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**Working Paper**

## Gender differences in access to health care among the elderly: Evidence from Southeast Asia

ADB Economics Working Paper Series, No. 633

**Provided in Cooperation with:**

Asian Development Bank (ADB), Manila

*Suggested Citation:* Rodgers, Yana van der Meulen; Zveglich, Joseph E. (2021) : Gender differences in access to health care among the elderly: Evidence from Southeast Asia, ADB Economics Working Paper Series, No. 633, Asian Development Bank (ADB), Manila, <https://doi.org/10.22617/WPS210047-2>

This Version is available at:

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# GENDER DIFFERENCES IN ACCESS TO HEALTH CARE AMONG THE ELDERLY

EVIDENCE FROM SOUTHEAST ASIA

*Yana van der Meulen Rodgers and Joseph E. Zveglich, Jr.*

**NO. 633**

February 2021

**ADB ECONOMICS  
WORKING PAPER SERIES**

ADB Economics Working Paper Series

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Yana van der Meulen Rodgers and Joseph E. Zveglic, Jr.

No. 633 | February 2021

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The authors wish to thank Yasuyuki Sawada and participants in the 2020 ADB Economists' Forum and an ADB Economic Research and Regional Cooperation Department seminar for their helpful comments on earlier drafts.



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[www.adb.org](http://www.adb.org)

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ISSN 2313-5867 (print), 2313-5875 (electronic)  
Publication Stock No. WPS210047-2  
DOI: <http://dx.doi.org/10.22617/WPS210047-2>

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## **ABSTRACT**

Populations become increasingly feminized with age. Since older women are more vulnerable to poverty, they may find it more difficult than men to access health care. This study examines factors that may constrain older persons in Southeast Asia from meeting their health-care needs when sick. Our analysis of household survey data from Cambodia, the Philippines, and Viet Nam shows that women are more likely to have reported sickness or injury than men, a difference that is meaningful and statistically significant. While women in Cambodia and the Philippines are more likely to seek treatment than men, the gender difference is reversed in Viet Nam where stigma and discrimination associated with some diseases may more strongly deter women. The probability of seeking treatment rises with age more sharply for women than men in all countries. However, for the subsample of elders, the gender difference is not significant.

*Keywords:* elderly, gender, health, health care, women

*JEL codes:* I14, J16, O53

## I. INTRODUCTION

In what has been called the feminization of later life, the population share has become increasingly female among older age groups in most countries, with women on average having higher life expectancies than men due to a combination of biological, social, and behavioral reasons (Kinsella 2000). Cross-disciplinary research has contributed to a better understanding of why elderly women have experienced relatively greater difficulties in meeting their health-care needs, how the caring labor of adult children plays an important role in meeting the health needs of elderly adults, and why poverty rates among older persons tend to be higher for women. Older women are more vulnerable to poverty given their relatively higher rates of widowhood as well as insufficient support from pensions and social security due to their relatively shorter times in the labor force (Smeeding and Sandstrom 2005). Poverty and income constraints in turn contribute to problems in accessing health care. Older women have faced additional constraints, including relatively lower rates of health insurance coverage, less education, and lack of economic independence, that have limited their access to health care and their ability to pay for it (Brinda et al. 2015, Zhang et al. 2017). Research from the United States indicates that women are less likely than men to use hospital services and outpatient surgery, and some of that gender difference is explained by differences in economic resources and health needs (Song et al. 2006). Bias may also play a role, as documented in India and Norway. In Karnataka, India, relatively more women slipped through the cracks in gaining access to services from network hospitals in part due to gender discrimination and class bias against the poor (Karpagam, Vasana, and Seethappa 2016). In Norway, care managers viewed care from daughters as a substitute for formal care and were found to discriminate against older women in providing health-care services if the women had daughters; they did not discriminate against older men (Jakobsson et al. 2016).

Yet in some contexts, women may be more likely to seek treatment from formal providers than men. One potential explanation is that women are more likely than men to report health problems and to have worse self-reported health status (Atchessi et al. 2018; Madyaningrum, Chuang, and Chuang 2018; Case and Paxson 2005). Another possibility is that women may be less able to receive informal care within the home from a spouse or adult child, thus becoming more dependent on sources of care outside the home. Across countries, families are using their own unpaid labor, especially that of women, to provide care for older family members (Stark 2005). Unpaid care for older men is often provided by spouses, while for women it is provided by other family members, especially by daughters, as documented for the Republic of Korea (Yoon 2014), the People's Republic of China (Chen et al. 2018), and Western Europe (Stark and Cukrowska-Torzewska 2018). One outcome is lower hospitalization rates for elderly people living with family members compared to the elderly who live alone, an outcome observed in Mexico (González-González et al. 2011). Given women's longer life expectancies, in most countries relatively more women are widowed than men, leaving women more reliant on formal services outside of the home for their health-care needs, including long-term care. For example, in the United States, a large share of out-of-pocket medical spending is allocated toward nursing facilities, and widowhood accounts for about one-third of the gender gap in out-of-pocket medical expenses (Goda, Shoven, and Slavov 2013).

The research on health-care seeking among older women and men has tended to focus more on higher-income countries with well-established nationally representative surveys such as the Harmonized Health and Retirement Study (HRS) and other HRS-Family Studies that have detailed



information on the elderly.<sup>1</sup> There is relatively less information about gender differences in health-care utilization among older persons in lower-income countries and why they occur. This study helps to fill that gap by drawing on information about the health status of household members in two popular surveys, i.e., the Demographic and Health Survey (DHS) and the Living Standards Measurement Survey, to explore the factors that have constrained the ability of the elderly to meet their health-care needs. We focus on whether women have faced additional difficulties in a context of social norms that prioritize men over women in access to health-care resources. Using a nationally representative sample of adults (ages 18 and above) for Cambodia, the Philippines, and Viet Nam, we use the determinants of illness and health-seeking behaviors and how they differ by gender and age, and we examine how the gender gap in health-seeking behavior changes as the population ages. Uncovering gender differences in health outcomes and access to care is crucial to fine-tune policy reforms to address the needs of older adults in Southeast Asia, especially in light of the increased risks of getting sick during the coronavirus disease (COVID-19) pandemic.

## II. BACKGROUND

While Asia's lower- and middle-income countries still have relatively young populations, projections show their demographic transitions are progressing rapidly with considerable shifts in the population age structures toward the elderly. These shifts have already prompted legislative reforms to build and reinforce the social safety net to better support older persons, especially those living in poverty. Most countries in South and Southeast Asia have committed to achieving universal health care, a goal that is incorporated in the Sustainable Development Goals (WHO 2019). Many have implemented reforms focusing specifically on the needs of their aging populations, but progress has remained uneven depending on the size of public sector health budgets (Mahal and McPake 2017). The remainder of this section highlights some of these reforms in our sample countries: Cambodia, the Philippines, and Viet Nam.

### A. Cambodia

The Government of Cambodia has implemented a comprehensive set of reinforcements to its social safety net following the long-lasting repercussions of the Khmer Rouge genocide, which led to enormous disruptions to family structures, social well-being, and economic prosperity. More than 40% of older adults surveyed in the early 2000s had experienced the death of a child between 1975 and 1979, compared to just 7% in the 4-year period after the genocide (Zimmer et al. 2006). More than half of these older adults lost a spouse during the Khmer Rouge period, with two-thirds of women and one-third of men reporting the loss of a spouse. While Cambodia's men were subjected to a disproportionate amount of violence during the Khmer Rouge regime, domestic violence against women appears to have increased after the genocide (Rodgers 2009). Women have faced additional gender-specific constraints as they have aged in achieving sound health and meeting their health-care needs given the country's patriarchal and hierarchical social structure, which gives higher status to men and lower status to unmarried women (USAID 2016). Although there is a widespread perception that Cambodia is a matrilineal society, ethnographic studies suggest that the country has more of a bilateral social system in which women have influence over social life while patriarchy still functions strongly in

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<sup>1</sup> For more information on the HRS, see <https://g2aging.org/?section=study&studyid=33>.

making women subordinate to men in schooling, access to resources, and decision-making power (Öjendal and Sedara 2006).

In 2016, the Government of Cambodia committed to achieving universal health coverage through its Social Health Protection Framework. Shortly thereafter, the Ministry of Health announced it would place greater emphasis on the needs of the elderly in its Third Health Strategic Plan (2016–2020). The government has specifically targeted the removal of sociocultural, financial, and bureaucratic barriers to quality health-care services among the elderly, and it has prioritized access to free or low-cost health care. One step in that direction is the expansion of so-called Health Equity Fund schemes to provide greater financial risk protection for vulnerable groups, including the elderly.

## **B. Philippines**

Even though the Philippines still has a young population structure, projections in Cruz, Cruz, and Saito (2019) indicate that by 2030 the Philippines will be an “aging society,” with over 10% of the population above the age of 60. In response, the government has implemented a number of policies to protect the health and economic security of older persons, including the 2019 Universal Health Care Law, which guarantees equitable access for all Filipinos to quality health-care services at affordable rates. The new law also enrolls all citizens in the national public insurance program, PhilHealth, and provides free consultations and tests through this program. Leading up to this policy reform, older persons have historically relied on their children for old-age support, including financial support for health expenditures. However, intergenerational transfers from adult children to their older parents have fallen over time in the Philippines and in other Asian countries as children have found it less necessary to provide such support, and older persons have lowered their expectations of receiving such support (Marquez 2019).

