Health Services Utilization Among Older Adults in Vietnam: Evidence From the National Household Living Standard Survey 2016

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Abstract
This study—using multinomial logistic regressions—analyzed a national sample of 2977 older adults to examine factors associated with their health services utilization in four types of health providers—namely, commune health stations (CHSs), private clinics, private hospitals, and public hospitals in Vietnam. Older Vietnamese favored using public hospitals for their health consultancies, even for regular health checkups. For nonsevere illness, the relative risk ratio of choosing private clinics was three times (95% CI: 2.2-4.1) that of CHSs. Possession of public health insurance was a key enabling factor that influenced the older adults’ choice of CHSs over private clinics. Older adults of ethnic minority and living in rural areas were more likely to use CHSs than other health facilities. This study suggests a substantial quality improvement of services at CHSs, an innovative reform toward a diversified structure of private and public clinics to address diverse needs and to strengthen primary care for older adults.

Keywords
health disparity, older adults, primary care, private clinics, utilization, Vietnam

What We Already Know
- Asia Pacific countries have experienced an unprecedented rise in the ageing population.
- Many earlier studies primarily focused on understanding the health service utilization for common health problems in seniors.
- There is a knowledge gap on service choices by older adults in various health providers in Vietnam.

What This Article Adds
- Older Vietnamese tended to visit public hospitals for their health consultancies.
- People covered by public health insurance preferred CHSs to private clinics.
- Older adults with nonsevere illness were more likely to choose private clinics over CHSs.

Background
The Asia Pacific region has seen an unprecedented rise in the ageing population. The number of older adults accounted for 60% of the world’s population in 2019 and is projected to hit 1.3 billion by 2050. Consequently, health systems of both high-income and low- and middle-income countries face challenges to adapt to changing health profiles, to meet the growing needs and demands for health care, and to acquire equal health care access among older adults. Vietnam is a lower-middle-income country in the region that has been experiencing a substantially fast rate of population ageing. The country had more than 11 million older people, accounting for about 11.95% of the population in 2017. This elderly population is forecast to comprise 25% of the population by 2050.

The Vietnam health system shares challenges with those of Asia Pacific countries to serve an ageing population. Health care demands significantly increase because more than two-thirds of the older people had at least one motor difficulty, and many lived with disabilities. The increase of

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chronic noncommunicable diseases (NCDs) has triggered the health system to expand its capacity to prevent, manage, and treat those diseases. Furthermore, health disparities concerning the quality of life, health-seeking behavior, health care access, and utilization had been observed in elderly populations who differed in terms of socioeconomic status, gender, and rural-urban residence.

Vietnam adopts social health insurance to cover the medical costs for most of its population. Currently, there are two types of health insurance for older adults—that is, social health insurance and private health insurance. Older adults under the social health system can either get free health care (hereafter called Medicaid scheme) or get a partial payment for their health costs (public health insurance scheme) if they visit their registered public facilities. Medicaid is for the poor, those with disabilities, and adults >80 years old. The public health insurance scheme is for the others and covers up to 80% of their eligible medical costs. Older people can also enroll voluntarily in private health insurance programs that cover their medical costs based on their specific contracts with health insurance companies. Before 2016, insured older adults—who bypassed registered primary care clinics without an appropriate medical doctor’s referrals—would have to co-pay at increasing rates depending on whether bypassing secondary or tertiary hospitals. However, the co-pay rates gradually reduced, and full expense coverage in most cases of bypassing have been implemented since 2021.

The Vietnamese system of health service delivery comprises both public and private providers, of which the former is dominant. According to the Vietnam Ministry of Health (2018), there were respectively 1192 and 228 public and private hospitals, 11,819 commune health stations (CHSs), and roughly 30,000 private clinics. In the public health system, CHSs are the first point of contact of seeking medical care. Their roles are to provide primary care, manage NCDs in the community, and promptly transfer older adults to adequate hospitals at the district, provincial, and national levels for further needed secondary and tertiary care. Private providers, however, are developing based on the need of the community, with a significant rise in private clinics that offer several types of outpatient and curative services. Meanwhile, hospital beds of the private sector accounted for only 6% of the total beds and were usually located in big cities.

