Willingness to Join Community-Based Health Insurance in Vientiane Capital's Informal Sector: Cross-Sectional Study

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ABSTRACT

Community-based health insurance (CBHI) was a voluntary scheme for the informal sector with low enrollment; only 3% of households participated. This study aims to identify the factors influencing households' willingness to enrol in CBHI in Vientiane Capital, Lao PDR. A cross-sectional study was conducted through face-to-face questionnaires during July-August 2024. 65.5% of Laotians were willing to enrol in the CBHI. The study revealed that participants over the age of 33 exhibited a willingness to enroll was 1.93 times greater than of participants aged 33 or younger (AOR 1.93, 95% CI 1.17-3.19). Individuals with a higher ability to pay were 2.72 times more willing to enrol (AOR 2.72, 95% CI 1.59-4.63) than those with a lower perceived ability to pay. Participants who reported low premiums influenced their decision to enrol were 4.25 times more willing to enrol (AOR 4.25, 95% CI 2.52-7.15), while those emphasising benefits packages were 2.08 times more willing to enrol (AOR 2.08, 95% CI 1.22-3.56). Perceived healthcare service quality indicated that better, more affordable access to healthcare services was associated with a 2.02-fold higher likelihood of enrolment (AOR 2.02, 95% CI 1.22-3.35). Participants who reported experiencing limited physicians when visiting hospitals indicated a willingness to enrol 1.72 times more than those who reported such access (AOR 1.72, 95% CI 1.03-2.87). Individuals with family members in CBHI were 1.83 times more likely to enrol than those without such connections (AOR 1.83, 95% CI 1.03-3.25).

Households were highly willing to enrol in CBHI, driven significantly by older age, high ability to pay, low premium, benefits package, and the perception of financial accessibility, had experienced limited access to physicians when visiting hospitals, including relatives with CBHI members, influenced willingness to enrol.

Keywords: Community-Based Health Insurance, Household, Health insurance, Willingness

INTRODUCTION

Rationale of the study

Universal Health Coverage (UHC) is SDG target 3.8, aiming to provide financial protection, quality healthcare, and affordable medicines and vaccines. To achieve UHC, governments should use National Health Insurance as voluntary or mandatory health insurance, according to the World Health Organisation's suggestion (1). The State Authority for Social Security (SASS) was introduced in 1995 in Lao PDR to cover civil servants and their dependents. In 2001, the Social Security Organisation (SSO) was established to cover private employees and their dependents, both managed by the Ministry of Labour and Social Welfare (2). The Community-Based Health Insurance started in 2002 to provide coverage for the informal sector. The Health Equity Fund (HEF) was set up

in 2004 to provide fully paid coverage to the poor. However, the CBHI had limited population coverage, with only 3% enrolment rates (3). In 2010, the Free Maternal, Neonatal and Child Health (FMNCH) services policy was implemented to enhance health services utilisation. Finally, in 2016, the National Health Insurance (NHI) was merged with the pre-existing schemes under the Ministry of Health (MOH) CBHI, HEF, and FMNCH and was swiftly rolled out to all provinces in 2017 (2).

The Lao PDR government introduced UHC in 2013 to achieve UHC by 2025. One of the key objectives was to extend social health protection to a substantial portion of the population and attain coverage of 80% by 2020. The implementation of national health insurance has been highly successful in expanding population coverage, reaching an impressive 94% by 2023 (4). However, the NHI was not implemented in Vientiane Capital; as a result, the CBHI scheme continued to operate as a voluntary option for financial health protection (2). In 2023, the Vientiane population was 1,009,269. Only 42% of the population is covered by the health insurance system. The CBHI scheme, which is voluntary, covers just 3% and is still being launched in Vientiane. Because Vientiane has not implemented the NHI, the health insurance system does not cover the remaining 58% of the population, resulting in a high number of informal workers, approximately 65% of Vientiane's population (5). Worldwide, approximately 200 million people are exposed to financial difficulties due to out-of-pocket (OOP) expenses for healthcare services annually (6, 7).

Most low- and middle-income countries (LMICs) face sustainability challenges in their healthcare systems. In these countries, OOP payments make up a significant proportion of healthcare expenditures (8). Relying solely on OOP payments to finance healthcare systems can lead to catastrophic healthcare expenditures for households (9, 10).

However, 1.3 billion people globally lack access to the most basic healthcare (11). The situation is more serious in developing countries while governments still strive to tackle poverty (12). In addressing this issue, the development of health insurance is generally recognised as an important strategy to achieve UHC (13). For health insurance systems, e.g. social health insurance and CBHI, individuals, households, and organisations directly pay the premium based on the employee's salary or means of income (14).

The CBHI is a low-cost scheme widely accepted to improve equity in rural healthcare in developing countries (11). South Korea is frequently cited as a successful example of implementing lessons learned from developing countries. The country is especially lauded for its rapid achievement of UHC through national health insurance. Additionally, Ghana and Rwanda are highlighted as LMICs that have successfully achieved UHC in terms of population coverage (11). However, in many African countries, both public and private health insurance primarily cater to the formal sector, reaching only about 10% of the population. With the majority of the population working in the informal sector, several African countries have started to introduce the CBHI scheme (15). The enrolment rates of the CBHI scheme worldwide vary from less than 10% to 92%, specifically in LMICs, which is extremely low in West Africa, with only Ghana and Rwanda above 90% (8).

In Lao PDR, the Ministry of Labour and Social Welfare (MLSW) manages health insurance schemes for formal sector workers, including the civil servant scheme, established in 1995 for government staff and their dependents. In 2001, private employees and their dependents were included in the Social Security Organisation (SSO) scheme for social health protection coverage. In 2002, the Government implemented initiatives to expand healthcare coverage to informal sectors, including a voluntary health insurance scheme called CBHI initiated by the MOH. Moreover, in 2004, the MOH established the HEF to assist the healthcare requirements of underprivileged and marginalised individuals. The fund is financially supported by donors and not only provides healthcare benefits but also offers additional perks such as daily allowances and transportation fees to support the poor. In 2010, the FMNCH policy provided free care for children under five and maternal care for pregnant women, including delivery, antenatal, and postnatal care (5).

The NHI scheme merged the pre-existing schemes under the MOH (CBHI, HEF, and FMNCH) was set in motion in 2016 and rapidly rolled out to all provinces (except Vientiane) in 2017 under Decree 470/PM. The situation in Lao PDR is similar to other countries that have relied on voluntary health insurance to cover the informal sector. The CBHI has been in operation since 2001 with support from various donors. There are two membership categories available: 1) Option 1: Members can seek treatment directly at the central hospital; 2) Option 2: Members are required first to visit the district hospital and then obtain a referral to the central hospital, which

offers multiple payment options, including 3, 6, 9, and 12 months, as shown on the CBHI webpage and in brochures. The membership card will be ready within a month after enrollment. Members can choose or switch the health insurance option at signup or by maintaining active payments. Existing members can switch between options 1 and 2 based on their eligibility period. However, data from a previous study indicates that after 23 years of operation, the scheme has only managed to cover slightly over 3% of the population in Vientiane Capital, Lao PDR, in its efforts to achieve UHC through voluntary insurance (5, 16). The significant factors were the financial capacity of the target populations, quality of health care, periodicity of the payment of membership premiums, enrolment procedures and conditions, trust in CBHI schemes, information, awareness-raising, education level, and benefit package.