This pattern of declining intergenerational support may hurt older women more than men as older women are more likely to rely on their children as the primary caregiver when they are sick, while older men are more likely to rely on their spouse. Previous evidence on gender differences in the health status of Filipino older persons yields mixed results, with some disadvantages for women, including poorer dental hygiene, greater rates of depression, and a higher incidence of self-reported pain. However, men’s higher rates of smoking also result in higher rates of morbidity related to smoking, and overall, there appears to be no substantial gender differences in disability (Cruz, Cruz, and Saito 2019).

## **C. Viet Nam**

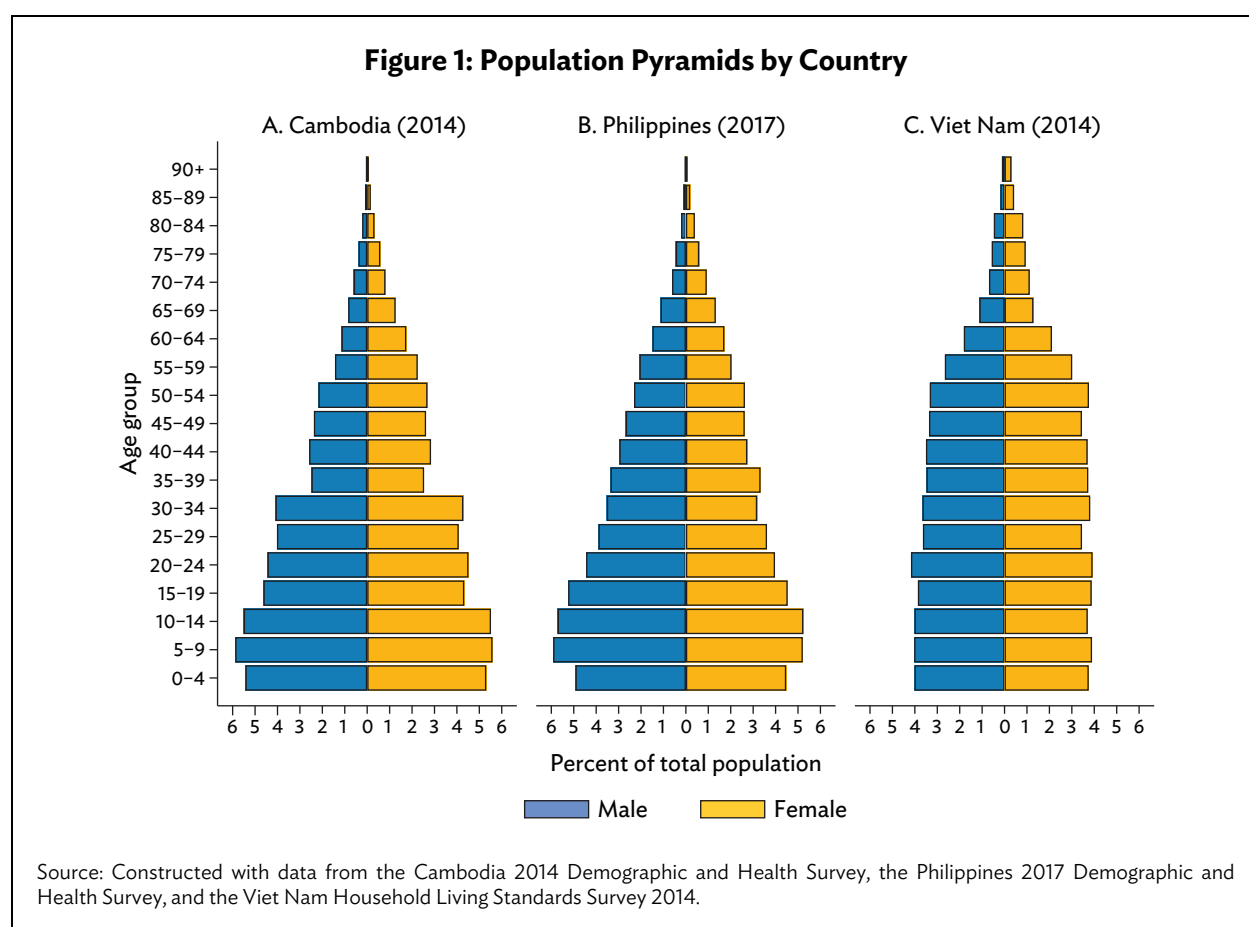
In recent decades, the Government of Viet Nam has placed a heavy weight on meeting the needs of vulnerable members of the population, reducing overall poverty, and improving societal well-being. An important initiative includes the 2006 Law on Gender Equality, which requires policy reforms that promote gender equality in its various dimensions, including universal enrollment in higher levels of schooling, more rewarding labor market opportunities for all, and universal access to free or low-cost health care. Another priority of the government is to strengthen the social safety net of the older population. The elderly share of the total population is projected to increase from 8.1% in 1999 to almost 20% by 2035 (UNFPA 2019).

The Government of Viet Nam has recognized the growing size of its elderly population and has already implemented a number of policy measures to address their needs. These efforts include an Ordinance on Elderly People, passed in 2000, that contained provisions for support and care for older people. In 2009, this Ordinance was replaced by a broader Law on the Elderly 2009 which guaranteed

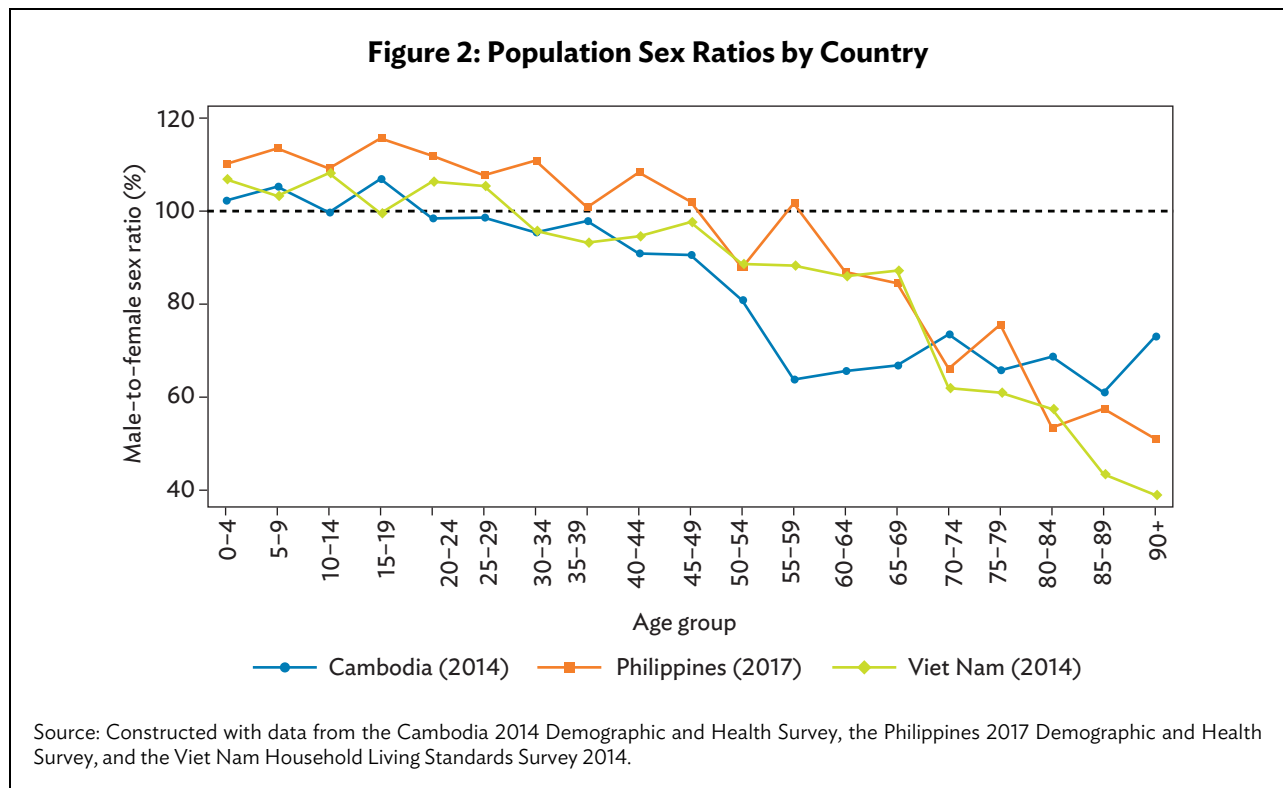
the rights of older people, followed 3 years later by the National Action Program on the Viet Nam Elderly which contained specific social targets, including health care and the promotion of “active aging” (UNFPA 2019). In 2014, the government instituted a revised Health Insurance law that removed barriers to coverage faced by the poor (Thuong 2020), and it has since adopted additional resolutions to further address the needs of the aging population.

#### D. Country Comparisons

The population pyramids in Figure 1 show the demographic structure of each country in our sample, with the bars showing the percentage of the total population that is male or female and belongs to a particular age group. For each country, the population is concentrated in the younger age groups, which is consistent with other lower- and middle-income countries in the region. Strikingly, gender imbalances are progressively skewed toward women in older age groups. For each country, the population structure exhibits a statistically significant variation by gender and 5-year interval age groups. The relatively young population in Cambodia reflects the impact of the Khmer Rouge genocide. The Philippines, with its high birth rate, is also skewed toward the younger population, although the 0–4-year-old age group has shrunk compared to the next group up. In contrast, Viet Nam has a fairly even distribution of the population across age groups until people reach their 60s.