Most highly skilled doctors and nurses are now working in secondary and tertiary public hospitals. Consequently, there is a shortage of skilled staff in CHSs. Meanwhile, private clinics attracted many skilled doctors and nurses from the public sector to work overtime (out of their working hours). Public hospitals offer more comprehensive, technically sophisticated services, whereas private hospitals usually focus on medical specialties, the easier-to-do, and highly remunerated services. In general, medical costs with public providers are lower than with most private providers because the government subsidizes the medical fees for public providers. However, the cost with private providers would be affordable to some more affluent older adults (with their out-of-pocket payment).

Health services provided by different providers in the delivery system need to be adequately organized to facilitate optimal use at the national and regional levels in Vietnam. Therefore, it is critical to understand changes in the health utilization pattern in older adults, which would help better meet their health care needs and obtain equity in health care access. Most existing studies on health care utilization primarily focused on specific diseases or conditions such as NCDs, gastrointestinal diseases, and musculoskeletal disorders, which were common health problems in seniors. Therefore, they could not provide an overall picture of the health care utilization for other health care needs such as regular health checkups or severe illness. In addition, they overlooked the service use in public and private providers that would contribute to an optimal cooperation between private and public providers toward enhancing the capacity of the health system. To address this gap, this study aims to examine factors that are associated with the health care utilization of older adults in four main types of health providers in Vietnam.

**Methods**

**Data**

The study used secondary data from the Vietnam Household Living Standard Survey (VHLSS) conducted regularly once every two years by the Vietnam General Statistics Office. With the aim of monitoring the living standards of different population groups, this cross-sectional survey has been carried out since 1991, applying the “Living Standards Measurement Study” method of the World Bank. This study analyses the VHLSS conducted in 2016, published in 2018 (the most recent wave implemented in 2018 was not published at the time of conducting this study). The survey used a cluster-randomized stratified sample to collect data, so that it was representative both nationally and regionally. Information was collected via face-to-face interviews with household heads and key officials at the commune level. It covered individual factors of health-seeking behavior such as information on the demographic and socioeconomic characteristics of each member of the household and health service utilization over the past 12 months from the time of interviews. This study included all older adults ≥60 years old, who were defined as older people by the Law on the Elderly in Vietnam.

**Variables of Interest and Measurements**

The selection of dependent and explanatory variables was based on Andersen’s Behavioral Model of Health Services...
Use and the availability of data in VHLSS 2016. According to this model, three groups of factors are determinants of health service utilization: predisposing, enabling, and medical need factors. Predisposing factors are those that exist prior to a patient’s illness. They consist of both demographic and social factors such as age, gender, place of residence, and ethnicity and education levels. Enabling factors (per capita income levels and health insurance) refer to available resources that make people possible to choose health services. Medical need factors include illness perceived by individuals and assessed by health professionals.

Dependent variables were the choice of health care providers. Respondents were asked which type of medical establishments (health care providers) they visited for each of their visits. The types of health care providers were recoded as 0, 1, 2, and 3 correspondingly to the visit made in CHSs, private clinics, private hospitals, and public hospitals.

Explanatory variables were classified into three groups. Key predisposing variables are described as follows. Older adults were classified into three age groups (60-69, 70-79, and >80 years old) that substantially differed in terms of medical needs, policy, and social benefits.11,23 Their gender was coded as male and female. Their ethnicity was classified into majority and minority groups of which the ethnic minority were considered as a vulnerable population by the government. Most of them lived in remote and mountainous regions in northern, central, and western Vietnam.24 An older adult’s level of education was classified into three categories: primary school and lower, secondary and high school, and college and higher. Their marital status was coded as single and with partners/spouse. The place of residence included urban or rural areas, and socioeconomic regions. Vietnam is geographically divided into six socioeconomic regions—namely, the Red River Delta, the Northern Midlands and Mountainous areas, the North Central and Central Coastal areas, the Central Highlands, the Southeast area, and the Mekong River Delta. The Southeast and the Red River Delta areas are the most affluent, whereas the North Central and Central Coastal areas and the Central Highlands are the lowest income regions.

Health insurance and income were enabling features that would affect the capability of accessing needed health services. The health insurance variable was classified into four states: no health insurance, Medicaid, public health insurance, and private health insurance. Personal incomes were divided into five quintiles. The most affluent older people belonged to the highest income quintile.

