Older Adults' Descendants and Family Networks in the Context of Global Educational Expansion

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Family networks are key to understanding the well-being of older adults because kin provide instrumental and financial support, help manage health and disability, and encourage social integration. Two momentous societal changes have shaped the families of contemporary older adults: the first and second demographic transitions and global educational expansion. The intersection of these two processes raises questions about how older adults are faring in terms of their kin availability. This paper examines the socioeconomic bifurcation of adults in midlife and beyond in terms of the existence of descendants and other kin. Disparities in kin availability may vary across socioeconomic status and contexts, and so we examine this phenomenon worldwide, analyzing data on two thirds of the world's population of adults aged 50 and above. Our results highlight different kin structures by socioeconomic status. High socioeconomic status adults have fewer descendants but a higher likelihood of having at least one child with tertiary education, a partner, and living parents. Low socioeconomic status older adults have larger families with more younger kin. Our results shed new light on potential mismatches between the contemporary family networks of older adults and longstanding social norms and assumptions about caregiving, family, and health policies.

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Background

The family networks of midlife and older adults are key social determinants of health. Even though most intergenerational transfers are downward, from parents to children (Lee and Mason 2011), the kin of older adults is a network of potential caregivers for instrumental and financial support, especially useful resources for individuals as they age into late adulthood (Furstenberg 2020; Kasper et al. 2015). In many countries, starting around age 70, the general pattern of downward intergenerational transfers reverses and adults begin to receive more in private transfers than they provide (d'Albis and Moosa 2015; Lee and Mason 2011). The assistance of family is vital for many older adults managing health and disability needs, providing help with travel to appointments, communicating with doctors, and managing chronic illnesses (McGarry 1998; Silverstein et al. 2002). Family members are also key conduits of social integration in these age ranges. Although younger populations tend to have affiliation networks dominated by friends, older populations' networks are far more family-based (Antonucci and Akiyama 1987; Ajrouch et al. 2005; Cornwell, Laumann, and Schumm 2008; Marsden 1987; McPherson, Smith-Lovin, and Brashears 2006). Family members provide a network of longstanding social relationships, often co-reside, and provide a context for regular social interaction with younger generations through grandparenting (Carr and Utz 2020). Ties to children and other younger kin are critical for many older adults whose same-age or older friends and family members may have passed away or become incapacitated, leaving children as the most reliable sources of support, caregiving, and social contact (Cornwell, Laumann, and Schumm 2008; Fuller, Ajrouch, and Antonucci 2020; Van Tilburg 1998). Numerous theories posit that daughters, and especially biological daughters, may be the most significant sources of caregiving and contact (Spitze and Logan 1990). These patterns are further exacerbated by known dimensions of stratification, with evidence suggesting that family ties are especially important among the less educated (Marsden 1987; McPherson et al. 2006; Verdery and Campbell 2019), and that older adults with educated children tend to live substantially longer as such children are better suited to assist in navigating complex diseases (Friedman and Mare 2014; Peng et al. 2019). Education is also strongly correlated with proximity to family (Daw, Verdery, and Patterson 2019; Kalmijn 2006; Reyes, Schoeni, and Choi 2020), as many move to pursue educational opportunities or occupations that educational attainment enables (Horowitz and Entwisle 2021). As such, there is a great need to better understand the family ties available to older adults, especially the availability of children, and how this availability is stratified.

