were also used to examine differences in the dependent and independent variables by the healthcare facilities. Multinomial logistic regression was employed using group “others” as the reference category to identify predictor variables associated with central hospitals, provincial hospitals, district hospitals, commune health centres, and private hospitals. Besides, marginal effects were applied to determine the effect of covariates in the probability of using healthcare facilities. Signs of the marginal effects for type of healthcare facilities indicated directions of the association between type of facilities and the covariates.

In this study, the multinomial analyses consisted of 3 nested models based on Andersen’s conceptual model, as follows.

- Model 1 adjusted for predisposing factors;
- Model 2 included enabling factors;
- Model 3 adjusted for older people’s health-needs factors.

In all calculations, sample weights were used to make all results representative for respective groups of older people. The significance level was set at 5%.

### Key Findings

Table 1 presents the description of the characteristics of older patients ( $N=834$ ) by place of residence. Among 834 respondents who used healthcare facilities for treatments, more than a quarter of older patients (27.91%) used health services at district hospitals, followed by provincial hospitals (23.6%), central hospitals (15.08%), private hospitals (18.33%), CHCs (8.83%), and other facilities (6.20%). There were significant differences in utilizing healthcare facilities between rural-urban among older patients ( $P=.0021$ ). The results indicated that healthcare utilization at central hospitals, provincial hospitals, and private healthcare services was more prevalent in urban than rural areas, while district hospitals and CHCs were more utilized by rural residents than their counterparts in urban areas.

The predisposing factors showed that the rural older patients were less likely to be educated, living alone compared to their urban counterparts.

Health-needs factors showed that there were insignificant differences between rural and urban older patients to report poor health status and chronic diseases.

Table 2 shows the descriptive analyses for the full sample and type of facilities used by older patients. The predisposing factors showed that there were significant differences in utilizing health care facilities among 3 regions. Older patients

residing in the Northern region had higher proportions of healthcare visits at central hospitals and district hospitals, while those living in the Central region had higher proportions of health care treatment at private hospitals and CHCs.

Regarding enabling factors, the healthcare facilities used by older patients were significantly different with “having health insurance,” “household wealth,” and “having to pay cost (or out-of-pocket payments).” Older patients using private healthcare facilities were less likely to have any kind of health insurance and more likely pay costs. The proportion of older patients in central hospitals and provincial hospitals were higher among the poorest wealth quintile (56.48% and 46.94%, respectively), while a large proportion of users at district hospitals and CHCs were among the average wealth quintile groups.

In terms of health-needs factors, the majority of older patients with 3 or more diseases had health treatments in central hospitals, provincial hospitals, and private hospitals, while those without or with 1 disease had health treatments in CHCs and others.

The multinomial logistic regression results for the full sample are presented in Table 3. **Model 1**—adjustment for predisposing factors—shows that older patients at very advanced ages (80 and over), women, and working older persons were less likely to have been hospitalized in central hospitals, provincial hospitals, district hospitals and private hospitals than their respective counterparts. Older patients in the urban areas had respectively 4.16 times and 3.04 times to be hospitalized in central hospitals and provincial hospitals than their rural counterparts. In contrast, older patients in the Central region had 0.19 times lower probability to be treated in central hospitals than their counterparts in other regions.

Further adjustments with enabling characteristics (**Model 2**) slightly decreased the odds ratio of using health treatments at central hospitals, provincial hospitals, district hospitals and private hospitals among those at very advanced ages (80 and over), women and working persons than their respective counterparts. Notably, older patients having health insurance were more likely to be hospitalized in central hospitals and provincial hospitals. Those with out-of-pocket payments were less likely to be hospitalized in most types of health care facilities, except private hospitals.

Controlling for health-needs factors, the results in **Model 3** show that older patients with educational level at college and higher had 0.01 times lower probability to be hospitalized in district hospitals and CHCs. Moreover, after controlling for the effects of health-needs factors, sufficient income was positively associated with choosing district hospitals, CHCs, and private hospitals. Besides, older patients with 3 or more chronic diseases had 9.65 times higher probability to be hospitalized in central hospitals. Also, older patients with poor health had 9.58 times higher probability to have treatments in CHCs.

