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ORIGINAL RESEARCH

Demographic, socioeconomic, and cultural factors for the rise in one-person households in developing countries: the case of the Philippines

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Abstract

This study investigates (1) the changes in the prevalence and composition of one-person households (OPH) in the Philippines; (2) describes the geographic variation in the prevalence of OPH over time; (3) examines the demographic and socioeconomic factors associated with the changes in the percentage of OPH; and (4) assesses the individual-level and contextual factors associated with Filipinos' propensity to live alone. Data were drawn primarily from the 1990, 2000, and 2010 Philippine Census of Population and Housing. Descriptive statistics and a series of regression models were used in the analyses. Results at the macro level showed that the increasing proportion of older people and the rising levels of union dissolution were associated with an increase in OPH, while marriage delay was related to a decline in OPH. Furthermore, micro-level analyses also showed that older Filipinos and those who were never married, divorced, or separated were more likely to live alone. In addition, internal migration was positively associated with living alone, while international migration was negatively associated with solo living. While living alone is associated with individualization and a preference for privacy in Western societies, it has negative connotations in the Philippines because it goes against cultural norms. Hence, interpretations of OPH should be sensitive to the country's cultural context to better understand its origin and future trajectory.

Keywords One-person households · Living alone · Filipino households · Philippines · Household structure

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Introduction

The proportion of the population living in one-person households (OPH), particularly at older ages, has increased over time (United Nations, 2017). This increase has been attributed to socioeconomic development, the rise of individualism, technological advancement, and demographic factors, such as declining fertility and increasing life expectancy (Burch & Matthews, 1987; Cheung & Yeung, 2015; Klinenberg, 2012; Liu et al., 2020). Most studies on this phenomenon have been conducted in developed countries, particularly in the Western contexts (Kramarow, 1995; Liu et al., 2020; McGarry & Schoeni, 2000; Reher & Requena, 2020), although studies in the Asian context have also started to emerge in recent years (Podhisita & Xenos, 2015; Raymo, 2015; Yeung & Cheung, 2015). In the Philippines, where universal marriages have historically been prevalent and fertility rates remain relatively high, a systematic analysis of the rise in non-traditional family types, such as OPH, remains scant. To fill this gap, this paper examines the temporal-spatial patterns of OPH in the Philippines from 1990 to 2010. Specifically, it investigates (1) the changes in the prevalence and composition of OPH; (2) describes the geographic variation in the prevalence of OPH over time; (3) examines the demographic and socioeconomic factors associated with the changes in the prevalence of OPH; and (4) assesses the individual-level and contextual factors associated with Filipinos' propensity to live alone.

Prior research has shown that living alone is associated with adverse conditions, including reduced levels of perceived social support, higher levels of loneliness and psychological distress (Gierveld et al., 2012; Takagi et al., 2020; Teerawichitchainan et al., 2015; Yeh & Lo, 2002), although its positive impacts have also been identified (Gu et al., 2019). Furthermore, at the societal level, a rise in OPH increases the number of households in the population and impacts resource consumption and social cohesion (Bennett & Dixon, 2006). Thus, it is essential to document trends in OPH and investigate the factors associated with this phenomenon so that people at risk of living alone can be identified and their needs are met. In addition, knowledge of trends in OPH, its geographic distribution, and the drivers of changes in OPH over time will aid in projecting its future trajectory and in preparing for its urban planning and housing development implications.

Background literature

Previous research has identified the role of demographic changes, socioeconomic factors, and geographic mobility as some of the prominent factors related to the increase in living alone (Cheung & Yeung, 2015; Klinenberg, 2012; Reher & Requena, 2020; Wolf, 1995).

Since household has been closely associated with the family, coresidence is commonly viewed as a family affair involving kin or relatives (Burch & Matthews, 1987). Thus, the number of available family members with whom one can coreside with is largely conditioned by demographic trends, such as union formation and

dissolution, mortality rates, and fertility rates (Bongaarts, 2001; Reher & Requena, 2018; Ruggles, 2012). Earlier studies indicate that changes in demographic factors such as fertility, union formation, and union dissolution are associated with changes in household structure (Jiang & O'Neill, 2007; Ogden & Hall, 2004). A macro-level analysis among developing countries showed that household size is positively associated with fertility level and mean age at marriage, and negatively associated with the level of marital dissolution (Bongaarts, 2001). At the micro-level, a growing number of studies have shown that having children is negatively associated with living alone, while the lack of a spouse due to non-marriage or union dissolution (e.g. widowhood, divorce, or separation) is positively associated with solo living (Aghajanian & Thompson, 2016; Dommaraju, 2015; Gaymu et al., 2006; Mudrazija et al., 2020; Torabi et al., 2015; Wandera et al., 2017). Meanwhile, in China, the improvement in life expectancy, along with the fertility decline, accounts for the rise in widowed OPH (Cheung & Yeung, 2015). In addition, the increasing sex differences in life expectancy in the United States led to a large number of widows among older people who have the highest levels of living alone (Reher & Requena, 2020).

Socioeconomic development has also been shown to be related to household size and living alone. For example, a cross-national study has shown that socioeconomic development, measured by several indicators, such as GDP per capita, and school enrolment ratio, is negatively associated with household size (Fu & Heaton, 1995). Similarly, Cheung and Yeung (2015) showed that economic development, measured in terms of local occupational structure, is associated with the rise in OPH in China between 1982 and 2005. More recently, they also demonstrated that the propensity to live alone is higher among young adults living in highly developed prefectures than their counterparts in less developed prefectures (Cheung & Yeung, 2021). Meanwhile, Bongaarts and Zimmer (2002) also found a positive correlation between schooling and the percentage living alone among older adults in developing countries, while Esteve et al. (2020) showed that the more developed a country is, the higher the levels of living alone.

There are various mechanisms through which socioeconomic development can influence the propensity to live alone. Klinenberg (2012) suggests that socioeconomic development and urbanization provide the primary structural and cultural environment conducive to solo living, including the availability of recreational amenities and the potential outsourcing of domestic chores such as food preparation and cleaning. He argues that mass urbanization enabled the "rise of the singleton society, in part because it has led to a booming subculture of singles who share similar values, orientations, and ways of life" (Klinenberg, 2012, p. 16). Indeed, the prevalence of OPH is relatively high in some highly urbanized areas worldwide, including Inner London, Paris, Seoul, and Tokyo (Hall & Ogden, 2003; Ogden & Schnoebelen, 2005; Ronald, 2017). For example, more than half of all households in the City of Paris in 1999 were one-person, while more than a third of all households in Inner London in 1991 were OPH (Hall & Ogden, 2003; Ogden & Schnoebelen, 2005). Among older adults, the level of economic development influences the prevalence of OPH because it affects their ability to live alone, either directly or indirectly (Reher & Requena, 2020). In particular, development enhances wealth, enabling older adults to meet their privacy preferences

and contributes to changes in how people value privacy in their living arrangements (Kramarow, 1995).

Another factor associated with the rise in OPH is migration, which is also linked to socioeconomic development since migrants tend to be concentrated in socioeconomically advanced areas. In addition, migration impacts household size because it results in the physical dispersal of kin (Burch & Matthews, 1987). For example, single-person households were found to be positively correlated with in-migration in the City of Tshwane, South Africa (Roux & Geyer, 2017). Meanwhile, the high propensity to live alone in migrant-sending provinces in South Africa was attributed to household members being left behind due to the high out-migration rate (Mutanda & Odimegwu, 2019). The positive association between migration and living alone has also been observed in some Asian countries like China and Vietnam (Cheung & Yeung, 2015; Guilmoto & De Loenzien, 2015).

Despite the increasing number of studies that examine the different dimensions of OPH, our understanding of this growing phenomenon remains incomplete. One of the overlooked factors in assessing OPH is the role of culture. Culture influences household structure by creating customs, morals, and social order that aid in restraining an individual's behaviors (Wang, 2008, as cited in Li et al., 2020). It can also indirectly affect household structure through demographic behaviors such as fertility, marriage, and union dissolution, since these behaviors differ across cultures. Despite the critical role of culture, only a few studies investigated its impact on household structure (Fu & Heaton, 1995; Li, et al., 2020). It is crucial to assess the role of culture in household change, especially in a culturally diverse society, to understand better why household transition lags in one society, but accelerates in other settings. Although intergenerational coresidence is common in the Philippines, particularly at older ages, because it indicates the fulfillment of filial piety, there may be cultural differences in the practice of this tradition due to differential exposure to Western values and ideals of privacy and independence. Indigenous ethnic minorities in the country are more likely to subscribe to the cultural ideal of coresidence compared to other ethnic groups who live in more socioeconomically developed parts of the country. In addition, given the cultural differences in demographic behavior, such as union formation and fertility in the Philippines (Abalos, 2014; Nogra, 1998), it is expected that these differences will influence household structure across communities. The impact of geographic mobility with OPH has been examined extensively in previous studies (Cheung & Yeung, 2015, 2021), but they mostly focused on internal migration. The role of international migration on OPH prevalence is underexplored, despite the increasing magnitude of this phenomenon in many countries. Whether a household is dissolved when a member leaves the country for work or becomes extended when other family members join the left-behind member for company needs to be empirically tested. Communities with a high concentration of international labor migrants may also spur growth in housing development due to the expected inflow of remittances, creating more available housing options for those who wish to live alone. This is particularly important in the Philippines, where roughly ten percent of its population is overseas, and international remittances play a substantial role in the country's economy.

Finally, few studies examine the influence of health on changes in household structure, mainly living alone. An individual's health status and functional ability are essential in setting the parameters that condition independence, especially when a person reaches old age (Burr & Mutchler, 2007). Good health enables individuals to live independently (Reher & Requena, 2020), but poor health can also trigger the transition to OPH when an ill member of a couple-only household succumbs to death. Conversely, the poor health situation of a person who lives alone may trigger family members or caregivers to move in with him or her for instrumental support.

