

Rural-urban gaps in health care utilization among older Thais: The role of family support



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ABSTRACT

This study examined rural-urban differences in health visits among older Thais utilizing Andersen's model. Data were drawn from the 2011 Survey of Older Persons in Thailand of adults 50 years and older ($N = 56,435$). Logistic regression models examine individuals' predisposing, enabling, and health need factors for explaining older adults' health care use. Approximately 50% of older adults sought health care but urban dwellers were more likely than rural dwellers to seek health care (54.8% vs. 49.7%). Predisposing factors and health needs narrow the rural-urban gap while enabling factors widened the gap in health visits. The receipt of financial support from children presented a significant moderating effect in the rural-urban divide of health care use. Despite Thailand's universal access to health care, geographic inequity in health care utilization withstands. Findings suggest investments in education, income security, social participation, and healthy lifestyle promotion can improve health care utilization. Furthermore, results suggest a need for continued investigation of the role of family support in bridging the rural-urban divide in the health of older Thais.

1. Introduction

Thailand is undergoing rapid population aging such that by 2030 adults 50 years and older will account for 42% of the total population (United Nations, 2017). Rapid population aging raises concerns about later life health vulnerabilities and the preparation of health care systems to meet increasing demands for health care services. In order to effectively mitigate the health vulnerabilities of older adults, and reduce medical costs, it is important to understand what factors influence older adults' health care use and the extent of inequality therein. Existing research on health care utilization among older Thais, though limited to single provinces or qualitative assessments, has identified the importance of geographic location (rural-urban divisions), distance to health facilities, health needs, occupation status, economic status, and the availability of family support as important factors in health care utilization (Netithanakul & Soonthornhdada, 2009; Rittirong, 2016; World Bank Group, 2016). Furthermore, previous research on health care use in Thailand has focused on curative care (e.g. inpatient, outpatient), and sub-groups of older adults such as those with chronic illnesses, thereby reflecting health care utilization that is more discretionary. There has been less research on preventive health care use, which is more reflective of individual's resources to seek care and an important pathway to enhancing overall health. Thus, utilizing a

national representative survey of the older adults, the purpose of this study was to examine the factors that contribute to rural-urban disparities in preventive health care utilization among older Thais with particular attention to the role of family support.

1.1. Family ties and health care use

Andersen's behavioral model of health care utilization (Andersen, 1995; Andersen, Davidson, & Baumeister, 2013) identifies that the availability of social relationships, and the support derived from these relationships, are important factors that influence an individual's propensity to utilize health care services. Family ties are one of the most important social relationships that can influence health behavior, such as health care utilization, through several implicit and explicit mechanisms (Umberson, Crosnoe, & Reczek, 2010). Primarily, family members can provide social support (monetary, instrumental, information, emotional), which can reduce the burdens associated with stressful circumstances, such as health care visits, while also providing the psychological benefits of "mattering" to others (Thanakwang & Soonthornhdada, 2011; Thoits, 2011). This combination of actual support received and the underlying perception that family members care for one's health can encourage health care utilization. Second, family members, as a source of social control and influence, can

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explicitly influence health behavior by exerting pressure or inspiration to adopt healthy habits (Falba & Sindelar, 2008; Reczek, Beth Thomeer, Lodge, Umberson, & Underhill, 2014). Third, family ties provide a sense of belonging and commitment to family members, which can promote healthy behavior (Umberson et al., 2010). As individuals age, family relationships, especially those with spouses/partners and children, become more prominent because they are often the most immediate sources of informal support as caregiving needs increase (Agree & Glaser, 2009). Importantly, the quality of family support, whether supportive or stressful, also influences health behaviors with more stressful relationships being associated with negative health behaviors (Tang, Brown, Funnell, & Anderson, 2008; Umberson et al., 2010).

Empirical research generally shows that family ties, both structural aspects such as the availability of spouses/partners and children, as well as the functional dimensions such as support exchanges, are associated with health care utilization but the evidence is inconclusive. Regarding structural dimensions of family ties, some studies show that being married/living with a partner, and having children, are positively associated with preventive health service utilization (Bish, Yardley, Nicoll, & Michie, 2011; Hoebel, Starker, Jordan, Richter, & Lampert, 2014; Stafford et al., 2018). Other studies, however, show that marital status and/or the availability of children are unrelated to or inversely associated with older adults' health care utilization (Li & Chi, 2011; Rittirong, 2016). Likewise, the empirical evidence pertaining to functional dimensions of familial social support is mixed. Some studies show that the support provided by family members can reduce the utilization of some types of formal health care services such as home health care, nursing home services, and the number of physician visits, due to the substitution of care (Van Houtven & Norton, 2004). Other studies, however, show that informal care by family members can complement specific types of health service use such as doctor visits while also substituting others such as formal home care services (Bolin, Lindgren, & Lundborg, 2008). Additionally, studies have shown that the relationship between social support exchanges with children and health care use varies by the type, and directions, of support examined. For instance, Peng and Lin (2018) in their study of health care use among older adults in Taiwan show that frequent contact with children (and other relatives and friends) is positively associated with utilization of preventive care services, including general health examinations. Research among Chinese older adults shows that intergenerational coresidence is associated with a lower likelihood and frequency of physician visits whereas the provision and receipt of financial support are associated with an increased likelihood and frequency of physician visits (Li & Chi, 2011). Yet, research among older adults in the United States shows that those who receive financial support from their children, and other family members, are less likely to visit a dentist but having a child in close proximity increases the likelihood of dental visits (Burr & Lee, 2013).

