Conceptual Framework of Empirical Factors Related to Voluntary Health and Social Insurance Enrolment: An Implication for Thai Social Security Act, Article 40

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Abstract

Background: Extending social insurance to informal employment has become a goal among international and national authorities. For Thailand, the voluntary social security scheme under Article 40 (A40) of the Social Security Act covers only seventeen percent of the total informal workers of 20.4 million. Many studies had identified factors relevant to the enrolment and renewal of voluntary social health insurance scheme. Thailand can learn and use the existing research findings from international perspectives to improve the coverage of voluntary social security scheme continuously and efficiently. **Methodology:** Searches of electronic databases from Google Scholar, PubMed, ThaiJo and ThaiLis were conducted. Studies that aimed to identify factors associated to the enrolment and renewal of health or social insurance, A40, and the National Saving Fund (NSF), written in English and Thai were included for the analysis. **Key results:** Ten studies were included in this review. The included studies reported demographic factors, education, occupation, income, knowledge and understanding of the scheme, quality of services, health issues, benefit package adequacy, and socio-cultural factors as significant determinants of the enrolment in a voluntary health insurance scheme, the A40, and the NSF. **Conclusion:** The present study provides evidence on determinants of the enrolment in a voluntary health or social insurance scheme that applicable to the Article 40 of Thai Social Security Act. Strategies should be developed with consideration of those significant determinants to increase the coverage and sustainability of the scheme.

Keywords: social security, Article 40 of Social Security Act, determinants, conceptual framework, informal worker

กรอบแนวคิดปัจจัยเชิงประจักษ์ที่สัมพันธ์กับการเป็นผู้ประกันตนภาคสมัครใจในระบบประกันสังคม: การประยุกต์ใช้เพื่อขยายความคุ้มครองในระบบประกันสังคม มาตรา 40 ของประเทศไทย

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บทคัดย่อ

ภูมิหลังและเหตุผล: การขยายความคุ้มครองของระบบประกันสังคมสู่แรงงานนอกระบบเป็นเป้าหมายสำคัญของหลายประเทศ ประเทศไทยส่งเสริมและขยายความคุ้มครองนี้สู่แรงงานนอกระบบผ่านพระราชบัญญัติประกันสังคมมาตรา 40 ที่เป็นภาคสมัครใจ ปัจจุบันมีผู้ประกันตนที่เป็นแรงงานนอกระบบเพียงร้อยละ 17 เท่านั้น จากจำนวนแรงงานนอกระบบทั้งหมด 20.4 ล้านคน มีการวิจัยจำนวนมากที่ศึกษาค้นคว้าปัจจัยที่สัมพันธ์กับการตัดสินใจสมัครเป็นผู้ประกันตนและการจ่ายเงินสมทบต่อเนื่องหรือการต่ออายุสมาชิก ซึ่งประเทศไทยสามารถเรียนรู้และใช้ประโยชน์จากข้อค้นพบที่มีอยู่เพื่อปรับปรุงกลยุทธ์การขยายความคุ้มครองและเพิ่มประสิทธิภาพได้ **ระเบียบวิธีศึกษา:** ใช้การสืบค้นการศึกษาวิจัยจากฐานข้อมูลอิเล็กทรอนิกส์ด้วยโปรแกรมสืบค้น Google Scholar, PubMed, ThaiJo และ ThaiLis การศึกษาวิจัยที่นำมาวิเคราะห์มีเนื้อหาเป็นภาษาอังกฤษและภาษาไทย มีวัตถุประสงค์เพื่อค้นหาปัจจัยหรือทดสอบความสัมพันธ์ระหว่างปัจจัยต่างๆ กับการสมัครเป็นผู้ประกันตนและ/หรือการจ่ายเงินสมทบต่อเนื่องหรือการต่ออายุสมาชิกของประกันสังคมหรือสุขภาพภาคสมัครใจ มาตรา 40 และกองทุนการออมแห่งชาติ **ผลการศึกษาและข้อยุติ:** จากการศึกษาวิจัยที่นำมาวิเคราะห์ทั้ง 10 ชิ้น พบว่า ปัจจัยที่สัมพันธ์กับการขึ้นทะเบียนเป็นผู้ประกันตน การส่งเงินสมทบ หรือการเข้าร่วมกองทุนการออมแห่งชาติ ได้แก่ ปัจจัยด้านลักษณะบุคคล การศึกษา อาชีพ รายได้ ความรู้และความเข้าใจเกี่ยวกับระบบหลักประกัน คุณภาพการบริการ ปัญหาสุขภาพ ชุดประโยชน์ทดแทน และสังคมและวัฒนธรรม หน่วยงานที่เกี่ยวข้องควรคำนึงถึงปัจจัยข้างต้นเพื่อพัฒนากลยุทธ์และรูปแบบการขยายความคุ้มครองไปสู่แรงงานนอกระบบ มาตรา 40 และความยั่งยืนของกองทุนประกันสังคม

คำสำคัญ: ประกันสังคม, มาตรา 40, ปัจจัย, กรอบแนวคิด, แรงงานนอกระบบ

Background and Rationale

Many countries including Thailand have a goal to extend the coverage of health and social protection to various groups of populations, particularly informal workers. From 2015 to 2020, digital technology has enormously affected employments and social change globally.[1] It has posed many challenges to governments to find effective strategies and adapt rapidly to secure the economic growth, sustainability, health, social, and environmental developments. It is best to find significant factors that will help the governments systematically assess the actual situations, develop, and implement policies and strategies to include disadvantaged populations. Studies across the world have tried to find out what factors might be significantly associated with enrolment and renewal of voluntary health or social insurance schemes among hard-to-reach populations. There seems to be similarities and differences depending on countries and areas of studies. It is always useful to learn experiences from existing studies and what is already known and how things have been done.

In Thailand, between 2015 and September 2020, approximately 1.2 million informal workers had registered as social security contributors under Article 40 (A40) of the Social Security Act. By the

end of September 2020, there were 3,437,629 contributors under Article 40[2], accounting around 17 percent of the total informal workers of 20.4 million.[3] Of about 17 million informal workers who were not contributors under Article 40, there might be many who were hard to reach popu-lations and struggling with uncertain economic, health, and social situations, but were in need of social protection.