These three research gaps are addressed in the present study. In addition to the demographic and socioeconomic factors that influence OPH, this research contributes to a better understanding of this phenomenon by investigating how culture, health status, and international migration are associated with the propensity to live alone, both at the individual and macro level.

Households in the Philippine context

The household has long been recognized as an essential basic social unit in Philippine society. It builds the individual's identity and serves as the basis for social interaction in the community, as it is the main social and economic unit to which a person belongs (Castillo, 1979). Living in the same household also enables the patterns of interaction, social control, and mutual assistance to reach their peak (Stinner, 1982). There are different types of households in the Philippines, but the nuclear household is the dominant form, followed by extended households (Abejo, 1995; Arce, 1994; Stinner, 1977). Nuclear households remain the most common household form in the country. However, their relative share declined from 69.1% in 1990 to 64.9% in 2010, while the proportion of extended households increased from 22.9 to 25.2% between 1990 and 2010 (Abalos, 2023).

The share of OPH in the Philippines is relatively low. Castillo (1979) offered a cultural explanation for the relatively low proportion of Filipinos who live alone. According to her, Filipinos do not enjoy being alone and find it difficult to understand why anyone would want to live by themselves. Filipinos prefer to be in the company of others over having privacy, and there is no Filipino equivalent of the word "privacy" (Castillo, 1979). The closest to this word is "to be alone," and to be alone is "to be lonely" (Castillo, 1979, p. 115). Indeed, a recent study showed that being alone is associated with higher levels of loneliness among older adults in the Philippines (Takagi et al., 2022). However, with the recent socioeconomic development and the rise of individualism, this Filipino preference (or lack thereof) for privacy may have also changed. This is evidenced by the growing proportion of OPH in recent decades, as presented in Table 1. It shows a steady increase in the prevalence of OPH, from 2.9% in 1990 to 7.8% of all households in 2015. Compared with developed countries, the share of OPH in the Philippines was substantially lower, but not far behind other Asian countries such as Indonesia (7.1%), Iran (8.5%), and Vietnam (6.9%), as can be seen in Fig. 1.

Table 1 also shows that the average household size in the country continues to decline, from 5.2 household members in 1990 to 4.4 members in 2015. In 1990,

Table 1 Trends in household size and demographic and socioeconomic indicators: Philippines, 1990–2015 (%). Source: Authors' calculation based on census data

	1990	2000	2010	2015
Number of household members				
1	2.9	4.3	6.0	7.8
2	8.2	9.7	11.3	12.2
3	13.0	14.7	16.9	17.6
4	17.1	18.3	19.6	19.6
5	17.4	17.1	16.9	16.1
6	14.7	13.4	12.0	11.1
7	10.8	9.3	7.7	7.0
8 +	16.0	13.2	9.5	8.6
Total	**100.0**	**100.0**	**100.0**	**100.0**
Average household size	5.2	4.9	4.5	4.4
% Of never-married (aged 25–35)	22.9	24.9	26.9	31.1
% Of divorced/separated among ever in union excluding widowed (aged 25 and over)	1.4	2.1	2.6	3.1
% Of overseas Filipino workers (aged 20 and over)	1.7	2.6	2.6	3.7
% Of internal migrants (aged 15 and over)	5.4	4.9	3.4	n.a
% Of older people (aged 60 and over)	5.3	6.0	6.8	7.5

n.a. Not available

58.9% of households had at least five members; this declined to 53.0% in 2000 and further went down to 42.8% in 2015. In contrast, households with two to four members steadily grew from 38.3% in 1990 to nearly half in 2015.

Demographic and socioeconomic changes in the Philippines

Over the last few decades, demographic and socioeconomic changes have swept the Philippines, including changes in union formation and dissolution, internal and international migration, and population aging. As noted, some of these factors have been identified in previous studies to be associated with the rise of OPH.

The timing of union formation in the Philippines has changed in the past decades (Abalos, 2014). For example, census data shows that the proportion of Filipinos aged 25–35 years who are never married increased from 22.9% in 1990 to 31.1% in 2015 (Table 1). Since Filipino children traditionally live with their parents before marriage, this delayed union formation also means delayed onset of leaving the parental home. However, despite the marriage delay, a near-universal proportion of Filipinos still marry. While the newly-married couple in the country usually lives with either of their parents after marriage, they also typically move out of the parental abode and establish their own household (Reynolds, 1962). Filipino parents also prefer their married children to set up their own households to learn their new

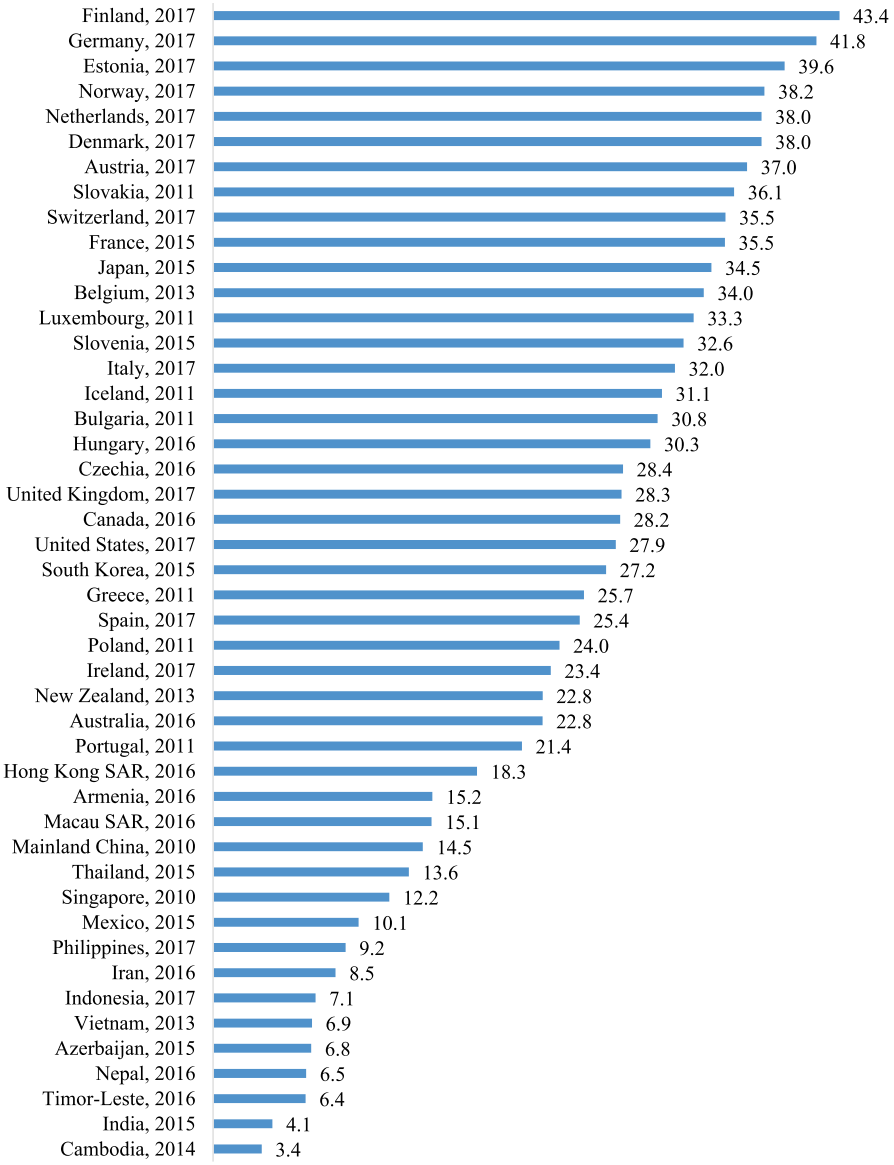

Fig. 1 Prevalence of one-person households in selected countries (%). Source: United Nations Economic Commission (UNECE) (2023) Statistical Database, United Nations (2022)

responsibilities and allow them to live their own lives (Castillo, 1979). This new nuclear household formed by married couples eventually grows with the birth of their first child, which occurs soon after marriage and sometimes even before marriage or cohabitation.

Since the Filipino family no longer plays an active role in the mate selection process of their children, they do not exert as much pressure on the couple to keep the

marriage intact (Medina, 2015). This may have led to the country's increasing prevalence of union dissolution, despite the Philippines' lack of divorce law and the prohibitive cost of legally terminating a marriage (Abalos, 2017). Census data indicates that the share of divorced/separated Filipinos[1] aged 25 years and over increased from 1.4% in 1990 to 3.1% in 2015. This union dissolution could result in OPH formation if one or both couples decide to live alone (Dommaraju, 2015). After union dissolution, women in the Philippines usually take custody of the children and are more likely to live in an extended household than live alone or head a single-parent family (Abalos, 2011). Given the social stigma attached to female-headed households and the greater vulnerability of lone mother household heads to predatory advances by men (Chant, 1997), living in an extended family is viewed as more secure for lone mothers than living alone. In contrast, living alone is more common among divorced and separated Filipino men (Abalos, 2011) because they are likely to leave the conjugal house after the separation (Medina, 1991).