We argue that family support, particularly from adult children, is an important determinant of older Thais' health care use for several reasons. In the Thai context filial piety prevails in the society and children are identified as the predominant source of income of older Thais (Knodel, Teerawichitchainan, Prachuabmoh, & Pothisiri, 2015). Although the Thai government currently provides a universal old-age allowance to all older persons who do not receive a pension or equivalent benefits, the amount, which is in the range of 600–1000 THB (equivalently 20–35 USD) per month, is very modest and may be inadequate to meet all their needs, including paying for health care. Furthermore, financial support from children may be more important in rural than in urban areas as rural older persons are more likely to rely on the old age allowance.

Not only the receipt of financial support from children, but the provision of financial support to adult children can also influence health service utilization in two different ways. On one hand, parents' provision of support to their adult children may instill a sense of purpose to their lives that can encourage health investments, by having an

annual health check-up. On the other hand, one study has shown that financial support to adult children is associated with lower psychological well-being of older Thai parents (Teerawichitchainan, Pothisiri, & Long, 2015). This may translate into health complications and a higher likelihood of health service use. Alternatively, support commitments to their children may restrict parents' available financial resources for health visits.

Intergenerational coresidence, another form of family support, is the preferred living arrangement of older Thais as such close proximity to children provides easier access to support and resource sharing among family members. Previous research (Rittirong, 2016) has shown that coresidence with adult children increases the likelihood of parents' utilizing health services. Although intergenerational coresidence has been declining due to increasing migration of younger cohorts, approximately two thirds of older Thais, urban and rural dwelling, live with or near their children (Knodel et al., 2015).

In addition, although the state has made significant improvements in reducing geographic inequality in health care infrastructure, services and personnel, rural-urban divides in the availability of health care facilities and quality of care still exist (Meemon & Paek, 2018; Sakunphanit, 2008). Thus, rural older adults may be more disadvantaged than urban dwellers in their access to health care, and are likely more reliant on family support to facilitate their health care use.

1.2. Health care access in Thailand

Thailand introduced a social health insurance system, the universal health coverage scheme (UCS), in 2001–2002 to create more equitable access to health care by reducing income related barriers to health care (Ministry of Public Health, 2005). The UCS covers inpatient and outpatient care as well as health promotion activities such as immunizations and annual check-ups. In effect, the UCS aims to reduce out-of-pocket payments for health care service, which would offer protection for vulnerable groups such as the poor and older adults, many of whom live in rural areas (Sakunphanit, 2008).

Those covered by the UCS, however, can only utilize designated primary health care facilities, and additional expenses that arise during a visit are paid by the individual. The anticipation of such expenses can deter health care visits. Additionally, some reviews of the health care system identify concerns regarding the relatively lower quality of service at UCS designated public health facilities, compared to private facilities. This is due to the reduced supply of skilled health professionals in public facilities as many choose to work in the private sector, and the high levels of migration of skilled health professionals from rural to urban areas of Thailand (Meemon & Paek, 2018; Sakunphanit, 2008). Other reviews, however, show that the UCS has improved access to health care services, especially in rural areas, as a result of a district health system implemented by the government to allow closer geographic proximity to public facilities, and further supported by policies to encourage and retain health care professionals in rural areas (Limwattananon, Tangcharoensathien, Tisayaticom, Boonyapaisarncharoen, & Prakongsai, 2012; Sakunphanit, 2008).

Although Thailand's social health insurance is designed to mitigate catastrophic health expenditure and encourage equitable health care access regardless of one's socioeconomic status, the evidence is inconsistent. Some studies argue that the UCS has indeed benefitted some of the most vulnerable groups such as the poor, women, lower educated, and there has been an overall reduction in socio-economic inequalities in primary health care utilization among urban and rural dwelling Thais (Limwattananon et al., 2012; Meemon & Paek, 2018; Yiengprugsawan, Carmichael, Lim, Seubsman, & Sleight, 2010). Other studies, however, show that households with higher proportions of older adults and chronically ill members, as well as those in higher income quintiles, continue to have high out-of-pocket or catastrophic health care expenditure (Somkotra & Lagrada, 2009). This can be attributed to a greater likelihood of utilizing private facilities due to

preference or convenience among other factors. In fact, an assessment of health seeking among Thais before and after the implementation of the UCS (between 2001 and 2005), identified that more than 50% of Thais with UCS coverage utilized private or informal health care services (Meemon & Paek, 2018). Moreover, a recent qualitative study among older adults who are covered by the universal coverage scheme, conducted by the World Bank Group (2016) identified a rural-urban divide in health care utilization among older adults that can be attributed to social structural factors such as income and transportation, as well as the availability of family support (World Bank Group, 2016). Thus, equality in health care access and utilization has yet to be achieved.

