

Early Version – Uncorrected

Determinants of Primary Healthcare Utilization among Border Residents in Thailand: A Cross-Sectional Study

Pawitchaya Simawong, B.B.A., Pharm.D., M.Pharm.,
Pimchanok Thongtuan, Pharm.D., M.Pharm.,
Kanutthawut Luangthep, B.Pharm.,
Wichid Pumchan, B.P.H., M.Sc., Ph.D.



DOI: <http://dx.doi.org/10.31584/jhsmr.20261488>

Received: 9 December 2025

Revised: 31 March 2026

Accepted: 17 April 2026

Published online: 30 October 2026

Please cite this article as: Simawong P, Zhongruan P, Luangthep K, Pumchan W. Determinants of primary healthcare utilization among border residents in Thailand: a cross-sectional study. J

Health Sci Med Res 2026 doi: <http://dx.doi.org/10.31584/jhsmr.20261488>

Early Version — Uncorrected: This accepted manuscript has not been typeset or proofread.

Content and formatting may change prior to final publication and should not be regarded as the final Version of Record.

© 2026 JHSMR. Hosted by Prince of Songkla University.

This is an open access article under the CC BY-NC-ND license

(<https://creativecommons.org/licenses/by-nc-nd/4.0/>).

Original Article

Determinants of Primary Healthcare Utilization among Border Residents in Thailand: A Cross-Sectional Study

Pawitchaya Simawong, B.B.A., Pharm.D., M.Pharm.¹,

Pimchanok Thongtuan, Pharm.D., M.Pharm.¹, Kanutthawut Luangthep, B.Pharm¹,

Wichid Pumchan, B.P.H., M.Sc., Ph.D.²

¹Sirindhorn College of Public Health Ubon Ratchathani, Faculty of Public Health and Allied Health, Praboromarajchanok Institute, Ubon Ratchathani, 34190, Thailand.

²Primary Care and Health Network Group, Ubon Ratchathani Provincial Health Office, Ubon Ratchathani, 34000, Thailand.

***Corresponding Author**

Contact: Pimchanok Thongtuan, Pharm.D., M.Pharm.

Affiliation: Sirindhorn College of Public Health Ubon Ratchathani, Faculty of Public Health and Allied Health, Praboromarajchanok Institute, Ubon Ratchathani, 34190, Thailand.

E-mail: pimchanok@scphub.ac.th

Abstract:

Objective: To examine the demographics, attitudes, subjective norms, and perceived behavioral control (PBC) associated with the intention to seek and utilize primary healthcare in Thailand's border areas.

Materials and Methods: A cross-sectional study was conducted from July to September 2025 among primary healthcare users in six border districts of Ubon Ratchathani Province. Using multistage sampling, 580 participants were recruited. Data were collected through a structured questionnaire assessing sociodemographic characteristics, Theory of Planned Behavior (TPB) constructs, intention to use primary healthcare (PHC) services, and self-reported utilization. Data were analyzed by using descriptive statistics, chi-square tests, negative binomial regression, and multivariate linear regression.

Results: Most participants were female (82.1%) and covered under the Universal Coverage Scheme (UCS) (90.9%). PBC had the highest mean score among TPB constructs (4.10 ± 0.76) and was significantly associated with both past PHC utilization (IRR=1.27, 95%CI=1.01–1.60, p-value=0.043) and future PHC intention ($\beta=0.27$, 95% CI=0.52–1.59, p-value<0.001). Chronic disease status and shorter travel time were also significantly associated with past utilization. In addition, ages 40–59 years, marital status, and insurance type were associated with future PHC intention. Beneficiaries of the UCS reported a higher intention to seek care at sub-district health-promoting hospitals (p-value<0.001).

Conclusion: PBC, travel time, and chronic disease were associated with PHC utilization. These findings suggest that improving accessibility, strengthening primary care pathways, and supporting confidence in PHC services may be relevant for PHC utilization among border residents, including working-age and married groups.

Keywords: Primary healthcare, utilization, border areas

Introduction

Primary Health Care (PHC) provides health system equity, sustainability, and efficiency. It is crucial for health promotion, disease prevention, primary care management, and rehabilitation. It also links community, secondary, and tertiary hospitals and supports continuity of care^{1–3}. Strong PHC systems can reduce morbidity, minimize unnecessary hospitalizations, promote equal access to services, and improve health system performance^{4,5}. These functions are

consistent with the global health agenda described in Sustainable Development Goal 3 (SDG 3) and Universal Health Coverage (UHC), both of which prioritize primary healthcare as a foundation for enhancing population health and reducing disparities⁶. Thailand's primary healthcare system has been expanded through sub-district health-promoting hospitals (SHPH), community health centers (CHCs), and family doctor clinics, increasing service accessibility and reducing out-of-pocket health expenditures, particularly in rural areas⁷. Under the UHC scheme, this PHC-led structure functions as the first point of care through district health networks⁸. Inequitable PHC utilization does, however, continue in urban, rural, and border areas. Residents who live in remote regions face barriers such as long travel distances, limited transportation options, and workforce shortages, which cause many of them to bypass primary care facilities and seek care at hospitals for even minor illnesses^{9,10}. Over time, this tendency leads to hospital overcrowding, higher medical costs, and inequitable resource allocation^{10,11}.