For households in the informal sector, the CBHI in Lao PDR offers a voluntary health financing scheme by gaining access to affordable healthcare, reducing the financial burden of medical expenses, and improving

health outcomes, particularly for those with chronic illnesses, thereby enhancing the overall well-being and economic stability of those self-employed, labourers, the impoverished, and the unemployed. The benefits packages include outpatient and inpatient care coverage, including surgeries, deliveries, and cesarean sections. However, there are certain exclusions, particularly for high-cost surgeries, non-medical services, aesthetic treatments, thalassemia, hemodialysis, vasectomies, traffic accidents, glasses, organ transplants, cosmetic procedures, sterilisation (unless medically needed), dental care, and injuries from self-harm or fights, etc (2). Studies showed that the CBHI is still limited in low-income countries (Burkina Faso, Ethiopia, Rwanda, Uganda, Lao PDR) (17, 18). Despite the many benefits of this scheme, evidence suggests the impact of CBHI on financial protection and access to needed health care is moderate for those enrolled. Most CBHI schemes have low participation levels, and the poorest people usually remain excluded (19). Practice shows that CBHIs play only a limited role in helping countries move towards UHC (20). In LMICs, those who engage in informal employment are unable to access payroll-based health insurance schemes due to the informal nature of their work. As a result, they frequently face significant OOP expenses when seeking healthcare from public and private providers. Over the last 25 years, the CBHI initiatives have emerged to address these gaps in access to healthcare services and offer financial security. However, evidence from numerous countries indicates that achieving substantial progress toward UHC through a CBHI approach is challenging due to various limitations (16). Prior studies have shown that the inability to enroll in CBHI was attributed to certain factors. Particularly, it was found that the poorest families, especially those not affiliated with community associations, could not bear the cost of premiums. Additionally, overlapping school fee periods with membership renewal periods was cited as another reason for the lapse in scheme membership renewal. Moreover, some families discontinued their participation in the scheme due to the challenge of paying premiums, particularly when children were returning to school, and parents had to cover school fees (21).

In Vientiane Capital, the CBHI program has been introduced, but its coverage remains low, with a significant number of households hesitant to participate in the scheme (21). Despite offering an extensive benefits package and requiring only a low co-payment, the financial security provided by the CBHI is still limited, evident in the persistently high rate of OOP payments. While showing a decreasing trend, the OOP expenditure as a percentage of total health expenditure remained notably high at 41.76% in 2020 (2). According to the annual report from CBHI and the 2024 development plan, Mahosot Central Hospital had 11,897 (141%) OPD cases and 558 (7%) IPD cases. Xaythany District Hospital had 5,566 (101%) OPD cases and 95 (2%) IPD cases (3). OOP spending is likely significant in Vientiane as it is not covered under the NHI, resulting in a higher burden of OOP costs for healthcare compared to other regions.OOP spending is likely significant in Vientiane as it is not covered under the NHI; residents there would likely face a higher burden of OOP costs for healthcare compared to other regions (22). These causes affect healthcare access, especially among the poor. In general, access to care remains a challenge in healthcare delivery at public facilities, especially at primary and secondary levels (healthcare centres and district hospitals). However, access to healthcare services in Vientiane, particularly preventive care, may be limited. The most prevalent Non-communicable diseases (NCDs) in Vientiane are cardiovascular diseases (CVDs), including heart disease and stroke; chronic respiratory diseases, including chronic obstructive pulmonary disease (COPD); type 2 diabetes; and Cancers (18).

The government has dedicated substantial resources to the development and long-term sustainability of CBHI. Despite these efforts, the scheme is currently facing challenges with low popularity and enrollment rates (2). A

recent study aimed to identify the factors influencing enrollment and explore the potential for expanding CBHI. Additionally, there was a lack of evidence regarding the enrollment rate of CBHI in Vientiane Capital. Therefore, this study focused on assessing the willingness to enrol in CBHI among households of the informal sector lacking regular income making obtaining healthcare difficult in Vientiane Capital and identifying the factors associated with enrollment.

RESEARCH METHODOLOGY

Study Design

A cross-sectional study aims to investigate willingness to enroll in the CBHI among households of the informal sector in Vientiane Capital, Lao PDR

Study Area

The study was conducted in Vientiane, the capital of Lao PDR. Vientiane covers a total area of 3,920 square kilometres and is comprised of nine districts, with five being urban and four being agricultural areas, based on the classification of districts with dense residential buildings, businesses, and infrastructure such as commerce, manufacturing, and services. Areas with many businesses, offices, and government buildings. Especially, greater access to public services like schools, hospitals, public transportation, and utilities (water, electricity, internet). While rural areas have lower population densities and more open spaces, fields, and agricultural land, the primary economic activity is agriculture, including farming, fishing, and other natural resource-based livelihoods, and limited or less convenient access to these services; residents may have to travel farther to access health care, education, or other services.

The data collection was focused on informal workers to assess their willingness to enroll in CBHI at the household level. The map of the nine districts in Vientiane Capital, Lao PDR, can be found in Figure 1.

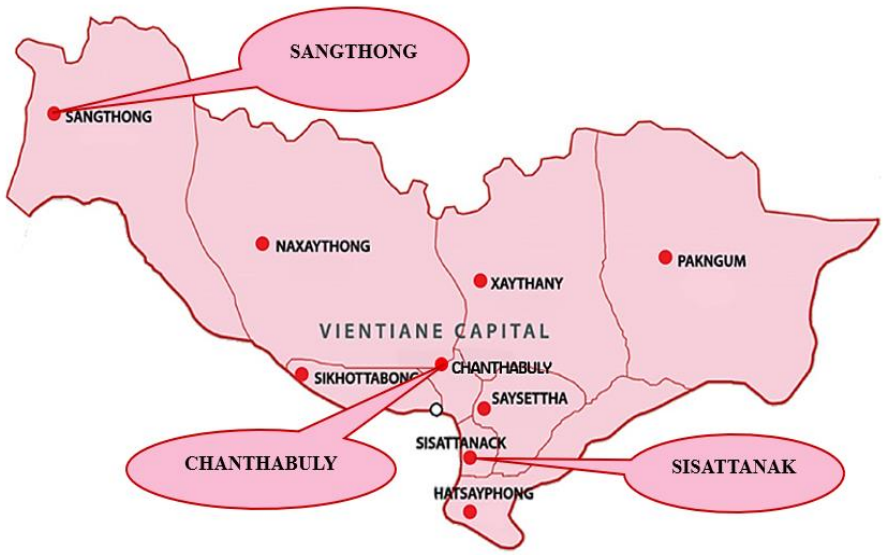


Figure 1. Map of the nine districts in Vientiane Capital, Lao PDR

The population coverage rate was determined by dividing the number of CBHI members by the total population of Vientiane Capital (1,009,269 people) and multiplying by 100. The districts with the lowest coverage rates were Sangthong (0.06%), Chanthabuly (0.10%), and Sisattanak (0.16%). The characteristics and population coverage rates of the CBHI in the nine districts of Vientiane Capital, Lao PDR, are displayed in Table 1.

Table 1. Characteristics and population coverage rates of the CBHI in nine districts in Vientiane Capital, Lao PDR

Name of districts	Characteristic of districts	Population coverage rate		Coverage rate based on Vientiane people
		n	%	
Chanthabuly	**Urban district**	**999**	**3.05**	**0.1**
Sikhottabong	Urban district	3,009	9.2	0.3
Xaysetha	Urban district	4,763	14.56	0.47
Sisattanak	**Urban district**	**1,622**	**4.96**	**0.16**
Hadxayfong	Urban district	5,594	17.1	0.55
Xaythany	Agriculture area	9,219	28.18	0.91
Naxaythong	Agriculture area	4,426	13.53	0.44
Sangthong	**Agriculture area**	**564**	**1.72**	**0.06**
Parknguem	Agriculture area	2,517	7.69	0.25
	Total	**32,713**	**100**	**3.24**

Source: Annual report of the meeting of lessons learned from the work of community health insurance of the National People Congress for the year 2023 and the direction of the plan for the year 2024, Ministry of Health, Lao PDR on 30 April 2024.

Sample Size Determination

Subjects or their representatives from each district comprised the study population. The research utilised Fisher's formula to determine the sample size (23).

The calculated minimum sample size was 375 participants, and after adjusting for a 10% non-response rate, the total was set to 413 participants to ensure sufficient subject representation. This adjustment for potential attrition and non-responses was made to maintain adequate representation of the subjects.