1.3. Conceptual framework

Following previous studies that examine inequalities in health care utilization (López-Cevallos & Chi, 2010; Salinas, Al Snih, Markides, Ray, & Angel, 2010; Samsudin & Abdullah, 2017), the present study relies on Andersen's Behavioral Model of Health Service Utilization (Andersen, 1995) as the conceptual framework. The original model was developed in the 1960s to examine families' utilization of health care services but has been revised to examine individual and contextual determinants of health care use (Andersen et al., 2013). The individual level determinants of Andersen's model are divided into three groups: 1) their predisposition to use health services, including demographics, health beliefs and practices, and social structural factors such as age, gender, marital status, education levels, occupation (López-Cevallos & Chi, 2010); 2) enabling factors such as income, health insurance, the availability and accessibility of social support (Burr & Lee, 2013; Li & Chi, 2011; López-Cevallos & Chi, 2010; Salinas et al., 2010), and 3) individual's health care needs including perceived and evaluated (diagnosed) health status such as disability, self-perceived health, and chronic conditions (Samsudin & Abdullah, 2017).

A community's health resources, such as the availability of and accessibility to health facilities and the number of health care professionals, can enable or infringe upon an individual's propensity to utilize health services (Andersen et al., 2013). Although relevant to rural-urban disparities in health care utilization in Thailand, it is beyond the scope of this study to include assessments of these structural conditions. Nevertheless, of pertinence to this study, Andersen's model argues that a health care system can be considered equitable, if need based and predisposing factors account for the majority of variance in individuals' use of health services. In contrast, inequality in health care access is often associated with social structural and enabling factors being key determinants of individuals' health care use (Andersen, 1995; Andersen et al., 2013).

1.4. Current study

Despite Thailand's rapid population ageing and the persistent inequalities in health care utilization, a national study of the factors that contribute to older adults' health care utilization has yet to be conducted. Given rural-urban disparities in health care resources exist, our study uses Andersen's model to better explain rural-urban divides in health care use among older Thais. In addition, we explore whether family support moderates the association between rural-urban residence and health care utilization among older Thais. Family support is examined as an enabling factor that can facilitate or suppress health care visits. We explore both the structural (marital status, living arrangement) and functional (intergenerational support transfers) dimensions of social support by family members. We expect that the difference in the health care use will be greater among older Thais in rural areas with family support relative to those without compared to urban dwellers.

2. Methods

2.1. Data and sample

This study draws upon data from the 2011 nationally representative Survey of Older Persons in Thailand, conducted by the National Statistical Office (NSO). Data were collected via face-to-face interviews with community residing older adults aged 50 years and older ($N = 62,840$) (National Statistics Office (NSO) (2012)). For this study's purposes, older adults who indicated limitations with all activities of daily living and instrumental activities of daily living were excluded as this suggests they are most likely to be bedridden ($n = 373, 0.6\%$). The sample was further restricted to individuals who provided information on all variables, producing an analytic sample of 56,435 older adults. Missing data accounted for 9.7% of the total sample. The majority of missing data were found in the measures of social participation (4.8%) and older adults' receipt of financial support from their children (2.2%).

2.2. Health seeking behavior and covariates

The outcome of interest, older adults' health care use, was derived from the following question to respondents: "During 12 months before the interview, did (name) have physical checkup which was not due to illness? If yes, where did (name) go?" Potential responses included 1) No physical checkup 2) yes, government health service (47.9%), 3) yes, private hospital/clinic (3.1%). Health care use is a dichotomous measure with those not seeking health care as the reference group compared to those who sought health care from either a government or private facility. Importantly, health care use in this study reflects preventive rather than curative care. Preventive care is more discretionary, or optional, and influenced by predisposing and enabling factors. In contrast, curative care is likely to be mandated by a health professional primarily due to one's health needs (Arcury et al., 2005)