Table 4 shows the results of the marginal effects of the determinants on using types of health care facilities among the

**Table 1.** Characteristics of older patients using healthcare facilities, by place of residence.

OLDER PEOPLE'S CHARACTERISTICS	TOTAL (N= 834)	RURAL (N= 653)	URBAN (N= 181)	P-VALUE
% Place to receive the last treatment				.0021
Central hospitals	15.08	11.62	24.2	
Provincial hospitals	23.6	19.94	33.23	
District hospitals	27.95	33.92	12.22	
Commune health centres	8.84	9.53	6.99	
Private hospitals	18.33	17.84	19.62	
Others	6.21	7.14	3.74	
Mean	3.34	3.43	2.99	
<i>Predisposing factors</i>				
% Age				.7853
60-69	39.66	39.32	40.57	
70-79	37.58	38.5	35.14	
80 and over	22.76	22.18	24.29	
Mean	72.07	71.93	72.56	
% Gender				.4909
Women	59.94	61.22	56.59	
Men	40.06	38.78	43.41	
% Marital status				.4293
Currently married	68.86	67.65	72.05	
Currently unmarried	31.14	32.35	27.95	
% Educational levels				.0288
No schooling and incomplete primary school	54.64	58.32	44.92	
Primary school	14.44	15.21	15.2	
Secondary school	15.91	16.12	15.36	
High school	10.62	7.35	19.23	
College and above	4.39	2.99	8.08	
% Employment status				.1363
Not working	66.72	64.25	73.22	
Working	33.28	35.75	26.78	
% Alcohol consumption				.5610
Never consumed	77.92	78.77	75.69	
Ever consumed	22.08	21.23	24.31	
% Smoking status				.7728
Currently not smoking	83.26	82.71	84.73	
Currently smoking	16.74	17.29	15.27	
% Living arrangements				.0309
Alone	8.89	11.02	3.28	
With spouse only	20.61	21.92	17.15	
With spouse and children only	18.73	19.72	16.13	
With others, with or without spouse and child(ren)	51.77	47.35	63.43	

(Continued)

**Table 1.** (Continued)

OLDER PEOPLE'S CHARACTERISTICS	TOTAL (N = 834)	RURAL (N = 653)	URBAN (N = 181)	P-VALUE
% Living region				.4590
Northern	35.04	36.09	32.26	
Central	33.4	35.5	27.86	
Southern	31.57	28.41	39.88	
<i>Enabling factors</i>				
% Health insurance				.6546
No	21.71	22.47	19.71	
Yes (any type of health insurance)	78.29	77.53	80.29	
% Social participation				.8505
No participation	59.34	58.88	60.54	
At least 1 club/association	40.66	41.12	39.46	
% Perceived sufficient income				.0581
Insufficient	69.95	73.39	60.91	
Sufficient	30.05	26.61	39.09	
% Paid healthcare cost				.4826
No	28.13	27.22	30.52	
Yes	71.87	72.78	69.48	
<i>Health needs</i>				
% Self-rated health				.1034
Good	13.93	12.28	18.25	
Poor	86.07	87.72	81.75	
% Had chronic conditions				.5488
None	15.39	13.79	19.59	
One disease	24.95	25.15	24.42	
Two diseases	25.41	27	21.2	
Three or more diseases	34.25	34.05	34.79	

Source: Own calculations, using VNAS 2011.

Vietnamese older people applied by the multinomial logistic regression models. Focusing on the marginal effect of predisposing factors on the probability of reporting using healthcare facilities, older age group increased the probability of having a health treatments in private hospitals, whereas working status increased the probability of choosing others. Besides, higher education decreased the probability for older persons in choosing district hospitals and CHCs. Notably, living in the Central and the Southern regions was negatively associated with the probability of visiting central hospitals, whereas older patients living in the Southern region and urban areas increased the probability of using health service in provincial hospitals and central hospitals, respectively.

Regarding enabling factors, having to pay medical cost increased the probability of choosing central hospitals and private hospitals, but decreased the probability of choosing

district hospitals and CHCs. Besides, better household wealth was negatively associated with the probability in choosing central hospitals and provincial hospitals but increased the probability of choosing district hospitals and CHCs.

