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# Social and psychological implications of actual and defacto childlessness among older persons in East and Southeast Asia

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## Abstract

We examine how ageing without children is linked to older adults' social participation and psychological distress in selected East and Southeast Asian countries (South Korea, China, Thailand, Vietnam, and Myanmar). Recognizing the nuances of such ageing experiences, we distinguish between actual childlessness (older persons without children) and defacto childlessness (older persons whose children all lived far away). We harmonize and analyze recent nationally representative survey data from the five abovementioned countries, utilizing both descriptive and multivariate approaches. First, we investigate the prevalence and dimensions of actual and defacto childlessness. Second, we examine the extent to which actual and defacto childlessness are associated with social participation and psychological distress in old age. The analyses focus on gender and wealth differences. We find that actual childlessness is associated with lower levels of social participation in Southeast Asian countries and greater levels of psychological distress in Korea, Thailand, and Myanmar. The effects of defacto childlessness are, however, mixed. We discuss the social and psychological implications of childlessness for older adults across varying societal contexts in the five Asian countries.

**Keywords:** Childlessness, Social participation, Psychological distress

## Introduction

Traditionally, adult children across Asia have played a predominant role in providing material, emotional, and personal care support for ageing parents. Thus, the absence of children in later life often raises concerns about potential negative implications for the well-being of older people (Croll 2006; Raymo et al. 2008). The region's major demographic shifts over the last half century, including rapid fertility decline, rising singlehood, and increased migration, have brought about an unprecedented and growing number of older people across developed and developing Asia who are ageing without the continued presence of adult children (Kreager and Schröder-Butterfill 2005; Yeung 2022). Existing studies usually focus on the disadvantages in later life of older Asians who never had children in their lives (e.g., Chou and Chi 2004; Feng 2018; Quashie and Pothisiri 2018; Zhang and Liu 2007). For instance, alarmists warn that childlessness

makes older people more vulnerable to social isolation and depression (Onishi 2017; Woodard 2014). Childlessness in developing areas of Asia is thought to be particularly vulnerable because of the underdevelopment of welfare states in such areas (World Bank 2016). Even in wealthy Asian nations (e.g., Japan and South Korea), where there are more concerted efforts to address population ageing, governments continue to emphasize adult children as the frontline of old-age support, thus possibly marginalizing older adults without children (Kodate and Timonen 2017).

Except for a few population-based studies (e.g., Schröder-Butterfill and Kreager 2005), previous research has paid little attention to the nuances of the childless ageing experience. Among older adults ageing without children, some have never had children (i.e., actual childlessness), while others have no adult children living nearby as the children have all migrated from the locality (i.e., defacto childlessness). Understanding the nuances of ageing experience without the continued presence of children is important because the findings can inform policy-makers of the differential needs of older adults who are childless and those who have children but lack immediate contact or instrumental support from their adult children. Subsequently, tailored services can be developed to meet the needs of an increasingly diverse older adult populations. The cross-national comparison of such effects can further help us to understand how social, cultural, and institutional environments influence the lives of childless older adults.

Based on nationally representative survey data from China, South Korea, Thailand, Vietnam, and Myanmar, this study examines how actual and defacto childlessness are associated with older people's levels of social participation and psychological distress. Not only are survey data from the five abovementioned East and Southeast Asian countries available and largely comparable (Teerawichitchainan and Knodel 2015), but these selected countries also represent a wide spectrum of economic development levels, demographic trajectories, cultural underpinnings, and government responses to population ageing in Asia. These variations thus allow us to examine how diverse societal contexts may have different implications for the well-being of older people who age without the constant presence of adult children. First, we investigate the prevalence of childlessness and distinguish between actual and defacto childlessness. Second, we assess the extent to which actual and defacto childlessness are associated with older adults' social participation and psychological distress. Third, we examine how gender and wealth moderate these associations. Importantly, we compare the prevalence and consequences of actual and defacto childlessness across the five countries to understand how structural and institutional factors and cultural norms may matter for these two dimensions of childlessness.

### **Literature review**

The availability of children may be linked to the well-being of older people through various mechanisms. For example, social exchange theory suggests that adult children enhance older persons' physical and psychological health by providing them with social support and a sense of purpose and meaning in life (Rossi and Rossi 1990). Moreover, according to the convoy model of social relations, children are seen as an integral part of older adults' social convoys, providing them with different types of support (e.g., material, instrumental, and emotional support) and consequently contributing to their

well-being (Antonucci and Akiyama 1987). Additionally, intergenerational solidarity theory posits that children promote connectedness and continuity between generations and that a sense of intergenerational solidarity and cohesion can in turn improve one's own well-being in later life (Bengtson and Roberts 1991). Furthermore, since parenthood has been shown to be closely linked to the adult development process and psychological growth, childless people are often perceived as having missed out on crucial adult development phases that may have long-term implications for their social integration and social networks (Dykstra and Hagestad 2007). Given that adult children are consistently theorized to play an important role in one's well-being in later life, it is often assumed that older adults who do not have children or who experience the continued absence of their children, are at greater risks of social isolation and psychological distress than those with adult children living nearby (Aboderin 2004).

Existing studies conducted primarily in Western countries, provide mixed empirical evidence regarding the association between childlessness and the well-being of older adult. For outcomes related to social participation in later life, some studies demonstrate that childless older adults have smaller social networks and fewer interactions with relatives compared to those with children (Dykstra 2006; Vicente and Guadalupe 2022; Vikström et al. 2011), whereas others report no difference between the two groups in regard to network size, voluntary work, and social engagements (Keith 1983; Wenger et al. 2007). Similarly, existing research demonstrates that the effects of childlessness on psychological well-being are largely inconclusive in Western countries and that the relationship is contingent upon various factors, such as gender, marital status, and societal contexts. For example, Koropecjy-Cox (1998) shows that childlessness marginally, yet significantly, increases loneliness among American women aged 50–84, but not among men. Vikström et al. (2011), however, report no significant difference in loneliness between parents and those without children among Sweden's population of oldest old individuals. Furthermore, Zhang and Hayward (2001) demonstrate no significant effect of childlessness on depression and loneliness among older Americans, although childless men who are divorced, widowed, or never married show significantly higher levels of loneliness than childless women with comparable marital status.