Predisposing factors included demographic characteristics, health behaviours, and information on ageing. Demographics included reported age in 10 year groups (0 = 50–59, 1 = 60–69, 2 = 70–79, 3 = 80+), and gender (0 = women, 1 = men). Social structural factors include educational attainment (0 = none, 1 = primary, 2 = above primary) employment (0 = not working 1 = working), and location of residence (0 = urban, 1 = rural). Measures of health behaviours within six months prior to the interview were used as indicators of health attitudes. Respondents were asked to indicate their frequency of health behaviours (never, sometimes, always) in 6 months prior to the interview. These included alcohol consumption (0 = abstained, 1 = consumed), smoking (0 = never smoked, 1 = ever smoked) and physical activity (0 = never, 1 = sometimes, 2 = always). The categories sometimes and always were combined due to the small proportion of responses for always consumed alcohol or smoke. Individuals' knowledge of ageing related care and services was included as an indicator of contextual factors that may predispose individuals to use health services. This was derived from a question asked to respondents about the receipt of information, in the past year, through various sources including village/community loud speaker, radio, television, newspaper/magazine, brochure, poster, internet/computer, or community members (0 = no receipt of information, 1 = received information from at least one source).

Enabling factors included respondents' subjective income, family support, household transportation, and social participation in the community. Subjective income has been shown to be a good indicator of older adults' financial security, and health (Arber, Fenn, & Meadows, 2014). Respondents' perceived economic security was measured as dichotomous variable (0 = adequate income, 1 = inadequate income). Family support was examined by respondents' marital status, availability of children, and intergenerational support. Marital status was a categorical measure (0 = married, 1 = widowed, 2 = separated/divorced/never married), and the availability of children was measured by

parents' living arrangements with their children (0=childless, 1=no coresident children, 2=at least 1 coresident child). Intergenerational support was measured by two variables that account for older adults' receipt and provision of financial support. Both measures were dichotomous with older adults who did not receive or provide money as the reference group. Financial support ranged from 1000 Thai baht or less to 50,000 Thai baht or more. The analyses are restricted to financial support as it was the only form of support exchange that was examined in the survey among respondents with coresident and non-coresident children. Childless older adults were included in the reference group of those who did not receive nor provide support. *Availability of transportation* within the household was based on whether any household member owned a private car/pickup truck/van or motorcycle (0=no, 1=yes). Finally, *social participation* was based on engagement in at least one of five different community-based social groups in the past year (0= no participation, 1= participation in at least one social club). The social clubs included: elderly club, occupation group, housewife group, cooperative/saving group, and village scout group.

Health needs were assessed by older adults' *self-rated health* in the week prior to the interview (0=good, 1=poor), *geriatric conditions* (0=none, 1=one, 2=two or more) *functional limitations* (0= no difficulty with ADL's or IADL's, 1=difficulty with at least 1 ADL or IADL), chronic conditions (0=none, 1= one condition, and 2=two or more conditions). Similar to previous studies (Chang, Lan, Ho, & Lan, 2010), geriatric conditions referred to the sum of difficulties with five ageing related conditions hearing (0=clear hearing 1=unclear hearing), vision (0=clear vision 1=unclear vision), dental function (0=does not use false teeth, 1=uses false teeth), urinary incontinence (0=no, 1= cannot control), and fecal incontinence (0=no, 1=cannot control). Chronic conditions were self-reported and included a wide range of non-communicable (hypertension, diabetes, heart disease, kidney disease, cancer) and communicable diseases (infectious diseases such as AIDS, polio, and leprosy). Respondents were asked to list a maximum of 5 diseases ranging from most to least serious. In this question the definition of chronic conditions, as well as the comparison of severity of the diseases, is based on the respondents' self-report. Thus, it is possible that the respondents ranked the severity of the diseases according to other concerns such as the cost of treatment.

2.3. Analysis plan

Descriptive analyses examine the distribution of health care utilization; predisposing, enabling and need based factors for the total sample and disaggregated by urban-rural residence. Pearson's chi-square test was used to test differences in the dependent and independent variables by location of residence. Following the methods of Chang et al. (2010), we first tested the statistical significance of each variable in the three sets of covariates using stepwise regression. Only significant variables at $p < .05$ level were selected for inclusion in the multivariate analyses. Consequently, self-rated health and geriatric conditions were not included in the multivariate analyses. Next, sequential logistic regression analyses were used to estimate the factors associated with older adults' health care utilization in the past year. Results are presented as odds ratios. Model 1 estimated the unadjusted association between urban-rural residence and health care use. Model 2 adjusts for predisposing factors, model 3 includes enabling factors, and model 4 adjusts for older adults' health needs. Following this, interactions of urban-rural residence and family support variables were estimated to examine whether family support moderates the association between area of residence and older adults' health care use. All statistical analyses were performed using STATA 11 and were weighted to adjust for the multistage sample design. Statistical significance was set to $p < .05$ level.

Table 1
Description of sample according to area of residence (N = 56,435).