The need for knowledge about older adults' family availability is especially critical when viewed in a cross-national context. Around the world, contemporary midlife and older adults have lived through two of the world's most rapid and significant changes—changes that can be expected to directly affect the size and composition of their family networks. These changes have not occurred simultaneously in all countries, leaving room for substantial variation. The first is the set of profound demographic changes associated with the first and second demographic transitions. The accompanying shift from high to low mortality and fertility has rearranged the availability of intra- and extra-household primary family members among contemporary cohorts of those over 50 years old (Murphy 2011; Verdery 2015). In societies that have long since transitioned to low mortality and fertility, older individuals have fewer children and grandchildren. In societies with more recent transitions, these changes are less certain and depend on the timing of the transitions relative to the birth cohorts of adults currently in midlife and older. The shifts can be sharp and sudden (Verdery 2019), with recent work reporting that in rapid demographic transitions, a 65-year-old may have as many as 20 percent fewer kin than a 70-year-old (Jiang et al. 2023). It is unclear how such changes might affect other kin relations for those over 50; lower marriage and higher divorce rates would imply fewer living partners, but increased remarriage and survivorship would suggest the possibility of increasing numbers of older adults living in partnership (Murphy 2011). The social and demographic changes associated with the gender revolution and second demographic transition further complicate these expectations. In addition to the postponement of marriage and parenthood, higher rates of non-marriage, the expansion of parenthood outside marriage, and increased cohabitation and divorce might, in some contexts, increase the availability of nontraditional primary family members like stepchildren (Goldscheider, Bernhardt, and Lappegard 2015; Lesthaeghe 2010). In all, because these demographic changes have played out differently across world regions (Zaidi and Morgan 2017), how they affect older adults' families across countries today remains unknown.

The second change that older adults today have experienced is global educational expansion. Primary and secondary school completion have increased rapidly, even in poor countries (Lutz et al. 2007). Universities have proliferated around the world, and in both rich and poor countries, student enrollments have risen and diversified (Frank and Meyer 2007). A particularly notable element of the expansion is the rapid rise in women's education (Kc et al. 2010). In this context, contemporary older adults are more educated than the generations before them, and their children's generation has even greater educational attainment—trends even more notable when looking at women and their mothers and daughters. Like the first and second demographic transitions, the global educational expansion has also

had an impact on the demography of families. In most contexts, higher educational attainment is associated with the probability of and timing of marriage as well as the number of children and timing of childbearing (Bledsoe et al. 1999; Jejeebhoy 1995). We also know that education transmits across generations, but that family structure moderates this process, resulting in the children of educated single mothers being less likely to attain high education than the children of educated married mothers (Martin 2012). This may leave some older adults with few or no primary kin to provide instrumental and financial support in later life. Or it may be that more educated older adults have fewer primary kin, but those family members have high levels of education, and therefore are in better health themselves, have better access to high-quality health information, and have greater resources to provide to parents (Friedman and Mare 2014). If less educated older adults have fewer primary kin, or highly educated kin, they may have few social and economic resources to rely on when confronting health or housing challenges. Educational expansion is also positively associated with economic well-being and health (Hannum and Buchmann 2005), contributing to lower mortality and extended life expectancy. Because of the education/mortality relationship, highly educated older adults may be more likely to have a living partner in late life to provide care and social support as well as siblings and parents.

The intersection of these two processes—revolutionary demographic change and global educational expansion—raises questions about how older adults are faring in terms of their kin availability. In this paper, we examine socioeconomic differences among older adults' availability of descendants and other kin. How kin availability varies by educational attainment may differ across contexts, and so we examine this phenomenon throughout the world, analyzing data on two thirds of the world's population of older adults. Our analysis unfolds in three parts. First, we examine differences by education in marital status and the existence of descendants in midlife and late adulthood. We estimate to what extent those lacking descendants are primarily those who never married. Second, we examine differences by older individuals' socioeconomic status (SES) in the existence of various types of potentially important kin. We first consider socioeconomic differences in having children, and specific characteristics of children that may be associated with the likelihood of receiving care from children: sons versus daughters, biological versus non-biological children, the educational attainment of children themselves, and living arrangements, including living alone and living with children. Then we examine differences by older adults' SES in having grandchildren and the number of grandchildren. The third and final part of our analysis examines whether high SES older individuals' greater likelihood of having the same generation and older kin may compensate for their having fewer descendants. We discuss the implications

of these inequalities in kin structures of older adults and what this means for the future of caregiving, social integration, and population health.