Both internal and international migration has been an important feature of the Philippine demographic landscape in recent decades. International labor migration was institutionalized in the 1970s and has been an essential income source for many Filipinos. Data from the Commission of Filipino Overseas (CFO) and Philippine Overseas Employment Agency (POEA) show that about 5000 Filipinos leave daily for overseas migration (Tingga, 2015), and official estimates indicate that 10.2 million Filipinos, or roughly 10% of the Philippine population, are overseas, as of December 2013 (Ogena, 2015). Based on census data, the proportion of adult Filipinos aged 20 years and over working overseas rose from 1.7% in 1990 to 3.7% in 2015. Similarly, internal migration is common in the country, although the proportion of internal migrants aged 15 years has somewhat declined from 5.4% in 1990 to 3.4% in 2010 (Table 1). Migration within the country is more prevalent among those in the younger age groups (Gultiano & Xenos, 2006). Young people move to urban areas to pursue education or find employment (Quisumbing & McNiven, 2006). The departure of these migrants can reduce the household size in rural areas and increase the household size in urban areas (Stinner, 1982). However, given the high housing costs in urban areas (Castillo, 1979), migrants tend to live with families of their relatives or friends (Abejo, 1995) or "double up" with fellow migrants.

The improvement in life expectancy and, to a lesser extent, fertility decline have resulted in slow but steady population aging in the Philippines (Abalos, 2020). For instance, as shown in Table 1, the proportion of Filipinos aged 60 years and over increased from 5.3% in 1990 to 7.5% in 2015. Research in other countries shows that an increase in the share of older people is related to an increase in OPH (Cheung & Yeung, 2015). In the Philippines, living alone, particularly at older ages, is frowned upon because it indicates that the family has reneged on its filial duty (Natividad & Cruz, 1997). However, despite this stigma, evidence shows that an increasing proportion of older Filipinos live alone (Abalos, 2020). There are also indications that some prefer to live independently from their children (Abalos, 2019). Therefore, as

[1] With all in-union as the denominator.

the share of older people continues to increase, it is expected that a higher proportion of older Filipinos will also live alone.

Aside from experiencing demographic and socioeconomic changes, the Philippines also offers a unique culture and context that can further improve our understanding of solo living. For example, while the Philippines shares some values with its Asian neighbors, such as filial piety, the Filipino version of filial piety is not based on strict principles of Confucian philosophies (Laguna, 2013). Instead, Filipinos' interaction with each other is guided by the idea of "smooth interpersonal relations," expressed through social harmony and yielding to the majority's will over one's interests (Chao & Tseng, 2002; Lynch, 1973). These Filipino values may influence preference for specific living arrangements, including living alone.

The Philippines also has over a hundred ethnic groups, including a sizable proportion of Filipinos belonging to indigenous cultural communities. These groups resisted or avoided substantive contact with outside forces, such as Spanish colonialism; thus, they have generally kept more of their traditional culture and social organization (May, 2003), making them less likely to live alone. The presence of these more traditional communities amidst a rapidly modernizing Filipino society may help explain the country's geographic variation in household structure.

Data and methods

Data source

Data for this analysis were drawn primarily from the 1990, 2000, and 2010 Census of Population and Housing (CPH) in the Philippines, provided by the Philippine Statistics Authority, the Philippine Population Data Archive (PopArchive) of the University of the Philippines Population Institute and the Demographic and Development Foundation, Inc., and the IPUMS International (Minnesota Population Center, 2020). These censuses collect information from household and institutional populations. A household in the Philippines is defined as "a social unit consisting of a person living alone or a group of persons who sleep in the same housing unit and have a common arrangement in the preparation and consumption of food" (National Statistics Office 2010: 20). The institutional population refers to those who live in group quarters such as dormitories, hospitals, retirement homes, prisons, and convents. The proportion of the Philippine population who live in institutions is less than one percent; hence, this study focuses only on the household population.

Analytic strategy

There are more than 1000 municipalities/cities in the Philippines nested within 80+ provinces and 17 regions in the census data. We used individual-level data to examine the prevalence of the population living in OPH and describe their demographic and socioeconomic characteristics. We then aggregated individual-level data into municipal/city and provincial-level data for macro-level analyses.

Specifically, we examined data at the provincial level for better visualization of the spatial and temporal changes in the country's OPH levels. For the macro-level multivariate analyses, we used municipal/city-level data to investigate the demographic and socioeconomic factors associated with the changes in OPH prevalence. Fixed-effects models were used to examine how these contextual factors are associated with the prevalence of OPH at the municipal/city level. Finally, we combined the individual-level data with the municipal/city-level indicators to simultaneously examine the individual-level and contextual factors associated with living alone among adult Filipinos. Two-level random-effects logistic regression models were used in these analyses.

Municipal/city-level (macro-level) data analysis

Dependent variables

The percentages of OPH at the municipal/city level were the main dependent variables in the macro-level analyses. In addition to the overall percentage of OPH in the municipality/city, we also examined several subgroups, including the following:

(1) Young OPH = the size of the household population aged between 15 and 34 years who were living alone.
(2) Middle-aged OPH = the size of the household population aged between 35 and 59 years who were living alone.
(3) Old-age OPH = the size of the household population aged 60 years and over who were living alone.

The sum of the prevalence rates of the three subgroups equals the overall prevalence rate of OPH in the municipality/city.

The independent variables in the multivariate analyses included demographic, socioeconomic, health, and cultural factors.

Demographic factors

1. Percentage of older people = the size of the household population aged 60 years and over.
2. Percentage of never-married among those aged 25–35 = the number of never-married residents aged 25–35 divided by the municipal/city household population in the same age range.
3. Percentage of divorced/separated among those who have even been in union (i.e. married or cohabiting) aged 25 years and over = the size of the population who were divorced or separated aged 25 years and over.

Socioeconomic factors

4. Percentage of internal migrants aged 15 years and over = the size of the household population aged 15 years and over who have changed municipal/city residence within the country in the past five years.
5. Percentage of households living in an owner-occupied housing unit = the number of households living in owner-occupied housing units divided by the total number of households in the municipality/city.
6. Population density = the total number of persons living in a municipality/city divided by the area of the administrative unit. Since the definition of urbanization in the Philippines differed across census periods, the population density was used as a proxy of urbanization in this study.
7. Percentage with at least secondary education among aged 18 years and over = the size of the household population aged 18 years and over who completed at least secondary education.
8. Percentage of overseas Filipino workers aged 20 years and over = the size of the household population who were working overseas aged 20 years and over.

Health and cultural factors

9. Percentage with disability among adult population = the size of the household population with disability aged 40 years and over.
10. Percentage of indigenous people[2] = the size of household population who were considered indigenous people.

Multilevel analysis of the factors associated with OPH

Two-level random-effects logistic regression models were also estimated to assess the association of individual-level and contextual factors with the propensity to live in OPH among adult Filipinos aged 15 years and over. In these logistic regression models, Level 1 units were individuals, and Level 2 units were municipalities/cities. The primary dependent variable in these regression models was a dichotomous one indicating whether an individual lived in an OPH (coded as 1) or otherwise (coded as 0). The analysis focused only on the 2010 data.

Individual-level variables. Seven individual-level variables were used in our analysis. These included age (treated as a categorical variable in models 1 and 2, but treated as a continuous variable in models 2a–2c), marital status (never married, currently in union i.e. married/cohabiting, and divorced/widowed/separated), educational attainment (below primary, primary, secondary, and college or higher), functional difficulty (at least one difficulty in seeing, hearing, communicating, mobility

[2] Although both the 1990 and 1995 census included a question on dialect/language spoken at home, which can be used as an indicator of ethnicity, the latter year was used because the ethnicity codes were more consistent with the 2000 and 2010 ethnicity codes. The number of indigenous people in the study is only an approximation of the actual number.

and self-care = 1; no difficulty = 0), internal migration (internal migrant = 1, otherwise = 0), international labor migration (overseas worker = 1, otherwise = 0), and ethnicity (indigenous people = 1, otherwise = 0).

Contextual-level factors. A similar set of municipal/city-level independent variables used in the fixed effects models were also used in the multilevel logistic regression models, except for disability, population density, education, and proportion of owner-occupied housing units. We used the presence of at least one functional difficulty as a measure of health instead of the more general question on disability and the proportion of urban population as an indicator of urbanization instead of population density. We also used the 2009 poverty incidence at the municipal/city level, produced by the Philippine Statistics Authority, as a direct measure of socioeconomic development instead of indirect measures derived from census data, such as educational attainment. Finally, the proportion of households living in owner-occupied housing units was dropped in the multilevel analyses because it was highly correlated with the urban population.

Results

Prevalence of Filipinos living in OPH by demographic and socioeconomic characteristics

Table 2 presents the percentage distribution of Filipinos aged 15 years and over living in OPH from 1990 to 2010 and the differentials by demographic and socioeconomic characteristics. It shows that the proportion of adult Filipinos living alone slowly increased from 0.9% in 1990 to 2.0% in 2010. Although the proportion was relatively low, the absolute number was substantial, ranging from nearly 332,000 in 1990 to around 1.2 million adult Filipinos in 2010. The overall low prevalence also masked the wide differentials across population subgroups. For instance, while the prevalence of OPH in 2010 among Filipino women aged 15–34 was only less than 1%, it reached 8.1% among women aged 60 and over. Living in OPH was also more common among those formerly married than in other marital status groups. The prevalence of OPH in 2010 was less than one percent among those who are currently in union and 2.8% among those who have never been married. In contrast, the corresponding proportions among those who were separated/divorced and widowed were 9.6 and 12.6%, respectively. There were also small but notable education differences in the prevalence of OPH. For example, the prevalence of OPH in 2010 was 3.4% among those with below primary education, while it was 2.2% among those with a university education. Regarding health status, having a disability was associated with a higher prevalence of living alone. For instance, the proportion of men and women living alone in 2010 was more than twice higher among those who are disabled compared to those without a disability. Being an internal migrant was also associated with a higher propensity to live alone, most notably among Filipino men. These demographic and socioeconomic differentials in the prevalence of OPH also differed between men and women. Overall, there was a higher proportion of men

Table 2 Percentage distribution of adult Filipinos living in OPH, 1990–2010. Source: Authors' calculation based on census data