In terms of medical needs, the older people were asked whether their specific visits were regular health checkups, nonsevere illness, or severe illness. Severe illness designated as “a severe injury/illness that a patient has to be taken care of by a bedside caregiver or could not participate in normal activities.”20

### Data Analysis

This study used a visit to a health care facility as a unit of analysis. An older adult could have many visits over the past 12 months from the time of interviews. As the data did not provide any information on the chronicle and relationship between different visits of the same person, all their medical visits were assumed to be independent of each other. The frequency distribution of health care visits by the demographic, socioeconomic profile, and levels of illness was analyzed for four types of providers. Multinomial logistic regressions were performed to quantify the effect of the predisposing, enabling, and needs factors on the use of health care service for four providers. The propensity of CHS visits was used as the base in the estimation to compare with those of private clinics and private and public hospitals. Results were expressed as relative risk ratio (RRR) of using private clinics and private and public hospital versus CHSs, with a 95% CI. All data analysis was done by Stata software version 15.

### Results

The sample extracted from VHLSS 2016 included 2977 individuals >60 years old, for a total of 3892 visits in all private and public hospitals, and clinics. Of these, 2318 visits (59.6%) were in public hospitals, 749 (19.2%) in CHSs, 689 (17.7%) in private clinics, and 136 (3.5%) in private hospitals. There were 754 people (25.3%) who visited health providers more than once (ranging from two to five times).

As shown in Table 1, the proportion of women (60%) was much larger than that of men (40%). This proportion is relatively similar to the overall national rate (ranging from 58.7% to 61.1% over the past two decades), reflecting the feminization of the ageing trend in Vietnam, which is the highest in the ASEAN region.4 More than half of the total older people were in the 60 to 69 years age group. Most of them (two-thirds) resided in rural areas. A substantial proportion (35%) were living in the Mekong delta region. More than half of these people had education at junior level and lower. Close to 11% of older adults were not covered by any health insurance schemes.

Table 2 illustrates the proportion of medical visits that older people made in CHSs, private clinics, and private and public hospitals. The proportion of public hospital visits was significantly high, ranging from 52% to roughly 74% of total health visits. Even for regular health checkups, 60% of total visits were made in public hospitals. This proportion was relatively lower for nonsevere illness and substantially higher for severe illness.

There were large disparities in using public hospitals by ethnicity and urban-rural areas. Specifically, older people of ethnic minority and living in rural areas used fewer public hospitals and more CHSs than those of the ethnic majority,
living in urban areas. In contrast, private clinics and private hospitals were favored by the older people residing in urban areas and of the ethnic majority. Close to 40% of uninsured visits were made in private clinics.

Factors Associated With Health Services Utilization in Different Health Providers

Table 3 presents maximum likelihood estimates of a multinomial logistic model using the utilization in CHSs as the base to compare the RRR of health care utilization in other types of health providers, adjusted for individuals’ demographics, medical needs, and socioeconomic characteristics.

The likelihood of choosing private clinics over CHSs for nonsevere illness was three times (95% CI: 2.2-4.1) that for regular health checkups. For severe illness, the relative likelihood ratios of using private clinics, public hospitals, and private hospital over CHSs were even higher, at RRRs of 4.3 (95% CI: 2.9-6.3), 4.2 (95% CI: 2.4-7.4), and 4 (95% CI: 3.0-5.3), respectively.

Ethnicity and urban-rural residence were the most important predisposing factors affecting health services utilization. Older Vietnamese living in urban areas were much more likely to use private clinics, private hospitals, and public hospitals than those living in rural areas. Also, people in the ethnic majority group have much higher likelihoods of using private clinics, private hospitals, and public hospitals—2.9 times (95% CI: 1.8-4.4), 7.7 times (95% CI: 2.3-25.6), and 2.5 times (95% CI: 1.9-3.5), respectively, compared with people in the minority group. However, age groups and gender did not significantly link to the choice of health care providers.