Looking at the data from another angle shows that most of the elderly are women. Figure 2 shows the male–female sex ratio by 5-year cohorts for each country; that is, the ratio of the number of men in each 5-year age group to the number of women, expressed as a percentage. Numbers close to 100 indicate that the shares of men and women in an age group are roughly the same. Only the youngest age groups (19 and below) have more men than women in all countries in our study. These ratios exhibit a marked and sharp drop for the older population groups, especially after the age of 50. For example, in Cambodia, the male–female ratio drops by almost 20 percentage points between the 45–49 and 55–59 age groups, and in the Philippines it drops by an even greater amount between the 55–59 and 70–74 age groups. In Viet Nam, the sharp drops do not appear until past the 65–69 age group. Overall, for the elderly (which we define as age 60 and above), women make up the majority share for all age groups, and the difference is particularly stark for those 70 and above. Despite the fact that the Khmer Rouge violence disproportionately targeted men in Cambodia, the ratio is not as skewed toward women as it is for the Philippines and Viet Nam.



### III. CONCEPTUAL FRAMEWORK

This study's estimation model is based on a health production model which explains how various inputs impact the production of health through the demand for health capital (Grossman 2000). Health is considered a durable capital good from which individuals gain utility not from the health itself, but from the use of time for which they are healthy. Individuals want good health, but they cannot purchase it directly in the marketplace. Instead, health is produced by combining time and

medical inputs. Health is both a consumption and investment good. Consumption of health makes people feel better and is utility generating. As an investment good, health increases the number of days available to work and earn income. It is assumed that an individual is endowed with an initial stock of health at birth that depreciates over time until death. Individuals can modify the rate of depreciation of their health through various activities. Some activities, like exercise, slow the rate of depreciation, while others, like smoking, increase it. Individuals can increase their time spent in the labor market and their productivity by increasing their stock of health, which makes health investments a form of human capital investment.

In the basic Grossman model, an individual's intertemporal utility function depends on their health endowment, their stock of health across time, and their consumption of other commodities as follows:

$$U = U(\alpha_0 H_0, \alpha_1 H_1, \dots, \alpha_n H_n, Z_0, \dots, Z_n).$$

The notation  $H_0$  denotes an individual's initial stock of health with which they are endowed at time 0,  $H_t$  is the person's endogenous stock of health at time  $t$ ,  $\alpha_t$  represents the service flow per unit of health stock that an individual enjoys in period  $t$ , and  $Z_t$  represents the aggregate consumption of all nonhealth goods in period  $t$ , and  $n$  represents the period for which the individual plans in the future. Total length of life is assumed to be endogenous and death takes place when a person's health stock falls below a minimum threshold  $H_{min}$ .

In the model, the net amount of investment in an individual's health stock over time depends both on that person's gross investment in and the depreciation of their health stock. The rate of health depreciation is assumed exogenous and varies with age. An individual's gross investment ( $I_t$ ) and aggregate consumption ( $Z_t$ ) are defined according to two household production functions:

$$I_t = I_t(M_t, TH_t; K)$$

$$Z_t = Z_t(X_t, T_t; K)$$

$I_t$  denotes an individual's gross investment in health;  $M_t$  represents a vector of commodities purchased in the marketplace that contribute to gross investment in health, including medical care;  $TH_t$  and  $T_t$  signify the time that individuals invest in their health and in the aggregate consumption good  $Z_t$ , respectively;  $K$  represents an individual's exogenously determined stock of knowledge that helps to improve the efficiency of household production; and  $X_t$  denotes the individual commodities purchased in the marketplace used in the household production of the aggregate consumption good  $Z_t$ . Both production functions are linear and homogeneous in their respective marketplace good ( $M_t$  and  $X_t$ ) and time inputs ( $TH_t$  and  $T_t$ ). The marketplace goods and time inputs are each assumed endogenous, in limited supply, and subject to constraints. The time budget constraint allows for time lost from market and household activities due to illness or injury, which is inversely related to the stock of health.

Individuals are assumed to choose the utility maximizing level of health stock  $H_t$  and aggregate consumption  $Z_t$  in each period, subject to the net amount invested over time in health (including depreciation), and their production, resource, and total budget constraints. In equilibrium, the optimal quantity of investment in each period determines the ideal quantity of health capital. Medical care is rationed by its market price and indirect costs, so factors such as travel costs to health-care facilities affect the cost of medical care and enter into the health production function. Grossman (2000)

argues that health demand is inversely related to the “shadow price” of health, which in turn depends on the price of medical care plus indirect costs. Changes in these variables change the optimal amount of health and will also impact the demand for health inputs. This shadow price increases with age if the depreciation rate on the stock of health increases over the course of the life cycle. In contrast, the shadow price of health falls with years of schooling if more educated individuals are more efficient producers of health. The original model, however, does not differentiate by gender of the individual. We posit that if women face social norms in which men are prioritized in the allocation of scarce resources, this raises the shadow price of health for women and reduces their health demand. We would then expect to see that gender is inversely related to the likelihood of seeking health care.

## IV. DATA AND METHODOLOGY

The analysis uses household-level data from the Demographic and Health Surveys (DHS) for Cambodia (2014) and the Philippines (2017), and the Viet Nam Household Living Standards Survey (VHLSS) (2014). The DHS are large, nationally representative household surveys that provide a wealth of information on population, health, and nutrition in lower- and middle-income countries. The data are publicly available and are widely used in scholarly research on the well-being of women and their families. We focus specifically on Cambodia and the Philippines in using the DHS because their surveys include questions on recent sickness or injuries and health-care seeking behavior for all members of the household, while other DHS sample countries in Asia do not include these questions pertaining to all household members. The VHLSS also contains questions on sickness and health-care seeking behavior for all household members, as well as detailed individual and household background characteristics. The surveys covered over 15,000 households in Cambodia, over 27,000 households in the Philippines, and over 9,000 households in Viet Nam.

Note that the questions on sickness and treatment-seeking behavior differ somewhat across the three countries. Of note, the DHS for Cambodia and the Philippines have a 30-day reference period for when the family member was sick or injured, as opposed to a 1-year reference period in the VHLSS. Although the DHS for Cambodia and the Philippines have identical sickness questions, the treatment-seeking questions differ. In Cambodia, treatment seeking by the household member who was sick or injured is specific to the reported illness or injury in the past 30 days. However, in the Philippines, treatment seeking by the sick or injured household member can be for any illness or injury on an outpatient basis in the past 30 days, and it can also relate to confinement to a hospital for any illness or injury in the 12 months prior to the survey. In the VHLSS, the sickness question is specific to a “severe” sickness or injury, one that required bedrest or required the person to stay home from work or school. Moreover, the treatment question in the VHLSS has a reference period of 12 months, includes seeking preventive care, and is answered by all individuals surveyed whether they reported sickness or not. Note also that the wealth index for Viet Nam is constructed by the authors using expenditure data, while for Cambodia and the Philippines, the wealth index is included as a variable in the survey data. More details on the data sources and construction of the key variables are found in the Data Appendix.

The empirical strategy centers on a probit analysis of the likelihood that an older adult will seek health-care services for an illness or injury, regressed on a range of demographic and household characteristics. A selection model is needed to address problems caused by the interaction of two types of selection effects. First, people who are sick or injured are more likely to seek treatment, so we have a nonrandom sample of sick individuals. Because the Cambodia survey does not query healthy individuals about preventative care, we do not model treatment-seeking behavior for this group. Second, some people who are not sick will also seek treatment because they have an unobserved characteristic leading them to seek treatment. The problem occurs because the determinants of treatment seeking and the unmeasured aspect of treatment are correlated in the selected sample, causing the effects of the independent variables of interest to be underestimated unless the selection is addressed. We fit maximum likelihood probit models with sample selection, which are effectively Heckman-type selection models generating adjusted probabilities for seeking health-care treatment conditional on having been sick.

The choice of a probit model with selection to estimate the determinants of health-care seeking behavior has precedent in a number of other studies using DHS data for other health outcomes, including contraceptive use (Tchuimi and Kamga 2020), maternal health care (Dixit et al. 2017), child survival (Oyekale 2014), and HIV prevalence (Clark and Houle 2014). Similar to the notation in Clark and Houle, for the full sample estimation, we can express the outcome of health-care seeking behavior for individual  $i$  as follows:

$$h_i^* = \mathbf{X}_i \gamma + \varepsilon_i$$

$$h_i = \begin{cases} 1 & \text{if } h_i^* > 0 \\ 0 & \text{otherwise} \end{cases}$$

In this case,  $h_i^*$  is an unobserved latent variable for seeking treatment from a formal medical professional, which depends on the observed covariates  $\mathbf{X}_i$  and the random error  $\varepsilon_i$ . We also estimate a probit model for whether or not the person was sick or injured in the past 30 days, which determines selection for treatment-seeking behavior. The selection model is as follows:

$$s_i^* = \mathbf{X}_i \beta + \mathbf{Z}_i \gamma + \theta_i$$

$$s_i = \begin{cases} 1 & \text{if } s_i^* > 0 \\ 0 & \text{otherwise} \end{cases}$$

Here,  $s_i^*$  is an unobserved latent variable for the likelihood of getting sick, which depends on the observed covariates  $\mathbf{X}_i$ , the exclusion criteria  $\mathbf{Z}_i$ , and random error  $\theta_i$ . Health-care seeking behavior  $h_i$  is observed only when a person gets sick or injured ( $s_i = 1$ ). The sample-selection procedure estimates both equations simultaneously as a sample selection probit with  $\rho$  equal to the correlation between the error terms in the outcome equation ( $\varepsilon_i$ ) and the selection equation ( $\theta_i$ ). If  $\rho$  is statistically significant, then the coefficients on a simple probit estimation of the outcome equation alone would be biased.