Regarding health-needs factors, “having 2 or more diseases” and “poor health status” increased probability to use central hospitals and CHCs, respectively.

### Discussion and Policy Implications

Utilizing Andersen’s Behavioral Model, this study examined factors associated with the choice of healthcare facilities among the Vietnamese older people. The results indicated that predisposing factors (age, gender, educational levels, employment status, living region, living place), enabling factors (health insurance, household wealth, and having to pay medical costs), and health-needs factors (chronic conditions and self-rated



**Table 2.** Characteristics of older patients using healthcare facilities.

OLDER PEOPLE'S CHARACTERISTICS	CENTRAL HOSPITALS (N=97)	PROVINCIAL HOSPITALS (N=178)	DISTRICT HOSPITALS (N=263)	COMMUNE HEALTH CENTRES (N=90)	PRIVATE HOSPITALS (N=155)	OTHERS (N=51)	P-VALUE
<i>Predisposing factors</i>							
% Age							.0764
60-69	40.84	50.38	43.18	38.62	22.12	33.51	
70-79	33.27	34.58	37.16	24.01	52.82	35.59	
80 and over	25.89	15.04	19.66	37.37	25.06	30.9	
Mean	71.78	70.58	71.28	73.54	73.86	73.8	
% Gender							.1764
Women	39.52	37.45	46.6	47.94	60.82	86.85	
Men	60.48	62.55	53.4	52.06	39.18	13.15	
% Marital status							.2785
Currently married	67.85	68.01	76.93	70.79	62.13	55.33	
Currently unmarried	32.15	31.99	23.07	29.21	37.87	44.67	
% Educational levels							.2608
No schooling and incomplete primary school	49.6	46.94	51.39	63.23	64.8	68.51	
Primary school	11.81	13.78	16.3	14.17	15.54	12.08	
Secondary school	16.41	15.66	19.61	17.82	11.39	9.62	
High school	11.52	15.4	11.85	4.454	5.32	9.13	
College and above	10.66	8.228	0.8486	0.3221	2.95	.65	
% Employment status							.0142
Not working	81.14	62.39	65.62	55.03	77.06	39.11	
Working	18.86	37.61	34.38	44.97	22.94	60.89	
% Smoking status							.2403
Currently not smoking	85.53	89.73	75.9	80.1	84.72	86.56	
Currently smoking	14.47	10.27	24.1	19.9	15.28	13.44	
% Alcohol consumption							.3784
Never consumed	86.04	76.07	76.68	63.74	82.16	78.54	
Ever consumed	13.96	23.93	23.32	36.26	17.84	21.46	
% Living arrangements							.5589
Alone	8.11	9.631	6.236	10.19	11.17	11.37	
With spouse only	21.08	15.87	26.18	18.37	21.19	13.81	
With spouse and children only	11.57	24.9	22.58	23.96	10.38	12.54	
With others, with or without spouse and child(ren)	59.24	49.6	45	47.49	57.26	62.28	
% Living region							.0045
Northern	53.94	27.09	41.9	27.89	24.9	28.55	
Central	22.51	26.73	35.31	37.89	36.39	61.36	
Southern	23.55	46.19	22.79	34.22	38.72	10.08	
% Living place							.0021
Rural	55.87	61.26	87.98	78.22	70.56	83.44	
Urban	44.13	38.74	12.02	21.78	29.44	16.56	

(Continued)

Table 2. (Continued)