For Thailand, it is important to gain a com-prehensive understanding of impact of various factors that may have influenced the enrolment and renewal decisions for health or social in-surance schemes. The systematic evaluation of relevant variables would help the nation improve the coverage of voluntary social security scheme continuously and efficiently. The purpose of this review was to develop a conceptual framework of empirical factors that were related to the enrolment and renewal of voluntary health and social insurance schemes with support of rigorous scientific research findings.

Methodology

Search Strategy

Search terms were used to find studies that identified factors related to enrolment and renew-al of voluntary or national social insurance. The search was limited to a 6 year period between 2015 and 2020 as this period was thought to cause technological disruption and have impact on population employments.[1] Studies with free full texts were included. The following search terms were used to first find relevant studies on Google Scholar; "social insurance", "social security scheme", "enrolment", "determinant", "factor". Similar articles were then traced on PubMed. A list of similar studies was created. A supplemen-tal search was then conducted on Thai Journals Online [ThaiJo] and Thailand Library Integrated System [ThaiLis] to retrieve more studies in Thai.

Study Eligibility

All studies in the list were analyzed for their relevance to the purpose of this study. Studies that aimed to identify factors associated to en-rolment or renewal of social insurance, health insurance, voluntary social security scheme (VSSS), or national saving fund (NSF), or aimed to test relationships among factors and uptake or com-pliance of social insurance and were written in English and Thai were included for the analysis. Studies excluded were qualitative studies, policy analysis, conference proceedings, study protocols, guidelines, handbooks, non–peer reviews, editorial works.

Study Selection and Data Extraction

A total of 57 studies were listed from PubMed. 313 Thai research and thesis papers were added to the list, totaling 370 studies. The abstracts of 370 studies were reviewed independently by authors on the above-mentioned inclusion and exclusion criteria. 360 studies were excluded leaving 10 studies for further reviews with their full texts. Two authors (S.K. and N.S.) reviewed the full-texts and extracted data. They also compared

and discussed the key findings and relevant data to resolve discrepancies between reviewers.

Quality Assessment

We used the Joanna Briggs Institution's checklist to assess the quality of the included studies.[4] The checklist comprises questions that authors of cross-sectional studies should answer to assure trustworthiness, relevance and results of their published studies. Each study in this review was assessed based on seven items; description of inclusion criteria, study characteristic, standard criteria used for measurement of the condition, identification of confounders, strategies for addressing confounding factors, valid and reliable measurement of outcome, and statistical techniques. Studies were given a score of 1 for items that had a clear description, and a score of 0 for those did not describe the relevant topics clearly. With a total score of seven points, a higher total score referred to a higher quality. Studies with less than 3 points were rated as low quality, 3 to 4 as medium quality, and from 5 and above as high quality. These quality findings were used to discuss methodological strengths and weaknesses of the included studies.

Results

Overview of Studies

Ten studies were included for analysis, according to the checklist, one study was classified as medium quality, 9 were classified as high quality. The items with less discussion included the valid and reliable measurement of outcome (n = 5), identification of confounders (n = 3) and strategies for addressing confounding factors (n = 3). (Table 1)

Seven of ten studies came from lower-middle income countries including Bangladesh (n = 2),[5,6] Ghana (n = 1),[7] Kenya (n = 2),[8,9] and Nepal (n = 1).[10] There were two studies from a low income country (Ethiopia, n = 2).[11,12] From the search for Thai studies, two studies had met the criteria.[13,14] Thailand is among countries of upper-middle income economy.[15] Of the eight foreign studies, there was one study analyzing the data collected in 2015,[5] four studies in 2016,[6,7,8,11] two studies in 2017,[10,12] and one study in 2018.[9] For the two Thai studies, one used the data collected in 2015[14] and another one in 2016.[13]

Cross-sectional study design was employed in most studies (n = 9), one study from Bangladesh[5] analyzed secondary data from the real-time management information system (MIS) of the scheme. All foreign studies aimed to identify factors associated to enrolment in health insurance schemes (HIS), one study from Thailand examined differences in attitude towards persistence in A40 among insured respondents,[13] another study from Thailand identified factors related to decision to save money in the NSF. The sample sizes ranged between 331 to 25,513 households. (Table 2)

Four foreign studies presented the associations between sample characteristics and the enrolment in the HIS with multivariate logistic regression on the odds of enrolment in the HIS.[6,7,9,12] Three studies used univariate logistic regression.[5,8,10]

Table 1 Quality assessments of studies

Reference	Description of inclusion criteria	Description of study characteristic	Standard criteria used for measurement of the condition	Identification of confounders	Strategies for addressing confounding factors	Valid and reliable measurement of outcome	Statistical analysis	Overall quality
Atnafu DD. et al. (2018) [11]	1	1	1	0	0	1	1	High
Ghimire P. et al (2019) [10]	1	1	1	1	1	1	1	High
Iqbal M. et al. (2017) [5]	1	1	1	1	1	0	1	High
Mahmood SS. et al. (2018) [6]	1	1	1	1	1	0	1	High
Mirach TH. et al. (2019) [12]	1	1	1	1	1	1	1	High
Oraro T. and Wyss K. (2018) [8]	1	1	1	1	1	0	1	High
Otieno PO. et al. (2019) [9]	1	1	1	1	1	1	1	High
Seddoh A. and Sataru F. (2018) [7]	1	1	1	1	1	0	1	High
Thamviriyavong P. (2018) [13]	1	1	1	0	0	0	1	Medium
Preecha R. and Lakkanawanit P. (2018) [14]	1	1	1	0	0	1	1	High

An Ethiopia study[11] performed two-sample *t*-tests and Pearson's chi–square test. One Thai study [13] employed two-sample t-tests and one-way ANOVA and another Thai study [14] used Pearson's chi-square test to test the association of sample characteristics with decisions in the NSF. (Table 3)

Determinants of Enrolment

The studies included in this review found significant determinants of the enrolment in the HIS, A40, and NSF described below.