The  $\mathbf{X}$  matrix includes a host of control variables at the individual and household level. Individual characteristics include the person's sex, age, years of schooling, and marital status. Household characteristics include the number of household members, number of younger and older children in the household, whether the household is headed by a woman, urban versus rural status, and the household wealth index. In robustness checks, we extend this parsimonious set of controls to

include a broader range of indicators measuring household socioeconomic status, including land ownership; consumer durables owned; modes of transportation owned; the quality of housing (as indicated by access to electricity and whether the flooring, walls, and roof are finished); water supply (source of drinking water and whether or not it was treated); sanitation (type of toilet facility); and cooking facilities (place of cooking, type of cooking fuel, and whether solid fuel was used indoors per Khan et al. [2017]). The model can also be estimated on subsamples of the data defined by key individual or household characteristics, which we include to better understand the main results.

The set of explanatory variables in the sickness and treatment estimations overlap; but we omit a variable from  $\mathbf{X}_i$  since identification on functional form alone often led to situations where the log likelihood would not converge. In the analysis, our omitted variable that meets the exclusion criterion is whether there is another sick person in the household. One can reasonably argue that another sick person in the household is likely to affect reporting illness but not treatment-seeking behavior.

All statistical analyses are weighted to the population using the sampling weights provided with the DHS or VHLSS. All standard errors of the estimated coefficients are corrected for clustering at the household level. Sample means are provided in Tables 1–3. In Cambodia, 24.5% of individuals ages 60 and above reported they were sick or injured in the past month, compared to 13.7% of all adults (Table 1). Elderly women were substantially more likely than men to report being sick or injured (26.7% versus 21.1%), but they were less likely than men to seek medical treatment conditional on having been sick (71.7% versus 74%). Notable gender differentials among the elderly include substantially fewer years of schooling for women, a lower likelihood for women to be currently married, a greater likelihood of living in a female-headed household for women, and fewer older (ages 6–17) children present in the household for men.

**Table 1: Sample Means for Cambodia, 2014**

Variable	Full Sample	Elderly	Elderly Women	Elderly Men
Seek treatment <sup>+</sup>	0.724 (0.447)	0.725 (0.447)	0.717 (0.451)	0.740 (0.439)
Sick	0.137 (0.344)	0.245 (0.430)	0.267 (0.443)	0.211 (0.408)
Female	0.531 (0.499)	0.597 (0.490)	1.000 (0.000)	0.000 (0.000)
Age	39.689 (16.181)	69.021 (7.451)	69.007 (7.487)	69.041 (7.399)
Education (years)	5.250 (4.184)	2.891 (3.346)	1.851 (2.740)	4.433 (3.563)
Currently married	0.707 (0.455)	0.581 (0.493)	0.405 (0.491)	0.842 (0.364)
Widowed	0.088 (0.283)	0.378 (0.485)	0.534 (0.499)	0.148 (0.355)

*continued on next page*



Table 1 *continued*

Variable	Full Sample	Elderly	Elderly Women	Elderly Men
Separated or divorced	0.025 (0.155)	0.019 (0.137)	0.026 (0.160)	0.008 (0.090)
No. of household members	5.298 (2.253)	4.797 (2.344)	4.748 (2.333)	4.870 (2.359)
No. of young children (0–5)	0.650 (0.807)	0.503 (0.744)	0.504 (0.736)	0.501 (0.754)
No. of older children (6–17)	1.207 (1.203)	0.901 (1.130)	0.971 (1.164)	0.797 (1.068)
Female-headed household	0.242 (0.428)	0.303 (0.460)	0.441 (0.497)	0.099 (0.299)
Urban	0.173 (0.378)	0.158 (0.365)	0.158 (0.365)	0.159 (0.366)
Wealth index	–0.025 (0.961)	–0.059 (0.906)	–0.083 (0.893)	–0.023 (0.923)
Other person sick in household	0.392 (0.488)	0.330 (0.470)	0.320 (0.466)	0.346 (0.476)
No. of observations	45,401	5,930	3,527	2,403

Notes: Sample percentages are weighted to national level with sample weights. The full sample includes all individuals ages 18 and above. The notation \* denotes conditional on having been sick or injured. Standard deviations in parentheses.

Source: Authors' calculations using Cambodia Demographic and Health Survey (2014).

In the Philippines, older people were more than twice as likely to report they had gotten sick or injured in the past 30 days compared to the population of all adults, and they were also more likely to seek treatment than the population at large (Table 2). The incidence of the elderly seeking treatment in the Philippines (26.6%) is considerably lower than in Cambodia (72.5%), which could reflect differences across the two countries in cultural norms around receiving care within the home from family members. Older women in the Philippines are more likely to report a sickness or injury than older men, and they are also more likely to seek health-care treatment after getting sick than are older men. Like Cambodia, older women are less likely to be married and far more likely to live in a female-headed household than older men. However, the considerable gender gap in schooling seen in Cambodia is noticeably absent in the Philippines, one of few lower- and middle-income countries in which most cohorts of women have an advantage over men in terms of obtaining a formal education. In addition, a relatively high share of female paid employees have college educations compared to other countries at comparable levels of development, and the Philippines is conspicuous for having near gender earnings parity—a rarity globally, not just for its income level (ADB 2015; Zveglic, van der Meulen Rodgers, and Laviña 2019).

**Table 2: Sample Means for the Philippines, 2017**

Variable	Full Sample	Elderly	Elderly Women	Elderly Men
Seek treatment <sup>+</sup>	0.243 (0.429)	0.266 (0.442)	0.274 (0.446)	0.255 (0.436)
Sick	0.123 (0.328)	0.253 (0.435)	0.258 (0.437)	0.247 (0.432)
Female	0.498 (0.500)	0.564 (0.496)	1.000 0.000	0.000 0.000
Age	40.684 (16.387)	68.994 (7.468)	69.415 (7.658)	68.448 (7.179)
Education (years)	10.238 (3.872)	8.162 (4.376)	8.134 (4.364)	8.198 (4.390)
Currently married	0.637 (0.481)	0.592 (0.492)	0.455 (0.498)	0.768 (0.422)
Widowed	0.069 (0.253)	0.326 (0.469)	0.456 (0.498)	0.160 (0.366)
Separated or divorced	0.039 (0.194)	0.031 (0.174)	0.032 (0.177)	0.030 (0.169)
No. of household members	4.980 (2.391)	4.175 (2.397)	4.061 (2.350)	4.322 (2.450)
No. of young children (0–5)	0.538 (0.807)	0.292 (0.621)	0.290 (0.623)	0.294 (0.619)
No. of older children (6–17)	1.163 (1.292)	0.771 (1.139)	0.749 (1.118)	0.799 (1.166)
Female-headed household	0.187 (0.390)	0.278 (0.448)	0.452 (0.498)	0.052 (0.222)
Urban	0.471 (0.499)	0.427 (0.495)	0.430 (0.495)	0.422 (0.494)
Wealth index	0.339 (1.006)	0.377 (1.042)	0.420 (1.027)	0.321 (1.058)
Other person sick in household	0.361 (0.480)	0.296 (0.456)	0.280 (0.449)	0.315 (0.465)
No. of observations	72,785	11,288	6,267	5,021

Notes: Sample percentages are weighted to national level with sample weights. The full sample includes all individuals ages 18 and above. The notation + denotes conditional on having been sick or injured. Standard deviations in parentheses.

Source: Authors' calculations using the Philippines Demographic and Health Survey (2017).

Patterns in Viet Nam are somewhat different, partly due to its own country context but also due to its having a different survey instrument. Sample means in Table 3 show that the elderly are more likely to have reported an illness or injury than the overall population of adults, and they are considerably more likely to have sought medical attention in the past year. Older women in Viet Nam are more likely to seek treatment compared to older men, but they are less likely than men to report that they were sick or injured. Older women have considerably less schooling than older men, they are less likely than their male counterparts to be married, and they are far more likely to live in female-headed households.