Border regions, especially in provinces like Ubon Ratchathani, encompass a vast area and comprise numerous communities that are remote from health facilities and have a limited health-system infrastructure. These areas also reflect considerable linguistic, ethnic, and cultural diversity, all of which influence health-seeking behaviors in ways that differ from urban settings with a higher service density¹². In these areas, challenges extend beyond service availability and access; socio-cultural determinants, such as local health beliefs, reliance on family decision-making, and varying levels of trust in primary care services, also play major roles in PHC utilization^{13,14}. Evidence from studies in Thai border and rural communities shows that individuals with higher incomes and education often bypass primary care¹⁰, while family support plays a key role in facilitating service use.⁹ The Theory of Planned Behavior (TPB) has been applied in health research to understand a range of health behaviors, including vaccine-acceptance decisions and participation in disease surveillance, as well as the determinants of adherence to clinical recommendations¹⁵⁻¹⁷. At the core of the framework is intention, including attitudes, subjective norms, and perceived behavioral control (PBC), which is used in this study as a guiding conceptual framework. Compared with behavioral models that emphasize either individual beliefs or structural access alone, the TPB integrates perceived behavioral control and social influences, making it suitable for border settings where access constraints, cultural norms, and social expectations intersect¹⁸. The TPB was selected over other models, such as the Health Belief Model, because it explicitly includes the construct of PBC. This framework allows for an

assessment beyond personal health perceptions to include how individuals perceive their ability to manage practical external barriers typical of border areas, such as traveling long distances through difficult terrain or overcoming transportation hurdles, which are often primary factors in decisions to seek care. This study examined the demographics, attitudes, subjective norms, and perceived behavioral control associated with the intention to seek and utilize primary healthcare. The results are expected to provide empirical evidence that can guide policies to strengthen sustainable and equitable PHC, as well as guide the design of context-appropriate, people-centered PHC services.

Material and Methods

Study design and population

This article is based on data derived from a broader research project; however, the present analysis focuses specifically on TPB constructs and primary healthcare utilization among primary healthcare users in Thailand's border areas. TPB constructs were examined as conceptual variables, and mediation pathways were not formally tested. The target population consisted of Thai residents living in border districts. The sample size was calculated using Cochran's formula for estimating proportions¹⁹, with a 95% confidence level ($Z=1.96$), a 5% margin of error ($e=0.05$), and an assumed population proportion of 0.50 due to the absence of prior studies in similar settings. Based on the finite population of 714,347 residents²⁰, the finite population correction was applied. An additional 20% was added to account for potential non-responses, resulting in a minimum required sample size of 423 participants. Proportional allocation was then used to distribute samples across the border districts. A total of 580 participants were recruited. The final sample size exceeded the minimum required size due to continued recruitment during the data collection period.

Cross-sectional and multistage sampling were used in this study. First, six out of ten border districts in Ubon Ratchathani Province were selected to represent the province's northern, central, and southern border zones. This selection captured geographic variation across border areas; the remaining districts were excluded due to fieldwork feasibility rather than systematic differences in primary healthcare organization. Second, three to five primary healthcare facilities (sub-district health-promoting hospitals or community health centers) within each selected district were randomly selected from the official registry of health service units. Finally, eligible service

users within each selected facility presenting during the data collection period were recruited consecutively until the allocated sample size for each district was reached.

Participants were Thai adults aged 18 years or older who resided in the border areas of Ubon Ratchathani Province and had utilized primary healthcare services within the preceding six months. All participants were required to be able to read and write in Thai, as well as provide voluntary informed consent. Participants with cognitive and mental disorders affecting response reliability were excluded. Exclusion was based on self-report and interviewer assessment of participants' ability to comprehend and complete the questionnaire.