OLDER PEOPLE'S CHARACTERISTICS	CENTRAL HOSPITALS (N=97)	PROVINCIAL HOSPITALS (N=178)	DISTRICT HOSPITALS (N=263)	COMMUNE HEALTH CENTRES (N=90)	PRIVATE HOSPITALS (N=155)	OTHERS (N=51)	P-VALUE
<i>Enabling factors</i>							
% Health insurance							.0437
No	12.03	15.5	18.96	21.68	35.71	39.89	
Yes (any type of health insurance)	87.97	84.5	81.04	78.32	64.29	60.11	
% Social participation							.6767
No participation	62.07	61.15	51.48	58.53	65.76	63.44	
At least 1 club/association	37.93	38.85	48.52	41.47	34.24	36.56	
% Perceived sufficient income							.8407
Insufficient	64.85	70.32	72.46	68.04	67.5	79.66	
Sufficient	35.15	29.68	27.54	31.96	32.5	20.34	
% Household wealth							.0000
Poor	56.48	46.94	15.64	13.73	34.9	14.88	
Average	27.1	23.82	54.38	43.23	31.04	57.97	
Rich	16.42	29.24	29.98	43.04	34.06	27.14	
% Having to pay cost							.0000
No	24.43	26.44	42.91	54.94	7.36	0.10	
yes	75.57	73.56	57.09	45.06	92.64	99.9	
<i>Health needs</i>							
% Self-rated health							.5119
Good	12.57	11.05	16.37	7.899	14.16	25.07	
Poor	87.43	88.95	83.63	92.1	85.84	74.93	
% Had chronic conditions							.0264
None	5.871	14.11	16.94	18.4	19.7	19.35	
One disease	19.63	22.95	19.72	44.93	24.59	41.69	
Two diseases	31.14	16.71	32.5	20.34	22.25	29.15	
Three or more diseases	43.36	46.23	30.84	16.34	33.46	9.81	

Source: Own calculations, using VNAS 2011.

health) were significantly associated with older people’s choices of healthcare facilities.

Among predisposing factors, urban areas contributed significantly to variance in choosing central hospitals and provincial hospitals. The urban older persons tended to choose central hospitals and provincial hospitals, while most of rural older persons tended to choose district hospitals and CHCs. This could be explained by the fact that Vietnam’s grassroots health care system with CHCs and district hospitals provided nearly all care services for the poor, and a substantial share of healthcare services for all, particularly in rural areas (World Bank, 2019).<sup>17</sup> Notably, the patterns of health-seeking behaviors were different between regions, in which patients living in the Central region were less likely to use healthcare services in

central hospitals and provincial hospitals than those living in the Southern region. This indicated unequal distribution of healthcare resources among different regions in Vietnam. Similar finding was indicated in Le et al.<sup>18</sup>

Among enabling factors, the results suggested that health insurance was a strong predictor of for older persons to choose central hospitals and provincial hospitals, but not for private healthcare facilities. Various studies suggested the importance of health insurance (see, for instance, Le et al.,<sup>18</sup> Acharya et al.,<sup>19</sup> van der Wielen et al., 2018).<sup>20</sup> Contrary to expectations, health insurance was not a significant predictor for older persons to choose CHCs, district hospitals, and private healthcare facilities. Although the government of Vietnam has made significant efforts to achieve universal health coverage with a

**Table 3.** Multinomial logistic regression models of predisposing, enabling and needs factors associated with health care facilities among the Vietnam

OLDER PEOPLE'S CHARACTERISTICS	MODEL 1 O.R. (CI)				MODEL 2 O.R. (CI)	
	CENTRAL HOSPITAL VERSUS OTHERS	PROVINCIAL HOSPITALS VERSUS OTHERS	DISTRICT HOSPITAL VERSUS OTHERS	CHCS VERSUS OTHERS	PRIVATE HOSPITALS VERSUS OTHERS	CENTRAL HOSPITALS VERSUS OTHERS
<i>Predisposing factors</i>						
% Age						
60-69 (ref.)						
70-79						
80 and over	0.18** (0.05-0.63)	0.13** (0.03-0.50)	0.21* (0.06-0.74)		0.29* (0.08-1.00)	0.09** (0.02-0.53)
% Gender						
Men (ref.)						
Women	0.17* (0.04-0.74)	0.20* (0.05-0.87)	0.14** (0.04-0.56)	0.12* (0.02-0.69)	0.11** (0.03-0.47)	0.11** (0.02-0.54)
% Marital status						
Married(ref.)						
Currently unmarried						
% Educational levels						
No schooling and incomplete primary school (ref.)						
Primary school						
Secondary school						
High school				0.09* (0.01-0.83)	0.13* (0.02-0.79)	0.07** (0.01-0.53)
College and above						
% Employment status						
Currently not working (ref.)						
Working	-0.09*** (0.03-0.31)	-0.19** (0.06-0.56)	-0.14*** (0.05-0.40)	0.30 (0.08-1.12)	-0.11*** (0.03-0.35)	-0.08*** (0.02-0.34)
% Alcohol consumption						
Never consumed (ref.)						
Ever consumed	0.16* (0.04-0.69)					
% Smoking status						
Never smoked (ref.)						
Currently smoking						
% Living arrangements						
Living alone (ref.)						
With spouse only						
With spouse and children only						
With others, with or without spouse and child(ren)						
% Living region						
Northern (ref.)						
Central	-0.19* (0.04-0.94)					-0.15** (0.04-0.59)
Southern						1.74 (0.32-9.57)