The importance of kin for older adult well-being

There are three important ways in which kin, and younger kin in particular, are beneficial for late-life well-being: caregiving, helping to manage health and disability, and social integration. For each of these, the implications of having a small family network in older age, depend in part on whether those lacking key kin are socioeconomically advantaged or disadvantaged. These connections between families, older adults' resources, and these three aspects of the social context of aging are important for thinking about the limitations and opportunities of health and social policies around the world.

The first is that kin are a *network of potential caregivers* (Freedman and Wolff 2020). A partner is often the primary source of support in older adulthood, but younger kin are key if one's partner is not in good health, or if one is unpartnered, a large and growing subgroup of older adults (Kasper et al. 2015). In addition to instrumental support, in many contexts, kin are the primary providers of financial assistance in later life. This is especially true in places without formal public pension plans. For example, in China, which currently is home to one quarter of the world's older adults, pension systems are incomplete, and most older adults rely on children, especially sons, for support (Zhou, Verdery, and Margolis 2019). Those with small families may be particularly disadvantaged in terms of lacking instrumental or financial support, and the relative importance of these factors may vary. Again here, the implications of lacking kin for older adults may differ by SES as those with more resources may be able to pay for caregiving.

The second way that kin can affect late-life well-being is by helping to *manage health and disability needs*. Kin helps older adults with various health-related tasks like medical logistics, communication with health professionals, and the management of conditions (McGarry 1998). Because there are so many ways in which older adults receive support when experiencing late-life health issues, it may not be surprising that adults with smaller family networks are at higher risk for poorer physical health and mortality (Berkman et al. 2000; Patterson, Margolis, and Verdery 2020). It may be that educational attainment mitigates the risks of having limited available kin. Older adults with more education and financial resources may be able to better understand medical jargon, better implement complex treatments, or access paid caregivers, while older adults with limited education and few kin may be at heightened risk of poorer health trajectories and higher mortality (Goldman 2001). These patterns may, however, depend on the prevailing mortality context of the society as well as the complexity of its healthcare system. In places with lower survivorship or that have healthcare systems that reduce mortality disparities, education, kin availability, and the

availability of educated children may be less consequential than those places where people live very long lives or confront complex healthcare systems.

The third way in which kin, and in particular younger kin, are important for later life well-being is *social integration and loneliness*. Family members comprise the vast majority of older adults' conversation networks (McPherson et al. 2006) and social networks (Stoeckel and Litwin 2013). In Europe, for example, the social networks of older adults are largely based on family. Almost two thirds (62 percent) of respondents with one or more confidants had a social network comprised *only* of family members (including spouse/partner, children, or extended family) (Stoeckel and Litwin 2013). Another 23 percent of respondents had a network where family comprised the majority or nearly the entirety of the network (59–99 percent). Only 8 percent had no family members in their network (rather based on friends, neighbors, colleagues, and formal helpers (Stoeckel and Litwin 2013). Older adults report high levels of emotional closeness with members of their social networks (Stoeckel and Litwin 2013), and this network itself constitutes an important aspect of healthy aging (Cornwell and Waite 2009). The flip side of this is that older adults without kin often report higher rates of loneliness than those enmeshed in the family. Unmarried older adults and those with smaller kin networks are more likely to report loneliness than those who are married or those with bigger families across many countries (Dykstra and Fokkema 2007; Fokkema, De Jong Gierveld, and Dykstra 2012; Margolis et al., 2022). This may be due to the fact that those without primary kin are more likely to live alone all around the world (Verdery et al. 2019), and living alone is a key predictor of loneliness (de Jong Gierveld, Dykstra, and Schenk 2012). Another key determinant of older adults' contact frequency with their adult children is the existence of grandchildren (Daw, Verdery, and Patterson 2019). Grandparenthood and caregiving for young grandchildren may reduce loneliness (Quirke, König, and Hajek 2019) and provide important emotional meaning and support (Silverstein and Long 1998). The association between social integration and access to kin may differ by educational attainment. In the United States, older adults with tertiary education tend to have discussion networks that are composed more of nonfamily members than family members, while we see networks dominated by kin for those with less education (McPherson et al. 2006).