Subjects Recruitment

Inclusion criteria

Representatives of their respective households of informal sector families can be anyone living in three districts: Sangthong, Chanthabuly, and Sisattanak districts in Vientiane Capital who is 18 years of age or older, willing to participate in this study, and not currently enrolled in any insurance scheme.

Exclusion criteria

Those who are unable to complete the self-questionnaire or researcher interview due to illiteracy.

Sampling Technique

The research involved at least 413 participants, and data were gathered through face-to-face interviews. The researchers used a multistage random sampling method combined with purposive sampling, targeting the three districts with the lowest enrolment rates: Sangthong (0.06%), Chanthabuly (0.10%), and Sisattanak (0.16%) among nine districts. A randomised proportionate sampling approach was utilised within each village, followed by simple random sampling to select the participants.

A total of 413 participants were selected across the three districts: Sangthong (103), Chanthabuly (103), and Sisattanak (207). The Sampling technique was shown in Figure 2.

Figure 2. Sampling Technique

Data Collection Procedures and Measurements

Data collection procedure

Data were gathered through face-to-face interviews utilising a specially designed questionnaire. The questionnaire was created after reviewing various types of literature. Three advisors approved the content validity of the questionnaire. Initially, the questionnaire was drafted in English and subsequently translated into Lao. Afterwards, it was translated back into English to ensure consistency. Ultimately, data were collected using the Lao version of the questionnaire. During a two-day training session for interviews, the researcher and research assistant engaged in role-playing exercises and conducted pre-test interviews. The data collection process is illustrated in Figure 3.

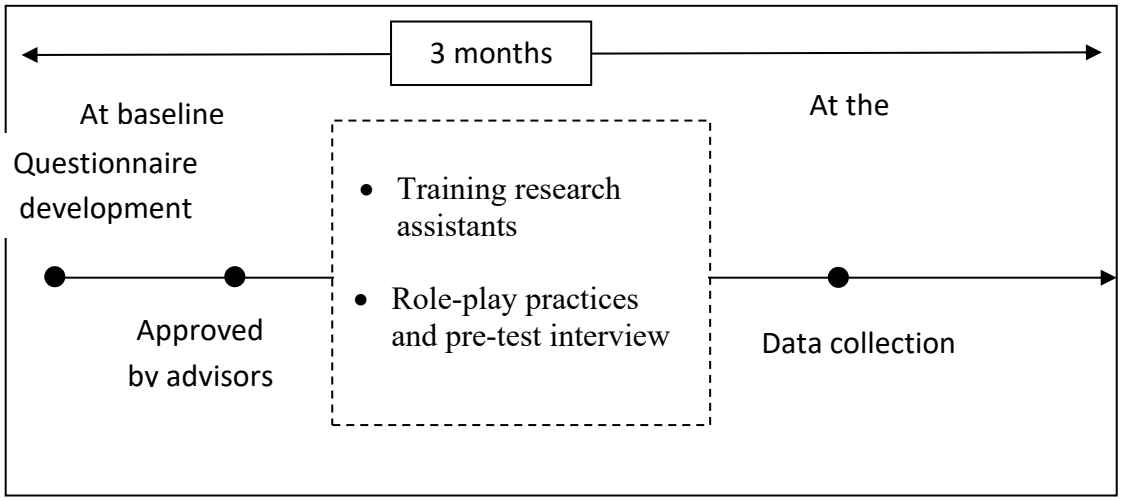


Figure 3. Data collection procedure

Research Instrument

A questionnaire with the topic "Willingness to enroll in Community-Based Health Insurance among households of the informal sector in Vientiane Capital, Lao PDR" consists of four sections, a total of 63 questions as follows:

Section A is socio-demographic characteristics and others (29 questions) collected information on the demographic characteristics of the respondents and others such as gender, age, ethnicity, marital status, occupation, family size, household income, and educational level. Other questions gathered in this section include perceived health risks of participants and family members, presence of chronic diseases, ability to pay, accessibility of healthcare services, and social support.

Section B is knowledge of CBHI through 12 questions. Each of the four domains consisted of three questions, covering the following areas: fundamental principles of the CBHI scheme, premium payment (who qualifies to join a CBHI scheme and the process of becoming a member), enrollment process, benefits package, and limitations (the types of health services covered by CBHI, potential exclusions.

Section C focuses on the perception towards the quality of healthcare services in CBHI, including 12 questions, divided into three domains with three questions each, consisting of technical quality, interpersonal quality, structural quality, and financial accessibility.

Section D consisted of 10 questions to assess participants' willingness to enroll and ability to pay in CBHI, whether they are willing to pay or not, including the factors that influenced them to enroll.

Validity and Reliability of the Instruments

Validity

The conceptual framework and questionnaires of this study received guidance from the thesis committee at Mahidol University and corrections for test validity. The variables were revised based on questionnaires from previous studies, and the operational definitions were developed from the structured questionnaires. All questionnaires were created after consulting with advisors and proposal defence committees about the contents, explanations, and appropriate wording. Furthermore, the questionnaires were reviewed by the researcher. All the questions were written in English, then translated into Lao and validated by the general director of the National Health Insurance Bureau, Ministry of Health, Lao PDR.

Reliability

After obtaining approval from the Mahidol University Institutional Review Board about ethics in human research, the questionnaire's pilot test was carried out. Before data collection, the survey instrument was pilot-tested to assess internal consistency, and the questionnaire was modified for further clarification. The internal consistency test was administered to 30 participants in the Feuang district, in Vientiane province, which aims to test problems regarding the contents, structure, and understanding of questionnaires. The internal consistency was measured using the Statistical Package for the Social Sciences (SPSS) version 25, with Cronbach's alpha values ranging from 0.75 to 0.89.

Statistical Analysis

Data were coded and entered using Epi Data version 3.1. The statistical analysis was conducted using the Statistical Package for Social Sciences (SPSS) software for Windows, version 25 (SPSS Inc., Chicago, Illinois, USA). Descriptive statistics such as the median and quartile deviations were presented as median and QD, along with minimum and maximum values. The Kolmogorov-Smirnov test was applied to assess the normality of distribution. The Chi-square statistics and bivariate logistic regression tests were utilised to explore the association between the dependent variable (WTE in CBHI) and independent factors. For the multiple logistic regression analysis, independent variables that had a p-value of less than 0.25 from the bivariate logistic regression were incorporated in both the complete model (using the Enter method) and the final model (employing the Wald method). Multivariate logistic regression analysis was performed to ascertain the predictors, and an Adjusted Odds Ratio (AOR) with a 95% Confidence Interval (CI) and a p-value of ≤ 0.05 was deemed statistically significant.

Data Collection Procedures

The data collection procedures proceeded as follows: 1) Before commencing the study in the designated area, the community leaders of three districts in Vientiane Capital were contacted to secure permission and approval for the study. 2) Individual respondents were approached by the researchers to request permission. 3) The researcher and two research assistants who are staff members at the CBHI's head office collected data through face-to-face interviews with the respondents using structured questionnaires. 4) Before conducting an interview, the respondents were asked to complete an informed consent form, and the researcher explained that the information was kept confidential. To ensure data quality, the researchers reviewed the questionnaires at the end of the process.

Ethical Considerations

Prior ethical approval was obtained from CIRB No.2024/283.0407. Before administering any questionnaires, comprehensive information regarding this study's objectives, methods, and potential benefits was adequately communicated to the respondents. Informed consent was obtained from participants before the interview. Participation in the survey was entirely voluntary, and individuals were free to withdraw or discontinue their involvement at any point. No monetary incentives were offered to any respondents. The questionnaires were

administered without including any participant names to ensure anonymity. Confidentiality of the respondents' information was strictly maintained. All data provided by participants was treated confidentially. Participants were treated respectfully and gratefully for their valuable contributions to this research. After the interview, only the researcher was able to assess the data. The data was kept confidential, and after analysis, it was destroyed.