Table 3. (Continued)

OLDER PEOPLE'S CHARACTERISTICS	MODEL 1 O.R. (CI)					MODEL 2 O.R. (CI)
	CENTRAL HOSPITAL VERSUS OTHERS	PROVINCIAL HOSPITALS VERSUS OTHERS	DISTRICT HOSPITAL VERSUS OTHERS	CHCS VERSUS OTHERS	PRIVATE HOSPITALS VERSUS OTHERS	CENTRAL HOSPITALS VERSUS OTHERS
% Living place						
Rural (ref.)						
Urban	4.16* (1.40-12.33)	3.04* (1.09-8.49)				2.92* (1.13-7.55)
<i>Enabling factors</i>						
% Health insurance						
No (ref.)						
Yes (any type of health insurance)						5.41** (1.53-19.12)
% Social participation						
At least 1 club/association						
% Perceived sufficient income						
Insufficient (ref.)						
Sufficient						
% Household wealth						
Poor (ref.)						
Average						-0.17* (0.03-0.82)
Rich						
% Having to pay medical cost						
No (ref.)						
yes						0.01*** (0.001-0.09)
<i>Health needs</i>						
% Self-rated health						
Good (ref.)						
Poor						
% Had chronic conditions						
None (ref.)						
One disease						
Two diseases						
Three or more diseases						
Constant	137*** (11-1660)	59*** (5-645)	155*** (16-1430)	32* (2-485)	69*** (7-616)	16,086*** (233-1,108,355)

Source: Own calculations, using VNAS 2011.

\* $P < .05$ . \*\* $P < .01$ . \*\*\* $P < .001$ ; standard errors are in parentheses.

MODEL 3 O.R. (CI)								
PROVINCIAL HOSPITALS VERSUS OTHERS	DISTRICT HOSPITALS VERSUS OTHERS	CHCS VERSUS OTHERS	PRIVATE HOSPITALS VERSUS OTHERS	CENTRAL HOSPITALS VERSUS OTHERS	PROVINCIAL HOSPITALS VERSUS OTHERS	DISTRICT HOSPITALS VERSUS OTHERS	CHCS VERSUS OTHERS	PRIVATE HOSPITALS VERSUS OTHERS
				3.88* (1.33-11.29)				
4.33* (1.33-14.10)				3.65* (1.03-12.96)	3.20* (1.08-9.47)			
						3.84* (1.11-13.29)	5.06* (1.18-21.68)	4.05* (1.08-15.19)
-0.19* (0.05-0.80)				-0.17* (0.03-0.86)	-0.18* (0.04-0.78)			
0.005*** (0.005-0.04)	0.002*** (0.002-0.01)	0.001*** (0.001-0.01)	0.02** (0.002-0.28)	0.01*** (0.00-0.06)	0.003*** (0.003-0.03)	0.001*** (0.001-0.01)	0.006*** (0.006-0.01)	0.02** (0.00-0.23)
							9.58* (1.40-65.59)	
				9.65* (1.23-75.60)				
4757*** (122-184,751)	9117*** (168-492,036)	2114*** (54-81,447)	3131*** (66-148,219)	3389** (24-462,260)	1335** (16-105,307)	4645*** (44-484,975)	193* (1-19,285)	1,542** (16-146,789)

**Table 4.** Marginal effect for the full sample of the probability in choosing healthcare facilities among the Vietnamese older people.