**Table 3: Sample Means for Viet Nam, 2014**

Variable	Full Sample	Elderly	Elderly Women	Elderly Men
Seek treatment	0.214 (0.410)	0.430 (0.495)	0.442 (0.497)	0.413 (0.493)
Sick	0.069 (0.253)	0.141 (0.348)	0.139 (0.346)	0.144 (0.351)
Female	0.522 (0.500)	0.585 (0.493)	1.000 0.000	0.000 0.000
Age	43.191 (16.963)	70.863 (8.967)	71.663 (9.218)	69.736 (8.477)
Education (years)	8.411 (4.312)	5.799 (4.437)	4.535 (4.054)	7.578 (4.344)
Currently married	0.719 (0.450)	0.612 (0.487)	0.440 (0.496)	0.854 (0.353)
Widowed, separated, or divorced	0.100 (0.300)	0.366 (0.482)	0.527 (0.499)	0.139 (0.347)
No. of household members	4.289 (1.628)	3.849 (1.952)	3.789 (1.971)	3.933 (1.922)
No. of young children (0–5)	0.408 (0.645)	0.317 (0.582)	0.303 (0.571)	0.337 (0.597)
No. of older children (6–17)	0.671 (0.857)	0.469 (0.784)	0.503 (0.804)	0.422 (0.753)
Female-headed household	0.239 (0.427)	0.308 (0.462)	0.449 (0.497)	0.110 (0.313)
Urban	0.351 (0.477)	0.341 (0.474)	0.333 (0.472)	0.351 (0.478)
Per capita expenditure index	–0.021 (0.921)	–0.037 (0.969)	–0.049 (1.006)	–0.020 (0.916)
Other person sick in household	0.155 (0.362)	0.145 (0.352)	0.141 (0.348)	0.151 (0.358)
No. of observations	25,632	4,165	2,434	1,731

Notes: Sample percentages are weighted to national level with sample weights. The full sample includes all individuals ages 18 and above. Health seeking includes preventive care and is not conditional on having been sick or injured. Standard deviations in parentheses.

Source: Authors' calculations using Viet Nam Household Living Standards Survey (2014).

## V. ESTIMATION RESULTS

Results from the sample selection probit estimations for the likelihood of getting sick or injured are reported in Table 4. For each country, the table reports results from two alternative models: Model 1 has a parsimonious set of control variables in which the wealth index is used to proxy for the household's socioeconomic status, and Model 2 is the full estimation in which a range of household characteristics are added to measure the household's socioeconomic status rather than the wealth index or per capita expenditure index. Both models are estimated with the full sample of all adults. The variable "other sick person in household" is omitted from the treatment-seeking equation to satisfy the exclusion restriction. Recall that our omitted variable in the treatment-seeking equation is whether there is another sick person in the household. One can reasonably argue that another sick person in the household is likely to affect reporting illness but not treatment-seeking behavior.

In Table 4, the main result is that across countries and models, women are more likely to report a sickness or injury than men, and the difference is meaningful and statistically significant. Some of this result could be explained by a pattern observed elsewhere in which women have worse self-assessed health than men (Case and Paxson 2005). Also of note, across countries, the likelihood of getting sick or injured increases with age, which seems fairly intuitive given that the elderly are more vulnerable to diseases of various kinds. The likelihood of getting sick or injured decreases with the total number of household members, a result that is robust across models and countries and may be explained by positive spillover effects among household members in preventive health behaviors and nutrition within larger households. As expected, having another sick family member present increases the likelihood that someone reports an illness. This variable, which satisfies the exclusion restriction, is statistically significant across countries and models. There are no other results that are consistent in sign and statistically significant across models in all three countries.

**Table 4: Sample Selection Probit Estimates for Likelihood of Reporting Sickness or Accident**

Variable	Cambodia		Philippines		Viet Nam	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
Female	0.225*** (0.020)	0.231*** (0.020)	0.090*** (0.019)	0.091*** (0.019)	0.081*** (0.027)	0.090*** (0.028)
Age	0.014*** (0.001)	0.015*** (0.001)	0.016*** (0.001)	0.016*** (0.001)	0.015*** (0.001)	0.016*** (0.001)
Education (years)	-0.015*** (0.003)	-0.012*** (0.003)	-0.002 (0.003)	-0.003 (0.003)	-0.006 (0.004)	0.001 (0.004)
Currently married	0.043 (0.033)	0.041 (0.033)	-0.024 (0.033)	-0.022 (0.033)	0.003 (0.049)	0.005 (0.050)
Widowed	0.029 (0.050)	0.024 (0.050)	0.073 (0.046)	0.070 (0.046)	-0.018 (0.069)	-0.027 (0.070)

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Table 4 *continued*

Variable	Cambodia		Philippines		Viet Nam	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
Separated or divorced	0.220*** (0.059)	0.209*** (0.059)	-0.059 (0.051)	-0.056 (0.051)	— —	— —
No. of household members	-0.055*** (0.008)	-0.050*** (0.008)	-0.048*** (0.009)	-0.044*** (0.008)	-0.056*** (0.011)	-0.044*** (0.012)
No. of young children (0–5)	-0.007 (0.017)	-0.016 (0.018)	-0.070*** (0.017)	-0.073*** (0.017)	0.094*** (0.025)	0.091*** (0.025)
No. of older children (6–17)	0.040*** (0.012)	0.033*** (0.012)	-0.004 (0.011)	-0.004 (0.011)	0.033* (0.019)	0.028 (0.019)
Female-headed household	0.002 (0.026)	-0.004 (0.026)	-0.038 (0.035)	-0.039 (0.034)	-0.026 (0.034)	-0.023 (0.035)
Urban	0.136*** (0.045)	0.144*** (0.040)	0.011 (0.034)	0.022 (0.035)	-0.076** (0.034)	-0.036 (0.037)
Wealth or per capita expenditure index	0.035* (0.021)	— —	-0.089*** (0.017)	— —	-0.034* (0.020)	— —
Other person sick in household	0.111*** (0.021)	0.107*** (0.020)	0.550*** (0.026)	0.535*** (0.026)	0.548*** (0.045)	0.541*** (0.045)
Additional controls	No	Yes	No	Yes	No	Yes
Constant	-1.614*** (0.062)	-1.682*** (0.071)	-1.815*** (0.068)	-1.656*** (0.109)	-2.085*** (0.081)	-2.048*** (0.125)
Inverse hyperbolic tangent of $\rho$	2.222*** (0.294)	2.150*** (0.264)	0.984*** (0.149)	1.037*** (0.157)	0.235 (0.213)	0.219 (0.208)
No. of observations	45,401	45,401	72,785	72,785	25,632	25,632

Notes: Results are coefficients from the sickness equation in the sample selection probit regressions using the full sample, weighted to the national level with sample weights. Model 1 is a parsimonious model that excludes a range of additional household and wealth characteristics, while Model 2 replaces the wealth or per capita expenditure index with a set of variables covering ownership of assets and quality of housing. For Viet Nam the dummy variable for widowed includes divorced or separated. Standard errors, in parentheses, are corrected for clustering at the household level. Stata estimates a transformation of  $\rho$  (inverse hyperbolic tangent) for computational efficiency, and tests of statistical significance are based on the transformed variable. The notation \*\*\* is  $p < 0.01$ , \*\* is  $p < 0.05$ , and \* is  $p < 0.10$ .

Source: Authors' calculations.

Table 4 further shows that in Cambodia, adults with more education are less likely to report an illness, and this result is statistically significant unlike in the other two countries. Cambodia has relatively lower gross domestic product per capita than the Philippines and Viet Nam, so it is possible that having more education in Cambodia is a stronger indicator of socioeconomic status and translates more into good health than in the other two countries. In Cambodia, several of the other variables are associated with a higher likelihood of getting sick or injured, including being divorced or separated, having older (ages 6–17) children in the household, wealth, and living in an urban area. Living with school-aged children and living in cities is likely to increase one's exposure to contagious diseases and the risk of getting sick, a pattern that has become even more clear during the COVID-19 pandemic.

In both the Philippines and Viet Nam, greater wealth is negatively associated with the likelihood of getting sick, which suggests that individuals with higher socioeconomic status have better access to the factors that determine good health, including access to clean water, sanitation, improved homes, and proper nutrition. These two countries differ in terms of the association between having children and getting sick: in the Philippines, having children is associated with a lower incidence of illness, especially if those children are under the age of six, while the opposite holds in Viet Nam. Table 4 also reports the cross-equation correlation ( $\rho$ ) in the error terms for the regressions for getting sick and seeking treatment.<sup>2</sup> These are positive and statistically significant for both Cambodia and the Philippines but not Viet Nam. It is not surprising that the results differ for Viet Nam given that the treatment-seeking questions were not directly linked to the illness as they are in Cambodia and the reference period in the survey is much longer (12 months versus 30 days).

Results from the sample selection probit estimations for the likelihood of getting treatment after having been sick or injured are reported in Table 5. Model 1 uses the parsimonious set of controls, including the household wealth index, while Model 2 uses the larger set of controls for household socioeconomic status. Estimations are reported for the full sample of adults. The most important result is that women in Cambodia and the Philippines are more likely than men to seek health-care treatment when they are sick or injured, and the difference is statistically significant. This result could reflect that women are more proactive than men in seeking treatment from formal sources, or women have less access to informal sources of care. In Viet Nam, however, women are less likely than men to seek treatment after having become sick or injured. A possible reason is that women in Viet Nam face greater stigma and discrimination than men in seeking care for diseases such as HIV, AIDS, and tuberculosis, and they are more reluctant than men to seek care from formal sources (Govender and Penn-Kekana 2008, Van Minh et al. 2018).

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<sup>2</sup> To improve the computation of the maximum likelihood estimates, Stata calculates the inverse hyperbolic tangent of  $\rho$ , which is equal to  $[\ln(1 + \rho) - \ln(1 - \rho)]/2$ , instead of  $\rho$  itself. The discussion of significance is based on the estimates of the transformed parameter and its standard error, as reported in Table 4.