RESULTS

The results are presented in two parts: descriptive analysis and analytic statistics. The first part includes the frequency and percentage distribution of both dependent and independent variables. The second part illustrates the relationships between different independent variables and the inclination to register for CBHI among the Laotian population. The findings were displayed in the following manner:

Description of the Study Area and Willingness to Enrol in CBHI

Data were collected from July to August 2024 in three districts with the lowest enrollment in the CBHI scheme, Sisattanak, Chanthabuly, and Sangthong, located in Vientiane Capital, Lao PDR. Based on the data collection process, the researcher had access to 455 people; however, 413 responded to the study and were analysed. As indicated in Table 2, the distribution of respondents in the study area utilised a simple random sampling technique, resulting in interviews with 413 individuals in the data analysis.

A total of 207 individuals from Sisattanak, 103 individuals from Chanthabuly, and 103 from Sangthong participated in the study. As shown in Table 4.1, out of 413 total respondents, 65.6% expressed a willingness to enrol in the CBHI, while 34.4% were unwilling. Across all districts, over half of the respondents were willing to enrol, with percentages of 67.1% in Sisattanak, 67.0% in Sangthong, and 61.2% in Chanthabuly. The percentage of respondents who were unwilling to enrol was only 38.8% in Chanthabuly, 33.0% in Sangthong, and 32.9% in Sisattanak. The description of the study area and willingness to enrol in CBHI is presented in Table 2.

Table 2. Description of the study area and willingness to enrol in CBHI

District			**Willingness to enroll**			
	Characteristic	**n**	**Unwilling**		**Willing**	
			n	**%**	**n**	**%**
Sisattanak	Urban	207	68	32.9	139	67.1
Chanthabuly	Urban	103	40	38.8	63	61.2
Sangthong	Rural	103	34	33.0	69	67.0
Total		**413**	**142**		**271**	

Description of Independent variables and Willingness to Enroll in CBHI

The descriptive analysis of 413 respondents revealed that 65.6% were willing to enroll in CBHI, while 34.4% expressed an unwillingness to enrol. Among the respondents, a significant majority opted for option 1 (75.8%), which allows direct access to the central hospital, whereas only 24.2% chose option 2, which requires contacting the district hospital first and adhering to the referral system. Within the group selecting option 1, more than half (56.7%) opted for a payment of 270,000 LAK for a 12-month registration. Similarly, those choosing option 2 had the highest payment, amounting to 189,000 LAK for a 12-month registration

The most appropriate premium for CBHI was ≤ 200,000 LAK per year (59.1%) and 40.9% for > 200,000 LAK per year with the minimum and maximum being 30,000 and 500,000 LAK per year. The frequency and percentage of participants willing to enrol in CBHI were shown in Table 3.

Table 3. Frequency and percentage of participants willing to enroll in CBHI

Willingness to enroll in CBHI	**Frequency**	**Percentage**
	(n)	**(%)**
Yes	271	65.6

No and not sure	142	34.4
Enrollment Preferences		
Option 1 (Member can access the central hospital directly)	313	75.8
Option 2 (Member needs to contact district hospital and follow the referral system)	100	24.2
Payment Details for Option 1		
The membership for 3 months: 75,000 LAK ($3.50)	**313**	**75.8**
The membership for 6 months: 150,000 LAK ($7.01)	42	10.2
The membership for 9 months: 225,000 LAK ($10.51)	26	6.2
The membership for 12 months: 270,000 LAK ($12.61)	11	2.7
Payment Details for Option 2	234	56.7
The membership for 3 months: 52,500 LAK ($2.45)	**100**	**24.2**
The membership for 6 months: 105,000 LAK ($4.91)	18	4.4
The membership for 9 months: 157,500 LAK ($7.36)	17	4
The membership for 12 months: 189,000 LAK ($8.83)	4	1
The most appropriate premium for CBHI	61	14.8
≤ 200,000 LAK ($9.11) per year	244	59.1
> 200,000 LAK ($9.11) per year	169	40.9

Remark: $1 = 21,406 LAK, as of May 2024

Option 1: Member can access the central hospital directly.
Option 2: Member needs to contact the district hospital first and follow the referral system.

Socio-demographic characteristics of participants

The socio-demographic characteristics information of respondents is illustrated in Table 4. The results showed the frequency and percentage distribution of socio-demographic factors of participants. Most of the respondents were female (59.1%), while 40.9% were male. The age group of participants is categorised into two groups. The majority of participants were in the group of 33 years old or younger (53.3%), while the group of respondents older than 33 years old constituted 46.7% of the total. The youngest respondent was 18 years old, the oldest was 67, and the average age was 34. The population consisted mainly of Lao ethnicity (69.2%), followed by Hmong (18.9%), Khmu (8.7%), and others (3.1%) identified as Tai, Phouthay, and Akha. Almost half of the respondents were single (48.2%) and married (46.2%), while the remaining were separated, divorced, or widowed.

A third of the respondents were merchants (36%), while 24.2% were daily labourers. Additionally, 11.1% worked as private employees, and the remaining 9.4% included students and monks. There were also a small number of farmers, housewives, civil servants, and those with no jobs. The number of family members ranged from 2 to 13, with a mean of 4.6 and a median of 4. Over half (56.6%) of respondents belonged to small families with 1-4 members, 39.5% were from medium-sized families, and only 3.9% were from large families.

Household income per capita was calculated by dividing the total household income by the number of family members. The average household income per capita was 75,367 LAK per month, with a median of 66,667 LAK per month (3.04 USD). The income per capita was divided into two categories: low and high. The data showed that the majority of participants (58.1%) were classified as high-income, while 41.9% were classified as low-income.

In the context of educational attainment among participants, a significant majority (60.3%) possessed a tertiary education, which includes degrees from universities or other higher education institutions. Following them, 27.4% of the participants had completed upper secondary education, which typically encompasses levels similar to high school. A smaller segment of 7.7% had completed lower secondary education, indicating a basic level of schooling beyond primary education. Very few individuals fell into the categories of illiteracy or only completed primary education. Of the most individuals in the household, 75.0% had received tertiary education, followed

by 20.8% with upper secondary education, and a small percentage with lower secondary education, illiteracy, and primary education.

Table 4. Socio-demographic characteristics of participants (n = 413)

Variables	**Frequency (n)**	**Percentage (%)**
Gender		
Male	169	40.9
Female	244	59.1
Age group (year)		
≤ 33	220	53.3
> 33	193	46.7
Median 33, QD 11, Min-Max 18-67		
Ethnicity		
Lao	286	69.2
Khmu	36	8.7
Hmong	78	18.9
Others	13	3.1
Marital status		
Single	199	48.2
Married	191	46.2
Separated	1	0.2
Divorced	17	4.1
Widowed	5	1.2
Occupation		
No job	19	4.6
Civil servant	15	3.6
Private employee	46	11.1
Daily laborer	100	24.2
Merchant	148	36
Farmer	36	8.7
Housewife	10	2.4
Others	39	9.4

Table 4. Socio-demographic characteristics of participants (n = 413) (cont.)

Variables	**Frequency (n)**	**Percentage (%)**
Family size (member)		
4-Jan	234	56.6
7-May	163	39.5
≥ 8	16	3.9
Median 4, QD 0.5**,** Min-Max 2-13		
Household income per capita (per month)		
Low (≤ 66,667 LAK ≈ 3.04 USD)	173	41.9

High (> 66,667 LAK ≈ 3.04 USD)	240	58.1
Median 66,667, QD 65,139, Min-Max 14,286-277,778		
The education level of the participant		
Illiterate	10	2.4
Primary education	9	2.2
Lower secondary education	32	7.7
Upper secondary education	113	27.4
Tertiary education	249	60.3
The highest education level of household		
Illiterate	3	1
Primary education	3	1
Lower secondary education	9	2.2
Upper secondary education	86	20.8
Tertiary education	312	75

Remark: 1 USD = 21,406 LAK, as of May 2024

Ability

Knowledge of CBHI consists of four domains: the principle of the CBHI domain, the premium payment domain, the enrolment process domain, and the benefits package and limitations domain. The findings in each domain indicated that the highest rate of accurate responses was 68.8% for CBHI as an optional program, 64.2% for CBHI's capability to reduce financial difficulties, 59.8% for CBHI registration at the village, district, or head offices, and 79.2% for the perception of benefits package and limitations, respectively. The frequency and percentage of knowledge of CBHI of participants are illustrated in Table 5.