Older Adults' Characteristics	Total N = 56,435	Urban N = 33,365	Rural N = 23,070	p-value ¹
% Health visit (No)				< 0.0001
Yes	51.48	54.84	49.69	
Predisposing factors				
% Age				0.005
50-59	50.43	51.73	49.74	
60-69	28.6	28.09	28.87	
70-79	15.99	15.38	16.31	
80 and over	4.98	4.79	5.08	
% Gender				0.025
Women	54.15	55.05	53.67	
Men	45.85	44.95	46.33	
% Education				< 0.0001
None	7.941	6.257	8.834	
Primary	75.84	61.71	83.33	
Above primary	16.22	32.04	7.83	
% Employed				< 0.0001
No	35.46	42.64	31.65	
Yes	64.54	57.36	68.35	
% Information on Ageing				< 0.0001
No	19.99	22.01	18.92	
Yes	80.01	77.99	81.08	
% Alcohol Consumption				< 0.0001
Never consumed	75.36	78.63	73.63	
Ever consumed	24.64	21.37	26.37	
% Smoking Status				< 0.0001
Never smoked	82.45	86.78	80.15	
Ever smoked	17.55	13.22	19.85	
% Exercise				< 0.0001
Never	19.11	17.30	20.07	
Sometimes	36.40	41.28	33.81	
Always	44.49	41.43	46.11	
Enabling Factors				
% Marital Status				< 0.0001
Married	72.7	68.06	75.15	
Widowed	18.47	18.3	18.55	
Separated/Divorced/Never Married	8.84	13.64	6.29	
% Living Arrangement				< 0.0001
Childless	8.41	13.01	5.97	
No children in household	36.29	29.03	40.14	
At least 1 coresident child	55.30	57.96	53.89	
% Financial support received				< 0.0001
None	34.93	45.54	29.31	
Received	65.07	54.46	70.69	
% Financial Support provided				< 0.0001
None	75.47	72.97	76.8	
Provided	24.53	27.03	23.2	
% Social Participation				< 0.0001
No club participation	70.08	79.44	65.12	
At least 1 club	29.92	20.56	34.88	
% Economic Security				< 0.0001
Adequate	85.39	87.25	84.4	
Inadequate	14.61	12.75	15.6	
% Household Automobile				< 0.0001
No	13.44	14.54	12.86	
Yes	86.56	85.46	87.14	
Health Needs				
% Self-Rated Health				0.0002
Good	54.38	55.87	53.59	
Poor	45.62	44.13	46.41	
% Geriatric Conditions				< 0.0001
None	66.63	64.21	67.91	
One	22.92	26.54	21.00	
Two or more	10.46	9.253	11.09	
% ADL/IADL Difficulty				0.912
None	77.49	77.52	77.47	
ADL and IADL	22.51	22.48	22.53	
% Chronic Conditions				< 0.0001
None	58.87	55.37	60.72	

(continued on next page)

Table 1 (continued)

Older Adults' Characteristics	Total N = 56,435	Urban N = 33,365	Rural N = 23,070	p-value ¹
One disease	29.81	31.33	29.01	
Two or more diseases	11.32	13.3	10.27	

¹ Pearson's Chi square test.

3. Results

3.1. Descriptive results

Table 1 shows the description of the characteristics of older adults for the total sample and according to their area of residence. Approximately 50% of older Thais sought health care in the past year. Urban dwelling older adults were more likely to have a physical check-up compared to those in rural areas. Regarding predisposing factors, compared to urban dwellers, rural older adults were more likely to be older, female, married and complete primary education. Rural older adults were also more likely than urban dwellers to smoke, consume alcohol, and to never exercise. Enabling factors showed that rural older adults were more likely than their urban counterparts to not live with their children, to receive money from their children, and to perceive income inadequacy. Rural dwelling older adults were, however, more likely than urban older adults to be socially active in their communities and to live in households with access to vehicular transportation. Regarding health needs, rural older adults were more likely than those in urban areas to report poor health but were less likely to report chronic conditions.

3.2. Multivariate results

Table 2 presents the results of the logistic regression models showing the factors associated with older adults' odds of seeking health care. Model 1, the unadjusted model, shows that older adults in rural areas have 19% lower odds of a health check-up. Adjusting for predisposing factors (Model 2) substantially reduces the rural-urban gap to 8% but the odds of having a health check-up are still significantly lower for older adults in rural areas. After the addition of enabling characteristics (Model 3), the magnitude of the rural-urban difference increased whereby rural dwellers show 14% lower odds of health care visits. Thus, when accounting for family support, perceived income adequacy, access to household transportation, and social engagement, the rural-urban disparity in health care use is greater. This may reflect an indirect effect of one or more of the enabling factors that deters health care utilization among rural older adults. Controlling for health needs (Model 4), reduces the rural-urban gap in health care visits slightly such that older adults in rural areas show 11% lower odds of urban dwellers to have a health visit. Importantly, the family support variables are independently associated with health care utilization even after adjusting for health needs. Among the structural dimensions of family support, separated/divorced/never married older adults have lower odds of a health check-up compared to their married counterparts. Among the functional dimensions of family support, the receipt of financial support from children is associated with higher odds of having a health check up.