	1990			2000			2010		
	Male	Female	Both sexes	Male	Female	Both sexes	Male	Female	Both sexes
Age group									
15–34	0.5	0.2	0.4	0.9	0.3	0.6	1.3	0.6	0.9
35–59	1.1	0.8	0.9	1.9	1.0	1.5	2.7	1.4	2.0
60+	3.2	5.6	4.4	4.6	6.6	5.7	5.8	8.1	7.1
Marital status									
Never married	1.3	0.9	1.1	2.0	1.3	1.7	3.4	2.1	2.8
Married	0.3	0.1	0.2	0.6	0.1	0.4	0.6	0.2	0.4
Cohabiting	0.6	0.7	0.6	0.5	0.2	0.3	0.3	0.1	0.2
Separated/ divorced	13.1	3.8	6.9	13.6	4.1	7.6	18.7	4.7	9.6
Widowed	10.6	6.9	7.7	12.7	8.8	9.8	18.1	11.0	12.6
Education									
Below primary	1.4	2.0	1.7	2.3	2.9	2.6	3.1	3.8	3.4
Primary	0.7	0.5	0.6	1.3	0.9	1.1	1.9	1.6	1.8
Secondary	0.7	0.5	0.6	1.3	0.7	1.0	2.0	1.1	1.6
University	1.1	0.9	1.0	1.9	1.3	1.6	2.5	1.9	2.2
Disability status									
With disability	3.1	3.2	3.1	4.3	5.4	4.9	5.4	5.7	5.5
Without disability	0.9	0.9	0.9	1.5	1.1	1.3	2.2	1.7	1.9
Internal migration status									
Migrant	1.4	0.8	1.1	2.5	1.2	1.8	4.9	2.5	3.6
Non-migrant	0.9	0.9	0.9	1.5	1.2	1.4	2.1	1.7	1.9
Total	**0.9**	**0.9**	**0.9**	**1.6**	**1.2**	**1.4**	**2.2**	**1.7**	**2.0**

than women who live in OPH among the young (15–34) and middle-aged (35–59) groups, but there were more women than men who live alone among older people.

Table 3 presents the demographic and socioeconomic profile of Filipinos aged 15 years and over living in OPH from 1990 to 2010. The values represent the percent among those who are living in OPH, disaggregated by sex and year. It shows that the majority of adult Filipinos living alone were males, and their relative proportion increased from 50.8% in 1990 to 56.2% in 2010. In terms of age groups, older people accounted for a sizable proportion of Filipino who lived alone. However, this proportion steadily declined over time, while the relative share of those in the middle-age group increased from 33.2% in 1990 to 38.5% in 2010. About a quarter of all solo dwellers were between the ages of 15 and 34, and this remained relatively unchanged over time. Given the shift in the age profile of those who lived alone, from predominantly older people to middle-aged adults, their marital status has also shifted. The proportion of Filipinos living alone who were widowed consistently

Table 3 Characteristics of Filipinos aged 15 and over living in OPH, 1990–2010. Source: Authors' calculation based on census data

	1990			2000			2010		
	Male	Female	Both sexes	Male	Female	Both sexes	Male	Female	Both sexes
Sex									
Male	–	–	50.8	–	–	56.5	–	–	56.2
Female	–	–	49.2	–	–	43.5	–	–	43.8
Age group									
15–34	33.3	15.1	24.3	30.7	14.5	23.6	30.5	18.0	25.0
35–59	38.8	27.4	33.2	43.8	29.1	37.4	46.1	28.8	38.5
60+	27.9	57.6	42.5	25.6	56.4	39.0	23.4	53.1	36.4
Marital status									
Never married	51.5	34.1	43.0	48.8	34.2	42.4	56.7	37.3	48.2
Married	16.0	5.7	10.9	21.5	5.7	14.5	15.1	7.0	11.6
Cohabiting	0.1	0.2	0.1	1.6	0.8	1.2	1.0	0.6	0.8
Separated/divorced/spouse absent	7.6	4.6	6.2	8.1	5.3	6.9	9.0	5.4	7.5
Widowed	24.7	55.4	39.8	20.0	54.0	34.9	18.1	49.7	32.0
Education									
Below primary	38.6	54.3	46.3	30.0	41.9	35.2	23.1	29.3	25.8
Primary	28.1	21.3	24.7	30.6	26.1	28.6	25.2	24.8	25.0
Secondary	24.3	15.0	19.7	32.1	23.1	28.1	38.1	28.8	34.1
University	8.9	9.5	9.2	7.3	8.9	8.0	13.6	17.1	15.1
Disability status									
With disability	5.5	5.0	5.3	5.4	9.0	7.0	4.9	6.5	5.6
Without disability	94.5	95.0	94.7	94.6	91.0	93.0	95.1	93.5	94.4
Internal migration status									
Migrant	8.0	4.9	6.5	7.3	5.1	6.3	7.1	5.3	6.3

Table 3 (continued)

	1990			2000			2010		
	Male	Female	Both sexes	Male	Female	Both sexes	Male	Female	Both sexes
Non-migrant	92.0	95.1	93.5	92.7	94.9	93.7	92.9	94.7	93.7
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

declined from 39.8% in 1990 to 32.0% in 2010. In contrast, the relative share of those who were never married or divorced/separated increased between 1990 and 2010. This could be due to increasing marriage delay or non-marriage and the rising union dissolution in the country, as these phenomena can serve as a pathway to living alone. A change in their socioeconomic profile has also accompanied the shift in the demographic profile of Filipinos who live in OPH. The proportion who lived in OPH with below primary education drastically declined from 46.3% in 1990 to 25.8% in 2010. In contrast, the corresponding proportions for those with at least secondary education rose from 28.9% in 1990 to 49.2% in 2010. This likely reflect the overall educational expansion in the Philippines over this period, but it also indicates the changing age profile of solo-dwellers, from predominantly older people who are mostly low-educated to middle-aged Filipinos with a college education. There was little change in the proportion of solo dwellers who were internal migrants.

There were also notable sex differences in the demographic and socioeconomic profile of Filipinos who lived alone. For example, Filipino men who lived in OPH tend to be in the middle-aged group, were mostly never married, and had relatively higher education, particularly in the most recent period. In contrast, Filipino women who lived alone were mainly in the older age groups, were widowed, and had relatively lower levels of education.

Prevalence of OPH by province

Almost all provinces in the Philippines displayed an increase in the proportion of the population living in OPH (Fig. 2). Therefore, we further examined the geographic distribution of OPH in the country by the rate of increase over time. Table 4 shows the grouping of the provinces into three groups according to the growth rate of OPH between 1990 and 2010. For the fast-growing group, the average percentage of the population living in OPH was 1.01% in 1990 and 2.37% in 2010, with an average percentage-point change of 1.36% between the two periods. Provinces with highly urbanized cities such as Metro Manila, Cebu, and Davao del Sur belonged to this group. Areas adjacent to Metro Manila, such as Laguna and Cavite, also posted a relatively high growth, hence were part of this group. For the slow or negative growth group, the average percentage of the population living in OPH was 1.01% in 1990 and 1.58% in 2010, and an average percentage point difference of 0.57%. Some of the provinces in this group included Abra, Mountain Province, and Kalinga Apayao, where a sizable proportion of their population belongs to the indigenous communities. In addition, provinces predominantly composed of Muslim populations, such as Maguindanao, Lanao del Sur, and Basilan, were also part of the slow or negative growth group.

Trends in the age composition of Filipinos living in OPH

There are different meanings and motivations for living alone depending on someone's circumstances over the life course, so we examined the trends in the age composition of Filipinos living in OPH by the pace of OPH growth between 1990 and