Table 5. The frequency and percentage of knowledge of CBHI of participants (n = 413)

Knowledge of CBHI	**Correct answer**	
	n	**%**
• **The principle of CBHI domain**		
CBHI is a voluntary scheme	284	68.8
CBHI provides affordable and accessible healthcare	216	52.3
CBHI covered the informal sector	176	42.6
• **The premium payment domain**		
CBHI can minimise financial hardships	265	64.2
CBHI can pay in 3, 6, 9, or 12 months	246	59.6
CBHI can pay both individuals and households	258	62.5
• **The enrolment process domain**		
CBHI can register at the village, district, or head offices	247	59.8
Get a 10% discount when you register for 12 months	161	39
Need to show proof of being listed in the census to enroll	231	55.9
• **The benefits package and limitations domain**		
The benefits package is adequate for healthcare needs	151	36.6
Certain benefits have waiting periods before becoming active	209	50.6
Perception of benefits package and limitations		
OPD-ER	399	96.6
IPD	356	86.2

ANC-PNC	318	77
Renal dialysis	288	69.7
Traffic accident	275	66.6

Ability to pay

More than half (58.1%) of participants answered that the CBHI premium is affordable. Almost all of them (71.2%) have money savings. Among the factors that influence enrollment, the highest percentage was minimising financial risk (82.3%), benefits package (71.4%), and low cost of premiums (66.8%), respectively. The highest percentage of factors that affected the ability to pay for CBHI were health needs (79.9%) and household expenses (64.6%). The highest percentage of main sources of household income was business/Self-employed (56.2%). Only 8% of the other main sources of household income were derived from barbers, salons, drivers, and seamstresses. The frequency and percentage of ability to pay participants are illustrated in Table 6.

Table 6. The frequency and percentage of ability to pay of participants (n = 413)

Ability to pay	**Yes answer**	
	n	**%**
The CBHI premium is affordable	240	58.1
The savings	294	71.2
Factors influence to enroll		
Low cost of premiums	276	66.8
Benefits package	295	71.4
Reliable of the scheme	163	39.5
Minimizing financial risk	340	82.3
Factors influence the ability to pay		
Monthly income	109	26.4
Household expenses	267	64.6
Number of dependents	172	58.4
Health needs	330	79.9
The main sources of household income		
Agriculture	73	17.6
Wage labor	75	18.2
Business/Self-employed	232	56.2
Others	33	8

Motivation

The motivation variable consists of the perceived health risks of participants and family members, the presence of chronic disease, and the perception toward the quality of healthcare service in CBHI. Perceived health risks of participants and family members and presence of chronic disease. In part, regarding perceived health risks of participants and family members, the results showed that 50.4% have not had chronic disease or injury in the last 3 months, 90.8% have no disability or chronic illness with family members, and 96.4% have no anxiety or mental health issues with family members. Almost all participants (78.9%) do not have chronic diseases, while only 21.1% have DM, HTN, or CKD. The frequency and percentage of motivation information of participants is illustrated in Table 7.

Table 7. The frequency and percentage of motivation information of participants

Motivation	**Yes**	

	n	%
Perceived health risks of participants and family members		
Experienced a chronic disease or injury in the last 3 months	190	46
Family member with a disability or chronic illness	38	9.2
Family member with an anxiety and mental health condition	15	3.6
Presence of chronic disease		
Presence of chronic disease (DM, HTN, CKD, etc.)	87	21.1

Perception toward quality of healthcare service in CBHI

Table 8 shows the perception of the quality of healthcare service in CBHI in the technical quality domain. Nearly half of the participants perceived doctor skills, diagnosis and treatment explanation, and medicine prescription as neutral levels, with percentages of 42.4%, 43.6%, and 43.1%, respectively. Overall, 57.9% had a low perception of the technical domain, while 42.1% had a high perception.

Table 8. The frequency and percentage of perception toward quality of healthcare service in CBHI of participants (Technical quality domain)

Perception toward quality of healthcare service in CBHI	**Strongly agree**	**Agree**	**Neutral**	**Disagree**	**Strongly disagree**
	n (%)	**n (%)**	**n (%)**	**n (%)**	**N (%)**
• **Technical quality (Q42-Q44)**					
1. Physicians possess clinical expertise in specialised healthcare treatments.	21 (5.1)	161 (39.0)	175 (42.4)	55 (13.3)	1 (0.2)
2. Physicians communicate diagnosis and treatment accurately.	16 (3.9)	168 (40.7)	180 (43.6)	47 (11.4)	2 (0.5)
3. Physicians prescribe appropriate medications for optimal treatment outcomes.	19 (4.6)	158 (38.3)	178 (43.1)	58 (14.0)	0 (0.0)
Technical quality domain	**Number**			**Percentage**	
Low perception (score 0-10)	239			57.9	
High perception (score 11-15)	174			42.1	
Median 10, QD 1.5, Min-Max 5-15					

Table 9 identifies the perception of the quality of healthcare service in CBHI in the interpersonal quality domain. Nearly half of the participants perceived that the receptionists and administrative staff at the healthcare facility were friendly, healthcare providers treated them respectfully and politely, and the members were satisfied with the healthcare providers' services at neutral levels, with percentages of 43.8%, 47.5%, and 48.2%, respectively. Overall, 60.0% had a low perception in the interpersonal quality domain, while 40.0% had a high perception.

Table 9. The frequency and percentage of perceptions toward the quality of healthcare service in CBHI of participants (Interpersonal quality domain)

Perception toward quality of healthcare service in CBHI	**Strongly agree**	**Agree**	**Neutral**	**Disagree**	**Strongly disagree**
	n (%)	**n (%)**	**n (%)**	**n (%)**	**n (%)**
• **Interpersonal quality (Q45-Q47)**					
1. The receptionists and administrative staff at the healthcare facility were friendly and helpful.	25 (6.1)	144 (34.9)	181 (43.8)	62 (15.0)	1 (0.2)

2. Healthcare providers treated me respectfully and politely. 3. The members were satisfied with the healthcare provider's services.	23 (5.5) 0 (0.0)	146 (35.4) 53 (12.8)	196 (47.5) 199 (48.2)	48 (11.6) 144 (34.9)	0 (0.0) 17 (4.1)
Interpersonal quality domain	**Number**			**Percentage**	
Low perception (score 0-10) High perception (score 11-15) Median 10, QD 1.0, Min-Max 6-15	248 165			60.0 40.0	

Table 10 expresses the perception of the quality of healthcare service in CBHI in the structural quality domain. The participants perceived that the healthcare facilities covered by CBHI have modern and well-maintained equipment, healthcare facilities have enough space and seating available, and healthcare facility wait times are reasonable at neutral levels, with percentages of 47.9%, 34.1%, and 39.0%, respectively. Overall, 67.6% had a low perception in the interpersonal quality domain, while 32.4% had a high perception.