Nevertheless, compared to research conducted in Western countries, relevant studies in Asian settings demonstrate more consistent evidence regarding the relationship between childlessness and psychological distress. For example, childlessness is usually linked to lower levels of life satisfaction, higher levels of anxiety, negative affect, and higher levels of loneliness among Chinese elderly individuals, particularly widows (Cheng et al. 2014; Zhang and Liu 2007). Comparative cross-national research further suggests that the negative effect of childlessness on psychological well-being and life satisfaction may be contingent upon societal contexts, such as the degree of tolerance towards childlessness, societal level of social contacts, and pronatalist norms (Huijts et al. 2011; Tanaka and Johnson 2014).

To date, previous studies have seldom used population-based data to distinguish the consequences of defacto childlessness (no adult children nearby) from those of actual childlessness. Furthermore, to our knowledge, no study has yet attempted to situate the relationship between childlessness, psychological distress, and social engagement across Asia's vastly different social, cultural, and political contexts. In particular, little is

known about the extent to which childlessness exerts similar or different influences on the well-being of older adults in cultures where filial piety remains a norm, yet socio-economic contexts of old-age support are changing dramatically due to decreasing family size, the increased migration of working-age adults, and the development of formal care arrangements. To fill these research gaps, our study explores the extent to which various dimensions of childlessness are correlated with older adults' social participation and psychological distress in the contexts of five Asian countries that have different demographic trajectories and economic and social policy developments.

### **Moderating effects of gender and wealth**

Research has shown that the experience of childlessness and its impact on well-being in later life may differ between men and women, as well as among individuals of varying economic resources (Wenger et al. 2007). Life course theory provides a useful lens for understanding the extent to which childlessness is associated with older adults' social participation and psychological distress, which may be contingent upon gender and wealth (Dykstra 2006). The theory suggests that gender and wealth differences in well-being in later life may result from earlier-life experiences and transitions (Silverstein and Giarusso 2011; Umberson and Gove 1989). For example, childless women tend to experience more negative social stigma than their male counterparts, who generally experience less societal pressure to have children and tend to have more resources with which to pursue personal interests. Gender differences may place childless women in a disadvantaged situation, increase their risk of social isolation, and adversely affect their social participation and psychological well-being (Koropeckyj-Cox 1998). Moreover, given that women are more likely to outlive their spouse, the constant presence of children may be more important to the well-being of older women than that of older men (Umberson et al. 1992).

Furthermore, wealth may also condition the effect of childlessness on the social and psychological well-being of older people. Individuals with greater wealth, for instance, may have more resources with which to pursue various sources of fulfillment (e.g., career advancement, hobbies) and better access to health care that can help to mitigate the negative impacts of childlessness in late adulthood (Wenger et al. 2007). Additionally, since those with greater financial resources may be less dependent on their children for support and can participate in social activities without financial concerns (Mood and Johnson 2016), these individuals may be less negatively influenced by the continued absence of children. We examine these potential moderating effects of gender and wealth.

### **Country settings**

While all of the examined countries share strong filial norms (Croll 2006), there are contextual differences among them that may condition how the absence of children shapes the ageing experiences of older women and men across different wealth strata. As demonstrated in Table 1, the examined countries vary in demographic trajectories and economic development. South Korea (hereafter Korea) has the lowest total fertility rate and is the most economically developed, followed by China and Thailand, which witness below-replacement fertility and a relatively higher per capita gross domestic product (GDP) compared to Vietnam and Myanmar. Myanmar is the least developed.

**Table 1** Demographic and development indicators of the examined countries

	S. Korea	China	Thailand	Vietnam	Myanmar
Total population, 2018 (in thousands) <sup>a</sup>	51,677	1,417,069	71,128	94,914	52,666
% aged 60+, 2018 <sup>a</sup>	21.04	17.21	18.66	12.14	9.73
% aged 60+, 2050 (medium projection) <sup>a</sup>	46.41	38.81	38.33	26.53	19.33
Total fertility rate, 2013-18 <sup>a</sup>	0.97	1.55	1.38	1.94	2.21
% in urban areas, 2018 <sup>b</sup>	81.5	59.2	49.9	35.9	30.6
GDP per capita, Current US \$, 2018 <sup>c</sup>	33,436.92	9905.34	7298.95	3230.93	1250.17
Human development index rank (out of 188 countries), 2018 <sup>d</sup>	22	87	80	118	148

<sup>a</sup> United Nations, Department of Economic and Social Affairs, Population Division, 2022. World Population Prospects: The 2022 Revision, New York: United Nations

<sup>b</sup> United Nations, Department of Economic and Social Affairs, Population Division, 2018. World Urbanization Prospects: The 2018 Revision. New York: United Nations

<sup>c</sup> World Bank. World Development Indicators Data Bank (accessed August 23, 2022)

<sup>d</sup> United Nations Development Program (UNDP), 2019 Human Development Report. New York: United Nations

Furthermore, migration rates of working-age adults from rural to urban areas and abroad are high in China and across Southeast Asia, affecting the age structure of the rural populations and raising concerns about the welfare of the elderly left behind (Knodel et al. 2010; Teerawichitchainan and Low 2021). These socioeconomic contexts are likely to affect the capacity of the public sector to support older adults who age without children. Additionally, older adults in less developed countries may have less economic power to purchase public or private age support services (e.g., caregiving). Thus, we expect childlessness, be it actual or defacto childlessness, to assert a more negative effect on older adults in less developed countries and that individual wealth will have a greater moderating effect in these countries.

Furthermore, the inclusion of China as a comparative case study is important, given the broad implications of China's one-child policy and massive migration for understanding the prevalence and consequences of defacto childlessness. Extensive research, for instance, demonstrates how a smaller family size and the out-migration of adult children may lead to shifting values related to intergenerational relationships (Liang 2016; Liu 2021), as well as changes in care arrangements and social support for left-behind older Chinese (Guo et al. 2009; Gustafson and Huang 2014).

In addition, the five examined countries differ in their cultural contexts. Although filial responsibility for ageing parents remains a cultural imperative in all of them, particularly as repayment for parental sacrifices in the course of childrearing (Croll 2006), these countries vary in regard to their kinship systems. The prevailing patrilineal kinship system in Korea, China, and Vietnam emphasizes the roles of married sons and daughters-in-law in supporting ageing parents, while the bilateral kinship system prevalent in Thailand and Myanmar is more flexible regarding which children should care for older parents. These differences, particularly the degrees of norm adherence, may have implications for the well-being of older parents compared to their childless counterparts. While the rigid norms of filial care in patrilineal societies may magnify the negative effect of childlessness, the relative flexibility observed in bilateral kinship systems may mitigate this effect (Teerawichitchainan et al. 2015). Similarly, given the stigma of childlessness for women in patrilineal societies, the burden of childlessness may be greater

for older women in such societies compared to women living in societies with a bilateral kinship system (Yang 2012).