Demographic Factors

Two studies[7,8] reported gender was significantly associated with the enrolment in the HIS and one[14] with the NSF. Among these, two[7,14] reported that females were more likely to enroll in the HIS and save money in the NSF while another study[8] found a negative effect of females on the enrolment in the HIS.

There was only one study[10] showing a positive association between privileged ethnic groups and the enrolment in the HIS.

Age was reported in one Ghana[7] and two Thai studies[13,14] to positively affect the enrolment in the HIS, persistence in A40, and decisions in the NSF.

A significant association between marital status was reported in one study from Ethiopia[11] and in two Thai studies.[13,14]

Only the studies from Ethiopia[11,12] found family size as a significant determinant of the

Table 2 Study characteristics and main findings

Reference	Study purpose	Setting/Sample	Year of data collection	Outcome measures	Main findings
Atnafu DD. et al. (2018) [11]	To identify differences in enrolment in community-based health insurance (CBHI) scheme and to describe the link between CBHI enrolment and healthcare utilization in the rural communities of Achefer District.	A rural community of South Achefer District, Ethiopia 594 households Response rate = 91.1%, 297 households = insured	2016	Utilization of healthcare community-based health insurance enrolment	Educational status; unable to read and write (proportion difference between insured vs. uninsured = -9.78 percentage points, p=0.013) able to read and write (proportion difference between insured vs. uninsured = 5.74 percentage points, p=0.034) Family size; fewer than 5 members (proportion difference = -10.76 percentage points, p=0.008) Occupation; farmer (proportion difference = - 3.68 percentage points, p=0.019) merchant (proportion difference = 6.04 percentage points, p=0.01) housewife (proportion difference =-2.35 percentage points, p=0.019) Marital status; married (proportion difference = 13.12 percentage points, p=<0.001) Perceived quality of care; low (proportion difference = 9.06 percentage points, p = 0.025) high (proportion difference = -15.52 percentage points, p=<0.001) very high (proportion difference = 4.34 percentage points, p=0.02) First Choice of place for treatment during illness; health institute (proportion difference=19.53 percentage points, p=<0.001) Health care cost of a recent treatment; <500 birr (proportion difference =-27.28 percentage points, p<0.001)
Ghimire P. et al (2019) [10]	To identify the factors associated with enrolment of households in the National Health Insurance Program (NHIP) to ensure equitable and universal access to healthcare by all Nepalese citizens.	Interviews took place in 2 municipalities of Ilam district. 570 households of equal numbers of NHIP enrolled and non-enrolled households. The mean age = 41.8 (+ 13.5) 87.4% were headed by males. 35.3 % of household heads had completed their secondary level education	2017	Enrolment in the NHIP	Increased odds Higher income (OR[a] = 4.08, 95%CI[b]=2.15–7.72) Privileged ethnic groups (OR = 1.7, 95%CI = 1.18–2.48) Illness experience in 3 months preceding the survey (OR = 1.51, 95%CI = 1.04–2.19) compared to none At least one of the members was chronically ill (OR =1.84, 95%CI = 1.23–2.73) compared to none
Iqbal M. et al. (2017) [5]	To explore the determinants of membership renewal in voluntary micro health insurance schemes	Data from the real-time management information system (MIS) of the scheme in Chakaria, Bangladesh 76 villages with 25,513 households	2015	Membership renewal	For outpatients only Increased odds: Frequency of visit to VHP/other selected health facilities 1–4 times (OR =2.1) 5–8 times (OR =6.4) 9+ times (OR =14.1) compared to zero visit Educational qualification (years of schooling) of household head 11 + years of schooling (OR = 1.9) compared to no formal education Amount of benefit received against healthcare expenditure ≥ 1205 BDT (OR = 2.2) compared to zero BDT

Table 2 Study characteristics and main findings (continued)

Reference	Study purpose	Setting/Sample	Year of data collection	Outcome measures	Main findings
Mahmood SS. et al. (2018) [6]	To identify factors influencing people from low-resource settings in micro health insurance schemes (MHI)	Chakaria, Bangladesh. 1956 households interviewed, 50.4% were enrollees and 49.6% were non enrollees.	2016	Uptake of health insurance scheme	Increased odds: Households with the main income earner having 10+ years of schooling (aOR[c]= 1.9, 95%CI = 1.2–2.9) compared to none Having financial literacy (aOR = 1.5, 95%CI = 1.2–1.8) Being a public/private service holder (aOR = 1.6, 95%CI =1.1–2.4) compared to farmers Membership in development programs of non - governmental organizations (aOR = 1.3, 95%CI 1.0–1.5) Presence of chronic illness in household (aOR = 1.5, 95%CI = 1.2–1.8) Households living closer to health centers (aOR = 2.1, 95%CI= 1.6–2.7) compared to those living further away
Mirach TH. et al. (2019) [12]	To assess factors that determine decisions to join the community based health insurance (CBHI) in West Gojjam zone, Ethiopia	13 rural districts and 5 town administrations in West Gojjam zone 690 household heads response rate = 97% 89.7% = male Mean age = 45.4 (± 12.09)	2017	CBHI enrollment decision	Increased odds: Family size (aOR =1.17, 95%CI = 1.02 -1.35) wealth; very rich (aOR = 3.62; 95%CI = 1.67–7.83) compared to poorest Existing chronic disease (aOR = 3.42, 95%CI =1.89- 6.19) Scheme benefit package adequacy (aOR = 2.17, 95%CI =1.20 -3.93) Health service quality at medium (aOR =3.20, 95%CI= 1.98- 5.15) Health service quality at good (aOR = 3.69, 95%CI =1.77 -7.69) compared to poor quality Good CBHI awareness (aOR = 4.90, 95%CI=1.65 - 14.4) compared to poor awareness Community solidarity at medium (aOR = 3.02, 95%CI = 1.17 - 2.60) compared to poor solidarity Decreased odds: Good health status (aOR = 0.380, 95%CI= 0.179 - 0.805) compared to poor health status
Oraro T. and Wyss K. (2018) [8]	To estimate how rotating savings and credit associations (ROSCA) membership influences the determinants of voluntary national health insurance (NHI) enrolment.	444 households in Kisumu City, Kenya, self-administered with a tablet between July and August 2016 29% of ROSCA households and 23% of non-ROSCA households were voluntarily enrolled into the NHI	2016	NHI enrolment	Increased odds: Being educated to at least secondary school level (OR = 1.80, 95%CI =1.05–3.11 for ROSCA members, and OR = 3.23, 95%CI =1.47–7.08 for non-ROSCA members) compared to primary or less Wealth; rich (OR = 2.81, 95%CI = 1.38–5.73) compared to poorest Decreased odds: Non ROSCA who were self-employed (OR = 0.25, 95%CI = 0.11–0.57) compared to paid employment Non ROSCA who were female (OR = 0.29, 95%CI =0.11–0.79) Daily/hourly pay (OR =0.20, 95%CI= 0.07–0.53) Task-based payment (OR =0.15, 95%CI= 0.05–0.44) Business profits (OR= 0.32, 95%CI= 0.11–0.95) Compared to fixed salary