Interactions between area of residence and family support variables, also presented in Table 2, were estimated to determine whether family support moderates the rural-urban gap in health care utilization. Although interactions were tested with all family support measures included in the analyses (marital status, living arrangement, provision and receipt of financial support) the data show that only receipt of financial support presented a statistically significant moderating effect. Thus, we present only the statistically significant interaction term. As shown in Model 5, the receipt of financial support combined with rural

dwelling is associated with increased odds of a health check up. To facilitate easier interpretation of the interaction term, Fig. 1, presents the mean predicted probabilities of health care use, based on the coefficients in Model 5, among older Thais according to their areas of residence and receipt of financial support. All other things being equal, older adults in rural areas have a 0.48 probability of health care use if they do not receive money from their children but this probability increases to 0.52 when they receive money from their children. Those in urban areas, however, have a higher probability of seeking health care with or without financial support from their children (0.53).

4. Discussion

Drawing upon the nationally representative survey data, this study aimed to examine rural-urban disparities in health care utilization among older adults in Thailand. To our knowledge, this is the first national study of older adults' health care utilization in Thailand, and the rural-urban inequalities therein. The importance of this study is underscored by Thailand's rapid population ageing combined with the aims of the universal coverage scheme (UCS) to improve equity in health care access for vulnerable segments of Thailand's population. Under the universal coverage scheme (UCS) older adults have free access to primary health care and health promoting services such as annual health check ups. Our study shows that overall approximately 50% of older Thais visited a health facility for a regular check-up not due to illness, within the previous year, and urban dwellers were more likely than those in rural areas to seek health care. Utilizing Andersen's behavioral model of health care utilization, we find two important results regarding the rural-urban disparity in the health care utilization.

First, our findings show that the rural-urban gap in health care utilization cannot be completely explained by predisposing, enabling or health related factors. Nevertheless, consistent with previous studies (Chang et al., 2010; Hoebel et al., 2014; Salinas et al., 2010; Samsudin & Abdullah, 2017) the results identify predisposing factors and health needs are important determinants of health care use, and contribute the most to narrowing the rural-urban gap in health care use among older Thais. Among the predisposing factors increasing age, higher education, access to aging related information, and being physically active were positively associated with health checkups whereas being a smoker was associated with a lower likelihood of health checkups. Both health needs assessed in our study, experiencing functional limitations and chronic diseases, were associated with an increased likelihood of health checkups. Importantly, enabling factors contributed to widening the rural-urban gap in health care use among older Thais. Specifically, enabling factors such as family support, social participation, and economic security were associated with the propensity to have a health checkup. We discuss the importance of these enabling factors in further detail.

Regarding family support, both structural and functional aspects of support were important to older Thais' health care use. As observed among older Chinese (Li & Chi, 2011), the receipt of financial support from children facilitates health care use among older Thais. Furthermore, consistent with previous studies (Stafford et al., 2018), being unmarried was associated with a lower likelihood of preventive health care use among older Thais. Specifically, formerly and never married older Thais showed a lower propensity to engage in preventive health care utilization compared to married older Thais. As previous studies have noted (Falba & Sindelar, 2008), it appears that partnership may be an important source of social influence and support that can encourage health care use among older Thais. Without access to tangible and intangible resources that may be derived from an intimate partner, such as motivation to engage in health enhancing behavior, information, monitoring, companionship for the health visit, older Thais exhibit fewer demands for preventive health care. Therefore, the findings provide some indication of potentially vulnerable sub-populations of older Thais who may need monitoring and targeted health promotion

Table 2
Logistic Regression Odds Ratios of Healthcare Utilization among older Thais in the Previous Year.