Finally, we attend to different political systems in our study countries, which may affect social protection measures for older people in general and for the childless in particular. For example, Korea's mandatory long-term care insurance, which was introduced in 2008, has enabled childless older adults who cannot perform activities of daily living to receive formal care in institutions. In China, a public care system is evolving rapidly. The government has developed pension schemes and community-based care systems for older adults (Liu and Sun 2016; World Bank 2016). These old-age protection measures may mitigate the adverse social and health effects of being childless or not having children nearby. By comparison, welfare states in Southeast Asia are largely underdeveloped, although the Thai government has recently expanded old-age support via universal health insurance and social pension schemes (Teerawichitchainan and Pothisiri 2021). Given these commonalities and differences, cross-national comparisons permit the examination of how societal contexts may shape the outcomes of childlessness and its association with well-being in old age.

## Methods

### Data sources

We analyze samples of persons aged 60 and over from five nationally representative ageing surveys: the 2012 Korean Longitudinal Study of Aging (KLoSA), the 2011 China Health and Retirement Longitudinal Study (CHARLS), the 2011 Survey of Older Persons in Thailand (SOPT), the 2011 Vietnam Aging Survey (VNAS), and the 2012 Myanmar Aging Survey (MAS).

The KLoSA is a nationally representative (except Jeju Island) longitudinal study of South Korean residents aged 45 and older. Using a stratified multistage probability sampling method, the baseline survey was conducted in 2006 ( $n=10,254$ ), with subsequent biannual data collection. We analyze the 2012 wave, which includes 5,289 persons aged 60 and over. The CHARLS is a nationally representative panel study of Chinese residents aged 45 and older. The baseline survey conducted in 2011 includes approximately 17,500 individuals (of which 7,453 are aged 60 and older) in 150 counties/districts and 450 villages/resident committees. The individuals have been followed up every two years. The 2011 SOPT was the fourth in a series of Thai government surveys of older persons that began in 1994. We analyze the 2011 sample, which consists of over 60,000 persons aged 50 and over (of which 34,173 are aged 60 and older). The VNAS is the first nationally representative ageing survey in Vietnam. Conducted in 2011, the survey consists of approximately 4000 adults aged 50 and older (including 2789 aged 60 and older) in 200 communities located throughout Vietnam. The MAS is the first national survey of its kind in Myanmar and was conducted in 2012. Its multistage sampling approach includes 4080 persons aged 60 and older living in 60 townships located throughout the country.

### Measures

The Korean and Chinese surveys are both part of the Health and Retirement Study (HRS) family surveys and thus contain many similar measures. Meanwhile, the three Southeast Asian ageing surveys were conducted independently, although several measures



are comparable not only among themselves but also with the HRS family surveys. We make significant efforts to harmonize the five datasets and make some modifications to accommodate their differences.

### ***Dependent variables***

This study considers both social and psychological well-being in late adulthood. *The index of social participation* measures the extent to which older people are socially engaged in community-based activities common in each country. The index is constructed based on whether and how often respondents have recently participated or are currently participating in the selected activities. We standardize the composite scores. A higher score indicates greater social participation. *Psychological distress* is assessed with different sets of measures for each country. For China and Korea, ten items from the Center for Epidemiological Study Depression (CES-D) scale are used. For South-east Asian countries, we aggregate responses to questions related to the mental well-being of older adults in the week (Vietnam) and month (Myanmar and Thailand) prior to the survey. The questions are adapted from the SF-36 health assessment instrument, which has been validated in several Asian contexts (Ware and Sherbourne 1992). The scale is standardized, and higher scores indicate greater psychological distress. Appendix Table 6 summarizes the specific questionnaire items in each survey that are used for constructing the two dependent variables.

### ***Independent variable***

Actual childlessness refers to older people who have no living children. Defacto childlessness refers to older adults who have living children, all of whom live outside the elder's locality. The concept of living in a similar locality refers to living in the same province in China, Thailand, and Vietnam; living in the same township in Myanmar; and living within a two-hour distance by public transport in Korea. For each survey, the independent variable is incorporated as a mutually exclusive categorical variable indicating whether the respondent is actual childless, defacto childless, or has at least one child in the same locality (reference).

### ***Control variables***

We incorporate sociodemographic characteristics as control variables, including gender (1 = female, 0 = male), age, marital status, educational attainment, pension (1 = receiving, 0 = not receiving), work status (1 = worked in the last year, 0 = not worked), living arrangement (1 = living alone, 0 = living with someone), urban/rural location of residence (1 = urban, 0 = rural), household wealth, and self-assessed health (1 = excellent, 5 = very poor). Educational attainment is constructed as a categorical variable indicating whether the respondent attained no education (reference), some primary education, a complete primary education, a secondary education or beyond. Marital status is a categorical variable indicating whether the respondent is currently married (reference), divorced/separated, widowed, or never married.

Household wealth is assessed differently depending on the information available in each survey. The values for Thailand, Myanmar, and Vietnam are constructed based on the respondent's ownership of household assets and housing quality, such as TV,

refrigerators, motor vehicles, and modern housing amenities. The index is derived from multiplying a normalized score for each household possession by its weight based on a principal component analysis. In China and Korea, household wealth is constructed by summing the values of all financial assets at the household level. All debts are subtracted from the total value. We use standardized z scores, with higher scores indicating greater wealth.

### **Analysis plan**

First, based on weighted samples, we describe the means and standard deviations of all analytical variables and the prevalence of actual and defacto childlessness by gender, age, and area of residence. Next, we use ordinary least squares (OLS) regression models to investigate the associations between childlessness and social participation and psychological distress. We use hierarchical regression to examine the differential effects of childlessness by gender and wealth. In Model 1, we examine the main effects of childlessness. In Model 2, we include interaction terms between childlessness dummy variables and moderating variables (gender and wealth). All models control for sociodemographic factors (full results can be found in the appendices).