OLDER PEOPLE'S CHARACTERISTICS	CENTRAL HOSPITALS	PROVINCIAL HOSPITAL	DISTRICT HOSPITALS	CHCS	PRIVATE HOSPITALS	OTHERS
<i>Predisposing factors</i>						
% Age						
60-69 (ref.)					–	
70-79					0.15*** (0.05)	
80 and over					0.12* (0.05)	
% Educational levels						
No schooling and incomplete primary school (ref.)			–	–		
College and above			–0.31*** (0.05)	–0.08*** (0.02)		
% Employment status						
Currently not working (ref.)						–
Working						0.019* (0.01)
% Alcohol consumption						
Never consumed (ref.)						
Ever consumed	–0.128* (0.04)					
% Living arrangements						
Alone (ref.)			–			
With spouse and children only			0.199* (0.09)			
% Living region						
Northern (ref.)	–	–	–			
Central	–0.143** (0.06)					
Southern	–0.12** (0.06)	0.20** (0.07)	–0.16* (0.07)			
% Living place						
Rural (ref.)	–		–			
Urban	0.115* (0.05)		–0.221* (0.05)			
<i>Enabling factors</i>						
% Household wealth						
Poor (ref.)	–	–	–	–		
Average	–0.13* (0.06)	–0.18** (0.07)	0.333** (0.06)			
Rich	–0.175* (0.07)		0.196** (0.07)	0.086* (0.03)		
% Having to pay medical cost						
No (ref.)	–		–	–	–	–
yes	0.087** (0.03)		–0.266*** (0.06)	–0.136*** (0.05)	0.243*** (0.04)	0.026*** (0.01)

(Continued)

Table 4. (Continued)

OLDER PEOPLE'S CHARACTERISTICS	CENTRAL HOSPITALS	PROVINCIAL HOSPITAL	DISTRICT HOSPITALS	CHCS	PRIVATE HOSPITALS	OTHERS
<i>Health needs</i>						
% Self-rated health						
Good (ref.)				–		
Poor				0.054** (0.02)		
% Had chronic conditions						
None (ref.)						
Two diseases	0.14* (0.06)					

Source: Own calculations, using VNAS 2011.

\* $P < .05$ . \*\* $P < .01$ . \*\*\* $P < .001$ ; standard errors are in parentheses.

number of social health insurance-related decrees (such as Decree 299/1992, Decree 58/1998, Decree 63/2005, and Decree 146/2018),<sup>18</sup> 17% of older people did not hold social health insurance cards, though the share for rural and poor groups was less than that for their urban and non-poor counterparts.<sup>21</sup> Previous studies showed that there was insignificant association of having health insurance with both OOP health expenditure and catastrophic expenditure occurrence in both rural and urban areas, and OOP health expenditure were higher in rural district (12.7% in rural vs 5.7% in urban).<sup>22</sup> Thus, it seemed that little improvement in financial protection mechanism has taken in action in Vietnam.

As expected, concerning medical cost, the analysis suggested that having to pay medical costs was the major reason for older people not using all kinds of healthcare facilities. This was consistent with the previous studies, which showed that self-medication was an option for primary health care when medical costs were high.<sup>23,24</sup> Therefore, this finding was a reminding to the need for a multi-faceted approach to mitigate the older patients' financial burdens caused by medical costs, especially for public health care facilities.

Regarding health-needs factors, having 3 or more diseases was positively a strong predictor of healthcare utilization by older patients in central hospitals. This was consistent with previous studies reporting that having multiple chronic conditions was positively associated with healthcare utilization.<sup>25,26,27</sup> Moreover, poor self-rated health was the main health-needs factor influencing older persons to choose CHCs. This could be explained by the fact that Vietnam's grassroots healthcare system with CHCs provided a substantial share of healthcare services for all, particularly in rural areas (World Bank, 2016). At the same time, the older patients in rural areas had worse health than their urban counterparts, and faced multiple barriers in accessing quality of health care (Giang et al., 2016).<sup>28,29</sup>

There was an additional finding to be worth noted in these models. After controlling for the effects of enabling and health-needs factors, people with higher education were less likely to choose CHCs and district hospitals, and a possible explanation

for such a finding might be that CHCs and district hospitals under-performed capacity, less availability of medicines, and low capacity for diagnoses and treatments (World Bank, 2016).