Availability and beneficial levels of health insurance, not personal income, were enabling predictors of using CHSs, private clinics, and public hospitals but not significantly linked to the use of private hospitals. The relative likelihood ratio of choosing private clinics over CHSs by older adults who had Medicaid and public health insurance were, respectively, 0.4 times (95% CI: 0.3-0.5) and 0.5 times (95% CI: 0.3-0.6) compared to those without health insurance. This means that people with Medicaid and public health insurance were 176% and 120% more likely to visit CHSs than private clinics. In addition, older adults with public health insurance were more likely to use public hospitals than uninsured older adults.

Discussion and Conclusions

The study finds that ethnicity, urban-rural living areas, possession of health insurance, and levels of illness were significant determinants of choosing different health care providers in Vietnam. Ethnicity and urban-rural areas were key predisposing factors associated with disparity of health care access in the older subpopulation. Older Vietnamese in the ethnic majority group and living in urban areas had more opportunities to access private clinics, private hospitals, and public hospitals than those from ethnic minority groups and those living in rural areas, who were limited to using CHSs. This finding corroborates the evidence of inequity in access to quality health care among disadvantaged older adults in Vietnam, suggesting that further social, medical, and health care support is needed from the government and relevant stakeholders for these population groups. Most of the older Vietnamese population resides in rural areas. Therefore, one of the key interventions should be to improve the capacity

| Variables                  | Total number (n) | Percentage |
|----------------------------|-----------------|------------|
| Gender                     |                 |            |
| Male                       | 1207            | 40.5       |
| Female                     | 1770            | 59.5       |
| Age (years)                |                 |            |
| 60-69                      | 1568            | 52.7       |
| 70-79                      | 820             | 27.5       |
| >80                        | 589             | 19.8       |
| Marital status             |                 |            |
| With a spouse/partner      | 1840            | 56.4       |
| Single                     | 574             | 43.7       |
| Ethnicity                  |                 |            |
| Minority                   | 280             | 9.4        |
| Majority                   | 2697            | 90.6       |
| Place of residence         |                 |            |
| Urban                      | 971             | 32.6       |
| Rural                      | 2006            | 67.4       |
| Socioeconomic regions      |                 |            |
| Red River Delta            | 259             | 19.7       |
| Midlands and Northern      | 141             | 10.7       |
| Mountains                  |                 |            |
| Northern and Coastal       | 295             | 22.4       |
| Central                    |                 |            |
| Central Highlands          | 64              | 4.9        |
| Southeast                  | 96              | 7.3        |
| Mekong Delta               | 460             | 35.0       |
| Education level            |                 |            |
| Junior school and lower    | 1601            | 56.1       |
| Middle and senior school   | 1068            | 37.4       |
| College and higher         | 184             | 6.5        |
| Health insurance           |                 |            |
| Not covered                | 323             | 10.9       |
| Medicaid                   | 1466            | 49.2       |
| Public health insurance    | 1173            | 39.4       |
| Private health insurance   | 15              | 0.5        |
| Income quintiles           |                 |            |
| 1, Lowest                  | 630             | 20.2       |
| 2                          | 592             | 19.9       |
| 3                          | 604             | 20.3       |
| 4                          | 595             | 20.0       |
| 5, Highest                 | 583             | 19.6       |
and quality of CHSs, especially for primary care, to provide quality health services to older people equally. Although the government has recently targeted strengthening the capacity of primary health facilities to serve the prevention and treatment of NCDs,²⁵ this plan needs to focus to meet the health needs of older people of ethnic minority and living in rural areas especially.

Similar to several studies in other Asia Pacific countries such as China²⁶ and Indonesia,²⁷ this study confirms the importance of health insurance, which has a significant impact on health care access of older people in Vietnam. It is important to highlight that 11% of older adults are still uninsured in Vietnam. Along with ageing, older people are increasingly likely to suffer from many health problems.