Table 2 Study characteristics and main findings (continued)

Reference	Study purpose	Setting/Sample	Year of data collection	Outcome measures	Main findings
Otieno PO. et al. (2019) [9]	To determine the prevalence of health insurance and associated factors among households in urban slum settings in Nairobi, Kenya	Viwandani slums (Nairobi, Kenya) 300 respondents 51.7% = male 48.3%= female 44% = between 30 and 44 years 57% = married or living together	2018	Enrolment in a health insurance program	Increased odds: Tertiary education (aOR= 3.8 , 95%CI =1.34 - 10.72) compared to no education Satisfied with the procedure of care (aOR= 4.55, 95%CI =1.7 - 12.1) compared to not satisfied Self-reported illness in the past 12 months at least one case (aOR = 2.57, 95%CI = 0.31 – 1.23) compared to none. Decreased odds: Casual workers (aOR =0.12, 95%CI= 0.06 - 0.27) Unemployed (aOR = 0.19, 95%CI= 0.08 - 0.42) Traders (aOR = 0.16, 95%CI=0.06 - 0.44) compared to those formally employed No satisfied with the cost of care (aOR=0.39, 95%CI= 0.20 - 0.78) Good health status perceived (aOR = 0.62, 95%CI= 1.17 - 5.66) compared to poor one
Seddoh A. and Sataru F. (2018) [7]	To examine the effects of demographic factors on enrolment onto the National Health Insurance Scheme (NHIS)	Ashaiman and Adaklu, Ghana 625 respondents 56 % = female. 56.6% = 21–40 years. 30% = educated to the Junior High School level. 26.7% = trading occupation. 79 % = have ever enrolled onto the NHIS	2016	NHIS enrolment	Increased odds: Age group of 61 and above (aOR = 2.97, 95%CI= 1.23–7.16) compared to 21 - 40 years Female (aOR = 2.73, 95%CI = 1.76 - 4.24) Education of tertiary (aOR = 5.26, 95%CI = 1.28-21.58) Education of postgraduate (aOR = 4.14, 95%CI = 1.02-16.85) compared to none
Thamviriyavong P. (2018) [13]	To study the attitude towards the persistence of the voluntary insured persons (Article 40) and the persistence of the voluntary insured persons (Article 40)	331 voluntary insured persons (Article 40) of Social Security Office, Pathumthani province, Thailand Averaged age = 38.91 years the majority was female, married, had a bachelor degree, were in an income range between 8001-14000 Thai baht.	2016	Attitude towards the persistence in the social security act's Article 40	Age 50 years and above showed more positive attitude towards persistence in A40 compared to age 31-40 years Widows and married insurers reported more positive attitude than those divorced Insurers with a bachelor degree had more positive attitude than those with secondary school Insurers with income range 14,001-20,000 baht/month showed more positive attitude than those with less than 8,000 baht/month Insurers who were self-employed, daily/hourly paid, and sellers reported more positive attitude than farmers
Preecha R. and Lakkanawanit P. (2018) [14]	To study 1) decision-making to save money in the National Savings Fund 2) degree of motivation factors and 3) degree of knowledge factors and 4) relationship of personal, motivation, and knowledge factors to decision-making to save money in the National Savings Fund	400 informal workers in Muang District, Nakhon Si Thammarat province, Thailand. The majority was female, aged 35-49 years, married, had 1-2 dependent family members, graduated from a bachelor degree, were sellers, and had incomes lower than 10,000 baht. 50 % = decided to save money in the National Savings Fund	2015	Decision to save money in the National Savings Fund	More females decided to save money in the fund than males (58.8 vs. 32.33, $p<0.000$) Those aged 35-49 years decided to save money in the fund the most (64.79%), followed by 50-59 years (61.98%) ($p<0.000$) Widows/divorced workers decided to save money in the fund than single and married workers (59.09 vs. 31.65 and 55.21%, respectively, $p=0.003$) Those having 3-4 dependent family members decided to save money the most (70.77%) followed by 1-2 members (55.21%) ($p<0.000$) Workers with a diploma degree decided to save money the most (81.63%) followed by secondary school degree (58.82%) ($p=<0.000$) Salers decided to save money the most (71.15%) followed by farmers (47.06%) ($p<0.000$) Those with an income between 40,001-50,000 Thai baht decided to save money the most (100%) followed by 20,001-30,000 baht (62.34%) ($p=0.001$) Other factors included objectives of saving, persons who approached and introduced the fund to them, tax-benefits.