Socioeconomic inequality in existence of living descendants in older age

How does the existence of living descendants vary by educational attainment in older age? The answer to this question depends on educational differences in the risks of marriage, divorce, widowhood, and childbearing, some of which may be countervailing. Across contexts, these patterns vary substantially. We know that older adults without a spouse or children are

not socioeconomically disadvantaged across all contexts (Verdery et al. 2019; Margolis and Verdery 2017). However, there is no cross-national research that addresses different types of key kin availability and how this varies by the SES of older adults.

Existence of living biological and non-biological children

Marriage and childbearing together comprise the clear path to having descendants. In some contexts, older adults today came of age during a time when non-marriage (Raymo et al. 2015) and childlessness (Kreyenfeld and Konietzka 2017) became more prevalent than in preceding generations, while in other contexts, today's older adults had almost universal marriage and the lowest rates of childlessness ever recorded. In some countries, these two things are tied together, where those who do not marry also do not have children (e.g., China, Japan, South Korea; Jones 2007; Raymo et al. 2015), but in other places these phenomena have been recently decoupled with the rise of nonmarital childbearing (e.g., United States; Gibson-Davis, Edin, and McLanahan 2005; Hayford, Benjamin Guzzo, and Smock 2014), and in still others (e.g., South Africa and Costa Rica), they have long been decoupled. The extent to which older adults lacking descendants are also never married may vary considerably across countries depending on the social norms around childbearing. Our analysis will examine how the cumulating processes of historical marriage and childbearing shape the existence of descendants overall, and biological children specifically, in older ages across countries.

The likelihood of having non-biological children in older adulthood may be due to adoption or fostering, or it may be shaped in part by one's marital history, in particular the experience of divorce and re-partnering. Increasing family complexity is very well documented in some countries like the United States where more older adults today have complex marital histories, and more stepchildren and step-grandchildren than previous generations (Seltzer 2019). However, the extent to which the increasing complexity of older adult kin networks is mirrored in countries outside the United States is not well understood. One factor that shapes the size and complexity of late-life kin constellations is the association between education and divorce. In many countries, the least educated have the highest risks of divorce, for example, since the 1950s in the United States (Teachman 2002; Raley and Sweeney 2020), Taiwan (Cheng 2016), Britain (Boertien and Harkonen 2018), Japan (Raymo, Fukuda, and Iwsawa 2013), Norway (Lyngstad 2004), Korea (H. Park and Raymo 2013), and Israel (Kaplan and Herbst 2015). However, in other countries, we see the opposite, with a positive relationship between education and divorce (e.g., France, Spain, Greece, Italy, and Poland), and still, in others there is no

relationship (e.g., Latvia, Estonia, Hungary, Finland, Sweden, Switzerland; Harkonen and Dronkers 2006).

Demographers have long noted that norms and expectations for care are less clear with stepchildren than with biological children. This may be because the relationships are not as strong, because of competing obligations between the adult child's biological parents and stepparents, or because the stepparent may no longer be married to the adult child's biological parent (Cherlin 1978; Coleman et al. 2005; Ganong and Coleman 1998; Seltzer 2019). A large literature in the United States documents that older adults are much more likely to receive intergenerational transfers from adult children if the children are biological children rather than stepchildren (Patterson et al. 2022; Wiemers et al. 2019), and that marital disruption and remarriage can harm adult children's relationships with parents, especially fathers (Pezzin and Schone 1999). However, the United States is an outlier in its high rates of divorce and remarriage and therefore may also be an outlier regarding the presence of stepchildren. It is unknown how common it is for older adults outside of the United States to have non-biological children. Documenting the prevalence of non-biological children globally is important for understanding current and future transfers.