## **Results**

### **Sample description**

Table 2 describes the characteristics of older people by analytic variables. The social participation index and psychological distress are standardized and thus have a mean close to 0 and a standard deviation close to 1. The proportions of women are slightly higher than those of men in all countries except for China, where the sample is equally divided between women and men. The average age varies slightly between 69 and 70 years. Over 70% of older Koreans and Chinese people reported being married at the time of the survey, while smaller proportions of Southeast Asian counterparts reported being married. The average number of living children is lower for older Koreans (3.3), Chinese (3.2) and Thais (3.5) than for Vietnamese (4.7) and Myanmar elders (4.3), reflecting their different trajectories in fertility histories.

Socioeconomic variables such as educational attainment and pension also demonstrate noteworthy differences between countries. For example, the percentages of elderly with a pension are substantially higher in East Asian countries, where the level of population ageing and economic growth have been higher and where concerted governments efforts to address population ageing are more apparent than in Southeast Asian countries. Among Southeast Asian countries, Vietnam has a higher percentage of pension recipients than Thailand and Myanmar, possibly due to its socialist legacy, particularly with regard to state-owned enterprises. Average self-rated health scores range from 2.7 to 3.9, with older adults in Korea, China, and Vietnam on average reporting poorer self-rated health than those in Thailand and Myanmar. Living alone is more common in Korea, China, and Thailand than in Vietnam and Myanmar.

### **Prevalence and dimensions of childlessness**

The results in Table 3 show significant variations in the prevalence of actual and defacto childlessness among those aged 60 and above. Actual childlessness is most prevalent



**Table 2** Sociodemographic characteristics of the samples, older persons 60 and over in selected East and Southeast Asian countries

	S. Korea	China	Thailand	Vietnam	Myanmar
<i>Dependent variables</i>					
Social participation index (standardized)	0.03 (1.02)	0.01 (1.02)	0.00 (1.00)	− 0.08 (1.01)	0.05 (0.99)
Psychological distress (standardized)	− 0.04 (1.00)	− 0.05 (0.98)	0.10 (1.03)	− 0.03 (0.93)	− 0.03 (0.99)
<i>Sociodemographic characteristics</i>					
Female (%)	55.8	50.7	55.9	57.0	54.0
Mean age (s.d.)	70.37 (7.85)	69.26 (7.57)	69.24 (7.47)	70.71 (8.38)	70.46 (7.86)
Currently married (%)	71.1	74.3	64.7	68.5	54.2
Mean number of children (s.d.)	3.34 (1.44)	3.20 (1.63)	3.51 (2.13)	4.69 (2.38)	4.27 (2.44)
Educational attainment (%)					
No education	19.6	36.3	11.8	18.4	22.1
Some primary	4.0	19.2	4.7	31.7	44.8
Complete primary	28.7	23	72.7	17.7	14.9
Secondary and beyond	47.7	21.5	10.7	32.2	18.1
Have pension (%)	34.2	49.6	7.5	18.4	8.3
Worked last year (%)	31.4	37.8	42.7	38.8	29.9
Urban (%)	73.5	48.9	33.5	32.9	31.4
Household wealth index (standardized)	0.04 (1.04)	0.10 (1.04)	0.00 (1.00)	0.20 (1.02)	0.05 (1.00)
Self-rated health	3.90 (0.88)	3.15 (0.92)	2.70 (0.82)	3.69 (0.73)	2.84 (0.87)
Solitary living (%)	14.7	10.7	8.6	5.3	4.9
<i>Unweighted N</i>	5,289	7,453	34,173	2,789	4,080

Sources: KLoSA 2012, CHARLS 2011, SOPT 2011, VNAS 2011, MAS 2012

in Myanmar (7%) and least prevalent in Korea (2%), with Thailand (6%), Vietnam (5%) and China (4%) in between. Meanwhile, the proportions of older people experiencing defacto childlessness is higher in Thailand (11%) and Korea (10%), compared with 3% in Myanmar and 2% in China and Vietnam.

Furthermore, within countries there are considerable differences in the levels of actual and defacto childlessness between sexes, age groups and urban/rural locations. In Southeast Asian countries, and to some extent in Korea, actual childlessness is more common among women than men and among urban than rural older people, reflecting higher rates of nonmarriage among women and urban residents. In China, however, the opposite is true. Furthermore, the prevalence of actual and defacto childlessness in Southeast Asia is generally higher among those aged 60–69 than among older age groups, indicating that the proportion of recent cohorts entering old age who are childless has been recently increasing. In Thailand and particularly in Korea, defacto childlessness is clearly more typical in rural areas than in urban areas.

#### Childlessness and social participation

Table 4 shows the extent to which both actual and defacto childlessness are linked with social participation after controlling for various confounders. Model 1 shows that actual childlessness is significantly associated with lower levels of social participation among older people in all Southeast Asian countries but has no significant effect in East Asian countries. It is only in China that defacto childlessness is associated with lower social participation.

**Table 3** Prevalence of actual and defacto childlessness among older persons in selected East and Southeast Asian countries

	S. Korea		China		Thailand		Vietnam		Myanmar	
	% actual childless	% defacto childless	% actual childless	% defacto childless	% actual childless	% defacto childless	% actual childless	% defacto childless	% actual childless	% defacto childless
All older persons	2.3	9.9	3.7	2.4	6.4	10.8	4.7	2.3	6.8	2.8
Male	2.2	11.6	4.9	3.1	4.5	12.8	1.5	1.8	4.6	2.3
Female	2.5	8.6	2.7	1.8	7.9	9.2	7.2	2.6	8.6	3.3
Age 60–69	2.7	10.3	3.2	3.5	7.2	13.7	7.2	3.6	8.2	3.6
Age 70–79	1.4	10.5	4.5	1.2	5.6	7.8	3.7	1.4	5.4	1.6
Age 80+	3.5	7.1	4.5	0.2	4.5	3.1	1.4	0.6	4.8	2.9
Urban	2.8	7.4	2.7	3.1	9.8	10.2	5.2	2.1	7.2	4.4
Rural	0.9	17.0	4.9	1.7	4.6	11.1	4.5	2.3	6.6	2.1

Sources: KLoSA 2012, CHARLS 2011, SOPT 2011, VNAS 2011, MAS 2012

Analyses are weighted

**Table 4** Actual and defacto childlessness and social participation among East and Southeast Asian older persons: OLS regression results