**Table 5: Sample Selection Probit Estimates for Likelihood of Seeking Treatment**

Variable	Cambodia		Philippines		Viet Nam	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
Female	0.202*** (0.025)	0.206*** (0.026)	0.095** (0.038)	0.095*** (0.037)	-0.370*** (0.084)	-0.369*** (0.084)
Age	0.012*** (0.001)	0.012*** (0.001)	0.011*** (0.001)	0.011*** (0.001)	0.016*** (0.004)	0.020*** (0.004)
Education (years)	-0.010*** (0.004)	-0.010*** (0.004)	0.002 (0.005)	0.000 (0.005)	-0.009 (0.010)	0.009 (0.012)
Currently married	0.084* (0.044)	0.076* (0.045)	0.086 (0.055)	0.085 (0.054)	-0.505*** (0.181)	-0.507*** (0.183)
Widowed	0.075 (0.062)	0.073 (0.063)	0.050 (0.083)	0.047 (0.081)	-0.767*** (0.240)	-0.794*** (0.245)
Separated or divorced	0.225*** (0.067)	0.218*** (0.068)	-0.154 (0.095)	-0.151 (0.093)	— —	— —
No. of household members	-0.040*** (0.009)	-0.043*** (0.009)	0.001 (0.013)	0.002 (0.014)	-0.048 (0.036)	-0.073* (0.038)
No. of young children (0–5)	0.012 (0.020)	0.012 (0.020)	-0.059* (0.030)	-0.062** (0.031)	-0.194** (0.094)	-0.155* (0.094)
No. of older children (6–17)	0.029** (0.013)	0.029** (0.013)	-0.005 (0.022)	-0.007 (0.021)	0.014 (0.058)	0.012 (0.058)
Female-headed household	-0.036 (0.028)	-0.041 (0.029)	-0.001 (0.050)	-0.001 (0.047)	0.224** (0.113)	0.219* (0.117)
Urban	-0.063 (0.050)	-0.074 (0.048)	-0.022 (0.041)	-0.019 (0.041)	-0.206** (0.105)	-0.077 (0.112)
Wealth or per capita expenditure index	0.006 (0.021)	— —	-0.034 (0.026)	— —	0.042 (0.069)	— —
Additional controls	No	Yes	No	Yes	No	Yes
Constant	-1.692*** (0.075)	-1.735*** (0.090)	-2.312*** (0.124)	-2.433*** (0.127)	0.813 (0.587)	0.971 (0.692)
No. of observations	5,860	5,860	9,231	9,231	25,632	25,632

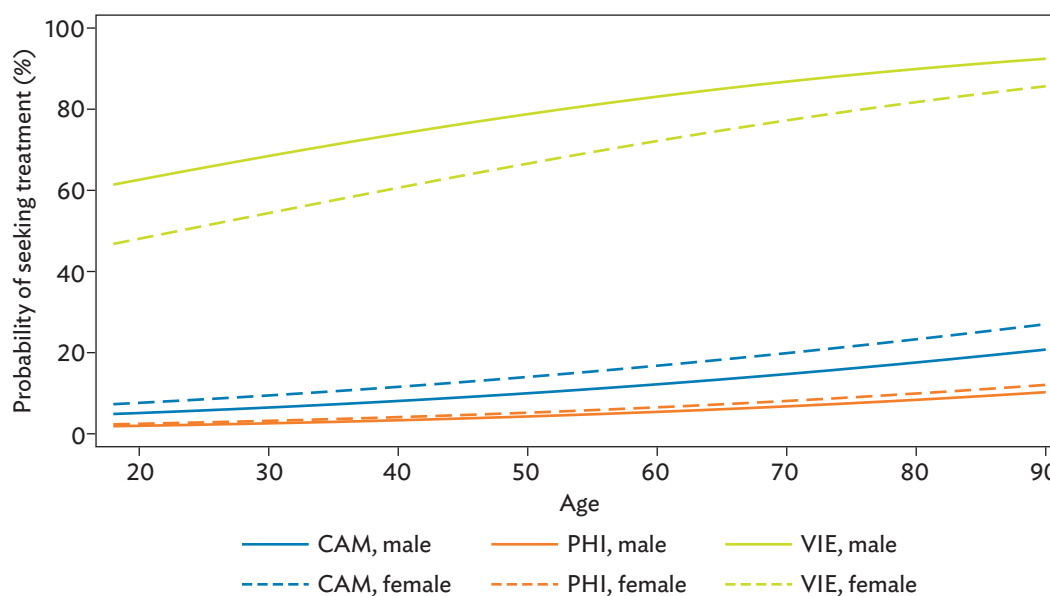
Notes: Results are coefficients from the treatment seeking equation in the sample selection probit regressions using the full sample, weighted to the national level with sample weights. Model 1 is a parsimonious model that excludes a range of additional household and wealth characteristics, while Model 2 replaces the wealth or per capita expenditure index with a set of variables covering ownership of assets and quality of housing. For Viet Nam the dummy variable for widowed includes divorced or separated. Standard errors, in parentheses, are corrected for clustering at the household level. The notation \*\*\* is  $p < 0.01$ , \*\* is  $p < 0.05$ , and \* is  $p < 0.10$ .

Source: Authors' calculations.

Across countries, individuals are more likely to seek treatment as they age, which is as expected. There are no other common patterns that are statistically significant across countries. Of note, people in Cambodia who are married or divorced or separated are far more likely to seek treatment than their never-married counterparts. Although Cambodian adults with older children are more likely to seek health-care services, those living in larger households are less likely to seek treatment outside of the home, possibly because informal care from another adult in the home acts as a substitute for care from a professional provider. People in Viet Nam who are married or who are widowed, divorced, or separated are less likely to seek health-care treatment compared to never-married individuals. In the Philippines and Viet Nam, having young children is associated with a lower likelihood of seeking treatment, probably due to the time constraints involved in caring for young children. Viet Nam stands out as the only country in which people in female-headed households are substantially more likely to seek health-care treatment.

We next used the probit coefficients to construct predicted probabilities of treatment seeking by sex and age using the variable means for each of the sample countries. As shown in Figure 3, the predicted probability of seeking treatment rises with age for each country. At every age group, these probabilities are the highest for Viet Nam, likely reflecting the inclusion of some preventive care in the underlying data, and the lowest for the Philippines. The very high predicted probabilities in seeking health care in Viet Nam could also reflect the country's emphasis on socialized medicine. Women's predicted probabilities are greater than those of men for every age group in Cambodia and the Philippines, but the opposite holds true for Viet Nam.

**Figure 3: Predicted Probabilities of Treatment Seeking by Sex and Age**



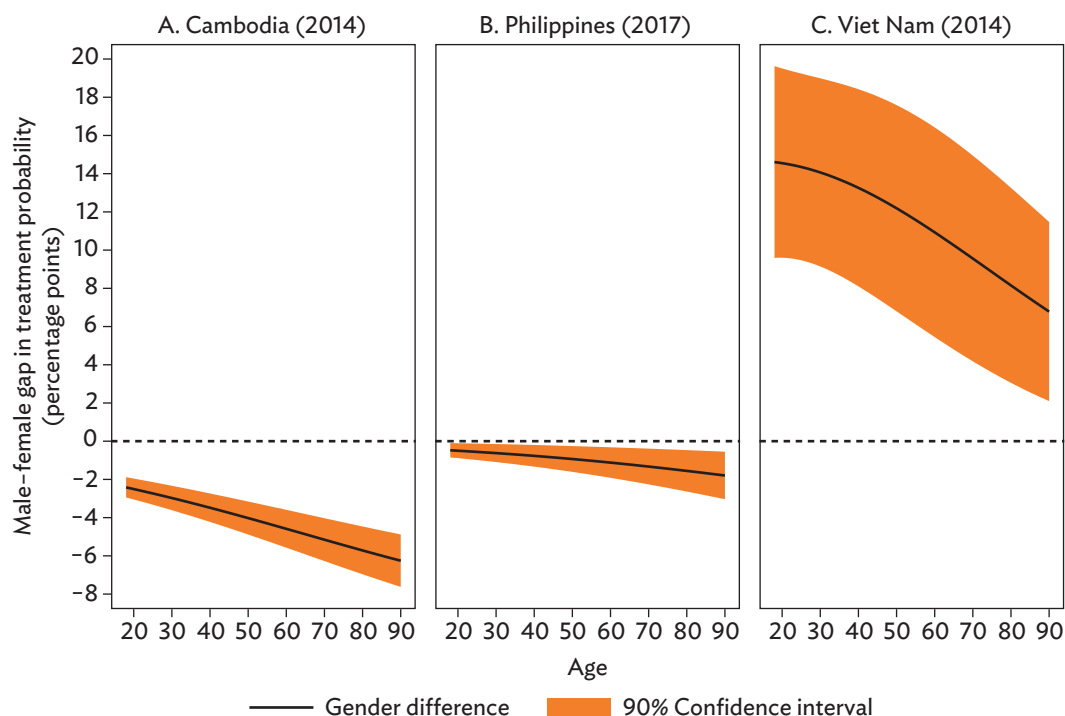
CAM = Cambodia, PHI = Philippines, VIE = Viet Nam.

Source: Constructed with data from the Cambodia 2014 Demographic and Health Survey, the Philippines 2017 Demographic and Health Survey, and the Viet Nam Household Living Standards Survey 2014.