Table 3 Determinants of enrolment in the health insurance scheme, persistence in A40, and decisions to save money in the NSF

Determinants	References									
	Iqbal M. et al. (2017)[5]	Mahmood SS. et al. (2018)[6]	Atnafu DD. et al. (2018)[11]	Mirach TH. et al. (2019)[12]	Seddoh A. and Sataru F. (2018)[7]	Oraro T. and Wyss K. (2018)[8]	Otieno PO. et al. (2019)[9]	Ghimire et al. (2019)[10]	Thamviriyavong P. (2018)[13]	Preecha R. and Lakkanawanit P. (2018)[14]
Country	Bangladesh	Bangladesh	Ethiopia	Ethiopia	Ghana	Kenya	Kenya	Nepal	Thailand	Thailand
Outcome measures	HIS[a] Membership renewal	HIS enrolment	CBHI[b] enrolment	CBHI enrollment	NHIS[c] enrolment	NHIS enrolment	HIS Enrolment	NHIS Enrolment	Attitude towards the persistence in A40[d]	Decision to save money in the NSF[e]
Statistical tests	Univariate logistic regression	Multivariate logistic regression	Independent t-test and Pearson's chi-square	Multivariate logistic regression	Multivariate logistic regression	Univariate logistic regression	Multivariate logistic regression	Univariate logistic regression	Independent t-test and One-way ANOVA	Pearson's chi-square
Demographic factors										
Sex					Increased odds (female, aOR[f] = 2.73)	Decreased odds (female, OR[g] = 0.29)				More females decided
Ethnic group								Increased odds (Privileged ethnic group, OR = 1.7)		
Age					Increased odds (age 61 and up, aOR = 2.97)				Positive attitude	Most in 35-49 years followed by 50–59 years
Marital status			More insurers in married workers						Widows/married had more positive attitude than divorced	More in widows/divorced than single
Family size			Fewer insurers in families with fewer than 5 members	Increased odds (aOR =1.17)						
Education	Increased odds (OR = 1.9)	Increased odds (aOR =1.9)	More insurers in those were able to read and write		Increased odds (aOR = 5.26)	Increased odds (OR = 1.80)	Increased odds (aOR = 3.8)			More in diploma degree than secondary education
Occupation		Increased odds (being a public/private service holder, aOR = 1.6)	Fewer insurers in farmers and housewives More insurers in merchants			Decreased odds in daily/hourly paid/task-based workers groups	Decreased odds in causal, unemployed, and traders		Self-employed insurers had more attitude than farmers	Most in sellers followed by farmers
Income				Increased odds (aOR = 3.62)		Increased odds (OR = 2.81)		Increased odds (OR = 4.08)	Positive attitude	More in those with higher incomes
Knowledge and understanding of the scheme										
Financial literacy		Increased odds (aOR =1.5)								

Table 3 Determinants of enrolment in the health insurance scheme, persistence in A40, and decisions to save money in the NSF (continued)

Determinants	References									
	Iqbal M. et al. (2017)[5]	Mahmood SS. et al. (2018) [6]	Atnafu DD. et al. (2018) [11]	Mirach TH. et al. (2019) [12]	Seddoh A. and Sataru F. (2018) [7]	Oraro T. and Wyss K. (2018) [8]	Otieno PO. et al. (2019) [9]	Ghimire et al. (2019) [10]	Thamviriyavong P. (2018) [13]	Preecha R. and Lakkanawanit P. (2018) [14]
Awareness				Increased odds (aOR = 4.90)						
Understanding of objectives										Positive association
Quality of services										
Perceived quality of care			More in those perceiving low quality	Increased odds (aOR = 3.69)			Increased odds (aOR = 4.55)			
First Choice of place for treatment			More insurers in Health institute							
Health care cost of a recent treatment			Fewer insurers in those who had a health care cost<500 birr							
Distance to health center		Increased odds (Closer distance, aOR = 2.1)								
Health issues										
Existing chronic disease				Increased odds (aOR = 3.42)			Increased odds (aOR = 2.57)	Increased odds (OR = 1.51)		
Presence of chronic illness in household		Increased odds (aOR = 1.5)						Increased odds (OR = 1.84)		
Frequency of visit to health facilities	Increased odds (OR = 2.1)									
Good health status				Decreased odds (aOR = 0.38)			Decreased odds (aOR = 0.62)			
Dependent family members										Most in those with 3–4 dependent members
Benefit package adequacy	Increased odds (OR = 2.2)			Increased odds (aOR = 2.17)			Increased odds (not satisfied decreased odds [aOR=0.39])			Tax-benefits showed a positive association

Table 3 Determinants of enrolment in the health insurance scheme, persistence in A40, and decisions to save money in the NSF (continued)

Determinants	References									
	Iqbal M. et al. (2017)[5]	Mahmood SS. et al. (2018)[6]	Atnafu DD. et al. (2018)[11]	Mirach TH. et al. (2019)[12]	Seddoh A. and Sataru F. (2018)[7]	Oraro T. and Wyss K. (2018)[8]	Otieno PO. et al. (2019)[9]	Ghimire et al. (2019)[10]	Thamviriyavong P. (2018)[13]	Preecha R. and Lakkanawanit P. (2018)[14]
Socio-cultural factors										
Membership in voluntary groups/programs		Increased odds (aOR = 1.3)								
Community solidarity				Increased oods (aOR = 3.02						
Persons who approached and introduced the scheme										Positive association

[a] HIS = Health insurance scheme, [b] CBHI = Community based health insurance, [c] NHIS = National health insurance scheme, [d] A40 = Social security act's Article 40, [e] NSF = National Saving Fund, [f] aOR = adjusted odds ratio, [g] OR = odds ratio

enrolment in the HIS. Those who lived in a larger family were more inclined to enroll in the HIS than those living in a smaller one.

Educational Status

Six foreign studies[5–9,11] and one Thai study[14] reported that education was a significant determinant of the enrolment in the HIS and decision to save money in the NSF. These seven studies found that those with a higher education level were more likely to enroll in the HIS than their counterparts.