Variables	S. Korea		China		Thailand		Vietnam		Myanmar	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
<i>Childlessness (children nearby = ref)</i>										
Actual childless (AC)	0.13	-0.31	-0.18	-0.06	-0.13***	-0.16**	-0.58***	-0.80***	-0.18*	-0.24*
Defacto childless (DC)	0.01	0.06	-0.16*	-0.22*	0.01	0.01	-0.05	0.05	-0.10	0.07
<i>Moderating variables</i>										
Female	0.12***	0.12***	0.08*	0.07*	0.10***	0.10***	-0.11**	-0.12**	-0.13***	-0.13***
HH wealth	0.09***	0.08***	0.05***	0.05***	0.01†	0.01	0.06**	0.06**	0.07***	0.07***
<i>Interaction terms</i>										
AC*female		0.40†		-0.24		0.04		0.31		0.12
DC*female		-0.02		0.23		0.03		-0.12		-0.24
AC*HH wealth		-0.35†		-0.18†		-0.04		0.11		0.05
DC*HH wealth		0.21***		0.12		0.06**		-0.13		-0.07
Constant	0.67***	0.69***	0.09	0.09	0.76***	0.768***	-0.11	-0.09	1.98***	1.99***
Unweighted number	5125	5125	4936	4936	22,020	22,020	2576	2576	4080	4080

Sources: KLoSA 2012, CHARLS 2011, SOPT 2011, VNAS 2011, MAS 2012, MAS 2012. Sociodemographic variables are controlled

\*\*\* $p < 0.001$ , \*\* $p < 0.01$ , \* $p < 0.05$ , † $p < 0.10$

When considering the interaction terms in Model 2, we find marginally significant gender differences in the effect of childlessness only in Korea. In Korea, actual childlessness is associated with higher levels of social participation among women but lower levels of social participation among men ( $p < 0.10$ ). In Korea, China, and Thailand, household wealth significantly moderates the effect of childlessness. In Korea and Thailand, older adults who are defacto childless and report greater wealth show higher levels of social participation than those who are defacto childless and report less wealth, suggesting that household wealth affords these individuals both the time and resources needed to participate in social activities. However, wealth shows an opposite effect on actual childlessness in Korea and China, with actual childless older adults with greater wealth showing lower levels of social participation than their peers with less wealth ( $p < 0.10$ ).

### **Childlessness and psychological distress**

Table 5 shows the extent to which actual and defacto childlessness are associated with psychological distress among older people after controlling for sociodemographic differences, including living alone. By and large, Model 1 indicates that the relative importance of actual versus defacto childlessness differs across the five examined countries. In Thailand and Myanmar, only actual childlessness is associated with greater psychological distress ( $p < 0.10$  in Myanmar), whereas in China and Vietnam, only defacto childlessness exerts significant effects. In Korea, actual childlessness is associated with higher levels of distress, whereas defacto childlessness is associated with lower levels of distress, although this finding is only marginally significant. These effects are net of the effect of living alone, suggesting that childlessness has a unique effect on psychological distress apart from the effect of living alone.

Model 2 shows a significant gender difference in the effect of actual childlessness in Vietnam. With respect to psychological distress, women are less likely to be affected by the negative effects of actual childlessness than men. Significant moderating effects of household wealth exist in Vietnam and Myanmar. Specifically, wealth mitigates the association between childlessness (both actual and defacto) and greater psychological distress in Vietnam ( $p < 0.10$ ). In Myanmar, wealth attenuates the negative effect of defacto childlessness. The moderating effects of gender and wealth are insignificant in Thailand, Korea, and China.

### **Discussion and conclusion**

The foregoing analyses of population-based data from five East and Southeast Asian countries indicate that it is not uncommon for older Asians to age without the continuing presence of children, particularly among the population of young old individuals. When actual and defacto childlessness rates are combined, the prevalence among adults aged 60–69 ranges from 7% in China to 21% in Thailand. Preliminary analyses (not shown) suggest that some have no living children (mostly due to being never married), while others do not have any residentially proximate children (primarily due to the out-migration of all of one's children). Although the current cohorts of Asian adults aged 60 and above usually have multiple children, reflecting past fertility trends, members of younger cohorts with fewer or no children will be reaching old age. For example, 13% of Thai adults presently in their 50s have no children, with actual childlessness

**Table 5** Actual and defacto childlessness and psychological distress among East and Southeast Asian older persons: OLS regression results

Variables	S. Korea		China		Thailand		Vietnam		Myanmar	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
<i>Childlessness (children nearby = ref)</i>										
Actual childless (AC)	0.33**	0.26	-0.12	-0.11	0.19***	0.19***	0.14	0.70***	0.12 <sup>†</sup>	0.16 <sup>†</sup>
Defacto childless (DC)	-0.08 <sup>†</sup>	-0.11 <sup>†</sup>	0.15*	0.19*	0.03	0.01	0.21***	0.23*	0.02	0.09
<i>Moderating variables</i>										
Female	-0.01	-0.02	0.19***	0.19***	0.06***	0.05***	0.25***	0.27***	0.21***	0.21***
HH wealth	0.02	0.02 <sup>†</sup>	-0.14***	-0.14***	-0.14***	-0.14***	-0.19***	-0.19***	-0.26***	-0.25***
<i>Interaction terms</i>										
AC*female		0.16		-0.02		-0.01		-0.67***		-0.06
DC*female		0.03		-0.04		0.04		0.01		-0.04
AC*HH wealth		0.07		0.07		-0.04		-0.12 <sup>†</sup>		-0.02
DC*HH wealth		-0.06		0.06		0.003		-0.18 <sup>†</sup>		-0.19**
Constant	-1.76***	-1.75***	-1.12***	-1.13***	-0.69***	-0.69***	-2.22***	-2.27***	-1.28***	-1.27***
Unweighted number	5125	5125	4936	4936	22,020	22,020	2592	2592	3796	3796

Sources: KLoSA 2012, CHARLS 2011, SOPT 2011, VNAS 2011, MAS 2012, MAS 2012. Sociodemographic variables are controlled

\*\*\* $p < 0.001$ , \*\* $p < 0.01$ , \* $p < 0.05$ , <sup>†</sup> $p < 0.10$

rates being as high as 30% among these female cohorts from Bangkok (Thailand's capital city) (National Statistical Office 2022). Moreover, East Asia and many parts of Southeast Asia are ageing rapidly and have some of the lowest fertility rates in the world. Even in countries with relatively lower percentages of older persons (e.g., Myanmar), their older-aged populations will substantially increase in the coming decades (Knodel and Teerawichitchainan 2015). Thus, ageing without children is likely emerge as a pressing issue in the foreseeable future.