Table 10. The frequency and percentage of perceptions toward the quality of healthcare service in CBHI of participants (Structural quality domain)

Perception toward quality of healthcare service in CBHI	**Strongly agree**	**Agree**	**Neutral**	**Disagree**	**Strongly disagree**
	n (%)	**n (%)**	**n (%)**	**n (%)**	**N (%)**
• **Structural quality (Q48-50)**					
4. The healthcare facilities covered by CBHI have modern and well-maintained equipment. 5. Healthcare facilities have enough space and seating available. 6. Healthcare facility wait times are reasonable.	21 (5.1) 30 (7.3) 14 (3.3)	130 (31.5) 120 (29.1) 97 (23.5)	198 (47.9) 141 (34.1) 161 (39.0)	63 (15.3) 90 (21.8) 92 (22.3)	1 (0.2) 32 (7.7) 49 (11.9)
Structural quality domain	**Number**			**Percentage**	
Low perception (score 0-10) High perception (score 11-15) Median 9.0, QD 2.0, Min-Max 4-15	279 134			67.6 32.4	

Table 11 shows the perception of the quality of healthcare service in CBHI in the financial accessibility domain. The participants perceived the CBHI premiums are affordable for the household, the CBHI greatly reduces medical expenses, and the CBHI premiums are worth the benefits as agreed levels with percentages of 48.2%, 48.9%, and 44.6%, respectively. Overall, 63.7% had a high perception of the financial accessibility domain, while 36.3% had a low perception.

Table 11. The frequency and percentage of perceptions toward the quality of healthcare service in CBHI of participants (Financial accessibility domain)

Perception toward quality of healthcare service in CBHI	**Strongly agree**	**Agree**	**Neutral**	**Disagree**	**Strongly disagree**
	n (%)	**n (%)**	**n (%)**	**n (%)**	**N (%)**
• **financial accessibility (Q51-Q53)**					
7. CBHI premiums are affordable for the household. 8. The CBHI greatly reduces medical expenses.	42 (10.2)	199 (48.2)	150 (36.3)	20 (4.8) 19 (4.6)	2 (0.5)

9. The CBHI premiums are worth the benefits.	48 (11.6) 74 (17.9)	202 (48.9) 184 (44.6)	144 (34.9) 143 (34.6)	11 (2.7)	0 (0.0) 1 (0.2)
Financial accessibility domain	**Number**			**Percentage**	
Low perception (score 0-10) High perception (score 11-15) Median 11, QD 1.5, Min-Max 6-15	150 263			36.3 63.7	

Opportunity

The opportunity variable consists of accessibility of healthcare services and social support. Accessibility of healthcare services. The data presented in Table 12 delineate the frequency and percentage of healthcare service accessibility among participants within the availability domain. The findings reveal that primary care (88.1%) and emergency care (80.4%) were the most prevalent healthcare services in the community. Conversely, access to dental care (48.4%) and preventive care (49.4%) was limited, with less than half of the participants reporting availability. The findings from the experience of using healthcare services revealed high care costs (75.1%), long waiting times (70.2%), transportation issues (40.7%), limited availability of physicians (49.2%), and inadequate insurance coverage (25.7%). Additionally, participants reported encountering other issues (2.2%), such as receiving impolite explanations, instances of queue jumping, and inadequate medication. In the evaluation of community healthcare services, 51.3% were classified as fair, 26.6% as poor, 18.2% as good, 2.9% as very poor, and merely 1% as excellent. Overall, the availability domain exhibited 70.5% high accessibility and 29.5% low accessibility in healthcare services

Table 12. The frequency and percentage of accessibility of healthcare services of participants (Availability domain)

Accessibility of healthcare services	**Yes answer**	
	n	**%**
· **Availability domain**		
Types of healthcare services in the community (Q18)		
Primary care (e.g., Outpatient)	364	88.1
Dental care	200	48.4
Emergency care	332	80.4
Preventive care (e.g., vaccinations)	204	49.4
The recent experience of hospital utilization (Q20)		
Long waiting times	290	70.2
High costs of care	310	75.1
Transportation issues	168	40.7
Limited availability of physicians	203	49.2
Inadequate insurance coverage	106	25.7
Others	9	2.2
Community healthcare service ratings (Q19)		
Excellent	4	1
Good	75	18.2
Fair	212	51.3
Poor	110	26.6
Very poor	12	2.9

Availability domain		
Low	122	29.5
High	291	70.5
Median 3, QD 0.5, Min-Max 1-5		

The data presented in Table 13 illustrates the frequency and proportion of healthcare service accessibility among the participants in the Accessibility domain. A majority of participants (58.6%) reside in proximity to the hospital, while 41.4% live at a distance. Similarly, 58.1% of participants have a short travel time to the hospital, with 41.9% requiring a longer duration for the same. Approximately half (43.3%) of the participants expressed a neutral sentiment regarding the ease of reaching the hospital. The majority, comprising 22.8%, found the task to be difficult, while 20.6% considered it easy. A smaller proportion of participants, 7.0% and 6.3% respectively, reported finding the task very difficult and very easy.

Table 13. The frequency and percentage of accessibility of healthcare services of participants (Accessibility domain)

Accessibility of healthcare services	**Number**	**Percentage**
Accessibility domain		
The distance to the hospital (Q21)		
Short distance (≤ 15 km)	242	58.6
Long distance (> 15 km)	171	41.4
Median 15.00, QD 5, Min-Max 1-42		
Time taken to reach the hospital (Q23)		
Short time (≤ 30 min)	240	58.1
Long time (> 30 min)	173	41.9
Median 30.00, QD 10, Min-Max 2-120		
Hospital access (Q22)		
Very easy	26	6.3
Easy	85	20.6
Neutral	179	43.3
Difficult	94	22.8
Very difficult	29	7
Median 3, QD 1, Min-Max 1-5		

The data in Table 14 illustrates the frequency and percentage of healthcare service accessibility among participants in the affordability domain. The findings indicate that 51.6% experienced financial strain due to healthcare expenses, 14.5% had sufficient health insurance coverage, and 29.5% made sacrifices at times to cover healthcare costs.

Table 14. The frequency and percentage of accessibility of healthcare services of participants (Affordability domain)

Accessibility of healthcare services	**Yes**	
	n	**%**
Affordability domain (Q24-26)		
The financial strain of healthcare expenses	213	51.6
Having sufficient health insurance coverage	60	14.5
Making sacrifices for healthcare costs	122	29.5

The data presented in Table 15 show the frequency and percentage of healthcare service accessibility among participants in the acceptability domain. The findings reveal that 49.6% expressed neutral satisfaction with the quality of healthcare services, 27.8% were dissatisfied, and 19.6% were satisfied. A small percentage of participants, 1.5%, reported being very satisfied, while another 1.5% reported being very dissatisfied.

Approximately 42.6% of the participants reported being treated with respect and dignity by doctors sometimes, 31% reported rare occurrences, 21.5% reported most of the time, and a small percentage reported always (2.7%) or never (2.2%). Around 48.7% of the respondents indicated a neutral level of acceptance of the healthcare services, while 29.1% found them acceptable, and 18.04% deemed them unacceptable. Additionally, a small percentage reported finding the services very acceptable (2.7%) or very unacceptable (1.2%).

Table 15. The frequency and percentage of accessibility of healthcare services of participants (Acceptability domain)

Accessibility of healthcare services	**Number**	**Percentage**
• **Acceptability domain (Q27-Q29)**		
Satisfaction with the quality of healthcare services		
Very satisfied	6	1.5
Satisfied	81	19.6
Neutral	205	49.6
Dissatisfied	115	27.8
Very dissatisfied	6	1.5
Being treated respectfully with dignity by the doctors		
Always	11	2.7
Most of the time	89	21.5
Sometime	176	42.6
Rarely	128	31
Never	9	2.2
Acceptability of the healthcare services received		
Very acceptable	11	2.7
Acceptable	120	29.1
Neutral	201	48.7
Unacceptable	76	18.4
Very unacceptable	5	1.2

Social support

A majority of participants (70.7%) did not have any relatives enrolled in the CBHI scheme, whereas 29.3% had relatives registered in CBHI. The decision to enroll was primarily influenced by healthcare providers (51.3%), followed by family members/friends/neighbors (48.7%).

Table 16. The frequency and percentage of social support

Variables	**Yes**	
	n	**%**
• **The relatives who are CBHI members (Q16)**	121	29.3
• **The influence on the decision to enroll in CBHI (Q17)**		
Family members/Friends/Neighbors	201	48.7
Healthcare providers	212	51.3

Multiple logistic regression for willingness to enroll.