Occupation

Four foreign studies[6,8,9,11] and two Thai studies[13,14] reported occupation as a significant determinant of the enrolment in the HIS, A40, and NSF. It seems that those who engaged in formal works or employments enrolled more in the HIS, A40, and NSF in comparison with those in casual works, doing daily or hourly paid tasks and agricultural sector.
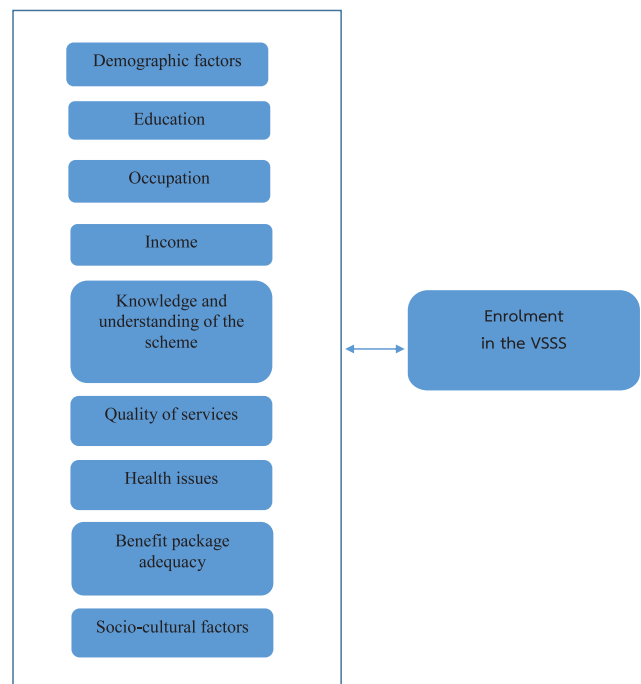

Figure 1 Conceptual framework of empirical factors related to enrolment in a voluntary social security scheme (VSSS)

Income

Income was reported in five studies[8,10,12–14] to positively affect the enrolment in the HIS, A40, and NSF.

Knowledge and Understanding of the Scheme

One study[6] found a positive association between financial literacy and the enrolment in the HIS. One study from Ethiopia[12] reported awareness of the scheme as a positively significant determinant of the enrolment in the HIS. Understanding the objectives of the NSF was shown in a Thai study[14] to positively associate with decision to save money in the NSF.

Quality of Services

Perceived quality of care was reported in three studies[9,11,12] to be a significant determinant in the enrolment in the HIS. One study[11] found first choice of place for treatment to affect the decision to enroll in the HIS. Those who chose public health institutes as their first choice for treatment enrolled more in the HIS than those who chose other types such as private clinics or hospitals.[11]

Health care cost of a recent treatment was another significant determinant of the enrolment in the HIS as shown in one study from Ethiopia.[11] Another study[6] found that closer distances to health centers positively affected the enrolment in the HIS.

Health Issues

Existence of chronic diseases was reported in three studies [6,9,10] to be a significant determinant of the enrolment in HIS. Existing chronic diseases increased the odds of enrolment in the HIS. Two studies, one from Bangladesh and one from Nepal, found presence of chronic illness in households had a positive association on the enrolment in the HIS.

Frequency of visit to health facilities, a significant factor that was positively associated with the enrolment in the HIS as reported by the study from Bangladesh.[5]

Number of dependent family members was also found to be a significant factor of decisions to save money in the NSF. The study from Thailand[14] found that workers having 3–4 dependents were more inclined to save money in the NSF.

Two studies[9,12] found similar effects of good health status on the enrolment in the HIS. Good health status tended to negatively affect the enrolment.

Benefit Package Adequacy

Three foreign studies[5,9,12] and one Thai study[14] reported benefit package adequacy as a positively significant factor of the enrolment in the HIS and NSF.

Socio-Cultural Factors

The study from Bangladesh[5] showed that being a member in a voluntary group or program had a positive effect on the enrolment in the HIS. Another study from Ethiopia[12] found that community solidarity played a significant role in determining the enrolment of the HIS. One Thai study[14] found a positive effect of persons who approached the participants and introduced the NSF to them on decisions to save money in the NSF.

Discussion

This study aimed to review existing studies between 2015–2020 that identified significant factors associated with the enrolment in a voluntary health or social insurance scheme during the technological disruption period in which many people's employment status changed rapidly.[1] The findings would pave ways for further studies and analysis of available data for identifying target groups for developing policies and strategies to extend the coverage, relevant supportive systems, and monitoring and evaluating systems in Thailand or elsewhere.

According to the studies included in this review, there were many pieces of empirical evidence that demographic factors, education, occupation, income, knowledge and understanding of the scheme, quality of services, health issues, benefit package adequacy, and socio-cultural factors were significant determinants of the enrolment in a voluntary health insurance scheme, A40, and NSF, which can be applied for developing effective strategies to extend the A40 coverage into workers who are not eligible for the Article 33 of Social Security Act (for formal employment).

Demographic Factors

Sex, ethnic group, age, marital status, and family size were reported as significant demographic factors of the enrolment in the HIS.

The available evidence was mixed regarding association between sex and enrolment in a HIS. While two out of three studies included in this review reported that females were more likely to enroll in the HIS which are in line with previous studies,[16–18] another study in Kenya had shown that females were less likely to enroll in the HIS similar to some previous studies as well.[19,20] The other seven studies in this review reported no significant association in enrolment in the HIS male and female participants as found in some previous studies.[21,22]

For those observations in which women were more likely to enroll in the HIS, it might be explained by the fact that women and older people are more self-health conscious, for this case, resulting in enrolling in a health/social insurance card.[17,23,24] In contrast, the low percentage of enrolment in the HIS among women in many developing countries might relate not only to lower economic status in households, but also to lower education levels. Women in many developing countries were known to play major roles in economic activities including farm work, other household livelihood activities and community management, but were poorer than their male counterparts.[25] Asset ownership, educational and income levels remained low among women, resulting in low female participation in voluntary programs and schemes.[26] This might be explained why females were less likely to enroll in the HIS in Kenya.