Furthermore, our study contributes to the growing literature on childless ageing by distinguishing the ageing experience of actual and defacto childlessness and by highlighting how the two dimensions of childlessness are associated with later-life well-being, net of marital status, living alone, and other confounding factors. The cross-national comparison also allows us to interpret how societal contexts shape the influences of childlessness in old age. As in previous research conducted primarily in Western countries (e.g., Hank and Wagner 2013; Wenger et al. 2007), our findings demonstrate nuanced relationships between childlessness and older adults' levels of social participation and psychological distress in Asia.

Lower levels of social participation among actual childless older adults in Southeast Asia are apparent, although similar effects are not found in East Asian countries. The negative effect of actual childlessness on social participation in the three developing Southeast Asian societies included in this study may be in part due to a lack of community-based infrastructures (e.g., senior centers), as well as fewer social and economic resources being in place to support childless older adults (Devasahayam 2014). Additionally, with relatively high fertility rates in Southeast Asia, norms regarding the social life of older adults that are closely tied to the presence of children may still prevail (Yeung et al. 2018). Nevertheless, we do not find any distinct cultural differences between patrilineal versus bilateral kinship systems. In particular, we initially expected that the patrilineal kinship system common in Korea, China, and Vietnam would magnify the negative effects of both actual and defacto childlessness on social participation; however, this difference is not apparent.

Regarding the effects of childlessness on psychological distress, some unexpected findings emerge. For example, in China and Vietnam, only defacto childlessness, not actual childlessness, is linked to psychological distress. Although caution should be taken in interpreting these findings, several speculations are possible. For instance, in China, with government welfare policies in place that specifically target older adults without any sources of support, childless older adults may be better equipped to deal with the challenges of ageing (Chan et al. 2008). On the other hand, with the increasing out-migration of young adults from rural to urban areas, a substantial number of older adults who live far away from their children (defacto childless) may feel more isolated and have fewer economic and social resources available to address their needs. Alternatively, defacto childlessness may have a greater influence on older adults' psychological distress in countries such as China and Vietnam because of strong filial norms. When such norms are not fulfilled because of children's geographic distance, this may cause psychological distress among older Chinese and Vietnamese individuals (Teerawichitchainan et al. 2015). However, older adults without children (i.e., actual childlessness) may have



already adapted to being childless and thus do not feel great distress (Zhang and Hayward 2001).

Furthermore, the finding that defacto childless older adults in Korea demonstrate lower levels of psychological distress than those with children is also surprising. This outcome may suggest that the geographic distance from adult children may not matter much given Korea's relatively short distances between urban and rural areas and the advanced transportation and telecommunication systems available. Some older Koreans may in fact feel better when they have their own autonomous lives and not having to worry about their children or grandchild-related chores. Alternatively, we are mindful that the criteria used for determining defacto childlessness (i.e., children live more than 2 h away by public transportation) may not be adequately sensitive to our research inquiry.

Finally, the results show that the effects of childlessness on older adults differ by gender and wealth. Generally, when the effects are significant, being female mitigates the effect of actual childlessness on levels of social participation and psychological distress. These findings are contrary to previous research suggesting that childlessness is more stigmatizing for women than for men (Yang 2012); however, they are consistent with the gerontological literature suggesting that older women are generally better than men at maintaining close informal relationships with relatives and friends (Antonucci and Akiyama 1987). However, the effect of wealth differs depending on the types of childlessness. A particularly interesting finding is that greater wealth helps defacto childless older adults in Korea and Thailand to be socially engaged, while it reduces the social participation level of those who are actually childless in Korea and China. While the positive effects of wealth may suggest that older adults with more economic resources are better equipped to engage in social activities and interact with others at a distance, the negative effect found in the case of actual childlessness implies that wealth does not always lead to higher levels of social participation. For Vietnam, the moderating effects of wealth are found to be consistent across different types of childlessness, suggesting that greater levels of wealth help to reduce the levels of psychological distress of both actual and defacto childlessness. More research is needed to understand the mechanisms through which wealth creates divergent experiences of childless older adults across settings.

Our study has several limitations. First, we cannot completely rule out the selection effect. Older adults who are actually childless or defacto childless may share different characteristics that may be associated with different levels of social participation and psychological distress than their counterparts. The lack of statistical power due to the small sample sizes of older adults who are childless may also have influenced the results. Second, the surveys do not ascertain whether respondents' actual childlessness is voluntary or involuntary, nor the reasons for involuntary childlessness (e.g., infertility, loss due to death). Previous research has shown that voluntary childlessness has a less negative or even positive impact on older people (e.g., no need to spend financial resources or time on childrearing) compared to involuntary childlessness, even in cultures where old-age support from one's children remains a norm (Dykstra and Hagestad 2007; Feng 2018). Losing a child to death also brings insurmountable grief for parents and may influence their social

and psychological functioning (Li et al. 2005). With an increasing level of diversity in family formation and fertility decisions, future research can explore whether voluntariness in or reasons for childlessness create meaningful differences in the effects of actual childlessness.

In addition to examining different pathways to actual childlessness, future studies can pay attention to diverse aspects of defacto childlessness. While some defacto childless elders may live alone or only with their spouse, others may form a skip-generation household (i.e., coresiding with one or more grandchildren and one's spouse but not with one's children). Different types of defacto childlessness may have different social and psychological implications for well-being in old age. Given its increasing prevalence across low- and middle-income countries (Zimmer and Treleaven 2020), the consideration of skip-generation households as part of defacto childlessness warrants future investigation.

Finally, while numerous efforts have been made to harmonize data, the issues of comparability cannot be entirely discounted. For example, for the measure of defacto childlessness, geographic proximity to one's children is defined differently in the five countries. In particular, unlike other countries where distance is determined based on geographic boundaries (e.g., within the same province), distance is measured according to time in Korean data (e.g., within two hours). Thus, a more comparable measure of defacto childlessness may yield different findings. Furthermore, in the current study, variables such as social participation and household wealth were constructed using different items due to limited data availability of the same measures across surveys. Caution should therefore be taken in interpreting cross-country differences.