Existence of living daughters and sons

In many contexts around the world, instrumental or financial support to parents from adult children is highly gendered, making access either to sons or daughters an important predictor of late-life well-being. In India, East Asia, and North Africa, because sons are the normatively expected key providers of old age support, having at least one son is important (Allendorf 2020; Pandian and Allendorf 2022). However, in some other contexts like the United States, instrumental support to parents is more often done by adult daughters, although the gender gap has been slowly decreasing over time (Wolff et al. 2018). In countries where older adults have many children, the probability of having at least one son and at least one daughter is high. However, as fertility declines, it becomes more likely that many older adults will lack either sons or daughters. Further, as kin availability shifts, traditional gender support roles may change. We have seen this in China where more and more middle-age and older adults have either no sons or no daughters (Pandian and Allendorf 2022; Zhou, Verdery, and Margolis 2019). Despite traditional norms that adult sons provide financial support to parents in China, married daughters have begun to provide more financial support to parents than married sons in urban China (Xie and Zhu 2009). Similarly, another more recent study finds that older adults in China with no spouse and only sons are worse off than those with no spouse and only daughters in terms of financial transfers, and this finding holds in both rural and urban China (Zhou, Verdery, and Margolis 2019). It is likely that norms

about parental care are shifting because of changes in kin availability, with more people without sons and daughters, and due to the rise in unmarried sons because of the "marriage squeeze." However, if traditional expectations remain constant, this suggests impending challenges facing sonless or daughterless families, and especially those without economic resources. Perhaps more educated parents will be early adopters of shifting gender norms around caregiving leading to less disadvantage. Our analysis examines educational attainment differences in the availability of sons and daughters.

Existence of highly educated children and co-resident children

Having a child with secondary or tertiary education has numerous positive associations with adults' health and well-being in older age such as influencing positive health behaviors, the treatment of complex illnesses and management of medications, and even mortality (Friedman and Mare 2014). Given the global variation in the timing of educational expansion, levels of fertility, and levels of intergenerational mobility, the extent to which contemporary older adults have at least one educated child is likely to vary. Moreover, we know that more educated children are more likely to live further away from their parents since they are more likely to move for schooling or work (Daw et al. 2019; Horowitz and Entwisle 2021). This may mean that higher SES older adults are less likely to live near their children and less likely to co-reside with their children. Our analysis examines variation by SES in having one or more highly educated children and having at least one child in the household.

Existence of grandchildren

Grandparenthood can bring emotional benefits (Silverstein and Long 1998) and increased family contact and social support to older adults (Daw, Verdery, and Patterson 2019; Choi, Jun, and Kim 2021). However, there may be interesting socioeconomic differences in older adults' having any grandchildren and the number of grandchildren. First, childless older adults will likely not have any grandchildren, since they do not have any children, but some may have step-grandchildren through marriage. The extent to which childlessness and stepchildren are distributed among those with high and low education in a society will affect those who lack grandchildren. Second, because educational attainment is related to fertility postponement, older adults with high education will likely transition to grandparenthood later in life, due to the compounding of fertility postponement of the older adult themselves and their children (Margolis and Wright 2017; Margolis and Verdery 2019). Third, highly educated older adults are likely to have fewer grandchildren due to having fewer children themselves, their children having fewer children, and the later transition

to grandparenthood. Fourth, in countries with son preference, older adults may transition to grandparenthood later in life since their sons will likely marry at older ages than their prospective daughters would have (men typically marry at older ages than women) or maybe without grandchildren if their sons cannot find a wife, as would be increasingly likely in societies with progressively shrinking birth cohorts (Guilmoto 2012). How these four factors vary across countries is unknown. We examine the variation by SES in the prevalence and number of grandchildren across contexts.