Controlling for health-needs factors, sufficient income become a strong predictor for older persons to choose district hospitals, CHCs, and private hospitals. This could be explained by the fact that Vietnam's grassroots healthcare system provided nearly all care services for the poor (World Bank, 2019).

To the best of our knowledge, this was the first study in Vietnam to examine factors associated with the choices of healthcare facilities by older people, using a nationally representative survey. The findings of this study have various implications for closing the gaps in choosing healthcare facilities across different older groups and thus utilization of healthcare services, especially in consideration of the ongoing objection to achieve Universal Health Coverage. Notably, the results showed that having to pay medical costs was a strong predictor for older persons in choosing all types of healthcare facilities, while having health insurance was not a significant predictor for older persons to choose CHCs, district hospitals, and private healthcare facilities. This suggested that policy changes in both financing and services paid by health insurance need to be revised so as to help older persons to have more choices of healthcare facilities.

### Conclusions

The Vietnamese population is expected to be aged rapidly in the coming decades. That disease patterns are changing from communicable to non-communicable has posed various challenges in providing healthcare services for older people. At the same time, depending on their particular socio-economic and health conditions, older people make various decisions in choosing appropriate healthcare facilities for their health treatments. Using the Andersen's Behavioral Model, this paper could identify various factors influencing older persons in choosing healthcare facilities and indicated that it would be critically important for health policy makers to recognize and address the distinct needs of healthcare by different older persons so as to allocate appropriate networks for healthcare

facilities, particularly those which are more accessible and affordable for older persons. More specifically, we found that the urban older persons tended to choose central hospitals and provincial hospitals, while most of rural older persons tended to choose district hospitals and CHCs. Health insurance was a strong predictor for older persons to choose both central hospitals and provincial hospitals, but not for choosing private healthcare facilities. More critically, having to pay medical costs was the major reason for older people not using all kinds of healthcare facilities. These issues are important for policy makers to provide more appropriate policies and strategies so as to promote accessible and affordable healthcare services for older persons, particularly those as disadvantaged groups.

Although this study could provide some important implications, it could not avoid limitations. First, the data was from a cross-sectional survey which could not allow for causal inference between independent variables and older persons' choices of healthcare facilities. Second, the analysis was based on self-reported data which could cause measurement errors in our sample. More importantly, since non-communicable diseases (NCDs) are prevalent among older persons and these require more frequent utilisation of healthcare services. However, NCDs could be influenced by various health-risk behaviours such as lack of physical exercises and unhealthy food intake, but we could not control for these factors due to no available data in the VNAS. Third, information (such as availability of medical services, waiting time, healthcare service fees, and distance from home to healthcare facilities) was not included in the VNAS so that we could not control for these factors. Last, OOP was discussed in the paper, but due to lack of detailed amount in the data, it could not be explored further in how it could impoverish older persons' households which in turn might strongly influence older persons' choices of healthcare facilities.

### Author Contributions

Tuyet Anh Nguyen was in charge of designing the research work, data calculations and drafting the paper. Long Thanh Giang checked the data, results, and edited the paper as well as revised the paper accordingly to referees' comments/requests.