In conclusion, our study is among the first to compare the prevalence and implications of actual and defacto childlessness across East and Southeast Asia. Our findings underscore the importance of contextualizing childlessness in different societal contexts to understand its nuanced consequences. Our findings also offer important insights for each country or region, as they prepare for ageing societies and rising trends in childlessness. For example, the finding that the social consequences of childlessness are more apparent in Southeast Asian countries calls for more investment in community networks and resources that can be used when childless older adults are in need of social and emotional support. Likewise, countries with a large rural–urban migration of younger generations may need to consider the specific needs of older adults who have children but cannot receive adequate support from them due to geographic distance. The implications of childlessness will become an even more important subject to study in the near future (Verdery et al. 2019). For example, will childlessness have less of an impact on future cohorts of older-aged populations given the normalization of childlessness and ultralow fertility? Or will childlessness create a greater divide in the social and psychological well-being of older adults? What kind of support systems will childless older adults rely on, especially in countries where formal care systems are at a nascent stage? These questions warrant further investigation of the implications of childlessness, as cohorts with fewer or no children transition into older age groups not only in Asia but also around the world.

## Appendix

See Tables 6, 7, 8.

**Table 6** Measurements of dependent variables (social participation index and psychological distress)

	South Korea	China	Thailand	Vietnam	Myanmar
Social participation index	Respondents were asked how frequently they currently participate in church or other religious groups; social clubs; sports clubs, arts or music groups or classes for seniors; alumni societies; societies for people from the same hometown; family councils; volunteer groups; or political party, NGOs, or interest groups	Respondents were asked how frequently, during the past 1 month, they interacted with friends; played ma-jong/cards/chess or went to community club; went to a sport, social, or other kind of club; took part in a community-related organization; engaged in voluntary or charity work; or attended an educational or training course	Respondents were asked how frequently, during the past 12 months, they participated in community-based groups (e.g., elderly clubs, co-operative/saving groups) and attended temple/church/mosque	Respondents were asked how frequently, during the past 12 months, they participated in social activities in their community, including an elderly association, farmers' union, veterans' association, or women's union	Respondents were asked how frequently, during the past 12 months, they participated in community or political meetings; attended religious ceremonies (including offering food to monks) or group physical exercise; or socialized with friends and neighbors
Psychological distress	<i>Adapted from CES-D</i> Respondents were asked the extent to which, during the past week, they had felt that things bothered them; had trouble keeping their mind on things doing; felt depressed; felt that everything was an effort; felt fearful; their sleep was restless; felt happy; felt lonely; could not get going; or felt hopeful about the future	Respondents were asked extent to which, during the past week, they had felt that things bothered them; had trouble keeping their mind on things doing; felt depressed; felt that everything was an effort; felt fearful; their sleep was restless; felt happy; felt lonely; could not get going; or enjoyed life	<i>Adapted from SF-36 health assessment instrument</i> Respondents were asked whether during the past month, they had felt sad; felt unhappy; felt depressed; felt lonely; experienced loss of appetite; felt moody/upset; worried a lot; felt hopeless; or felt that life was not worthwhile	Respondents were asked whether during the past week, they had felt sad; felt unhappy; felt depressed; felt lonely; experienced a loss of appetite; experienced sleeping difficulties; felt happy; or felt peaceful	Respondents were asked whether during the past month, they had felt sad; felt unhappy; felt depressed; felt lonely; experienced a loss of appetite; felt moody/upset; experienced sleeping difficulties; felt happy; or felt peaceful

Sources: KLoSA 2012, CHARLS 2011, SOPT 2011, VNAS 2011, MAS 2012

**Table 7** Actual and defacto childlessness and social participation among East and Southeast Asian older persons: OLS regression results

Variables	S. Korea		China		Thailand		Vietnam		Myanmar	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
<i>Childlessness (children nearby = ref)</i>										
Actual childless (AC)	0.13	-0.31	-0.18	-0.06	-0.13***	-0.16**	-0.58***	-0.80***	-0.18*	-0.24*
Defacto childless (DC)	0.01	0.06	-0.16*	-0.22*	0.01	0.01	-0.05	0.05	-0.10	0.07
<i>Moderating variables</i>										
Female	0.12***	0.12***	0.08*	0.07*	0.10***	0.10***	-0.11**	-0.12**	-0.13***	-0.13***
HH wealth	0.09***	0.08***	0.05***	0.05***	0.01†	0.01	0.06**	0.06**	0.07***	0.07***
<i>Interaction terms</i>										
AC*female		0.40†		-0.24		0.04		0.31		0.12
DC*female		-0.02		0.23		0.03		-0.12		-0.24
AC*HH wealth		-0.35†		-0.18†		-0.04		0.11		0.05
DC*HH wealth		0.21***		0.12		0.06**		-0.13		-0.07
<i>Control variables</i>										
Age	-0.00	-0.00	0.00	0.00	-0.01***	-0.01***	-0.002	-0.002	-0.02***	-0.02***
<i>Marital status (currently married = ref)</i>										
Never married	-0.42	-0.37	-0.07	-0.27	-0.13**	-0.12*	0.04	0.04	0.10	0.08
Divorced/separated	-0.43***	-0.41***	-0.14	-0.14	-0.16***	-0.15***	0.17	0.18	-0.06	-0.06
Widowed	-0.02	-0.02	-0.01	-0.01	-0.06***	-0.05***	-0.08	-0.08†	-0.06†	-0.06†
<i>Education (no educ = ref)</i>										
Some primary	0.15*	0.15*	0.05	0.05	0.05	0.05	0.14**	0.14**	0.11***	0.11**
Complete primary	0.23***	0.23***	0.12**	0.12**	0.17***	0.17***	0.36***	0.35***	0.14***	0.15**
Beyond primary	0.47***	0.46***	0.32***	0.32***	0.03	0.03	0.40***	0.40***	0.05	0.06
Pension	0.11***	0.10***	0.16***	0.16***	0.06*	0.06*	0.68***	0.68***	0.15**	0.15**
Worked last year	0.00	-0.00	-0.15***	-0.15***	0.15***	0.15***	0.14**	0.13***	0.11***	0.11**
Urban	-0.03	-0.03	0.06†	0.06†	-0.46***	-0.46***	-0.35***	-0.36***	-0.13***	-0.13***
Self-rated health	-0.22***	-0.22***	-0.08***	-0.08***	-0.12***	-0.12***	-0.01	-0.01	-0.11***	-0.11***

**Table 7** (continued)

Variables	S. Korea		China		Thailand		Vietnam		Myanmar	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Solitary living	0.07	0.07	0.24***	0.24***	0.08***	0.08***	0.08***	0.08***	- 0.004	0.002
Psychological distress	- 0.09***	- 0.09***	- 0.10***	- 0.10***	- 0.05***	- 0.05***	0.06*	0.06**	- 0.13***	- 0.13***
Constant	0.67***	0.69***	0.09	0.09	0.76***	0.768***	- 0.11	- 0.09	1.98***	1.99***
Unweighted number	5,125	5,125	4,936	4,936	2,020	2,020	2,576	2,576	4,080	4,080