**Table 2. Frequency Distribution of Health Care Visits in Various Health Providers.**

| Variables               | Total number of visits (n) | CHSs visits (%) | Private clinic visits (%) | Private hospital visits (%) | Public hospital visits (%) |
|-------------------------|----------------------------|-----------------|---------------------------|----------------------------|---------------------------|
| Level of illness        |                            |                 |                           |                            |                           |
| Health checkups         | 848                        | 27.6            | 9.1                       | 3.0                        | 60.3                      |
| Nonsevere illness       | 2021                       | 20.6            | 24.1                      | 3.4                        | 51.9                      |
| Severe illness          | 1023                       | 9.7             | 12.2                      | 3.9                        | 74.2                      |
| Gender                  |                            |                 |                           |                            |                           |
| Male                    | 1538                       | 16.8            | 16.8                      | 3.1                        | 63.3                      |
| Female                  | 2354                       | 20.9            | 18.3                      | 3.7                        | 57.1                      |
| Age (years)             |                            |                 |                           |                            |                           |
| 60-69                   | 2048                       | 17.8            | 19.2                      | 3.9                        | 59.1                      |
| 70-79                   | 1079                       | 21.6            | 15.0                      | 3.5                        | 59.9                      |
| >80                     | 765                        | 19.9            | 17.4                      | 2.3                        | 60.4                      |
| Marital status          |                            |                 |                           |                            |                           |
| Single                  | 1518                       | 23.3            | 18.5                      | 3.2                        | 55.0                      |
| With a spouse/partner   | 2374                       | 16.6            | 17.2                      | 3.7                        | 62.5                      |
| Ethnicity               |                            |                 |                           |                            |                           |
| Minority                | 347                        | 40.4            | 10.7                      | 1.20                       | 47.8                      |
| Majority                | 3545                       | 17.2            | 18.4                      | 3.7                        | 60.7                      |
| Place of residence      |                            |                 |                           |                            |                           |
| Urban                   | 213                        | 9.8             | 17.6                      | 4.6                        | 68.0                      |
| Rural                   | 476                        | 23.5            | 17.7                      | 3.0                        | 55.8                      |
| Socioeconomic regions   |                            |                 |                           |                            |                           |
| Red River Delta         | 911                        | 16.0            | 15.3                      | 3.4                        | 65.3                      |
| Midlands and Northern Mountains | 392                     | 30.1            | 7.1                       | 2.8                        | 60.0                      |
| Northern and Coastal Central | 885                    | 22.3            | 14.0                      | 2.7                        | 61.0                      |
| Central Highlands       | 183                        | 18.0            | 19.1                      | 4.4                        | 58.5                      |
| Southeast               | 412                        | 12.4            | 12.9                      | 5.1                        | 69.7                      |
| Mekong Delta            | 1109                       | 18.4            | 28                        | 3.7                        | 49.9                      |
| Education level         |                            |                 |                           |                            |                           |
| Junior school and lower | 2152                       | 20.8            | 19.1                      | 3.4                        | 56.7                      |
| Middle and senior school| 1345                       | 16.4            | 16.4                      | 3.6                        | 63.6                      |
| College and higher      | 226                        | 8.9             | 13.3                      | 4.4                        | 73.4                      |
| Health insurance        |                            |                 |                           |                            |                           |
| Not covered             | 399                        | 17.3            | 39.6                      | 3.5                        | 39.6                      |
| Medicaid                | 1953                       | 22.8            | 14.2                      | 2.5                        | 60.5                      |
| Public health insurance | 1520                       | 15.3            | 16.6                      | 4.7                        | 63.4                      |
| Private health insurance| 20                         | 15.0            | 5.0                       | 5.0                        | 75.0                      |
| Income quintiles        |                            |                 |                           |                            |                           |
| 1, Lowest               | 779                        | 20.4            | 14.5                      | 3.5                        | 61.6                      |
| 2                       | 779                        | 17.5            | 18.0                      | 2.0                        | 62.5                      |
| 3                       | 778                        | 20.4            | 20.3                      | 3.0                        | 56.3                      |
| 4                       | 779                        | 19.0            | 17.8                      | 4.5                        | 58.7                      |
| 5, Highest              | 777                        | 18.9            | 17.9                      | 4.5                        | 58.7                      |