In Viet Nam, the male–female gap in the probability of seeking care does shrink with age, suggesting that any possible constraints that women face (such as stigma and discrimination) are less of an issue as women age (Figure 4). Men are more likely to seek treatment than women, and the 90% confidence interval remains above 0 for all age groups. In contrast, the gender treatment gap favors women for all ages in Cambodia and the Philippines, and this is statistically significant throughout based on the 90% confidence interval. Hence in Cambodia and the Philippines, women exhibit increasingly higher predicted probabilities of seeking health care than men as they age.

**Figure 4: Gender Gap (Male–Female) in Predicted Probabilities of Treatment Seeking**



Source: Constructed with data from the Cambodia 2014 Demographic and Health Survey, the Philippines 2017 Demographic and Health Survey, and the Viet Nam Household Living Standards Survey 2014.

To better understand the mechanisms through which these effects on treatment-seeking behavior operate, we conducted a set of regressions using different subsamples in which individuals vary by age, household location, and wealth. These results are found in Table 6, which reports only the coefficients on the female and age variables from the treatment-seeking equation of the full sample selection probit regressions. For the sake of reference, the full-sample results are repeated in the first column for each country. The next two columns show that for all three countries, the main effect of being a woman on health-seeking treatment is being driven by women in the working-age population (18–59) in terms of statistical significance. This differs from the results in Figure 4 where the gender probability gap was significant for all age groups, reflecting the effect of allowing age differences for the coefficients of all other control variables in the model. For each country, the coefficient on the female variable is imprecisely estimated in the subsample of elderly individuals, and it is smaller in magnitude compared to the female coefficient for the working-age population. A similar conclusion is made about

the coefficient on the age variable: for each country, it is estimated with less precision and has a smaller magnitude in the subsample of elderly individuals compared to the working-age population.

In the case of household location, we find that the baseline results we have for age and gender effects in seeking health-care treatment hold regardless of whether the individual lives in an urban or rural area. The coefficients on female and age are comparable in magnitude and sign across the urban and rural subsamples, although in the Philippines, the estimate for being female does lose its statistical significance for urban areas. In contrast, results do vary depending on whether a household is wealthy or not, especially in Cambodia. In Cambodia, our main conclusion that women and age have a positive association with health-care seeking behavior only holds for the wealthy (as defined by the top 40% of the income distribution). Among the least wealthy, women and older individuals in Cambodia are less likely to seek treatment. For the Philippines and Viet Nam, the baseline results from the full sample still hold across the wealthy and least wealthy subsamples in terms of magnitude and sign, but some of the coefficient lose their statistical significance.

**Table 6: Sample Selection Probit Estimates for Likelihood of Seeking Treatment across Subsamples: Coefficients on Female and Age Variables**

Country and Variable	Base	Age Group		Household Location		Wealth Percentile	
		Working Age (18–59)	Elder (60+)	Rural	Urban	Lowest 40%	Highest 40%
Cambodia							
Female	0.202*** (0.025)	0.226*** (0.027)	0.079 (0.075)	0.200*** (0.026)	0.260*** (0.054)	−0.162*** (0.059)	0.191*** (0.052)
Age	0.012*** (0.001)	0.013*** (0.001)	0.008* (0.004)	0.011*** (0.001)	0.016*** (0.002)	−0.010*** (0.002)	0.011*** (0.002)
No. of observations	5,860	4,457	1,403	4,157	1,703	2,180	2,703
Philippines							
Female	0.095** (0.038)	0.109*** (0.040)	0.028 (0.082)	0.115*** (0.036)	0.044 (0.074)	0.170*** (0.057)	0.063 (0.064)
Age	0.011*** (0.001)	0.011*** (0.002)	0.001 (0.004)	0.014*** (0.001)	0.007*** (0.003)	0.013*** (0.002)	0.007*** (0.003)
No. of observations	9,231	6,322	2,909	6,437	2,794	4,446	2,925
Viet Nam							
Female	−0.370*** (0.084)	−0.345*** (0.102)	−0.100 (0.173)	−0.376*** (0.097)	−0.397** (0.167)	−0.527*** (0.131)	−0.155 (0.147)
Age	0.016*** (0.004)	0.022*** (0.005)	−0.010 (0.013)	0.014*** (0.004)	0.019*** (0.007)	0.005 (0.005)	0.030*** (0.006)
No. of observations	25,632	21,467	4,165	17,802	7,830	10,586	9,735

Notes: Results are coefficients from the treatment seeking equation in the sample selection probit regressions using the full sample and six subsamples, weighted to the national level with sample weights. All regressions are based on the parsimonious model (Model 1 in Tables 4 and 5). Results using the full set of controls are similar. Standard errors, in parentheses, are corrected for clustering at the household level. The notation \*\*\* is  $p < 0.01$ , \*\* is  $p < 0.05$ , and \* is  $p < 0.10$ .

Source: Authors' calculations.

## VI. CONCLUSION

This study has explored the determinants of sickness and health-care seeking behavior in Southeast Asia, with a focus on the needs of the aging population and gender differences in how those needs are met. We used recent household surveys for Cambodia, the Philippines, and Viet Nam to estimate a sample selection probit model that controls for sample selection. In tests for gender differences in sickness and treatment-seeking behavior, results show that across countries, women are more likely to report a sickness or injury than men, and the difference is meaningful and statistically significant. In addition, women are also more likely than men to seek treatment in Cambodia and the Philippines. However, the opposite is true in Viet Nam, where being a woman is negatively associated with health-care seeking behavior. A possible reason is that women face relatively more stigma and discrimination than men in seeking treatment for some communicable diseases in Viet Nam, an argument supported by previous research (Govender and Penn-Kekana 2008, Van Minh et al. 2018). Separate regressions using subsamples of working-age and elderly individuals indicate that these gender effects in seeking treatment are driven more by women of working age. Across all three countries, adults are more likely to get sick and to seek treatment as they age, a result that does not come as a surprise. Our computations of predicted probabilities show that in Viet Nam, the male–female gap in the probability of seeking treatment becomes smaller with age, suggesting that the constraints that women face seeking care become less important with age. In Cambodia and the Philippines, older women exhibit increasingly higher predicted probabilities of seeking health care than older men as they age.

Our results point to surprisingly low probabilities of seeking treatment in the Philippines and Cambodia, yet both these countries have made efforts in recent years to reinforce their social safety nets to better meet the needs of elderly people, and they have committed to providing universal health care. Uncovering the reasons for fairly low take-up of formal health-care services and gender differences in access to care is crucial to designing policies to better meet the needs of older persons in Asia, especially in light of the increased risks of getting sick during the COVID-19 pandemic. It could be that Viet Nam’s long history of socialized medicine is the main driver of relatively high probabilities that individuals seek health-care services from professional providers. However, Viet Nam’s sizable male–female gap in health-care seeking behavior points to constraints faced by women that prevent them from taking advantage of policies that Viet Nam has passed to make quality health-care services more readily available. If we are correct that stigma and discrimination in seeking treatment is contributing to this gap, programs and policies that adjust these types of attitudes and gender norms will go a long way to eliminate health inequities in Viet Nam.

## APPENDIX: DATA SOURCES AND VARIABLE DEFINITIONS

Item	Cambodia	Philippines	Viet Nam
<i>Data Source</i>			
Dataset	National Institute of Statistics, Directorate General for Health, and ICF. 2015. <i>Cambodia Demographic and Health Survey 2014</i> . Phnom Penh, Cambodia, and Rockville, Maryland, USA: National Institute of Statistics, Directorate General for Health, and ICF.	Philippine Statistics Authority and ICF. 2018. <i>Philippines National Demographic and Health Survey 2017</i> . Quezon City, Philippines, and Rockville, Maryland, USA: Philippine Statistics Authority and ICF.	General Statistics Office, Viet Nam Ministry of Planning and Investment. 2015. <i>Viet Nam Household Living Standards Survey 2014</i> . Hanoi, Viet Nam: General Statistics Office.
<i>Dependent Variables</i>			
Sickness	Binary variable equal to 1 if person reported having an illness or injury in the 30 days prior to the time of the survey.	Binary variable equal to 1 if person reported having an illness or injury in the 30 days prior to the time of the survey.	Binary variable equal to 1 if person reported having a severe illness or injury in the 12 months prior to the time of the survey.  Note: According to the survey, an illness or injury is “severe” if the person was bedridden and needed a caregiver or if they had to stop work, study, or other usual activities.
Sought treatment	Binary variable equal to 1 if person sought treatment from a formal medical professional for the reported illness or injury.  Note: Survey question is only asked of those reporting illness or injury in the last 30 days.	Binary variable equal to 1 if person that reported illness or injury either (i) sought treatment from a formal medical professional for any illness or injury on an outpatient basis in the 30 days prior to the survey or (ii) was confined to a hospital for any illness or injury in the 12 months prior to the time of the survey.  Note: Treatment-seeking response may relate to a different illness or injury than the one defining the sickness variable.	Binary variable equal to 1 if person received medical treatment from formal medical professional in the 12 months prior to the time of the survey.  Note: Treatment-seeking response may relate to a different ailment than the severe illness or injury that defines the sickness variable.
<i>Personal Characteristics</i>			
Female	Binary variable equal to 1 if person is a woman.	Binary variable equal to 1 if person is a woman.	Binary variable equal to 1 if person is a woman.
Age	Age of the person in years at the time of the survey.  Note: Age top code is 95, and unknown age is coded as “98” in the survey data.	Age of the person in years at the time of the survey.  Note: Age top code is 95, and unknown age is coded as “98” in the survey data.	Age of the person in years at the time of the survey.