The independent variables that had significance in the Chi-square ($p < 0.05$) and binary logistic regression analyses ($p < 0.25$) were incorporated into the multiple logistic regression. The model was analysed using multiple logistic regression for willingness to enroll to observe the predictor variables.

Thirty variables were selected and analysed with the "Enter" method for the full model. After analysing with the Enter method, the variables were analysed with the "Backwards (Wald)" method for the final model.

Table 17 showed the multiple logistic regression (Enter method) analysis; only five variables were statistically significant ($p < 0.05$). Participants with a high perceived ability to pay were 2.70 times more willing to enroll in CBHI than those with a low ability to pay (AOR 2.70, 95% CI 1.52-4.78). Participants who considered low premium as an influential factor in their decision to enroll were significantly more willing to enroll in CBHI 4.86 times compared to those who did not consider this factor (AOR 4.86, 95% CI 2.73-8.66).

Additionally, participants who identified benefit packages as influential were 2 times more willing to enroll than those who did not (AOR 2.09, 95% CI 1.09-4.01). Participants who acknowledged the importance of affordable access to healthcare services demonstrated approximately a 2.37 times higher likelihood of enrollment than those who did not recognise this factor (AOR 2.37, 95% CI 1.36-4.14).

Moreover, participants who resided with counterparts living at a distance of more than 15 kilometres from a hospital expressed 54% more willingness to enroll in CBHI than participants living within a short distance of a hospital (COR 0.46, 95% CI 0.22-0.98).

Table 17. Factors associated with willingness to enroll for CBHI by multiple logistic regression analysis (Enter method).

Variables	**Full model**		
	AOR	**95% CI for AOR Lower-Upper**	**P-value**
Sociodemographic			
Gender			
Male	1		
Female	1.43	0.83-2.47	0.2
Age group (year)			
≤ 33	1		
> 33	2.16	0.98-4.73	0.06
Ethnicity			
Khmu/Hmong/others	1		
Lao	1.31	0.71-2.40	0.39
Marital status			
Single/separate/divorced/widowed	1		
Married	0.95	0.46-1.95	0.89
Family size (member)			
≤ 4	1		
> 4	0.76	0.44-1.32	0.33
Ability			
Knowledge about premium payments			
Low knowledge	1		
High knowledge	0.83	0.45-1.51	0.54

Knowledge about the benefits package			
and limitations			
Low knowledge	1		
High knowledge	1.58	0.75-3.30	0.23
Perceived ability to pay			
Low ability	1		
High ability	2.7	1.52-4.78	**0.001**
Perception of low premiums			
No	1		
Yes	4.86	2.73-8.66	**<0.001**
Perceived benefit packages			
No	1		
Yes	2.09	1.09-4.01	**0.027**
Perceived reliability of the scheme	1		
No	1.45	0.77-2.71	0.25
Yes			
Perceived as minimising financial risk			
No	1		
Yes	1.25	0.55-2.87	0.59
Perceive the household expenses			
No	1		
Yes	0.64	0.35-1.19	0.16
Perceive the number of dependents			
No	1		
Yes	1.52	0.86-2.70	0.15
Perceive the family's health needs			
No	1		
Yes	0.51	0.19-1.33	0.17
Motivation			
Present of chronic disease			
No	1		
Yes	0.67	0.31-1.46	0.32
Having a history of diseases among household members			
No	1		
Yes	1.36	0.74-2.51	0.32
Affordable access to healthcare services			
Low access	1		
High access	2.37	1.36-4.14	**0.002**
Opportunity			
Access to the OPD at the community level			
No	1		
Yes	2.34	0.99-5.52	0.05
Access to dental care at the community level			
No	1		

Yes	0.96	0.49-1.87	0.9
Access to emergency care at the community level			
No	1		
Yes	1.84	0.75-4.53	0.18
Access to preventive care at the community level			
No	1		
Yes	0.85	0.47-1.53	0.59
Having experienced the high cost of care when visiting a hospital			
No	1		
Yes	1.44	0.65-3.18	0.37
Having experienced transportation issues when visiting a hospital			
No	1		
Yes	0.99	0.53-1.85	0.98
Having experienced inadequate insurance coverage when visiting hospitals			
No	1		
Yes	0.59	0.30-1.15	0.12
The distance to the hospital			
Short distance (≤ 15 km)	1		
Long distance (> 15 km)	0.46	0.22-0.98	**0.044**
Time taken to reach the hospital			
Short time (≤ 30 min)	1		
Long time (> 30 min)	1.7	0.75-3.87	0.21
Accessing the nearest hospital			
Difficult	0.81	0.39-1.71	0.59
Easy and Neutral	1		
Having relatives who are CBHI members			
No	1		
Yes	1.59	0.85-2.97	0.15

In the final model, there were a total of 23 steps in this model and the method used in the multiple logistic regression test is backward (Wald). Seven independent variables were indicated as having a significant effect on participants' willingness to enroll in the CBHI scheme. The study revealed that participants over the age of 33 exhibited a willingness to enroll that was 1.93 times greater than that of participants aged 33 or younger (AOR 1.93, 95% CI 1.17 - 3.19). Furthermore, individuals who perceived themselves as having a higher ability to pay were approximately 2.72 times more willing to enroll compared to those with a lower perceived ability to pay (AOR 2.72, 95% CI 1.59-4.63). Participants who indicated that low premiums significantly influenced their decision to enroll demonstrated a substantially higher willingness to enroll, approximately 4 times more than those who did not prioritise low premiums (AOR 4.25, 95% CI 2.52-7.15). Similarly, those who perceived the importance of benefits packages were 2.08 times more willing to enroll compared to respondents who did not prioritise benefits packages (AOR 2.08, 95% CI 1.22-3.56). The findings regarding individuals with high affordable access to healthcare services suggest that these participants exhibited a willingness to enroll that was approximately twice as high as those with limited affordable access (AOR 2.02, 95% CI 1.22-3.35).

Individuals who reported experiencing limited access to physicians when visiting hospitals indicated a willingness to enrol 1.72 times more than those who reported such access (AOR 1.72, 95% CI 1.03-2.87). Furthermore, participants with relatives who were members of CBHI were 1.83 times more likely to enroll

compared to those without such familial connections (AOR 1.83, 95% CI 1.03-3.25). The results from the multiple logistic regression (full model and final model) were shown in Table 18.

Table 18. Factors associated with willingness to enroll for CBHI by multiple logistic regression analysis (Backward method).

Variables	**Final model (Step 23)**		
	AOR	**95% CI for AOR Lower-Upper**	**P-value**
Sociodemographic			
Age group (year)		1.17-3.19	**0.01**
≤ 33	1		
> 33	1.93		
Ability			
Perceived ability to pay			
Low ability	1		
High ability	2.72	1.59-4.63	**<0.001**
Perceived low premiums			
No	1		
Yes	4.25	2.52-7.15	**<0.001**
Perceived benefit packages			
No	1		
Yes	2.08	1.22-3.56	**0.007**
Motivation			
Affordable access to healthcare services			
Low access	1		
High access	2.02	1.22-3.35	**0.006**
Opportunity			
Having experienced limited physicians when visiting hospitals			
No	1		
Yes	1.72	1.03-2.87	**0.038**
Having relatives who are CBHI members			
No	1		
Yes	1.83	1.03-3.25	**0.039**

DISCUSSION

This cross-sectional study was conducted among 413 Laotians from Vientiane, Lao PDR, during July-August 2024. A total of 413 completed responses were entered for analysis. This study tested factors in the association between socio-demographics, ability, motivation, and opportunity and the willingness to enroll in the CBHI scheme. For this chapter, the results are discussed based on existing relevant literature.