Abbreviation: CHSs, commune health stations.
Having health insurance is a key driver of seeking and getting access to needed health services without financial hardship.\textsuperscript{13} Therefore, interventions should address the main barriers that prevent the older population from having health insurance. Those barriers have been identified in Vietnam as affordability, poor knowledge of health insurance benefit and

| Table 3. Multinomial Logistic Regression Analysis of the Use of Clinics and Hospitals\textsuperscript{a}. |
|-----------------------------------------------|
| Variables                      | Choice of private clinics over CHSs | Choice of private hospitals over CHSs | Choice of public hospitals over CHSs |
|-----------------------------------------------|
| Level of illness                  | RRR  | 95% CI  | RRR  | 95% CI  | RRR  | 95% CI  |
| Health checkups                  | 1.0  | 1.0    | 1.0  | 1.0    | 1.0  | 1.0    |
| Nonsevere illness                | 3.0  | 2.2-4.1\textsuperscript{b} | 1.3  | 0.8-2.2 | 1.2  | 1.0-1.5 |
| Severe illness                   | 4.3  | 2.9-6.3\textsuperscript{b} | 4.2  | 2.4-7.4\textsuperscript{b} | 4.0  | 3.0-5.3\textsuperscript{b} |
| Gender                          |      |        |      |        |      |        |
| Male                            | 1.0  | 1.0    | 1.0  | 1.0    | 1.0  | 1.0    |
| Female                          | 0.9  | 0.7-1.1 | 1.2  | 0.8-1.8 | 0.9  | 0.7-1.1 |
| Age (years)                     |      |        |      |        |      |        |
| 60-69                           | 1.0  | 1.0    | 1.0  | 1.0    |      |        |
| 70-79                           | 0.7  | 0.5-0.9 | 0.8  | 0.5-1.2 | 0.8  | 0.7-1   |
| >80                             | 1.0  | 0.8-1.4 | 0.7  | 0.4-1.3 | 1.0  | 0.8-1.3 |
| Marital status                  |      |        |      |        |      |        |
| Single                          | 1.0  | 1.0    | 1.0  | 1.0    |      |        |
| With a spouse/partner           | 1.2  | 0.9-1.5 | 1.5  | 1.0-2.2 | 1.4  | 1.0-1.7\textsuperscript{b} |
| Ethnicity                       |      |        |      |        |      |        |
| Minority                        | 1.0  | 1.0    | 1.0  | 1.0    | 1.0  | 1.0    |
| Majority                        | 2.9  | 1.8-4.4\textsuperscript{b} | 7.7  | 2.3-25.6\textsuperscript{b} | 2.5  | 1.9-3.5\textsuperscript{b} |
| Place of residence              |      |        |      |        |      |        |
| Rural                           | 1.0  | 1.0    | 1.0  | 1.0    | 1.0  | 1.0    |
| Urban                           | 2.2  | 1.6-2.9\textsuperscript{b} | 2.7  | 1.7-4.2\textsuperscript{b} | 2.5  | 1.9-3.5\textsuperscript{b} |
| Socioeconomic regions           |      |        |      |        |      |        |
| Northern Midlands and Mountains | 1.0  | 1.0    | 1.0  | 1.0    | 1.0  | 1.0    |
| Red River Delta                 | 1.9  | 1.1-3.3\textsuperscript{c} | 1.0  | 0.4-2.1 | 1.2  | 0.9-1.8 |
| Northern Central and Coastal areas | 1.3  | 0.8-2.2 | 0.6  | 0.3-1.4 | 0.9  | 0.6-1.3 |
| Central Highlands               | 2.2  | 1.1-4.3\textsuperscript{c} | 1.5  | 0.5-4.3 | 1.2  | 0.7-1.9 |
| Southeast                       | 1.4  | 0.8-2.7 | 1.5  | 0.6-3.5 | 1.5  | 0.9-2.2\textsuperscript{c} |
| Mekong Delta                    | 2.8  | 1.7-4.7\textsuperscript{b} | 1.0  | 0.4-2.1 | 1.0  | 0.7-1.4 |
| Education level                 |      |        |      |        |      |        |
| Junior school and lower         | 1.0  | 1.0    | 1.0  | 1.0    | 1.0  | 1.0    |
| Middle and senior school        | 1.2  | 1.0-1.6 | 1.1  | 0.7-1.8 | 1.2  | 1.0-1.5 |
| College and higher              | 1.2  | 0.6-2.2 | 1.6  | 0.7-3.6 | 1.6  | 1.0-2.8 |
| Type of health insurance        |      |        |      |        |      |        |
| Not covered                     | 1.0  | 1.0    | 1.0  | 1.0    | 1.0  | 1.0    |
| Medicaid                        | 0.4  | 0.3-0.5\textsuperscript{b} | 0.8  | 0.4-1.5 | 1.3  | 0.9-1.8 |
| Public health insurance         | 0.5  | 0.3-0.6\textsuperscript{b} | 1.2  | 0.6-2.4 | 1.5  | 1.1-2.1\textsuperscript{c} |
| Private health insurance        | 0.1  | 0.0-1.2 | 1.0  | 0.1-11.1 | 1.0  | 0.8-1.3 |
| Income quintiles                |      |        |      |        |      |        |
| 1, Lowest                       | 1.0  | 1.0    | 1.0  | 1.0    | 1.0  | 1.0    |
| 2                               | 1.5  | 1.0-2.1\textsuperscript{b} | 0.7  | 0.4-1.4 | 1.2  | 0.9-1.6 |
| 3                               | 1.4  | 1.0-2.0\textsuperscript{b} | 0.9  | 0.4-1.7 | 1.0  | 0.7-1.3 |
| 4                               | 1.3  | 0.9-1.9 | 1.4  | 0.8-2.5 | 1.0  | 0.8-1.3 |
| 5, Highest                      | 1.2  | 0.9-1.7 | 1.3  | 0.7-2.3 | 1.0  | 0.8-1.3 |