The questionnaire was developed from established theoretical frameworks and prior empirical research. It consisted of four components encompassing key sociodemographic and contextual determinants, including gender, age, marital status, education, occupation, income, types of health insurance, chronic disease, distance and time to the nearest primary care facility, mode of transportation, and initial point of care. Attitudes, subjective norms, and perceived behavioral control were measured using multi-item, five-point Likert scales with reverse-scored items recoded, and mean scores for each construct were interpreted using a five-level classification: 4.51–5.00 (very high), 3.51–4.50 (high), 2.51–3.50 (medium), 1.51–2.50 (low), and 1.00–1.50 (very low). Participants' intention to seek primary care was measured with four items that covered common acute illnesses, preventive services, and anticipated use of primary care over the next three to six months, as well as their willingness to recommend these services to others. For actual primary care utilization, participants reported their most recent care-seeking episode and the number of primary care visits made in the past six months. They also rated their likelihood of choosing a primary care facility for future care on a 0–10 numeric rating scale.

Content validity was assessed by three experts in primary healthcare systems, behavioral science, and research methodology. A pilot test was conducted among 30 participants with similar characteristics in the study setting to assess the clarity, comprehensibility, and cultural appropriateness of the questionnaire. The item-objective congruence indices ranged from 0.67 to 1.00. Cronbach's alpha coefficients were 0.969 for attitude, 0.967 for subjective norms, 0.966 for perceived behavioral control, and 0.967 for intention. Inter-construct correlation analysis indicated moderate to high associations among TPB variables without evidence of severe redundancy ($r = 0.383\text{--}0.798$). Exploratory factor analysis showed a high KMO value (0.956) and a significant Bartlett's test of sphericity ($p < 0.001$), identifying a two-factor structure in

which attitude, subjective norms, and perceived behavioral control loaded on one factor, while intention loaded on a separate factor. The two factors were correlated ($r = 0.727$), suggesting conceptual relatedness rather than substantial measurement overlap. To reduce potential redundancy, TPB items were carefully worded to reflect distinct theoretical constructs and were pilot-tested prior to data collection.

Data collection

Data were collected between July and September 2025 using self-administered questionnaires in either online or paper-based formats. The mode of administration was determined by participants' literacy level, digital access, and personal preference, with assistance provided by trained research assistants when necessary. Written informed consent was obtained from all participants prior to data collection. To minimize potential selection bias associated with consecutive recruitment, data collection was conducted across multiple primary care facilities on different days and at varying times. Participant characteristics, including gender distribution, were monitored during recruitment to assess sample composition in relation to the primary care service users in the study area.

Statistical analysis

Data analysis used a statistics program. Descriptive statistics were used to explore participant characteristics. The associations between category variables were tested using the chi-square. Factors associated with past primary care utilization were analyzed using negative binomial regression due to the count nature of the dependent variable and the presence of overdispersion (variance-to-mean ratio = 4.93), with results reported as IRR, 95% CI. Future intention was operationalized as a composite score derived from multiple Likert-scale items and analyzed as a continuous outcome using multivariate linear regression, with results reported as coefficients B and 95% CI. Statistical significance was set at $p\text{-value} < 0.05$.

Ethical considerations

All questionnaires were anonymized, and data were stored securely with access limited to the research team. This study was approved by the Ethics Committee of the Ubon Ratchathani Provincial Health Office, Ubon Ratchathani, Thailand (Approval No. SSJ.UB 2568-04.012).

Results

Most participants were female (82.1%) with a mean age of 51.5 years, and 90.9% were covered by the Universal Coverage Scheme (UCS). More than one-third had chronic diseases (35.3%). The median monthly income was 3,000 baht, which fell below the Thailand national poverty line of 3,078 baht per person per month²² and was significantly lower than the provincial average income per capita of approximately 5,000–6,000 baht²³, which remains nearly twofold higher than that of residents in this border area. Regarding geographic accessibility, although 57.6% of participants lived within 3 km of a PHC facility, over half (58.3%) required 10–30 minutes to reach it. This suggested that short distances did not guarantee quick access, likely due to rugged border terrain and a heavy reliance on motorcycles for transport (65.7%). In terms of healthcare-seeking behavior, over half of the participants (56.9%) reported that their initial point of care for a minor illness in the past 12 months was a primary care facility (Table 1).

Factors associated with future intention to seek primary care services

The multiple linear regression showed that future intention to seek primary care services was significantly associated with age group, marital status, type of health insurance scheme, and the PBC score. Participants aged 40–59 years had lower intention scores compared with those aged 60 years or older ($\beta=-0.10$, 95% CI=-1.21 to -0.03, p -value=0.039). Those who were unmarried, widowed, or divorced had higher intention scores compared with married participants ($\beta=0.10$, 95% CI=0.10–1.23, p -value=0.022). Furthermore, those insured under the UCS showed a higher intention to seek primary care in the future compared to those covered by the SSS ($\beta=0.10$, 95% CI=0.05–2.01, p -value=0.039). Higher PBC scores were also significantly associated with higher intention to seek primary care services ($\beta=0.27$, 95% CI=0.52–1.59, p -value<0.001) (Table 5).