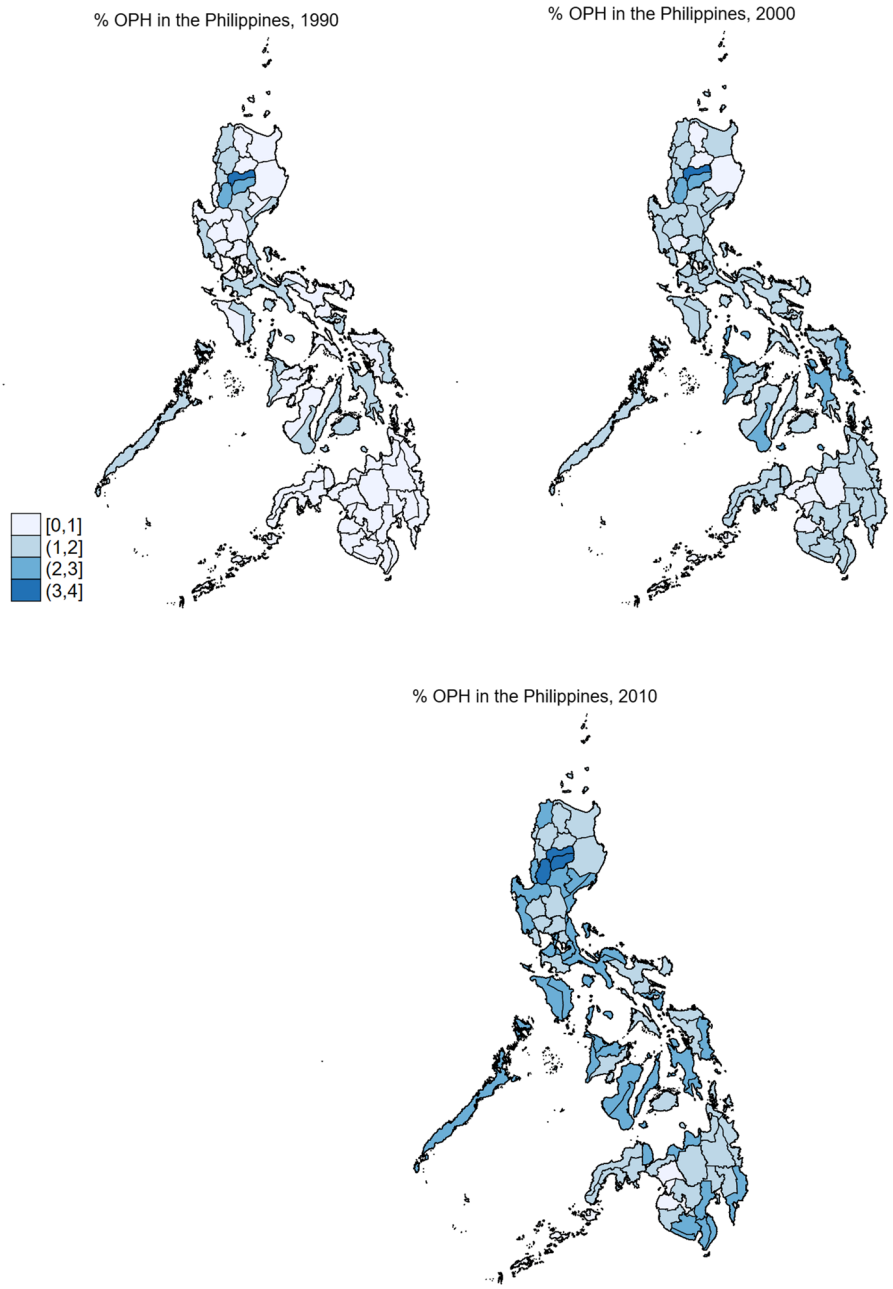

Fig. 2 Percentage of the adult population (15 +) living in OPH by province, Philippines: 1990–2010

Table 4 Three quantile groups of provinces in the Philippines (Grouped by the percentage-point change of population living in one-person households between 1990 and 2010). Source: Authors' calculation based on census data

	Provinces	Percentage of adult population living in OPH
Fast growth	Benguet, Camarines Norte, Capiz, Cavite, Cebu, Davao del Sur, Davao Oriental, Eastern Samar Laguna, Leyte, Biliran, Manila, Marinduque, Misamis Occidental, Misamis Oriental, Negros Occidental Nueva Vizcaya, Palawan, Quirino, Romblon, South Cotabato, Sarangani, Southern Leyte, Sultan Kudarat Metro Manila 2nd District, Metro Manila 3rd District, Metro Manila 4th District	1990: 1.01 2010: 2.37 Percentage-point change:1.36
Medium growth	Aklan, Albay, Bulacan, Cagayan, Batanes, Camarines Sur, Davao (Davao del Norte), Iloilo, Guimaras, Isabela, La Union, Masbate, Negros Oriental, Cotabato (North Cotabato), Nueva Ecija, Occidental Mindoro, Oriental Mindoro, Pangasinan, Quezon, Rizal, Siquijor, Sorsogon, Surigao Del Norte, Dinagat islands, Surigao del Sur, Tarlac, Zambales, Aurora	1990: 0.95 2010: 1.99 Percentage-point change:1.04
Slow or negative growth	Abra,Agusan del Norte, Agusan del Sur, Antique, Basilan, City Of Isabela, Bataan, Batangas, Bohol, Bukidnon, Camiguin, Catanduanes, Ifugao, Ilocos Norte, Ilocos Sur, Kalinga-Apayao, Apayao, Kalinga, Lanao del Norte, Lanao del Sur, Maguindanao, Cotabato City, Mountain Province, Northern Samar, Pampanga, Samar (Western Samar), Sulu, Tawi-Tawi, Zamboanga Norte, Zamboanga del Sur, Zamboanga Sibugay	1990: 1.01 2010: 1.58 Percentage-point change: 0.57

We used the xtile command in Stata, and specified three groups to generate three quantile categories

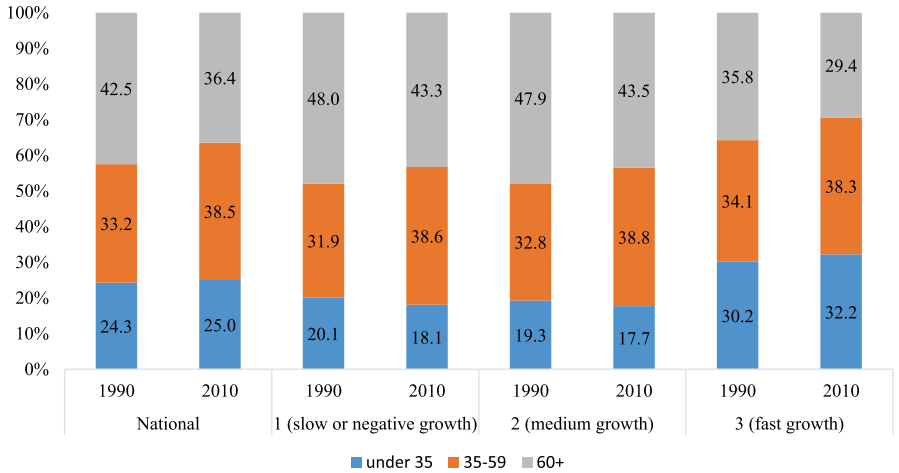

Fig. 3 Changing age composition of those living alone in the provincial population by the pace of growth between 1990 and 2010. Source: Authors' calculation based on census data

2010. Living in OPH at the younger age groups could be driven by education and employment-related migration. Living alone in middle-aged groups could be triggered by union dissolution, while solitary living in old age may be largely due to widowhood. Figure 3 shows the changing prevalence of living alone and its age composition for the Philippines and the quantile groups. At the national level, old-age OPH was the most dominant group (42.5% in 1990), while the young and middle-aged OPH accounted for 24.3% and 33.2%, respectively. In 2010, middle-aged OPH outpaced old-age OPH as the largest group (38.5%), although old-age OPH remained substantial at 36.4%. For the fastest-growing group, the growth in OPH was fuelled mainly by an increase in OPH among both the young and middle-aged groups, whereas only the middle-aged group drove the increase among the slow or negative and medium-growth groups.

Contextual factors associated with the prevalence of OPH in the Philippines

We performed several fixed effects regression analyses at the municipal/city level to examine the contextual factors associated with the spatial and temporal changes in OPH prevalence. Table 5 presents the results of the fixed-effect regression models predicting the changes in municipal/city-level percentages of different types of OPH in the Philippines. The dependent variables were the percentages of various types of OPH (e.g. young OPH, middle-aged OPH, and old-age OPH) in a particular municipality/city from 1990 to 2010. The independent variables were the percentages of different demographic and socioeconomic indicators aggregated at the municipal/city level across the three periods (N = 3810 municipality/city-year).

The regression coefficients indicate the change in the municipal/city level prevalence of OPH associated with a one-percentage-point or percent change in the independent variables, controlling for municipal/city-and time-fixed effects. The

Table 5 Results from the fixed-effect models showing the factors associated with the municipal/city-level population living in OPH in the Philippines, 1990–2010. Source: Authors' calculation based on census data

	% Of all OPH (log)		% Young-OPH (log)		Middle-aged-OPH (log)		% Of old-OPH (log)	
	Coefficient	*p*	Coefficient	*p*	Coefficient	*p*	Coefficient	*p*
% Of older people (aged 60 and over)	0.183	< 0.001	0.219	< 0.001	0.150	< 0.001	0.288	< 0.001
% Of never-married (aged between 25 and 35)	− 0.011	0.038	− 0.010	0.260	− 0.016	0.007	− 0.019	< 0.001
% Of divorced/separated among ever in union excluding widowed (aged 25 and over) (log)	0.117	0.004	0.261	0.005	0.222	< 0.001	0.016	0.707
% Of internal migrants (aged 15 and over) (log)	0.012	0.431	0.059	0.021	0.045	0.018	− 0.022	0.147
% Of households living in owner-occupied housing units (log)	− 0.472	0.088	− 0.914	0.015	− 0.693	0.021	− 0.111	0.680
Population density (log)	0.207	0.059	0.385	0.179	0.493	0.051	0.646	0.001
% With at least secondary education (aged 18 and over)	− 0.005	0.385	0.030	0.001	0.000	0.941	− 0.011	0.029
% Of overseas Filipinos (aged 20 and over) (log)	− 0.007	0.617	− 0.025	0.468	− 0.005	0.837	0.038	0.061
% With disability (aged 40 and over) (log)	0.024	0.613	− 0.062	0.313	0.069	0.168	0.015	0.711
% Of indigenous people (ethnic minority) (log)	0.004	0.630	− 0.004	0.816	− 0.012	0.287	− 0.001	0.843
Time (ref = 1990)								
2000	0.173	0.028	0.020	0.878	0.215	0.037	0.155	0.037
2010	0.413	0.014	− 0.102	0.678	0.484	0.019	0.275	0.059

Robust standard error was used in the estimation. Most of the variables were log-transformed since their distribution was highly skewed. Since log-transformation ignores zero values, a constant of 0.001 was added to each variable before they were log-transformed. The same was done to other variables with normal distribution for consistency

regression models show that several demographic and socioeconomic indicators were associated with the changing prevalence of OPH between 1990 and 2010. For example, an increase in the proportion of older people was associated with an increase in the overall prevalence of OPH. In addition, union formation and dissolution patterns were also associated with overall OPH prevalence. Specifically, delayed marriage, measured in terms of the proportion never married among those aged 25 to 35 years, was related to a reduction in OPH, while union dissolution was associated with an increase in OPH.

The relationship between these contextual factors with the different types of OPH is also presented in Table 5. While the pattern in the association of the contextual factors with each type of OPH did not completely deviate from the pattern observed in the overall OPH, some associations are worth highlighting. For example, the influence of internal migration and union dissolution was present only in the young and middle-aged OPH because these events are more common during these life course stages. Meanwhile, education was significantly associated with young and old-age OPH, but the direction of the relationship was different; it was positively associated with young OPH but negatively associated with old-age OPH.