Older Adults' Characteristics	Model 1 O.R. (s.e.)	Model 2 O.R.(s.e.)	Model 3 O.R.(s.e.)	Model 4 O.R.(s.e.)	Model 5 O.R.(s.e.)
Area of residence (Urban)					
Rural	0.81(0.02)***	0.93(0.02)**	0.86(0.02)***	0.89(0.02)***	0.81(0.04)***
Predisposing Factors					
Age (50-59)					
60-69		1.37(0.04)***	1.31(0.04)***	1.18(0.04)***	1.18(0.04)***
70-79		1.63(0.07)***	1.53(0.07)***	1.29(0.06)***	1.29(0.06)***
80 and over		1.60(0.10)***	1.54(0.10)***	1.31(0.09)***	1.31(0.09)***
Gender (Women)					
Men		0.92(0.03)**	0.92(0.03)**	0.94(0.03)	0.94(0.03)
Highest Education (None)					
Primary		1.24(0.06)***	1.22(0.06)***	1.22(0.06)***	1.22(0.06)***
Above Primary		2.05(0.12)***	2.05(0.12)***	2.13(0.13)***	2.11(0.13)***
Employment (No)					
Yes		0.84(0.03)***	0.82(0.03)***	0.94(0.03)	0.94(0.03)
Information on Ageing (No)					
Yes		2.04(0.07)***	1.94(0.06)***	1.96(0.07)***	1.96(0.06)***
Alcohol Consumption (No)					
Yes		0.89(0.03)**	0.87(0.03)***	0.93(0.04)	0.93(0.04)
Smoke (No)					
Yes		0.82(0.03)***	0.83(0.04)***	0.87(0.04)**	0.87(0.04)**
Physical Activity (None)					
Sometimes		1.28(0.05)***	1.25(0.05)***	1.30(0.05)***	1.30(0.05)***
Always		1.33(0.05)***	1.30(0.05)***	1.39(0.05)***	1.39(0.05)***
Enabling Factors					
Marital Status (Married)					
Widowed			1.01(0.04)	1.01(0.04)	1.01(0.04)
Separated/Divorced/Never Married			0.82(0.05)***	0.83(0.05)***	0.83(0.05)***
Living Arrangement (Childless)					
No children in household			0.96(0.06)	0.96(0.06)	0.97(0.06)
At least one child in household			0.95(0.06)	0.91(0.06)	0.92(0.06)
Received Financial Support (No)					
Yes			1.09(0.04)**	1.08(0.04)*	0.99(0.04)
Provided Financial Support (No)					
Yes			1.03(0.03)	1.04(0.04)	1.04(0.04)
Social Participation (No)					
At least one activity			1.43(0.04)***	1.44(0.04)***	1.44(0.04)***
Household Automobile (No)					
Yes			1.18(0.05)***	1.22(0.05)***	1.23(0.05)***
Income Adequacy(Adequate)					
Inadequate			0.94(0.04)	0.91(0.04)*	0.91(0.04)*
Health Need Factors					
ADL/IADL difficulty (None)					
At least one ADL/IADL				1.18(0.04)***	1.18(0.04)***
Chronic Diseases (None)					
One				2.20(0.07)***	2.20(0.07)***
Two or more				2.43(0.11)***	2.43(0.11)***
Interactions					
Area × Financial Support Received					
Rural × Received money					1.15(0.06)**
Constant	1.21(0.02)***	0.39(0.03)***	0.36(0.03)***	0.22(0.02)***	0.23(0.02)***
F-statistic	70.75***	95.92***	67.93***	91.70***	88.16***
Observations	56,435	56,435	56,435	56,435	56,435

O.R. = Odds Ratio; S.E. = Standard Error; *p < .05; **p < .01; ***p < .001.

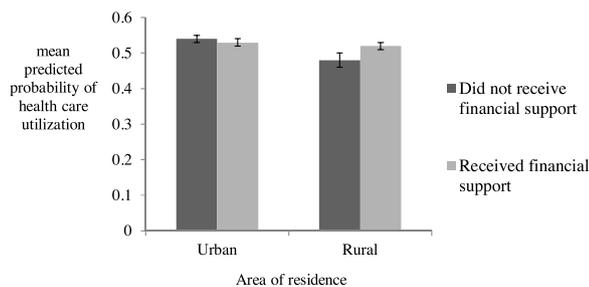


Fig. 1. Mean predicted probabilities of health care utilization, showing 95% confidence intervals, among older Thais according to their area of residence and receipt of financial support from children (N = 56,435).

efforts to reduce risks of adverse health- those without a spouse and those not receiving support from their children.

As observed among older adults in Taiwan (Peng & Lin, 2018), social participation in the community was associated with an increased likelihood of preventive health care use among older Thais. Although our study cannot examine the frequency of engagement or contact with persons in the social clubs, our finding suggests that having access to these social networks may be an important source of informational, emotional, and possibly instrumental support that can encourage preventive health care utilization. This finding lends support to previous research among older adults in Thailand, specifically a Northern province, that has found friendships are an important component of older Thais' social networks and have direct and indirect influence on older Thais' health behaviours and healthy aging (Thanakwang &

Soonthorndhada, 2011). Thus, increasing older adults' participation in social clubs can be an important initiative to promote preventive health care utilization.

Of pertinence to social policies to address health and income security of older Thais, is our finding that older Thais who perceived income inadequacy showed lower odds of preventive health care use, only after controlling for subjective reports of disability and chronic conditions. Therefore, health needs being equal, older Thais' assessments of their abilities to meet their daily consumption needs shape their discretionary use of health care services. This can contribute to inequalities in subjective and objective health outcomes. For instance, existing research shows that income adequacy is associated with better self-rated and quality of life among older adults in low and middle income countries (Gildner et al., 2016). Therefore, improving existing income security schemes can also contribute to healthy aging among older Thais.