Sources: KLoSA 2012, CHARLS 2011, SOPT 2011, VNAS 2011, MAS 2012. Sociodemographic variables are controlled

\*\*\* $p < 0.001$ , \*\* $p < 0.01$ , \* $p < 0.05$ , † $p < 0.10$

**Table 8** Actual and defacto childlessness and psychological distress among East and Southeast Asian older persons: OLS regression results

Variables	S. Korea		China		Thailand		Vietnam		Myanmar	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
<i>Childlessness (children nearby = ref)</i>										
Actual childless (AC)	0.33**	0.26	-0.12	-0.11	0.19***	0.19***	0.14	0.70***	0.12†	0.16†
Defacto childless (DC)	-0.08†	-0.11†	0.15*	0.19*	0.03	0.01	0.21***	0.23*	0.02	0.09
<i>Moderating variables</i>										
Female	-0.01	-0.02	0.19***	0.19***	0.06***	0.05***	0.25***	0.27***	0.21***	0.21***
HH wealth	0.02	0.02†	-0.14***	-0.14***	-0.14***	-0.14***	-0.19***	-0.19***	-0.26***	-0.25***
<i>Interaction terms</i>										
AC*female		0.16		-0.02		-0.01		-0.67***		-0.06
DC*female		0.03		-0.04		0.04		0.01		-0.04
AC*HH wealth		0.07		0.07		-0.04		-0.12†		-0.02
DC*HH wealth		-0.06		0.06		0.003		-0.18†		-0.19**
<i>Control variables</i>										
Age	0.01***	0.01***	-0.00	-0.00	-0.001	-0.001	0.01***	0.01***	-0.003†	-0.004†
<i>Marital status (currently married = ref)</i>										
Never married	0.04	0.06	0.21	0.24	-0.12*	-0.11*	-0.19	-0.23	-0.29***	-0.28**
Divorced/separated	0.14	0.14	0.40***	0.40***	0.27***	0.27***	-0.18	-0.19	0.02	0.02
Widowed	0.11**	0.12**	0.17***	0.17***	0.12***	0.12***	0.16***	0.16***	0.06†	0.06†
<i>Education (no educ = ref)</i>										
Some primary	0.03	0.03	-0.03	-0.03	0.01	0.01	-0.03	-0.03	0.04	0.04
Complete primary	-0.09*	-0.09*	-0.14***	-0.14***	-0.04	-0.04	0.03	0.04	0.02	0.02
Beyond primary	-0.12**	-0.12**	-0.23***	-0.23***	-0.12***	-0.12***	-0.07	-0.05	-0.06	-0.07
Pension	-0.03	-0.03	-0.17***	-0.17***	-0.02	-0.02	-0.02	-0.02	-0.09†	-0.09†
Worked last year	-0.26***	-0.26***	-0.00	0.00	-0.12***	-0.12***	0.04	0.05	0.05†	0.05
Urban	-0.02	-0.02	-0.06*	-0.06*	0.05**	0.05**	0.01	0.02	0.17***	0.17***
Self-rated health	0.27***	0.27***	0.42***	0.42***	0.32***	0.32***	0.41***	0.42***	0.46***	0.46***



**Table 8** (continued)

Variables	S. Korea		China		Thailand		Vietnam		Myanmar	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Solitary living	0.06	0.05	- 0.08	- 0.08	0.05*	0.05	0.43***	0.42***	0.06	0.04
Constant	- 1.76***	- 1.75***	- 1.12***	- 1.13***	- 0.69***	- 0.69***	- 2.22***	- 2.27***	- 1.28***	- 1.27***
Unweighted number	5,125	5,125	4,936	4,936	22,020	22,020	2,592	2,592	3,796	3,796

Sources: KLOSA 2012, CHARLS 2011, SOPT 2011, VNAS 2011, MAS 2012. Sociodemographic variables are controlled

\*\*\* $p < 0.001$ , \*\* $p < 0.01$ , \* $p < 0.05$ , † $p < 0.10$

### Abbreviations

AC	Actual childless
DC	Defacto childless
CES-D scale	Center for Epidemiological Study Depression scale
CHARLS	China Health and Retirement Longitudinal Study
GDP	Gross domestic product
HRS	Health and Retirement Study
KLoSA	Korean Longitudinal Study of Aging
MAS	Myanmar Aging Survey
OLS regression	Ordinary least squares regression
SOPT	Survey of Older Persons in Thailand
UNDP	United Nations Development Program
VNAS	Vietnam Aging Survey

### Acknowledgements

This work is supported by Singapore's Ministry of Education Academic Research Fund Tier 2 (MOE2019-T2-2-084), the Institute of Social Welfare at Seoul National University, and the Asian Universities Alliance (AUA) Scholars Award.

### Author contributions

Both authors contributed equally to the conceptualization, methodology, analysis, and writing.

### Funding

We received funding from the Institute of Social Welfare at Seoul National University, the Asian Universities Alliance (AUA) Scholars Award, and Singapore's Ministry of Education Academic Research Fund Tier 2 (MOE2019-T2-2-084) in conducting this research.

### Availability of data and materials

Our study was based on publicly available data from the 2012 Korean Longitudinal Study of Aging (KLoSA, <https://survey.keis.or.kr/klosa/klosa04.jsp>) and the 2011 China Health and Retirement Longitudinal Study (CHARLS, <http://charls.pku.edu.cn/en/>). Additionally, we analyzed data from the 2011 Survey of Older Persons in Thailand (SOPT), the 2011 Vietnam Aging Survey (VNAS), and the 2012 Myanmar Aging Survey (MAS). Data from Thailand, Vietnam, and Myanmar are available upon request from the National Statistical Office of Thailand ([https://www.nso.go.th/nsoweb/index?set\\_lang=en](https://www.nso.go.th/nsoweb/index?set_lang=en)), the Hanoi Institute of Social and Medical Studies (<https://en.isms.org.vn/vietnam-national-aging-survey-vnas>), and HelpAge International Myanmar (<https://www.helpage.org/global-network/asia/south-east-asia/myanmar/>), respectively.

### Declarations

#### Competing interests

The authors declare they have no competing interests.

Received: 31 August 2022 Accepted: 18 January 2024

Published online: 15 February 2024

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