The joint effect of individual and contextual factors on the propensity to live in OPH

We conducted two-level random-effects logistic regression models to examine the association between living in OPH and individual-level and contextual factors. The first model contains only individual-level variables, while the second model adds the contextual-level variables. To assess whether the relationship between the explanatory factors and the propensity to live alone differs across the life course, we stratified the analyses by three broad age groups (15–34, 35–59, and 60 +). Given the sex differences in the propensity to live alone (Dommaraju, 2015), separate analyses for males and females were also conducted. The results of the random-effects regression models are reported in Tables 6 and 7 for the male and female subsamples, respectively. Table 6 shows that all individual-level factors were associated with solo living among Filipino men. Specifically, age was positively associated with living alone. For example, Filipino men aged 35–59 and 60 years and over were nearly nine times and fourteen times more likely to live alone, respectively, compared to those under 35 years. The higher likelihood of living alone among the older age groups could be due to non-marriage, marital dissolution, or widowhood. This was borne out in the analysis as being unmarried, i.e. never married or formerly married, was also associated with a higher propensity for solo living. In terms of education, those with primary and secondary education had a lower risk of living alone than those with below primary education. The higher likelihood of those with lower education to live alone could be related to poverty. Our analysis of the 2010 Philippine census microdata indicated that a relatively high proportion of men with below primary education who lived alone stayed in housing unit that needed major repair or was dilapidated. However, it is worth noting that compared to those with below primary education, those with at least a college education had higher odds of living

Table 6 Results from random-effects logistic regression models showing the individual and contextual factors associated with living alone among adult Filipino men. Source: Authors' calculation based primarily on census data

Independent variables	Model 1		Model 2		Model 2a (15–34)		Model 2b (35–59)		Model 2c (60+)	
	Odds ratio	*p*	Odds ratio	*p*	Odds ratio	*p*	Odds ratio	*p*	Odds ratio	*p*
Individual-level factors										
Age group (ref = 15–34)					1.198	< 0.001	1.048	< 0.001	0.986	< 0.001
35–39	8.647	< 0.001	8.626	< 0.001						
60+	14.200	< 0.001	14.128	< 0.001						
Marital status (ref = currently married/cohabiting)										
Never married	22.131	< 0.001	22.078	< 0.001	17.153	< 0.001	33.488	< 0.001	35.763	< 0.001
Divorced/widowed/separated	25.868	< 0.001	25.848	< 0.001	31.420	< 0.001	27.135	< 0.001	26.246	< 0.001
Level of education (ref = below primary)										
Primary	0.769	< 0.001	0.767	< 0.001	0.872	< 0.001	0.930	< 0.001	0.840	< 0.001
Secondary	0.919	< 0.001	0.916	< 0.001	0.998	0.950	1.022	0.233	0.889	< 0.001
College or higher	1.081	< 0.001	1.076	< 0.001	0.897	< 0.001	1.050	0.034	0.959	0.237
With functional difficulty (ref = otherwise)	1.034	0.039	1.034	0.042	0.898	0.113	0.945	0.035	1.034	0.138
Internal migrant (ref = non-migrant)	3.352	< 0.001	3.331	< 0.001	4.529	< 0.001	2.389	< 0.001	1.122	0.101
Overseas Filipino worker (ref = otherwise)	0.341	< 0.001	0.341	< 0.001	0.287	< 0.001	0.321	< 0.001	0.610	0.018
Indigenous people (ref = otherwise)	0.842	< 0.001	0.887	< 0.001	0.965	0.297	0.910	0.003	0.936	0.149
Contextual factors										
% Of older people (60 and over)			1.134	< 0.001	1.075	< 0.001	1.091	< 0.001	1.095	< 0.001
% Of never-married (aged between 25 and 35)			0.986	< 0.001	0.984	< 0.001	0.986	< 0.001	0.982	< 0.001
% Of divorced/separated among ever in union excluding widowed (aged 25 and over)			0.998	0.924	1.032	0.219	0.986	0.400	0.995	0.807
% Of urban population			1.004	< 0.001	1.006	< 0.001	1.002	< 0.001	0.998	0.008

Table 6 (continued)

Independent variables	Model 1		Model 2		Model 2a (15–34)		Model 2b (35–59)		Model 2c (60+)	
	Odds ratio	*p*	Odds ratio	*p*	Odds ratio	*p*	Odds ratio	*p*	Odds ratio	*p*
% Of internal migrants (aged 15 and over)			1.038	< 0.001	1.039	< 0.001	1.034	< 0.001	1.020	0.002
% Of overseas Filipino workers			0.926	< 0.001	0.903	< 0.001	0.939	< 0.001	0.935	< 0.001
% Of indigenous people (ethnic minority)			1.000	0.833	1.001	0.261	1.001	0.183	0.998	0.058
Poverty incidence			0.995	< 0.001	0.991	< 0.001	0.996	0.001	1.000	0.965
% With functional difficulty (15 and over)			1.003	0.693	0.999	0.942	1.004	0.528	1.009	0.239

Estimations are based on unweighted data

Table 7 Results from random-effects logistic regression models showing the individual and contextual factors associated with living alone among adult Filipino women. Source: Authors' calculation based primarily on census data

Independent variables	Model 1		Model 2		Model 2a (15–34)		Model 2b (35–59)		Model 2c (60+)	
	Odds ratio	*p*	Odds ratio	*p*	Odds ratio	*p*	Odds ratio	*p*	Odds ratio	*p*
Individual-level factors										
Age group (ref = 15–34)					1.174	< 0.001	1.054	< 0.001	1.004	< 0.001
35–39	6.639	< 0.001	6.616	< 0.001						
60 +	17.655	< 0.001	17.512	< 0.001						
Marital status (ref = currently married/cohabiting)										
Never married	28.026	< 0.001	27.978	< 0.001	29.463	< 0.001	45.847	< 0.001	22.245	< 0.001
Divorced/widowed/separated	22.409	< 0.001	22.415	< 0.001	17.251	< 0.001	23.775	< 0.001	18.010	< 0.001
Level of education (ref = below primary)										
Primary	0.698	< 0.001	0.696	< 0.001	0.886	0.111	0.924	0.005	0.817	< 0.001
Secondary	0.800	< 0.001	0.799	< 0.001	1.654	< 0.001	1.055	0.049	0.833	< 0.001
College or higher	1.054	0.001	1.052	0.001	1.737	< 0.001	1.172	< 0.001	0.886	< 0.001
With functional difficulty (ref = otherwise)	1.177	< 0.001	1.176	< 0.001	1.104	0.317	1.121	< 0.001	1.128	< 0.001
Internal migrant (ref = non-migrant)	2.467	< 0.001	2.458	< 0.001	4.390	< 0.001	1.428	< 0.001	0.724	< 0.001
Overseas Filipino worker (ref = otherwise)	0.432	< 0.001	0.433	< 0.001	0.293	< 0.001	0.452	<0.001	0.656	0.024
Indigenous people (ref = otherwise)	0.827	< 0.001	0.900	< 0.001	0.871	0.014	1.070	0.129	0.917	0.015
Contextual factors										
% Of older people (60 and over)			1.143	< 0.001	1.061	0.011	1.098	< 0.001	1.110	< 0.001
% Of never-married (aged between 25 and 35)			0.980	< 0.001	0.993	0.240	0.975	< 0.001	0.978	< 0.001
% Of Divorced/separated among ever in union excluding widowed (aged 25 and over)			0.975	0.135	1.084	0.026	1.016	0.401	0.936	< 0.001
% Of urban population			1.002	< 0.001	1.010	< 0.001	1.003	< 0.001	0.999	0.033
% Of internal migrants (aged 15 and over)			1.018	0.001	1.032	0.002	1.021	< 0.001	1.003	0.607
% Of overseas Filipino workers			0.933	< 0.001	0.904	< 0.001	0.946	< 0.001	0.944	< 0.001

Table 7 (continued)

Independent variables	Model 1		Model 2		Model 2a (15–34)		Model 2b (35–59)		Model 2c (60+)	
	Odds ratio	*p*	Odds ratio	*p*	Odds ratio	*p*	Odds ratio	*p*	Odds ratio	*p*
% Of indigenous people (ethnic minority)			1.000	0.466	1.005	0.002	1.000	0.986	1.000	0.533
Poverty incidence			0.995	< 0.001	0.985	< 0.001	0.997	0.030	1.000	0.711
% With functional difficulty (15 and over)			1.003	0.678	1.016	0.310	1.002	0.800	0.999	0.856

Estimations are based on unweighted data

alone, suggesting that the relationship between living alone and education may be curvilinear when other factors are controlled for. Having at least one functional difficulty was positively associated with solo living among Filipino men.

Moreover, internal migration was positively associated with living alone among Filipino men, while international migration was negatively associated with solo living. Internal migrants in the Philippines tend to rent a small space and live alone, while international migrants usually live with their families when they come home to the Philippines. Those living alone prior to migration may ask their relatives to stay in the migrant's house or rent out the property while the migrant works elsewhere in the Philippines or overseas. Meanwhile, being part of an indigenous community was negatively associated with men's solo living.

When the contextual factors were added in Model 2, the relationship between the individual-level factors and living alone remained largely unchanged. It further shows that some demographic and socioeconomic factors at the municipal/city level were associated with solo living. In particular, a higher proportion of older people, and a greater concentration of internal migrants in the municipality/city increased the odds of living alone among Filipino men. In contrast, a higher concentration of overseas Filipinos in the community and poverty incidence at the municipal/city level were negatively associated with the overall prevalence of OPH, although the poverty effect was very minimal.