A secondary aim of our study was to examine whether family support significantly moderates the association between rural-urban residence and health care utilization. Our results provide some support for our hypothesis that family support will be more important to health care use among rural relative to urban dwellers. Thus, our second important finding is that the receipt of financial support was more salient to increasing the probability of having a health check up among rural older Thais relative to urban dwellers. This may be indicative of a comparatively lower availability of, or accessibility to, public and private health facilities in rural areas compared to urban areas (Yiengprugsawan et al., 2010). As identified in a recent World Bank study, older adults in rural areas often identify that long distances to health facilities and a lack of public and affordable transportation as the main barriers to health care utilization (World Bank Group, 2016). Although our findings show that urban dwellers have a higher probability of utilizing preventive health care, with or without financial support from children, such support may be more important to facilitate health care use among rural older Thais, relative to urban dwellers, through increasing their ability to afford private transportation and/or additional costs incurred through health care visits. As noted earlier, received social support may also have an indirect effect on health behaviour by providing emotional gratification that older adults "matter" to their children, and they may consequently have a greater desire to protect their health.

Overall, our findings regarding the role of family support to health care utilization are consistent with previous research that shows family ties and family support are important to the health behavior of older Thais (Rittirong, 2016; Thanakwang & Soonthorndhada, 2011). We add to the existing literature by documenting the salience of supportive family relations, as measured by financial transfers from adult children, to health care utilization among rural dwelling older Thais. Our study suggests that the absence of such familial support can potentially present worse health outcomes among older adults in rural compared to urban areas of Thailand.

The study is not without limitations. The survey does not provide detailed questions that can offer more nuanced or holistic assessment of older adults' health care use such as the geographic proximity to health care facilities, the frequency of health visits, hospitalization, visits for inpatient or outpatient care, or the status and type of insurance. Furthermore, the cross-sectional data do not allow examinations of the influence of temporal conditions, such as intergenerational exchanges, health behaviors, perceived economic security, and health needs, on individual's health care utilization. Additionally, we acknowledge the possibility of biased estimates due to reversal causality. For instance, we may overestimate the association between chronic conditions and health care utilization if respondents were more likely to indicate having chronic conditions due to their health visit. Importantly, we do not have detailed questions regarding the quality of relationships with

their family members (partners and children), which can also influence health behavior and health outcomes (Li & Chi, 2011; Rook, 2015). Future studies will benefit from utilizing longitudinal data and including assessments of the quality of social ties to enhance our understanding of health care utilization in Thailand.

Despite these limitations, this study's findings are nationally representative and provide a useful starting point for comparing older Thais' health care use in future studies. These findings also lay the groundwork for future research to examine the intersection of social ties and health care utilization to health outcomes of older Thais. Moreover the factors related to health care utilization shed light on where public health interventions can be targeted to eliminate geographic inequity in health care utilization for the rapidly aging population.

5. Conclusion

In contributing to the growing body of research on inequalities in health care utilization in low and middle income countries (Krishnaswamy et al., 2009; López-Cevallos & Chi, 2010; Samsudin & Abdullah, 2017), this study sought to examine the factors that are associated with older adults' health care utilization in Thailand and the rural-urban disparities therein. Despite the existence of a national health insurance system, which aims to improve access to health care, approximately 50% of older Thais did not seek preventive health care in the year preceding the survey. More importantly, rural-urban disparities withstand. There are several implications for health policies.

Foremost, promotion of preventive health care is needed in Thailand. Following this, geographic-based inequities in the distribution of health care resources, and infrastructure development, needs to be addressed. Improving rural-urban equity in health care services can not only reduce inequality in health over the life course but also contribute to the overall national development of Thailand. Additionally, investment in educational equity and income security, are two mutable structural conditions that can improve health service utilization and ultimately health outcomes. Our study also shows that family ties and family support, especially financial support from children, is important for preventive health care utilization among older Thais. Declining fertility and increasing migration among younger cohorts signals fewer adult children are likely to be available to support and facilitate older adults' health care utilization. This can be especially detrimental to the health of rural older adults. The changing demographic realities reinforce the need for the refinement of social policies to address income insecurity and infrastructural investment in public transportation in rural areas to allow more independent health service utilization. Moreover, as other studies (Lloyd-Sherlock, Pot, Sasat, & Morales-Martinez, 2017) have noted there is need for continued investment in Thailand's home-care volunteer program, which caters to the health needs of dependent older adults and those without family support, along with improving the availability and standardization of the quality of community care services. These community based services may substitute or complement family support to meet the health care needs of the older Thai population, especially in rural areas.

Conflict of interest

The authors declared no potential conflicts of interest in the authorship and/or publication of this manuscript.

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