People in more privileged ethnic groups were more inclined to enroll in the HIS. This might be explained by the fact that underprivileged ethnic groups were more likely to be financially unstable and have relatively less access to information and services. Paying for enrolment into the social

security schemes like the HIS might thus be too difficult for them. Another explanation for this finding is that richer and ethnically privileged families might be better connected to the governmental organizations and enrolled more in other government programs and services. With greater interactions, they might have better exposure to insurance information and knowledge on how to enroll.[10] A study about United States Medicaid program showed that those enrolled in other forms of government programs were more likely to be registered in a health insurance scheme.[26]

Workers having larger family sizes were more likely to enroll in the HIS than smaller ones. This can possibly be explained by the huge financial burden that large families faced at times of risk. Additionally, when many members family lived together in a single unit, they might share different ideas for making good decisions, thus enrolling in the HIS.[10]

Educational Status

Education not only enhanced information-seeking behavior and understanding of government policies and programs but also enhanced quality decision making.[27] The influence of education on enrolment in the HIS had been studied in previous studies.[16-18,28,29] Better understanding of the concept of health/social insurance among the educated group will improve informed decision-making.

Occupation

Those who engaged in formal works or em-

ployments enrolled more in the HIS, A40, and NSF in comparison with those in casual work, daily or hourly paid tasks and agricultural sector. This finding is in line with earlier studies.[30,31] People who work in such informal conditions for example in the agricultural sector have seasonal income and thus their ability to pay fluctuates with income flow. Another explanation is that the burden of losing working time to go to the registration office presents a disincentive to enroll.[30,31] However, those workers who wish to register under A40 can do that via the website of the Social Security Office and pay the contribution at contracted counter services such as 7–11 shops that are located over the countries.

Income

As income can determine the ability to pay, the financial resource capacity of people and affordability of the contribution fee was a first concern to the enrollment.[32] Those who were in good socio-economic level would be in a better position to enroll and pay the contribution than their counterparts.

For A40, eligible people had to pay the contribution to complete the registration. This means that they sense the need for the social protection and choose the contribution option and benefits that fit their income levels. However, only 30 percent of the total insured persons under A40 pay the monthly contribution.[33] Thus, in this case, income or poverty might not be a true factor for the low enrolment. This argument has two points.

Firstly, 'low income' may not only be an issue of lack of money but also lack of control over personal life uncertainties. As a consequence, people may wait until they need social protection before registering in a voluntary social insurance. This may lead to adverse selection effect.[32,34–37] This was reported in a study in Ghana. The majority (65.2 percent) of the richest respondents said they could not renew their membership because of poverty.[38]

Secondly, the 'no money to pay' statement may not refer directly to lack of money. It may be a socially acceptable response.[39] A critical analysis in Ghana of the situation of some poor insurers revealed that the household heads had the social responsibility of caring for close relatives. The poor (usually the men) also had dependent family members to take care of such as their wives, children and chronically ill relatives. As they had low incomes, enrolling all these dependents was impossible. The study reported that a cocoa farmer and a father of six children (one above 18 years) and two dependents above 18 years did not have enough money to pay for everybody so he enrolled his wife and four children only.[38]

Knowledge and Understanding of the Scheme

There was empirical evidence supporting that sufficient financial literacy encouraged the enrolment in the HIS. Financial literacy referred to knowledge and understanding of individuals about the concept of financial transaction, loss, savings and interest.[6] The low rate of participation among people with a low level of financial literacy might

also point to the lacking in the marketing/communication strategy of the scheme that needed more educated or better financially literate people to join.[6] However, the effect of financial literacy on the enrolment in the VSSS is little known.

Awareness of the scheme was positively associated significantly to the enrolment. This finding is consistent with other studies.[40-45] Knowledge and understanding of insurance objectives and the functioning of the VSSS facilitated both enrolment and contribution payment. It is clear that if there is low literacy and lack of information related to the VSSS among the community, there will be low enrolment and renewal decisions.[40]

Quality of Services

People who experienced good quality of service while utilizing the benefit for example sickness benefits were more likely to enroll in the scheme which is in line with other studies.[40,46,47] This can be explained by the quality of the services or providers that the better the insured perceive the more likely the insured would enroll or pay the contribution. That is because the primary objective of joining the scheme is to get high quality health service and social protection at affordable costs. Quality of services at public facilities such as client reception (availability of service providers, waiting time, respect and consideration displayed by personnel), rapidity of procedures are strong factors for membership.[48] Satisfaction with services is a key determinant of client's behavioral intention to have health/social insurance coverage. Previous studies have

shown that client satisfaction with the quality of service is correlated with enrolment in a health insurance program.[49–51]

Those who chose public facilities as their first choice of place for treatment were more likely to enroll in the HIS in Kenya.[11] A possible explanation for this observation is the fact that public provision of primary healthcare services in Kenya was subsidized. The majority of insured people sought care in these facilities.[52]

Also in Thailand, the primary health care services are subsidized, everyone is entitled to approach the local primary health care units for which their rights are recognized. People regardless of their membership of A40 who are resided close to a public health care facility have to seek care in health care facilities that are close to their homes first. However, the effect of the distance of public health care facilities should not be ruled out. There are people who live in a far distance for example ethnic groups who live in hilly areas.

Health Issues

Those who reported good health status were less likely to enroll in the HIS. This finding is in agreement with earlier studies.[53,54] A likely explanation for this is that workers who perceive themselves as healthy tend to skip out on health insurance to meet the cost of other basic needs.[53,54]

People with sick members were willing to enroll in a HIS which is supported by the finding of a previous study.[48] A possible explanation is that people with poor health and chronic illnesses

had greater perceived risk for care seeking and strongly needed to join the scheme.[48]

For the observed significant association between existence of chronic disease and enrolment in the HIS, it indicates the possibility of adverse selection might have taken place in a voluntary health or social insurance scheme. Adverse selection results when high-risk or sick individuals enroll more in the health/social insurance schemes compared to low-risk or healthy individuals. Adverse selection may limit potential for cross-subsidies and can affect the sustainability and financial viability of the scheme through repeated unnecessary use and higher risk group disproportionately joining the scheme.[34,36]

VSSS such as A40 are vulnerable to adverse risk selection which can lead to inadequate risk pooling.[55] However, voluntary schemes can raise funds in the absence of widespread prepayment and pooling. They can also recognize people with the benefits of insurance and prepayment, although they have a limited ability to cover a range of services for those too poor to pay contributions.[56] Adverse selection effects, nevertheless, need to be explored for A40.