Table 5. Multivariate analysis of factors associated with past utilization and future intention to seek primary health care

Discussion

In this study, perceived behavioral control was associated with intention and actual primary care utilization, as commonly reported in research applying the Theory of Planned Behavior. Participants who perceived more control over primary care included the ability to travel to a facility, manage their time, and navigate service barriers. Similar to prior studies, PBC was associated with both intention and reported primary care utilization in this border setting¹⁸. The association between PBC and PHC utilization may reflect that in border regions, an individual's confidence in overcoming barriers is as important as service availability. In these remote areas, seeking care is a complex logistical task where high PBC may reflect a person's ability to manage logistical hurdles, such as long motorcycle journeys through rugged terrain and time constraints. Beyond physical access, high PBC may also reflect trust in the health system, particularly in communities with diverse local health beliefs. This finding is consistent with studies in other rural contexts; for instance, in rural China, PBC factors such as travel time, financial affordability, and service access were significantly associated with choosing primary care as the first point of contact²⁴. Similarly, studies in Iran showed that higher PBC over self-care behaviors was associated with both intention and actual utilization²⁵. These findings suggest that PBC is a significant construct associated with both an individual's intention and primary care utilization in rural Thai border regions. Although PBC was associated with the outcomes, the very high internal consistency and high correlations among TPB constructs suggest a limited separation between them. This indicates some degree of overlap, and these findings should be interpreted with caution. Furthermore, as this study employed a cross-sectional design, these results should be interpreted as associations rather than causal pathways; establishing such temporal or mediation relationships would require further longitudinal research. Additionally, the characteristics of the study population should be considered, as the female-dominated sample may reflect underlying utilization patterns or recruitment contexts within primary care settings, and may also partly reflect socio-cultural factors, such as the traditional role of women as primary health managers in Thai rural families. While this aligns with higher PHC utilization

patterns among women, this gender imbalance may be related to TPB constructs, such as social norms and perceived control, which could differ for men due to distinct work-related barriers. This imbalance should be considered when interpreting the findings.

Regarding health insurance schemes, UCS beneficiaries reported a higher utilization of primary healthcare services compared to those under other schemes. This trend is likely due to the mandatory registration requirements, which typically link beneficiaries to a specific primary care unit or a local health center within their residential area. Under this system, the PHC facility serves as the mandated first point of contact to access fully covered services, creating a gatekeeping structure that channels routine care, preventive services, and minor illness management to the primary level. This structural design encourages familiarity and continuity of care between residents and their local providers. These findings aligned with previous studies showing higher primary care utilization among UCS beneficiaries compared to those covered by the Social Security Scheme (SSS) or the Civil Servant Medical Benefit Scheme (CSMBS), where different reimbursement rules may allow for more direct access to higher-level hospitals^{26,27}.

Intention to seek primary care was also associated with health insurance coverage. Under the UCS, primary care was reported as the first point of contact more often than under the SSS. Prior studies suggest that health insurance design and benefit packages may be associated with where individuals seek initial care, particularly in health systems in which primary care functions as a gatekeeping tier²⁸. Repeated use of primary care has also been associated with greater familiarity and continuity in patient-provider relationships, which may relate to future care-seeking preferences^{29,30}.

Chronic diseases, travel time to primary care facilities, and perceived behavioral control have all been associated with past primary care utilization. Participants with chronic diseases reported more frequent use of primary care services, consistent with studies from rural India showing that individuals with ongoing conditions regularly return for symptom monitoring, medication refills, and routine follow-up³¹. Similar evidence from other rural settings suggests that primary healthcare facilities are commonly used for recurrent and chronic conditions, highlighting their role in long-term disease management³².

Participants who lived closer to primary care facilities, based on travel time, reported lower past utilization compared with those traveling more than 30 minutes. While this result contrasts with the expectation that proximity increases use, this finding may reflect bypassing

behavior. In Thai border and rural communities, healthcare decisions are often shaped by socio-cultural factors rather than distance alone^{9,10}. Previous studies suggest that individuals living near PHC facilities may seek care at higher-level hospitals when primary care services are perceived as low quality, particularly for complex health problems. This primary care bypassing behavior has been associated with concerns about quality of care, drug availability, and limited trust in primary care providers³³. Global research in LMIC settings similarly suggests that patients may travel farther to facilities they trust, regardless of distance³⁴.