Do same generation kin and older kin compensate for fewer descendants?

Although declines in marriage and fertility lead to reductions in some key kin types, mortality decline increases the survival of many types of kin. For example, contemporary older adults are more likely to have living siblings and parents as well as partners (Uhlenberg 1996; Verdery 2015). Differences in family structure may vary by SES, with high SES individuals having fewer children and grandchildren, but perhaps more likely to have a partner, living siblings, and living parents in older age. To what extent these different kin types might "compensate" for each other is unknown.

A note on the methods of kinship analysis

Studies of kinship networks have tended to rely on formal demographic methods or microsimulation methods since most household surveys only include family members in the household and exclude extra-household kin. These methods allow one to characterize kinship structure based on a set of demographic rates (Caswell 2019; Goodman, Keyfitz, and Pullum 1974; Hammel et al. 1976). These methods for analyzing kin networks have many strengths, but current implementations are unable to tell us about socioeconomic disparities *within* countries, especially when considering the prospect of intergenerational correlations in SES. Another set of tools relies on population-level administrative data to link kin within families over long periods of time. An example of this is using administrative register data for the entire Swedish population to estimate kinship enumeration (Kolk et al. 2023). Administrative data sources reveal great depth and offer linkages with other sorts of government records. However, few populations around the world have these types of data. A third data source is genealogical data (Lussier and Keinan 2018), which have numerous strengths but unclear representativeness, especially outside of wealthy countries. Here, we use available survey data to examine kin availability and disparities in the availability of key kin around the world.

Research Questions

This analysis examines socioeconomic variation in kin availability in midlife and beyond. First, we estimate variation in descendants across countries and examine whether those lacking descendants are primarily those who never married. Second, we examine the existence of children and grandchildren by SES, and four characterizations of descendants that may be important for caregiving: sons versus daughters, biological versus non-biological children, the educational attainment of children, and co-residence with children. Third, do other types of kin (besides descendants) make up for high SES older adults having fewer descendants? We examine whether the fact that high SES individuals may be more likely to have the same generation or older kin may make up for their smaller networks of descendants.

Data

We examine global variation in older adults' descendants and family networks with multiple international studies, allowing us to evaluate and compare countries from diverse regions. We draw on 11 surveys that together cover 39 countries with an estimated 66 percent of the current global population over age 50. Specifically, we use the following surveys: the Brazilian Longitudinal Study of Ageing (ELSI), the Chinese Health and Retirement Longitudinal Survey (CHARLS), Costa Rican Longevity and Healthy Aging Study (CRELES), Longitudinal Ageing Study in India (LASI), Korean Longitudinal Survey of Aging (KLoSA), Mexican Health and Aging Study (MHAS), the Survey of Health, Ageing and Retirement in Europe (SHARE), Health, Aging, and Retirement in Thailand (HART), U.S. Health and Retirement Study (HRS), Japanese Study of Aging and Retirement (JSTAR), and Health and Aging in Africa: A Longitudinal Study in South Africa (HAALSI). Each survey focuses on one country except SHARE, which includes the following countries: Austria, Belgium, Bulgaria, Croatia, Czechia, Cyprus, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Israel, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Poland, Portugal, Romania, Slovenia, Slovakia, Spain, Sweden, and Switzerland.

We selected these surveys because they are "International Sister Studies" of the U.S. Health and Retirement Study (https://hrs.isr.umich.edu/about/international-sister-studies), designed to facilitate cross-national analysis. With survey weights, these data are nationally representative of each corresponding country, except for Thailand and South Africa. All surveys include late middle age and older adults, although the minimum age varies across surveys. We use a consistent age criterion, limiting our analytic sample to respondents aged 50 and above.