There are some similarities and differences in the relationship of the individual-level and contextual factors with living alone when the analysis was stratified by three broad age groups. One of the consistent findings was the positive association of age (except for 60 +) and being unmarried with living alone across each age group. However, some associations were present in one group, but were muted in other age groups. For instance, the association of socioeconomic conditions at the individual and contextual level with the propensity to live alone was evident only among the younger groups. Specifically, being an internal migrant enhanced the propensity for solo living among Filipinos in the young and middle-aged groups. Most young and middle-aged migrants tend to move without their family members; hence it is more convenient for them to live alone. Meanwhile, having a functional difficulty and being an ethnic minority were associated with a lower likelihood of living alone among middle-aged Filipino men. Middle-aged men with functional difficulty were less likely to live alone because they tend to have a spouse or coresident children during this period who can take care of them when they have health problems.

The parallel results for Filipino women are presented in Table 7. The results for Models 1 and 2 were similar to that of Filipino men. There were also some notable differences across age groups. For instance, having a functional difficulty was associated with higher odds of living alone among middle-aged and older Filipino women, while being an ethnic minority was related to lower odds of living alone among the youngest and oldest age groups. One of the reasons for the positive association between having functional difficulty and living alone among older Filipino women and not among older Filipino men could be due to sex differences in life expectancy. Since women live longer than men, they do not have

a surviving spouse who can assist and coreside with them when they experience poor health in old age.

It is worth noting that while higher education was associated with living alone across all age groups, the direction of the relationship differed among the young, middle, and older groups. For example, having a college education enhanced the propensity to live alone among the younger and middle-aged groups, but it reduced the likelihood of solo living among the older age groups. Higher education among young and middle-aged women may signify individualism, economic freedom, and independence (Mutanda & Odimegwu, 2019). Meanwhile, more human capital in old age allows older people to achieve the cultural ideal of living with family members.

Summary and discussion

This paper improves our understanding of the changing household structure in developing countries by focusing on OPH's temporal and spatial patterns in the Philippines. Extending previous research, we investigated OPH's changing prevalence and composition, its temporal and spatial patterns, and the contextual factors associated with this phenomenon. In addition, we showed how demographic, socioeconomic, health and cultural factors were associated with Filipinos' propensity to live alone. We found some patterns similar to other countries, but also others that are distinct to the Philippines. While the rise of individualism and desire for privacy play an essential role in the prevalence of OPH in other developed societies, the pattern in the Philippines was driven mainly by demographic factors and, to some extent, the persistence of the cultural norm of intergenerational coresidence. In the past, Filipinos preferred to be in the company of others, equating being alone to being lonely (Castillo, 1979). Prior research among older Filipinos showed that living alone was associated with higher levels of loneliness (Takagi et al., 2022). Moreover, stigma was associated with living alone, particularly at older ages, because it implies that family members have not fulfilled their filial duty to care for older adults (Natividad & Cruz, 1997).

The increase in OPH in the Philippines was related to socioeconomic development, with the highly urbanized and economically developed areas such as Metro Manila leading the growth of OPH in the country. The rising prevalence of OPH in these highly urbanized areas was driven mainly by the increase of OPH among the young and middle-aged groups. For example, in 2010, a significant proportion of young solo dwellers in cities, particularly Metro Manila, were migrants, were mostly never married, and had a relatively high level of education. Meanwhile, most middle-aged solo-dwellers in Metro Manila in 2010 were also never married, but about a fifth were currently in union, who may have left their family in their place of origin, and around a tenth were divorced or separated. In contrast, most predominantly rural provinces with high poverty incidence, such as areas in the Autonomous Region in Muslim Mindanao, tended to have a slow or negative OPH growth.

Demographic factors, including population aging, union formation, and dissolution, primarily contributed to the changes in OPH prevalence and the propensity

to live alone in the Philippines. Results at the macro level showed that the increasing proportion of older people and the rising levels of union dissolution were associated with an increase in OPH, while marriage delay was related to a decline in OPH. Furthermore, micro-level analyses also showed that older Filipinos and those who were never married, divorced, or separated were more likely to live alone, echoing the findings of previous studies (Dommaraju, 2015; Torabi et al., 2015). The steady increase in the share of older people and the growing incidence of living alone among this group may be a cause of concern not only because living alone is associated with poor well-being (Gierveld et al., 2012; Takagi et al., 2020; Teerawichitchainan et al., 2015), but because formal support system for older people in the Philippines is still underdeveloped. Such a support system is critical in meeting the healthcare needs of older people.

The random-effects logistic regression models showed a negative association between international migration and living alone. This negative association could be due to the household dissolution when its sole member leaves the country and thus is no longer captured in the census. Filipinos working overseas but staying in the country at the time of the census tend to live with their family members and do not live alone since they view their stay in the country as temporary. Some overseas Filipinos who live alone but have permanent housing property may rent out their property or ask their relatives to stay in their house while they are away, reducing the likelihood of OPH formation. Some left-behind family members may also move in with other relatives while their partner is working overseas. Moreover, the random-effects logistic regression models also indicated that internal migration was associated with a greater propensity to live alone among men and women in the Philippines, particularly among the young and middle-aged groups.

The important role of culture in living alone was also observed in the study. Results showed that being an ethnic minority was negatively associated with living alone among middle-aged men, and young and older women. Demographic factors such as a higher prevalence of early marriage and a lower likelihood of internal migration among ethnic minorities may explain their lower propensity to live alone than non-ethnic minorities. Moreover, the postnuptial tradition of living with parents among young couples, and intergenerational coresidence at older ages, may be more prevalent in these indigenous communities. It is also likely that families in these settings rely on farming and fishing as their source of income, and encourage their young family members to stay in the same household to help in the family's livelihood.

Health factors were also associated with the propensity to live alone in the Philippines, but the direction of the relationship differed between men and women, when examined across age groups. Having at least one functional difficulty was negatively associated with living alone among middle-aged men but was positively associated with solo living among middle-aged and older women. Middle-aged men are more likely to have surviving spouse who usually acts as their caregiver; hence they are less likely to live alone. In contrast, women tend to outlive their spouses; thus, they are more likely to live alone even if they suffer from health conditions.

In addition, we found that Filipinos who lived in OPH were not a homogenous group and that the role of different factors on their propensity to live alone varied

across the life course. For example, the influence of college education on living alone, differed across age groups; it was positively associated with living alone among young and middle-aged women but was negatively associated with solo living among older women. This implies that efforts to address the needs of those living alone and understand the consequences of this phenomenon for their well-being should be sensitive to these life course differences.

The socioeconomic development in the country, particularly educational improvement, may have a countervailing impact on OPH. Better socioeconomic conditions among the youth will enable them to pursue individualism and achieve privacy by living alone. In contrast, more resources among the older age groups may translate to a better ability to achieve cultural tradition of coresidence with their children. Moreover, with their older parents' better socioeconomic condition, children may delay leaving the parental home or even go back to living with their parents since it is common for parents to continue supporting their children even after marriage.

The proportion living in OPH in the Philippines has been on the rise and is expected to accelerate in the future due to ongoing demographic changes, such as improvement in life expectancy and increasing union dissolution. This trend occurs in a context that reflects a complex mix of persistence and changes in cultural norms, modernization, and socioeconomic disparities in the Philippines. Thus, this is an opportune time to assess its future impact on housing demands, social relationships, and the provision of formal and informal support, particularly among older adults.

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Declarations

Conflict of interest The authors declare no competing interests.

References

Abalos, J. B. (2011). Living arrangements of the divorced and separated in the Philippines. *Asian Journal of Social Science, 39*(6), 845–863.

Abalos, J. B. (2014). Trends and determinants of age at union of men and women in the Philippines. *Journal of Family Issues, 35*(12), 1624–1641.

Abalos, J. B. (2017). Divorce and separation in the Philippines: Trends and correlates. *Demographic Research, 36*(50), 1515–1548.

Abalos, J. B. (2019). Determinants of health and well-being among older persons in the Philippines [Doctoral thesis, Australian National University]. https://doi.org/10.25911/5d51481642ca0

Abalos, J. B. (2020). Older persons in the Philippines: A demographic, socioeconomic and health profile. *Ageing International, 45*, 230–254. https://doi.org/10.1007/s12126-018-9337-7

Abalos, J. B. (2023). A demographic portrait of the Filipino family: A glimpse from the recent past. In V. L. Gregorio, C. M. Batan, & S. L. Blair (Eds.), *Resilience and familism: The dynamic nature*