The lower future intention to seek primary care services among participants aged 40-59, compared with older adults, may be related to the heavy work commitments and time constraints typical of this age group. In border communities, these working-age adults serve as the main breadwinners and may prioritize time-saving care options or self-treatment to avoid missing work. This trend may be further influenced by higher education and income levels, which are often associated with increased self-care and the use of private healthcare providers, potentially reducing reliance on primary care services¹⁰. Furthermore, unmarried participants showed a higher intention to use primary care facilities, which may be related to reliance on self-management for health needs. Without a spouse to assist with home care or transportation to distant hospitals, particularly when facing severe symptoms or limited financial resources, primary care services may represent a more accessible option. Conversely, married participants may have more options. A spouse may provide initial care, such as purchasing over-the-counter medications or monitoring symptoms at home. Moreover, having a partner may facilitate access to specialized clinics or larger hospitals located further away. This finding is consistent with previous research suggesting that marital status shapes health-related behaviors^{35, 36}.

This study has several limitations. First, the cross-sectional design and reliance on self-reported data limit causal inference and may introduce recall or social desirability biases. To minimize these, we restricted the recall period for healthcare utilization to the preceding six months to ensure more accurate reporting and minimize recall bias. Additionally, to reduce social desirability bias, we utilized standardized, pilot-tested questionnaires, ensured total participant anonymity, and employed neutral wording to encourage honest responses. Second, although our findings are context-specific to a single border province, potentially limiting the generalizability to regions with different socio-cultural or geographic characteristics, they offer valuable insights for similar remote and underserved areas. Third, although multistage sampling

was applied, consecutive recruitment at healthcare facilities may introduce selection bias, as individuals who did not seek care during the study period, including those who bypass primary care, were not captured; therefore, the findings primarily reflect determinants among current primary healthcare users. The sample was predominantly female, and it is unclear whether this reflects the actual primary care utilization patterns or recruitment. This imbalance may affect TPB constructs and healthcare utilization. To minimize this bias, data collection was conducted across different days of the week and varied times of day (morning and afternoon) to capture a more diverse range of service users. In addition, TPB constructs and prior primary healthcare utilization were measured concurrently, and the observed associations may partly reflect prior care experiences. Finally, the very high internal consistency of the TPB scales may indicate overlapping item content, and the use of a single self-reported questionnaire may introduce common method bias. However, we attempted to reduce this risk by ensuring anonymity and using clear, distinct wording for each construct to maintain content validity.

Conclusion

PBC, travel time, and chronic disease status were associated with primary healthcare utilization. Consistent with an associative framework, PBC was also associated with both intention to seek and the actual utilization of primary healthcare. These findings highlight the factors associated with primary healthcare utilization and may inform future research focusing on working-age and married individuals, as well as those with chronic conditions, particularly in border settings.

Acknowledgments

The authors sincerely thank all the participants and village health volunteers (VHVs) from the sub-district health-promoting hospitals (SHPHs) for their support in data collection.

Funding sources

This study was supported by the Sirindhorn College of Public Health, Ubon Ratchathani (Grant number 002/2568).

Conflicts of interest

The authors declare no potential conflicts of interest.

References

1. Hone T, Macinko J, Millett C. Revisiting Alma-Ata: what is the role of primary health care in achieving the Sustainable Development Goals? *Lancet* 2018;392(10156):1461–72.
2. Bitton A, Ratcliffe HL, Veillard JH, Kress DH, Barkley S, Kimball M, et al. Primary health care as a foundation for strengthening health systems in low- and middle-income countries. *J Gen Intern Med* 2017;32(5):566–71.
3. Kringos DS, Boerma WGW, Hutchinson A, Saltman RB, editors. Building primary care in a changing Europe: Case studies [Internet]. Copenhagen (Denmark): European Observatory on Health Systems and Policies; 2015. [cited 2025 Nov 17]. Available from: <https://pubmed.ncbi.nlm.nih.gov/29064645/>
4. World Health Organization. Primary health care: closing the gap [Internet]. Geneva: WHO; 2021 [cited 2025 Nov 17]. Available from: <https://iris.who.int/server/api/core/bitstreams/4ac41cc1-efce-41b6-ada9-eb965f94c303/content>
5. Kruk ME, Gage AD, Arsenault C, Gureje O, Hirschhorn LR, Kruk ME, et al. High-quality health systems in the Sustainable Development Goals era: time for a revolution. *Lancet Glob Health* 2018;6(11):e1196–252.
6. United Nations. Goal 3: Fast Facts [Internet]. New York: United Nations; 2023 [cited 2025 Nov 17]. Available from: https://www.un.org/sustainabledevelopment/wp-content/uploads/2023/09/Goal-3_Fast-Facts.pdf
7. Chaitiang N, Satyasomboon T, Tunsuchart K. Primary Health Care System Development According to Thailand's Health Policy. *PH.PL* 2024;10(3):655-66.