\textsuperscript{a}RRR is the relative risk ratio measuring the relative likelihood ratio of choosing a certain type of health care facility over commune health stations (CHSs) when a characteristic variable differs from its reference value.
\textsuperscript{b}P < .01.
\textsuperscript{c}P < .05.
advantage, misleadingly perceived quality of services, and complexity of and long waiting times in the public insurance enrollment process.28

Interestingly, this study found that personal income did not affect health services utilization in public and private hospitals. However, income has been found to be linked to self-rated health in many previous studies in Vietnam9,23 and other settings.29 A possible explanation is that health insurance with at least 80% coverage on health expenses might play a more important role in older people’s health-seeking behavior in Vietnam.

Remarkably, older Vietnamese were more likely to use public hospitals for all levels of illness, even for regular health checkups, bypassing CHSs. Because of a lack of skilled staff, essential equipment, and medication, especially for the prevention and control of NCDs, CHSs were often underutilized and were not responsive to the health care needs of older people.8,30 As Vietnam aims to apply a primary care-based model for older adults where CHSs provide primary care for prevention and treatment of NCDs, reorganizing services and improving services quality at CHSs are critical to regaining health care trustworthiness from older adults. Furthermore, older Vietnamese chose private clinics for nonsevere illness rather than CHSs. This health-seeking behavior could be a result of several facts: health care costs for nonsevere illness are affordable even without reimbursement from social health insurance and consumers would be more likely to choose private providers because of short waiting times, personalized care, and proximity. This finding suggests that an innovative reform toward a diversified structure of private and public clinics is necessary to address the diverse needs of older adults.

This study is limited by the available data in the survey. Thus, it cannot examine the effect of social support, such as accessing health information, getting helped by a caregiver or a social worker, and home living arrangements, on the use of health services by older people. Also, it cannot identify the reasons why people with public health insurance bypass their registered facilities. Another limitation is that we assumed that an individual’s health visits were independent of each other during the survey time. The visits could be highly correlated with each other. Finally, this study did not consider the distance to reach health facilities, which could hinder older adults’ access to health facilities. Living in remote and mountainous regions, for most older adults from ethnic minorities, it can be geographically easier to access CHSs than public and private hospitals.

In conclusion, the study highlights several key implications about the health-seeking behavior of older adults for health care providers. It suggests that a substantial quality improvement of services at CHSs and an innovative reform toward a diversified structure of private and public clinics is necessary to address diverse needs and to strengthen primary care for older adults. Finally, the case of Vietnam would be of interest to other countries in Asia Pacific regions that experience similar issues of caring for a growing ageing population.

Acknowledgments
The views expressed in this article are fully the author’s responsibility and do not necessarily reflect the views of the organizations the author works for. I am grateful to Dr. Chi Nguyen, Indiana University, USA, for her comments on the logistic regression analysis.

Declaration of Conflicting Interests
The author declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding
The author received no financial support for the research, authorship, and/or publication of this article.

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