Our analysis aims to paint a contemporary portrait of inequality in descendants and family networks of adults aged 50 and above around the

world. To do so, we analyze one wave per survey, which is chosen to aim for (1) the most recent nationally representative wave of the country's age 50+ population, (2) the inclusion of the key measures in the survey wave, and (3) a large sample size. Table 1 presents the name of each survey, countries included, the ISO3 code with which we label each country in the figures, the year of the survey, and the number of respondents from each country in our analytic sample. The total sample size for this analysis is 202,173 respondents.

Survey measures

Respondents' sociodemographic characteristics

We analyze the following demographic characteristics of respondents: age, gender, and marital status (never married; currently married/partnered or previously married, including separated, divorced, and widowed). We also examine differences by SES, which we operationalize by constructing a measure of contextually high education that allows us to examine differences across places in the face of wide cross-national variation in the distribution of educational attainment. We code our measure of contextually high education with the harmonized variable for education across surveys that has the following categories: (a) less than secondary education, (b) secondary education completed or vocational school, and (c) tertiary education or higher. Our coding captures a large enough proportion of the population that the category of high SES is meaningful, and estimates are robust. Contextually high education is coded as "upper secondary completed, vocational school" in the countries with lower levels of education in our sample (i.e., Brazil, China, Costa Rica, India, Italy, Malta, Mexico, Portugal, Republic of Korea, Romania, South Africa, Spain, Thailand). In all other countries, contextually high education is coded as "tertiary education or higher" (see Table 1). This measure of high SES captures the 24 percent of respondents in our sample with high education given the country context.

Respondents' descendants

Respondents' number of descendants is the sum of the self-reported number of living children and grandchildren. Our measure of children is the total number of living children, including the respondents' biological children, stepchildren, and adopted children. Note that the Gateway to Global Aging harmonized data often reports children at the household level, which does not allow one to distinguish whether the children refer to the respondent or spouse. However, we use the core data files to code children at the individual, rather than household level. Note that levels of reported childlessness may be higher in these surveys than found for these cohorts at younger

TABLE 1 Data sets and countries used to examine family networks of older adults around the world

	Country	ISO3 code	Survey	Observations	Year of survey	Percentage of 2020 global age 50+ population	Region	Contextual High Education
1	Austria	AUT	SHARE	3,287	2015	0.20	Western Europe	Tertiary
2	Belgium	BEL	SHARE	5,699	2015	0.24	Western Europe	Tertiary
3	Brazil	BRA	ELSI	9,949	2020	2.88	Americas	Upper secondary
4	Bulgaria	BGR	SHARE	898	2019–2020	0.15	Eastern Europe	Tertiary
5	China	CHN	CHARLS	7,924	2011	25.06	Asia	Upper secondary
6	Costa Rica	CRI	CRELES	2,827	2005	0.07	Americas	Upper secondary
7	Croatia	HRV	SHARE	2,444	2015	0.09	Southern Europe	Tertiary
8	Cyprus	CYP	SHARE	538	2019–2020	0.02	Asia	Tertiary
9	Czechia	CZE	SHARE	4,788	2015	0.22	Eastern Europe	Tertiary
10	Denmark	DNK	SHARE	3,661	2015	0.10	Northern Europe	Tertiary
11	Estonia	EST	SHARE	5,557	2015	0.03	Northern Europe	Tertiary
12	Finland	FIN	SHARE	1,159	2019–2020	0.12	Northern Europe	Tertiary
13	France	FRA	SHARE	3,870	2015	1.39	Western Europe	Tertiary
14	Germany	DEU	SHARE	4,346	2015	1.99	Western Europe	Tertiary
15	Greece	GRC	SHARE	4,811	2015	0.24	Southern Europe	Tertiary
16	Hungary	HUN	SHARE	2,992	2011	0.20	Eastern Europe	Tertiary
17	India	IND	LASI	52,393	2017–2019	14.22	Asia	Upper secondary
18	Ireland	IRL	SHARE	1,007	2007	0.08	Northern Europe	Tertiary
19	Israel	ISR	SHARE	2,013	2015	0.12	Asia	Tertiary
20	Italy	ITA	SHARE	5,205	2015	1.47	Southern Europe	Upper secondary