8. Sumriddetchkajorn K, Shimazaki K, Ono T, Kusaba T, Sato K, Kobayashi N. Universal health coverage and primary care, Thailand. *Bull World Health Organ* 2019;97(6):415–22.
9. Quashie NT, Pothisiri W. Rural-urban gaps in health care utilization among older Thais: The role of family support. *Arch Gerontol Geriatr* 2019;81:201-08.
10. Rojjananukulpong R, Ahmad MM, Saqib SE. Disparities in Physical Accessibility among Rural Thais Under Universal Health Coverage. *Am J Trop Med Hyg* 2021;105:837-45.
11. Phankitiya S, Luvira V. Self-Referral to the University Hospital Resulting in Unnecessary Patient Expenses: A Prospective Descriptive Study in a Super-Tertiary Hospital. *Indian J Community Med* 2021;46:295-99.
12. Primary Health Care Performance Initiative. Improving geographic and financial access to care & strengthening primary care in Thailand. [Internet]. 2022 [cited 2025, Nov 17]. Available from: <https://www.improvingphc.org/thailand-access-0>
13. Kanthawee P, Markmee P, Muangin T, Suwannarong K. Border health system management along Thai-Laos border; a case study at communities with temporary check point in Wiang Kaen District, Chiang Rai Province. *Dis Control J* 2020;46(4):579-94.
14. Moonpanane K, Pitchalard K, Thepsaw J, Singkhorn O, Potjanamart C. Healthcare service utilization of hill tribe children in underserved communities in Thailand: barriers to access. *BMC Health Serv Res* 2022;22:1114.
15. Haque MN, Alam MA, Saha S, Panthumas S, Clara AA, Sharif MPI. Vaccine Adherence and Behavioral Changes of Adults Regarding Prevention of COVID-19: A Community Survey Using the Theory of Planned Behavior. *JPSS* [internet]. 2023 Oct [cited 2025 Nov 15];32:160-9. available from: <https://so03.tci-thaijo.org/index.php/jpss/article/view/267459>
16. Cheraghalizadeh H, Adib-Rad H, Pasha H, Chehrazi M, Nasiri-Amiri F, Omidvar S. Effectiveness of face to face and virtual education to promote breast self-examination based on the theory of planned behavior: a randomized controlled trial study. *BMC Cancer* 2025;25:548.
17. Siripipatthanakul S, Limna P, Sriboonruang P, Kaewpuang P. Applying the TPB and the UTAUT Models Predicting Intentions to Use Telemedicine Among Thai People During the COVID-19 Pandemic. *Int J Comput Sci Res* 2023;7(1):1362–84.
18. Ajzen I. The theory of planned behaviour: reactions and reflections. *Psychol Health*. 2011;26(9):1113-27.

19. Cochran WG. Sampling techniques. 3rd ed. New York: John Wiley & Sons; 1977.
20. Department of Provincial Administration, Ministry of Interior. Population Statistics by Registration (Monthly). In: Registration Statistics System [Internet]. Bangkok: Department of Provincial Administration; [cited 2025 Nov 21]. Available from: <https://stat.bora.dopa.go.th/stat/statnew/statMONTH/statmonth/#/mainpage>
21. Srisa-at B. Preliminary research. 10th ed. Bangkok: Suviriyasan Company Limited; 2017.
22. Office of the National Economic and Social Development Council. Poverty and Inequality Report 2023 [Internet]. Bangkok: NESDC; 2024 [cited 2026 Jan 8]. Available from: <https://www.nesdc.go.th>
23. National Statistical Office. The 2023 Household Socio-Economic Survey: Northeastern Region [Internet]. Bangkok: NSO; 2024 [cited 2026 Jan 8]. Available from: https://www.nso.go.th/nsoweb/official_stat/province/er#gsc.tab=0
24. Gao M, Zhu X. Rural residents' willingness to utilize primary care and its influencing factors in the context of graded diagnosis and treatment: a study in Deqing, China. *Front Public Health* 2024;12:1478686.
25. Pourmand G, Doshmangir L, Ahmadi A, Noori M, Rezaeifar A, Mashhadi R, et al. An application of the theory of planned behavior to self-care in patients with hypertension. *BMC Public Health* 2020;20(1):1290.
26. Limwattananon S, Neelsen S, O'Donnell O, Prakongsai P, Tangcharoensathien V, van Doorslaer E, et al. Universal coverage with supply-side reform: The impact on medical expenditure risk and utilization in Thailand. *J Public Econ* 2015;121:79-94.
27. Patcharanarumol W, Panichkriangkrai W, Sommanuttawechai A, Hanson K, Wanwong Y, Tangcharoensathien V. Strategic purchasing and health system efficiency: A comparison of two financing schemes in Thailand. *PLoS ONE* 2018;13(4):e0195179.
28. Starfield B, Shi L, Macinko J. Contribution of primary care to health systems and health. *Milbank Q* 2005;83(3):457-502.
29. Hughes D, Leethongdee S. Universal coverage in the land of smiles: lessons from Thailand's 30 Baht health reforms. *Health Aff (Millwood)* 2007;26(4):999-1008.
30. Limwattananon S, Tangcharoensathien V, Tisayaticom K, Boonyapaisarncharoen T, Prakongsai P. Why has the Universal Coverage Scheme in Thailand achieved a pro-poor public subsidy for health care? *BMC Public Health* 2012;12(Suppl 1):S6.