Item	Cambodia	Philippines	Viet Nam
Education	Formal schooling completed in years at the time of the survey.	Formal schooling completed in years at the time of the survey.  Note: For persons with missing years of schooling but whose last schooling level attended was known, missing values were replaced with the sample average of years for the indicated schooling level.	Formal schooling completed in years at the time of the survey.  Note: Actual years for those who completed 12 years or less of schooling (up to higher secondary school), 14 years for college graduates (including other tertiary), 16 years for university, 18 years for master's degree, and 20 years for doctorate.
Marital status	Binary variables equal to 1 if the marital status of the person at the time of the survey was: (1) never married (omitted) (2) married (3) widowed (4) separated or divorced	Binary variables equal to 1 if the marital status of the person at the time of the survey was: (1) never married (omitted) (2) married (3) widowed (4) separated or divorced	Binary variables equal to 1 if the marital status of the person at the time of the survey was: (1) never married (omitted) (2) married (3) separated, divorced, or widowed  Note: Cell size for elderly subsample was insufficient to have a separate category for persons that are separated or divorced.
<i>Household Characteristics</i>			
Total household size	Number of people who usually live in the household.	Number of people who usually live in the household.  Note: Replaced by the number of people currently living in the household if there were 0 usual household members.	Number of household members, based on survey response.
Young children in household	Number of survey respondents age 0–6 within the household.	Number of survey respondents age 0–6 within the household.	Number of survey respondents age 0–6 within the household.
Older children in household	Number of survey respondents age 7–17 within the household.	Number of survey respondents age 7–17 within the household.	Number of survey respondents age 7–17 within the household.
Female head of household	Binary variable equal to 1 if the head of household is a woman.	Binary variable equal to 1 if the head of household is a woman.	Binary variable equal to 1 if the head of household is a woman.
Urban	Binary variable equal to 1 if the residence is in an urban area.	Binary variable equal to 1 if the residence is in an urban area.	Binary variable equal to 1 if the residence is in an urban area.
Wealth index	Score on the standardized wealth index.  Note: The wealth index—which is derived from information on ownership of selected assets and indicators of housing, water, and toilet facility quality—is used as a proxy for relative income or expenditure.	Score on the standardized wealth index.  Note: The wealth index—which is derived from information on ownership of selected assets and indicators of housing, water, and toilet facility quality—is used as a proxy for relative income or expenditure.	Not available.

Item	Cambodia	Philippines	Viet Nam
Per capita expenditure index	Not available.	Not available.	Score on the standardized per capita expenditure index.  Note: Nominal per capita expenditure series standardized to put it on a scale similar to the wealth index.
Other sick person in household (sickness equation only)	Binary variable equal to 1 if any other person in the household (other than the respondent) reported an illness or injury, based on the definition of the sickness variable.	Binary variable equal to 1 if any other person in the household (other than the respondent) reported an illness or injury, based on the definition of the sickness variable.	Binary variable equal to 1 if any other person in the household (other than the respondent) reported an illness or injury, based on the definition of the sickness variable.
<i>Detailed Wealth Indicators</i>			
Agricultural land area	Area of agricultural land owned in hectares.	Area of agricultural land owned in hectares.	Area of agricultural land owned in hectares.
Consumer durables	<p>Binary variables equal to 1 if any member of the household owns a specified consumer durable:</p> <ul style="list-style-type: none"> <li>(1) radio</li> <li>(2) television</li> <li>(3) CD or DVD player</li> <li>(4) mobile phone</li> <li>(5) fixed-line phone</li> <li>(6) refrigerator</li> <li>(7) sewing machine or loom</li> <li>(8) wardrobe</li> <li>(9) watch</li> </ul> <p>Note: Household may respond positively to more than one type of consumer durable.</p>	<p>Binary variables equal to 1 if any member of the household owns a specified consumer durable:</p> <ul style="list-style-type: none"> <li>(1) radio</li> <li>(2) audio component or karaoke</li> <li>(3) television</li> <li>(4) DVD player</li> <li>(5) cable television service</li> <li>(6) mobile phone</li> <li>(7) fixed-line phone</li> <li>(8) computer</li> <li>(9) air conditioner</li> <li>(10) refrigerator</li> <li>(11) washing machine</li> <li>(12) watch</li> </ul> <p>Note: Household may respond positively to more than one type of consumer durable.</p>	<p>Binary variables equal to 1 if any member of the household owns a specified consumer durable:</p> <ul style="list-style-type: none"> <li>(1) radio</li> <li>(2) audio components</li> <li>(3) television</li> <li>(4) DVD player</li> <li>(5) mobile phone</li> <li>(6) fixed-line phone or fax</li> <li>(7) computer</li> <li>(8) printer</li> <li>(9) camera or video recorder</li> <li>(10) air conditioner</li> <li>(11) refrigerator</li> <li>(12) oven or microwave</li> <li>(13) gas, magnetic, or electric cooker</li> <li>(14) water pump</li> <li>(15) water heater</li> <li>(16) washing machine or dryer</li> <li>(17) sewing machine</li> <li>(18) large furniture item</li> </ul> <p>Note: Household may respond positively to more than one type of consumer durable.</p>
Own motorized transport	<p>Binary variable equal to 1 if any member of the household owns a form of motorized transport.</p> <p>Note: Motorized transport includes car or truck, motorcycle or scooter, motorcycle-cart, or boat with a motor.</p>	<p>Binary variable equal to 1 if any member of the household owns a form of motorized transport.</p> <p>Note: Motorized transport includes car or truck, motorcycle or scooter, or boat with a motor.</p>	<p>Binary variable equal to 1 if any member of the household owns a form of motorized transport.</p> <p>Note: Motorized transport includes car, motorcycle, or boat with a motor.</p>

Item	Cambodia	Philippines	Viet Nam
Housing quality	<p>Binary variables equal to 1 if living accommodations have the given characteristic:</p> <p>(1) grid-connected electricity (2) finished floor (3) finished walls (4) finished roofing</p> <p>Note: Household may respond positively on multiple housing quality indicators.</p>	<p>Binary variables equal to 1 if living accommodations have the given characteristic:</p> <p>(1) grid-connected electricity (2) finished floor (3) finished walls (4) finished roofing</p> <p>Note: Household may respond positively on multiple housing quality indicators.</p>	<p>Binary variables equal to 1 if living accommodations have the given characteristic:</p> <p>(1) grid-connected electricity (2) finished walls</p> <p>Note: Household may respond positively on multiple housing quality indicators.</p>
Water quality	<p>Binary variable equal to 1 if water is from an improved source in both dry and wet seasons.</p> <p>Note: Improved water sources include piped water into dwelling, yard, or plot; public taps or standpipes; tube wells or boreholes; protected dug wells and springs; rainwater; and bottled water.</p>	<p>Binary variable equal to 1 if either (i) water is from an improved source or (ii) water for drinking is bottled or from a refilling station and water cooking and handwashing is from an improved source.</p> <p>Note: Improved water sources include piped water, public taps, standpipes, tube wells, boreholes, protected dug wells and springs, and rainwater.</p>	<p>Binary variable equal to 1 if water is from an improved source.</p> <p>Note: Improved water sources include piped water reaching the house, public taps, drilled wells, protected dug wells and streams, and rainwater.</p>
Toilet facilities quality	<p>Binary variable equal to 1 if household's toilet facilities are improved (hygienic) and not shared with other households.</p> <p>Note: Improved toilet facilities include those that flush to a piped sewer systems, septic tanks, or pit latrines; ventilated improved pit latrines; pit latrines with slab; and composting toilets.</p>	<p>Binary variable equal to 1 if household's toilet facilities are improved (hygienic) and not shared with other households.</p> <p>Note: Improved toilet facilities include those that flush to a piped sewer systems, septic tanks, or pit latrines; ventilated improved pit latrines; pit latrines with slab; and composting toilets.</p>	<p>Binary variable equal to 1 if household's toilet facilities are improved.</p> <p>Note: Improved toilet facilities include those that flush to septic tanks, absorption latrines (suilabh), and ventilated improved pit latrines. Survey does not include information on whether the household shares its toilet facilities with other households.</p>
Cooking area quality	<p>Binary variable equal to 1 if household uses clean fuel to cook or cooking is done outside of the residence.</p>	<p>Binary variable equal to 1 if household uses clean fuel to cook or cooking is done outside of the residence.</p>	<p>Not available.</p>

Source: Authors' compilation.

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## Gender Differences in Access to Health Care Among the Elderly

*Evidence from Southeast Asia*

This paper examines gender among other factors that may constrain older persons in Southeast Asia from meeting their health-care needs when sick based on data from Cambodia, the Philippines, and Viet Nam. It finds that while women in Cambodia and the Philippines are more likely to seek treatment than men, the gender difference is reversed in Viet Nam where stigma associated with some diseases may more strongly deter women than men. Household survey data from these countries show that the probability of seeking treatment rises with age more sharply for women than men. Yet, for the subsample of elders, the gender difference is not significant.

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