Benefit Package Adequacy

Benefit package was also significantly associated with the enrolment. This is similar to previous findings.[40,42,57] This could be attributed to the direct benefits obtained from broadly defined benefit packages; as the benefit package increased, the insurers benefit increased. For example, including a new service, more benefits, and less contribution

amount positively influenced enrolment.[42,58]

Socio–Cultural Factors

Those who were members of a voluntary group or program were more inclined to enroll in the HIS. This might have to do with group solidarity and other benefits of joining the group. For example in Bangladesh,[6] joining a community program gave the members more opportunities to generate more incomes. This income generating program gave the members access to additional funds that they could use to pay for the contribution fee. Additionally, involvement with such programs also gave this group better exposure to knowledge and information, which non-members might not have access to or were not aware of. The higher likelihood of voluntary groups members joining the Chakaria health card scheme might also be indicative of the in-built solidarity that the members of such development programs shared.[6] Previous studies had also found the success of HIS schemes to rely on the level of social capital.[59-61]

A study[12] indicated that community solidarity was a significant factor of the enrolment. This is in line with other studies.[44,62,63] The decision to join the scheme was high for individuals who perceived the existence of good community solidarity. That is, when there is a strong community solidarity, individuals value not only their own benefits but also that of community.[44,62,63]

Persons who approached and introduced the scheme had a significant effect on the enrolment decision in the NSF.[14] This is attributed to the fact that community members might be more re-sponding to messages from people of community respect such as religious leaders.[64–65]

Although community leaders were frequently recommended in previous studies,[64–66] but in Thailand, community leaders might have conflicts of interests in community based-social funds. Community based-social funds were set up by community inhabitants to financially protect members in common social issues most needed in particular communities.[67] As the contribution amount of such community–based social schemes might be much lower than the one of A40 option 1 (70 baht/month), people in community might be more likely to enroll and contribute to their community based-social schemes than A40.

Study Strengths and Limitations

This study shows evidence–based factors that were associated to the enrolment in voluntary health or social insurance schemes in the new era of technological disruption. The findings form an empirical conceptual framework for future studies, analysis of available data, or further developments of policies, communication strategies and monitoring and evaluation. Further studies need to be carried out among people with significant determinants to understand the factors that attract people to join. At the same time, the behaviors of those who did not join also needs to be studied carefully to identify barriers to joining and paying the contribution.

In terms of limitations, this study was based on a search of three electronic databases (PubMed, ThaiJo, and ThaiLis) and relevant

websites, grey literature was not included. The systematic approach used, however, was likely to have captured relevant studies according to the inclusion and exclusion criteria and also provided an exemplar for future research relevant to the more efficient implementation of A40 in Thai context. Another remark is that most studies included in this review were more related to enrolment in a health insurance scheme rather than a social security scheme. As these two schemes share common purposes, that is to prevent catastrophic expenditure due to health problems and improve life security, but face similar issues, the findings of this review can be applied for more efficient and effective strategies for both health and social security schemes for workers who are under A40.

Directions and strengths of determinants were inconsistent among international and Thai studies. This shows the enrolment in the VSSS might have been affected by the cultures, attitudes, and the characteristics of the SSS of each country. Therefore, it is highly encouraged to study the responses to the enrolment among those with significant factors by country. Moreover, some studies used univariate logistic regression which might have limited the ability to control for some key confounders within their analysis. Regarding the sample sizes of the included studies, the effects of determinants could not be nationally representative. The enrolment and the explanatory factors were thus associative rather than causative within the context of each study. For Thailand, more data from both quantitative and qualitative study designs should be collected for

better development and successful implementation of strategies. An analysis of available data of insurers under A40 to determine determinants of contribution payment continuity might indicate further qualitative studies.

Implications for Thai Social Security Act's Article 40

The government should implement social interventions targeting gender strategic needs that empower both men and women to be equally responsible for financial stability and equity.

More specific strategies should be developed to target vulnerable groups who need social protection. One of effective actions to increase access to information to vulnerable groups such as ethnic groups, people with low financial literacy, is to use plain language and local language via local media, radio, television programs when promoting the social security scheme benefits which is more user-friendly. Portable local registration and contribution collection services on site are well convenient for those who have difficulties with electronic registration and contribution payment channels and live at far distances.[58]

Improving access to education and introducing the principle of social protection in curricula in rural areas should be a major policy intervention that will transform most rural communities in both short and long term.

There should be a risk assessment at the times of registration. This is just to gain more information for better risk management, adverse selection reduction, benefit promotion, and

scheme improvements. For example, in Rwanda,[68] individual account for income, household assets, and ability to work were assessed. Other significant determinants such as family size and presence of chronic illness in the family can be added. This will give more insights to promote an at least pre-paid 3 month contribution payment in advance for those at high risk with health issues to be eligible for the sickness benefit or consider sliding scale premium (in which participants with higher incomes pay a higher share of the total premium cost). The latter has been tried in different parts of the world in minimizing the financial risk resulting from moral hazard and adverse selection.[32,37]

For A40, associations between health issues and enrolment and contribution payments should be studied to assess the existing of adverse selection.

Matching premium collection time with the income flow may encourage more of those engaged in the agricultural sector to join and pay the contribution.

The provision of good quality service should be kept in mind in all steps of service processes. The service providers should regularly be reflected on the service quality and should be trained how to provide the services that meet the needs and limitations of the insurers.

Local governments and other community stakeholders could play a significant role to raise awareness, improve community trust and the connectedness of people to government and voluntary programs.

Conclusion

This study had collected many pieces of evidence that identified significant determinants of the enrolment in a voluntary health or social insurance scheme which could be implied for Article 40 of the Social Security Act. We suggest that strategies should be developed with consideration of those significant determinants to increase the coverage and sustainability of the scheme. But for successful implementation of the strategies, more qualitative studies need to be carried out among people with significant determinants to better understand the factors that attract people to join. At the same time, the behaviors of those who did not join also need to be studied carefully to identify barriers to joining and paying the contribution.

Acknowledgement

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