31. Kane S, Joshi M, Desai S, Mahal A, McPake B. People's care seeking journey for a chronic illness in rural India: Implications for policy and practice. *Soc Sci Med* 2022;312:115390.
32. Srivastava AK, Gupt RK, Bhargava R, Singh RR, Songara D. Utilisation of rural primary health centers for outpatient services - a study based on Rajasthan, India. *BMC Health Serv Res* 2023;23(1):387.
33. Kruk ME, Paczkowski M, Mbaruku G, de Pinho H, Galea S. Women's preferences for place of delivery in rural Tanzania: a population-based discrete choice experiment. *Am J Public Health* 2009;99(9):1666–72.
34. Lilford RJ, Daniels B, McPake B, Bhutta ZA, Mash R, Griffiths F, et al. Supply-side and demand-side factors affecting allopathic primary care service delivery in low-income and middle-income country cities. *Lancet Glob Health* 2025;13(5):e942-53.
35. Joung IM, Stronks K, van de Mheen H, Mackenbach JP. Health behaviours explain part of the differences in self reported health associated with partner/marital status in The Netherlands. *J Epidemiol Community Health* 1995;49(5):482-8.
36. Bracke PF, Colman E, Symoens SA, Praag LV. Divorce, divorce rates, and professional care seeking for mental health problems in Europe: a cross-sectional population-based study. *BMC Public Health* 2010;10:224.

Table 1. Number and percentage of variables divided by characteristics (n=580)

Variables	n	%
Gender		
Male	104	17.9
Female	476	82.1
Age, min-max, (mean± S.D.)	21-87, (51.54±10.11)	
≤ 39	69	11.9
40-59	397	68.4
≥ 60	114	19.7
Marital status		
Single/Divorced/Separated	144	24.8
Married	436	75.2
Education		
No education/ primary school	220	37.9
Secondary school	335	57.8
Diploma/bachelor's degree or higher	25	4.3
Occupation		
Unemployed	282	48.6
Employed	298	51.4
Health insurance		
UCS	527	90.9
CSMBS	36	6.2
SSS	17	2.9
Chronic disease		
Non-chronic disease	375	64.7
Having a chronic disease	205	35.3
Income (Baht/month)		
Median (range)	3,000 (2,000-5,000)	
≤ 3,000	334	57.6

Variables	n	%
3,001-10,000	213	36.7
> 10,000	33	5.7
Distance to PHC (kilometers)		
<1	84	14.5
1-3	250	43.1
3-5	122	21.0
5-10	83	14.3
>10	41	7.6
Time to PHC (minutes)		
<10	161	27.8
10-30	338	58.3
30-60	65	11.2
> 60	16	2.8
Mode of transportation		
Walk	15	2.6
Bicycle	139	24.0
Motorcycle	381	65.7
Car / Public transportation	45	7.7
Initial point of care – last minor illness (12 months.		
Primary health care (SHPH/PCU/CHC/FDC)	330	56.9
District/General hospital	179	30.9
Private hospital	3	0.5
Community pharmacy	38	6.6
Unable to recall	30	5.2

UCS=Universal Coverage Scheme, CSMBS=Civil Servant Medical Benefit Scheme and SSS=Social Security Scheme, PHC=Primary Healthcare, SHPH=Sub-district Health Promoting Hospital, PCU=Primary Care Unit, CHC=Community Health Center and FDC=Family doctor clinic

Table 2. Mean scores and distribution of Theory of Planned Behavior (TPB) constructs among participants