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### REFERENCES

- United Nations, Economic and Social Commission for Asia and the Pacific. *Ageing in the Asian and Pacific Region: An Overview*. UNESCAP; 2017.
- Goodkind D, Si Anh T, Cuong B. Reforming the old-age security system in Vietnam. *Southeast Asian J Soc Sci*. 1999; 27(2): 139–162.
- Ngoc TTB, Barysheva GA, Shpekht LS. The care of elderly people in Vietnam. *Eur Proc Soc Behav Sci*. 2016;72015:485–501.
- Ministry of Health (Vietnam) & Health Partnership Group (HPG). *Joint Annual Health Report 2016: Towards Healthy Aging in Vietnam*. MOH & HPG; 2018.
- Van Minh H, Phuong NT, Saksena P, James CD, Xu K. Financial burden of household out-of-pocket health expenditure in Viet Nam: findings from the National Living Standard Survey 2002–2010. *Soc Sci Med*. 2013;96:258–263.
- Nguyen MP and Wilson A. Perspective how could private healthcare better contribute to healthcare coverage in Vietnam? *Int J Health Policy Manage*. 2017;6: 305–308.
- World Health Organization. *Viet Nam: Human Resources for Health—Country Profile*. World Health Organization; 2016.
- World Health Organization. *WHO 2000 Report: Health Systems—Improving Performance*. World Health Organization; 2000.
- World Bank. *Live Long and Prosper: Aging in Asia and Pacific*. World Bank; 2016.
- Ikumi M, Ho LE, Anh Q, Hiroyuki Y, Tam NM. Patient choice of healthcare facilities in the central region of Vietnam. *J Int Coop Stud*. 2017;25:47–64.
- Vuong QH and Nguyen TK. Vietnamese patients' choice of healthcare provider: In search of quality information. *Int J Behav Healthcare Res*. 2015;5:184.
- Blackwell DL, Martinez ME, Gentleman JF, Sanmartin C, Berthelot J-M. Socioeconomic status and utilization of health care services in Canada and the United States. *Med Care*. 2009;47:1136–1146.
- Gil M-R, Choi CG. Factors affecting the choice of national and public hospitals among outpatient service users in South Korea. *Inquiry*. 2019;56:46958019833256.
- Davidson PL, Andersen RM, Wyn R, Brown ER. A framework for evaluating safety-net and other community-level factors on access for low-income populations. *Inquiry*. 2004;41:21–38.
- Andersen RM. Revisiting the behavioral model and access to medical care: does it matter? *J Health Soc Behav*. 1995;36:1–10.
- Pregibon D. Goodness of link tests for generalized linear models. *Appl Stat* 1980;29:15.
- World Bank. *Vietnam National and Provincial Primary Health Care Scorecards*. World Bank; 2019.
- Le NQ, Blizzard L, Si L, Giang LT, Neil AL. The evolution of social health insurance in Vietnam and its role towards achieving universal health coverage. *Health Policy Open*. 2020;1:100011.
- Acharya S, Ghimire S, Jeffers EM, Shrestha N. Health care utilization and health care expenditure of Nepali older adults. *Front Public Health*. 2019;7:24.
- van der Wielen N, Falkingham J, Channon AA. Determinants of National Health Insurance enrolment in Ghana across the life course: Are the results consistent between surveys? *Int J Equity Health*. 2018;17:49.
- Giang TL, Phong PM. Utilization and financial burden of healthcare services for older people in Vietnam (in Vietnamese). *Econ Stud*. 2017;12:45–54.
- Lee HY, Oh J, Hoang VM, et al. Use of high-level health facilities and catastrophic expenditure in Vietnam: can health insurance moderate this relationship? *BMC Health Serv Res*. 2019;19:318.
- Aung NC, Rechel B, Odermatt P. Access to and utilisation of GP services among Burmese migrants in London: a cross-sectional descriptive study. *BMC Health Serv Res*. 2010;10:2855.
- Jiang M, Yang G, Fang L, Wan J, Yang Y, Id YW. Factors associated with healthcare utilization among community-dwelling elderly in Shanghai, China. *PLoS One*. 2018;13:e0207646.
- Ayenew M, Negin J, Moller J, Farell P, Yawson AE. Predictors of public and private healthcare utilization and associated health system responsiveness among older adults in Ghana. *Glob Health Action*. 2017;10:1301723.
- Gong CH, Kendig H, He X. Factors predicting health services use among older people in China: an analysis of the China Health and Retirement Longitudinal Study 2013. *BMC Health Serv Res*. 2016;16:63.
- Ameh S, Gómez-Olivé FX, Kahn K, Tollman SM, Klipstein-Grobusch K. Predictors of health care use by adults 50 years and over in a rural South African setting. *Glob Health Action*. 2014;7:24771.
- Le DD, Leon-Gonzalez R, Giang TL, Nguyen AT. Socio-economic-related health inequality in non-communicable diseases among older people in Vietnam. *Ageing Soc*. 2021;41:1421–1448.
- Giang TL, Pham THT, Pham LT. Social health insurance in health care for older people in Vietnam. *J Econ Dev*. (in Vietnamese), 2016; 231(II): 38–48.