Socio-demographic factors and willingness to enrol in CBHI

Based on the final model, the age group was found to be statistically significant in association with willingness to enroll in CBHI, as determined by multiple logistic regression analysis. A positive correlation exists between older age (more than 33 years) and willingness to enroll in CBHI; participants over the age of 33 exhibited a willingness to enroll 1.93 times greater than participants aged 33 or younger. Corresponding with LMICs,

Nigeria identified age-related patterns/trends in CBHI enrollment (24). The ages of 36-65 and older people display a positive correlation maintained in CBHI schemes (25). Similarly, the study conducted in Burkina Faso found that people aged 36- 65 years and older display a positive correlation maintained in CBHI schemes, potentially due to various diseases (26). In contrast, Nepal found that age did not have a significant relationship with the willingness to pay CBHI premiums (27).

Ability domain variables and willingness to enroll in CBHI

The final model of multiple logistic regression analysis found that perceived ability to pay, perceived low premium and the benefits package for factors influencing to enroll significantly impacted the willingness to enroll.

People with a high perceived ability to pay were willing to enroll 2.72 times more than those with a low perceived ability to pay. The finding is similar to another study that reported a higher ability to pay resulted in a higher willingness to pay for the scheme in rural communities in South Nigeria (28). The study found that the low premium had a significant impact on enrollment, with a 4.25-fold increase in enrollment due to various influencing factors. In Ethiopia, the affordability of premiums significantly influenced enrollment in the CBHI scheme (29). The study also reported that the perceived benefit packages of the scheme influenced enrollment in CBHI 2.08 times in the final model. The benefit packages covered by CBHI schemes were reported to influence enrollment. Benefit packages that are tailored to the needs of a community (30-34), are non-discriminatory (35)and cover outpatient services to increase enrollment in a CBHI scheme (29).

Motivation domain variables and willingness to enroll in CBHI

Results of multiple logistic regression (final model) identified that the perception toward quality of healthcare service in CBHI with affordable access to healthcare services, impacts the willingness to enroll in the CBHI scheme. The findings regarding the perception of healthcare service quality in CBHI indicate that participants with better affordable access to healthcare services were approximately 2 times more likely to enroll compared to those with poorer financial accessibility. These results confirm that the perceived quality of healthcare services influences enrollment decisions, with higher quality perceptions leading to increased participation (36). Specifically, financial accessibility is crucial; other factors, such as perceived healthcare quality, also play significant roles in influencing enrollment decisions in CBHI schemes (37, 38).

Results from binary logistic regression show that participants and family members who had a history in the household were 2.6 times more likely to express willingness to enroll compared to those without such a history. Specifically, 76.8% of individuals with a history of household diseases indicated a willingness to join a CBHI program, in contrast to those without such a history. Corresponding with a previous study in Ethiopia, chronic diseases significantly influence CBHI participation, as households with such conditions are more likely to seek insurance to mitigate health expenditures and improve welfare outcomes (39).

Opportunity domain variables and willingness to enroll in CBHI

A previous study in Uganda found that limited physician availability may increase willingness to join CBHI, as it offers access to healthcare services that might otherwise be difficult to obtain, enhancing perceived value among community members (40). The looming physician shortage may increase interest in CBHI as a means to enhance access to care and address gaps in physician availability (41). In rural areas in West Texas, limited physician availability may encourage healthcare providers to consider joining community-based health initiatives due to increased demand and potential benefits (42). For these reasons, improving healthcare for physicians in remote community areas may increase enrollment in CBHI. However, some previous studies indicated that limited physician availability can lead to delays in treatment, pushing patients to seek care in private facilities, which may not be covered by CBHI (43). Limited physician availability in hospitals may hinder the effectiveness of the CBHI scheme, as it could lead to inadequate care and increased reliance on hospitalisation for common ailments (38)This negatively impacts the effectiveness of the CBHI scheme by exacerbating health disparities, particularly for lower-income individuals facing high out-of-pocket costs and financial strain (44). The limited availability of physicians also negatively impacts patient satisfaction with the CBHI scheme, as it contributes to longer waiting times and reduced access to quality care (45).

CONCLUSION

The cross-sectional study aims to examine the willingness to enroll and factors associated with willingness to enroll among households in CBHI, Lao PDR. The independent variables consist of socio-demographic variables, ability domain variables, motivation domain variables, and opportunity domain variables. The dependent variable was the willingness to enroll in the CBHI scheme. This research was conducted using a face-to-face questionnaire in three districts with the lowest enrollment in the CBHI scheme during July-August 2024. The reliability test was conducted through a pilot test with 30 Laotians in Feuang district, Vientiane Capital, and the reliability score was within 0.75-0.89 (Cronbach's alpha). Based on the data collection process, the researcher had access to 455 people; however, 413 responded to the study and were analysed. Descriptive statistics explain the frequency (number and percentage) of data. The Chi-square, binary logistic regression, and multiple logistic regression were used for association analysis. This study was approved by the ethical by obtained from CIRB 2024/283.0407). The willingness to enroll in the CBHI scheme was found to be 65.6% among Laotians from 413 participants, and 75.8% preferred access to the central hospital directly, which is option 1 of the scheme. They accepted the payment detailed for 12 months of coverage was 270,000 LAK (12.61 USD). However, the most appropriate premium for CBHI was less than equal to 200,000 LAK (9.11 USD) per year.

Among the participants, more than half were female, and the average age was 34 years. The majority were Lao and single or married. A third of the respondents were merchants, and over half of respondents belonged to small families with 1-4 members. The average household income per capita was 75,367 LAK per month. Most individuals in the household had received tertiary education. More than half had a poor perception of the quality of healthcare service in CBHI in part of the technical quality domain, interpersonal quality domain, and structural quality domain, but they had a good perception of the financial accessibility domain. A majority of participants reside near the hospital and had a short travel time to the hospital. Nearly half expressed neutral satisfaction with the quality of healthcare services. Only 29.3% had relatives registered as CBHI members, and more than half indicated that the healthcare providers were primarily influenced by the decision to enroll in the scheme.

The CBHI was a voluntary scheme that was launched 23 years ago in Lao PDR but still faces challenges with a very low enrollment rate. This study can identify which factors significantly influence willingness to enroll and provide insights and benefits for enhancing the enrollment rate, including improving the scheme until it meets the healthcare needs of Laotians.

RECOMMENDATION

Based on the key findings of the study, the recommendations were offered to increase the uptake of the CBHI scheme at the household level in Vientiane Capital.

Recommendation for the Government

Part of the recommendation was the government's role of the National Health Insurance Bureau under the Ministry of Health. The Lao government should enhance the policies by tackling healthcare costs, including lowering premiums, improving affordability for households in the informal sector, and boosting enrollment rates in CBHI. This can be achieved by educating the community through a multi-platform public awareness campaign and by expanding the benefits package to better meet the healthcare needs of households.

Recommendation for the healthcare provider

Improve the quality and perception of CBHI healthcare services and ensure that the advertising of CBHIs covers essential services, benefits packages, and acknowledgement to increase trust and willingness to pay. Ensure that CBHI-affiliated facilities provide quality services and adequate space for patients, especially physicians, which can increase the perceived value of insurance. This may include hiring adequate and well-trained staff, improving the supply of essential drugs, and upgrading infrastructure in local healthcare services. Moreover, implementing responsive and transparent complaint systems to report dissatisfaction or file compla-

ints about services so that issues can be addressed quickly and fairly. Educating people about the scheme focuses on the benefits of the scheme, steps of premium payment, and options for the scheme (individual and household),

including the enrollment process via posters, brochures, radio, and television, even while the patients or people wait to meet the physician.

Limitations of the study

This study may not completely capture the willingness to enroll in rural areas and the entire capital city due to variations in socio-demographic characteristics, knowledge, attitudes, and perceptions towards the quality of health care services. These factors, including willingness to enroll, may present different challenges in other districts and might not accurately reflect the actual household income due to potential response biases, leading to overestimation or underestimation of the willingness to enroll. This study did not perform Item Objectives Congruence (IOC) validation; therefore, future research should focus on formulating clearer questions for assessment.

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