of families in the Philippines. Contemporary perspectives in family research (pp. 1–18). Emerald Publishing Limited.
Abejo, S. (1995). *The size, structure and life cycle of family households in the Philippines [Doctoral thesis,* Australian National University]. https://doi.org/10.25911/5d690a1554076
Aghajanian, A., & Thompson, V. (2016). Gender and living arrangements of the elderly in Iran. *Asian Population Studies, 12*(2), 177–186. https://doi.org/10.1080/17441730.2016.1150697
Arce, W. F. (1994). The life cycle of the household and selected characteristics: A search and discussion. *Philippine Sociological Review, 42*(1/4), 119–141.
Bennett, J., & Dixon, M. (2006). *Single person households and social policy: Looking forwards*. Joseph Rowntree Foundation.
Bongaarts, J. (2001). Household size and composition in the developing world in the 1990s. *Population Studies, 55*(3), 263–279. https://doi.org/10.1080/00324720127697
Bongaarts, J., & Zimmer, Z. (2002). Living arrangements of older adults in the developing world: An analysis of demographic and health survey household surveys. *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences, 57B*(3), S145–S157.
Burch, T. K., & Matthews, B. J. (1987). Household formation in developed societies. *Population and Development Review, 13*(3), 495–511.
Burr, J. A., & Mutchler, J. E. (2007). Residential independence among older persons: Community and individual factors. *Population Research and Policy Review, 26*, 85–101.
Castillo, G. (1979). *Beyond Manila: Philippine rural problems in perspective*. International Development Research Centre.
Chant, S. (1997). Marginal (M)Others: Lone parents and female household headship in the Philippines. *The European Journal of Development Research, 9*(2), 1–34.
Chao, R., & Tseng, V. (2002). Parenting of Asians. In M. Bornstein (Ed.), *Handbook of parenting. Vol. 4: Social conditions and applied parenting* (pp. 59–93). Erlbaum.
Cheung, A.K.-L., & Yeung, W.-J.J. (2015). Temporal-spatial patterns of one-person households in China, 1982–2005. *Demographic Research, 32*(44), 1209–1238.
Cheung, A.K.-L., & Yeung, W.-J.J. (2021). Socioeconomic development and young adults' propensity of living in one-person households: Compositional and contextual effects. *Demographic Research, 44*(11), 277–306.
Dommaraju, P. (2015). One-person households in India. *Demographic Research, 32*(45), 1239–1266.
Esteve, A., Reher, D. S., Treviño, R., Zueras, P., & Turu, A. (2020). Living alone over the life course: Cross-national variations on an emerging issue. *Population and Development Review, 46*(1), 169–189.
Fu, X., & Heaton, T. B. (1995). A cross-national analysis of family and household structure. *International Journal of Sociology of the Family, 25*(2), 1–32.
Gaymu, J., Delbès, C., Springer, S., Binet, A., Désesquelles, A., Kalogirou, S., & Ziegler, U. (2006). Determinants of the living arrangements of older people in Europe Déterminants des modes de vie des personnes âgées en Europe. *European Journal of Population/Revue Européenne de Démographie, 22*(3), 241–262.
Gierveld, J., Dykstra, P. A., & Schenk, N. (2012). Living arrangements, intergenerational support types and older adult loneliness in Eastern and Western Europe. *Demographic Research, 27*(7), 167–200.
Gu, D., Feng, Q., & Yeung, W.-J.J. (2019). Reciprocal dynamics of solo-living and health among older adults in contemporary China. *The Journals of Gerontology: Series B, 74*(8), 1441–1452.
Guilmoto, C. Z., & De Loenzien, M. (2015). Emerging, transitory or residual? One-person households in Vietnam. *Demographic Research, 32*(42), 1147–1176.
Gultiano, S., & Xenos, P. (2006). Age structure and urban migration of youth in the Philippines. In D. I. Pool, L. R. Wong, & E. Vilquin (Eds.), *Age-structural transitions: Challenges for development* (pp. 225–256). Committee for International Cooperation in National Research in Demography.
Hall, R., & Ogden, P. E. (2003). The rise of living alone in Inner London: Trends among the population of working age. *Environment and Planning A, 35*(5), 871–888.
Jiang, L., & O'Neill, B. C. (2007). Impacts of demographic trends on US household size and structure. *Population and Development Review, 33*(3), 567–591.
Klinenberg, E. (2012). *Going solo: The extraordinary rise and surprising appeal of living alone*. The Penguin Press.
Kramarow, E. A. (1995). The elderly who live alone in the United States: Historical perspectives on household change. *Demography, 32*(3), 335–352.

Laguna, E. (2013). *Intergenerational exchange of support and international migration in the Philippines*. [Doctoral thesis, University of Bremen].

Li, T., Fan, W., & Song, J. (2020). The household structure transition in China: 1982–2015. *Demography, 57*(4), 1369–1391.

Liu, J., Wang, J., Beaujot, R., & Ravanera, Z. (2020). Determinants of adults' solo living in Canada: A longitudinal perspective. *Journal of Population Research, 37*, 53–71.

Lynch, F. (1973). Social acceptance reconsidered. In F. Lynch & A. de Guzman (Eds.), *Four readings on Philippine values (pp.1–68).* Manila University Press.

May, R. (2003). Ethnicity in the Philippines. In C. Mackerras (Ed.), *Ethnicity in Asia* (pp. 136–156). Routledge.

McGarry, K., & Schoeni, R. F. (2000). Social security, economic growth, and the rise in elderly widows' independence in the twentieth century. *Demography, 37*(2), 221–236.

Medina, B. (1991). *The Filipino family, a text with selected readings*. University of the Philippines Press.

Medina, B. (2015). *The Filipino family* (3rd ed.). University of the Philippines Press.

Minnesota Population Center. (2020). Integrated Public Use Microdata Series, International: Version 7.3. https://doi.org/10.18128/D020.V7.3.

Mudrazija, S., Angel, J. L., Cipin, I., & Smolic, S. (2020). Living alone in the United States and Europe: The impact of public support on the independence of older adults. *Research on Aging, 42*(5–6), 150–162.

Mutanda, N., & Odimegwu, C. O. (2019). Solitary living in South Africa: What is driving the pattern and change? *Journal of Population Research, 36*, 137–158.

National Statistics Office [NSO]. (2010). *The 2010 census of population and housing (CPH) enumerator's manual*. NSO.

Natividad, J., & Cruz, G. T. (1997). Patterns in living arrangements and familial support for the elderly in the Philippines. *Asia-Pacific Population Journal, 12*(4), 17–34.

Nogra, M.F.D. (1998). Ethnicity and Fertility: The Philippine Case. [Master's thesis, University of the Philippines Population Institute].

Ogden, P. E., & Hall, R. (2004). The second demographic transition, new household forms and the urban population of France during the 1990s. *Transactions of the Institute of British Geographers, 29*(1), 88–105.

Ogden, P. E., & Schnoebelen, F. (2005). The rise of the small household: Demographic change and household structure in Paris. *Population, Space and Place, 11*(4), 251–268.

Ogena, N. (2015). Internal migration and development in the Philippines. Paper presented at the 2015 Internal Migration Summit: on 25 June 2015. "Filipino on the Move", Century Park Hotel. Metro Manila.

Podhisita, C., & Xenos, P. (2015). Living alone in South and Southeast Asia: An analysis of census data. *Demographic Research, 32*(41), 1113–1146.

Quisumbing, A. R., & McNiven, S. (2006). Migration and the rural-urban continuum: Evidence from Bukidnon, Philippines. *Philippine Journal of Development, 33*(1–2), 1–43.

Raymo, J. M. (2015). Living alone in Japan: Relationships with happiness and health. *Demographic Research, 32*(46), 1267–1298.

Reher, D., & Requena, M. (2018). Living alone in later life: A global perspective. *Population and Development Review, 44*(3), 427–454.

Reher, D., & Requena, M. (2020). Long-term trends in living alone in later life in the United States, 1850–2015. *The History of the Family, 25*(3), 455–483. https://doi.org/10.1080/1081602X.2019.1696217

Reynolds, H. R. (1962). The Filipino family in its cultural setting. *Practical Anthropology, 9*(5), 223–234.

Ronald, R. (2017). The remarkable rise and particular context of younger one-person households in Seoul and Tokyo. *City & Community, 16*(1), 25–46.

Roux, D. J., & Geyer, H. S. (2017). Demographic transitions in South African cities: An analysis of household structures in the City of Tshwane. *Regional Science Policy & Practice, 9*(3), 165–181.

Ruggles, S. (2012). The future of historical family demography. *Annual Review of Sociology, 38*, 423–441.

Stinner, W. F. (1977). Urbanization and household structure in the Philippines. *Journal of Marriage and Family, 39*(2), 377–385.

Stinner, W. F. (1982). Modernization and household size and structure in the urban and rural Philippines. *Journal of Southeast Asian Studies, 13*(1), 120–132.

Takagi, E., Cruz, G. T., & Saito, Y. (2022). Older adults' loneliness and social relationships in the Philippines: Comparison between rural and urban contexts. *Asia Pacific Journal of Public Health, 34*(6–7), 662–666.

Takagi, E., Saito, Y., & Chan, A. (2020). Gender differences in the association between social relationships and loneliness among older adults in Singapore. *Journal of Population Research, 37*, 243–263.

Teerawichitchainan, B., Knodel, J., & Pothisiri, W. (2015). What does living alone really mean for older persons? A comparative study of Myanmar, Vietnam, and Thailand. *Demographic Research, 32*(48), 1329–1360.

Tingga, F. (2015). Stock estimate of Filipinos overseas. Paper presented at the Experts Group Meeting "Strengthening the demographic evidence base for the post-2015 development agenda", on 5–6 October 2015. United Nations Headquarters, New York.

Torabi, F., Abbasi-Shavazi, M. J., & Askari-Nodoushan, A. (2015). Trends in and patterns of solo living in Iran: An exploratory analysis. *Journal of Population Research, 32*, 243–261.

United Nations, Department of Economic and Social Affairs, Population Division. (2017). Living Arrangements of Older Persons: A Report on an Expanded International Dataset. New York.

United Nations, Department of Economic and Social Affairs, Population Division. (2022). Database on household size and composition 2022.

United Nations Economic Commission for Europe. (2023). Private households by household type, measurement, country and year. https://w3.unece.org/PXWeb2015/pxweb/en/STAT/STAT__30-GE__02-Families_households/08_en_GEFHPrivHouse_r.px/table/tableViewLayout1/. Accessed on 14 Apr 2023.

Wandera, S. O., Ddumba, I., Akinyemi, J. O., Adedini, S. A., & Odimegwu, C. (2017). Living alone among older persons in Uganda: Prevalence and associated factors. *Ageing International, 42*, 429–446.

Wolf, D. A. (1995). Changes in the living arrangements of older women: An international study. *The Gerontologist, 35*(6), 724–731.

Yeh, S.-C.J., & Lo, S. K. (2002). Living alone, social support, and feeling lonely among the elderly. *Social Behavior and Personality, 32*(2), 129–138.

Yeung, W.-J.J., & Cheung, A.K.-L. (2015). Living alone: One-person households in Asia. *Demographic Research, 32*(40), 1099–1112.