Construct	Mean $\pm$ S.D.
Attitude toward PHC	3.69 $\pm$ 0.56
Subjective norms	4.03 $\pm$ 0.80
Perceived behavioral control (PBC)	4.10 $\pm$ 0.76

Table 3. Association between intention to seek primary care and actual primary care utilization

Intention to seek primary care	Used PHC		Did not use PHC		p-value
	n	%	n	%	
Low intention	9	42.9	12	57.1	<0.001
Moderate intention	51	38.1	83	61.9	
High intention	270	63.5	155	36.5	

Table 4. Association between expected Primary Health Care Unit as first contact and type of health insurance

Variables	Types of health insurance						p-value
	UCS		CSMBS		SSS		
	n	%	n	%	n	%	
Expected Primary Health Care Unit as first contact							<0.001
SHPH	427	93.2	15	3.3	16	3.5	
Non-SHPH	100	82.0	21	17.2	1	0.8	

Table 5. Multivariate analysis of factors associated with past utilization and future intention to seek primary health care

Predictor variables	Past PHC utilization ^a			Future PHC intention ^b		
	IRR(Exp(B))	95% CI	p-value	Coefficient(B)	95% CI	p-value
Gender						
Male	0.89	0.68-1.17	0.400	-0.01	-0.66-0.58	0.899
Female	1.00			1.00		
Age						
≤ 39	0.94	0.62-1.40	0.748	0.04	-0.54-1.34	0.400
40–59	1.10	0.84-1.43	0.486	-0.10	-1.27- -0.03	0.039*
≥60	1.00			1.00		
Marital status						
Single/Divorced/Separated	0.91	0.71-1.16	0.445	0.10	0.10-1.23	0.022*
Married	1.00			1.00		
Education						
No education/Primary	1.10	0.60-1.99	0.765	-0.02	-0.61-0.40	0.679
Secondary	1.33	0.75-2.37	0.335	-0.02	-1.52-1.01	0.690
≥Diploma	1.00			1.00		
Occupation						
Unemployed	1.02	0.83-1.26	0.844	-0.02	-0.64-0.35	0.563
Employed	1.00			1.00		

Predictor variables	Past PHC utilization ^a			Future PHC intention ^b		
	IRR(Exp(B))	95% CI	p-value	Coefficient(B)	95% CI	p-value
Health insurance						
UCS	0.69	0.37-1.28	0.236	0.10	0.05-2.01	0.039*
CSMBS	0.52	0.25-1.08	0.080	-0.02	-2.11-1.30	0.644
SSS	1.00			1.00		
Chronic disease						
Non-chronic disease	0.76	0.62-0.94	0.011*	0.04	-0.29-0.73	0.402
Having a chronic disease	1.00			1.00		
Income (Baht/month)						
≤ 3,000	1.01	0.65-1.57	0.960	-0.02	-0.67-0.36	0.562
3,001-10,000	0.87	0.56-1.37	0.553	0.03	-0.63-1.48	0.432
> 10,000	1.00			1.00		
Distance to PHC (kilometers)	1.10	0.76-1.61	0.602	-0.06	-1.40-0.41	0.283
<1	1.15	0.90-1.48	0.271	-0.08	-1.10-0.12	0.119
1-5	1.00			1.00		
>5						
Time to PHC (minutes)						
<10	0.67	0.48-0.93	0.019*	0.08	-0.06-1.10	0.076
10-30	0.66	0.49-0.89	0.005*	0.06	-0.22-1.22	0.169

Predictor variables	Past PHC utilization ^a			Future PHC intention ^b		
	IRR(Exp(B))	95% CI	p-value	Coefficient(B)	95% CI	p-value
>30	1.00			1.00		
Mode of transportation						
Walk	1.52	0.73-3.17	0.259	0.04	-0.92-2.24	0.412
Bicycle	1.40	0.92-2.13	0.113	0.03	-0.33-0.79	0.416
Motorcycle	1.14	0.77-1.68	0.505	0.04	-0.46-1.34	0.338
Car/public transportation	1.00			1.00		
Attitude toward PHC	0.96	0.79-1.17	0.689	0.06	-0.13-0.81	0.159
Subjective norm	0.91	0.74-1.12	0.389	-0.05	-0.68-0.30	0.452
Perceived behavioral control	1.27	1.01-1.60	0.043*	0.27	0.52-1.59	<0.001*

^a Negative binomial regression

^b Multiple linear regression

*Statistically significant at p-value<0.05

Multicollinearity was acceptable (VIFs < 5). For linear regression models, standardized residuals were within acceptable ranges (-3.25 to 2.30), and results were robust to outlier exclusion.

IRR = Incidence Rate Ratio; β = standardized beta coefficient; CI = Confidence Interval