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TABLE 1 (Continued)

	Country	ISO3 code	Survey	Observations	Year of survey	Percentage of 2020 global age 50+ population	Region	Contextual High Education
21	Japan	JPN	JSTAR	3,741	2007	3.18	Asia	Tertiary
22	Latvia	LVA	SHARE	781	2019–2020	0.04	Northern Europe	Tertiary
23	Lithuania	LTU	SHARE	1,422	2019–2020	0.06	Northern Europe	Tertiary
24	Luxembourg	LUX	SHARE	1,542	2015	0.01	Western Europe	Tertiary
25	Malta	MLT	SHARE	804	2019–2020	0.01	Southern Europe	Upper secondary
26	Mexico	MEX	MHAS	9,575	2001	1.45	Americas	Upper secondary
27	The Netherlands	NLD	SHARE	4,116	2013	0.38	Western Europe	Tertiary
28	Poland	POL	SHARE	2,065	2019–2020	0.76	Eastern Europe	Tertiary
29	Portugal	PRT	SHARE	1,661	2015	0.24	Southern Europe	Upper secondary
30	Romania	ROU	SHARE	1,266	2019–2020	0.40	Eastern Europe	Upper secondary
31	Slovakia	SVK	SHARE	986	2019–2020	0.11	Eastern Europe	Tertiary
32	Slovenia	SLO	SHARE	4,185	2015	0.05	Southern Europe	Tertiary
33	South Africa	ZAF	HAALSI	4,184	2015	0.53	Africa	Upper secondary
34	South Korea	ROK	KLoSA	6,488	2020	1.08	Asia	Upper secondary
35	Spain	ESP	SHARE	5,552	2015	1.03	Southern Europe	Upper secondary
36	Sweden	SWE	SHARE	3,880	2015	0.21	Northern Europe	Tertiary
37	Switzerland	CHE	SHARE	2,772	2015	0.19	Western Europe	Tertiary
38	Thailand	THA	HART	5,092	2015	1.28	Asia	Upper secondary
39	United States	USA	HRS	16,693	2019	6.26	Americas	Tertiary
	Total			202,173		66.14		

ages (Murphy 2009) and in some surveys like SHARE, biases may be larger among men than women (Schröder 2011). Grandchildren are measured as the respondents' total number of living grandchildren.

Characteristics of descendants

We measure respondents' access to four types of potentially important living kin in older adulthood. First, we measure whether respondents have any sons and any daughters. The second is whether the respondent has any biological children and any non-biological children. These data are self-reported on all surveys, and non-biological children include both adopted children and stepchildren. As with all cross-national research, there may be cross-cultural differences in the types of relationships that constitute adopted or stepchildren (e.g., whether one might enumerate a stepchild from a prior marriage). We know of no way to adjust for this other than careful questionnaire design (the Supporting Information contains data acknowledgments that point to questionnaires for each survey we use). The third is the educational attainment of children. Most surveys include information on the level of education of children, and we examine two separate measures of children's education—whether respondents have at least one child with nine or more years of education, and whether respondents have at least one child with 13 or more years of education to capture whether the older adult has a child with these two commonly measured levels of educational attainment (Lutz et al. 2007; Kc et al. 2010). Fourth, we measure whether respondents co-reside with at least one child, including biological, step, or adopted children of either the respondent or their partner.

Same generation kin and older kin

We measure two types of same generation kin as the respondent. The first is a living partner, which includes both cohabiting partners and marital partners. Although many surveys distinguish between the two, not all do, so we combine them to facilitate cross-national analysis. The second is the respondents' number of living siblings. We also measure one type of older kin—the number of living parents (zero, one, or two).

Table 2 presents the available kin measures across the surveys in our analytic sample. Almost all surveys have all key kin measures, with a few exceptions noted.

Analytic plan

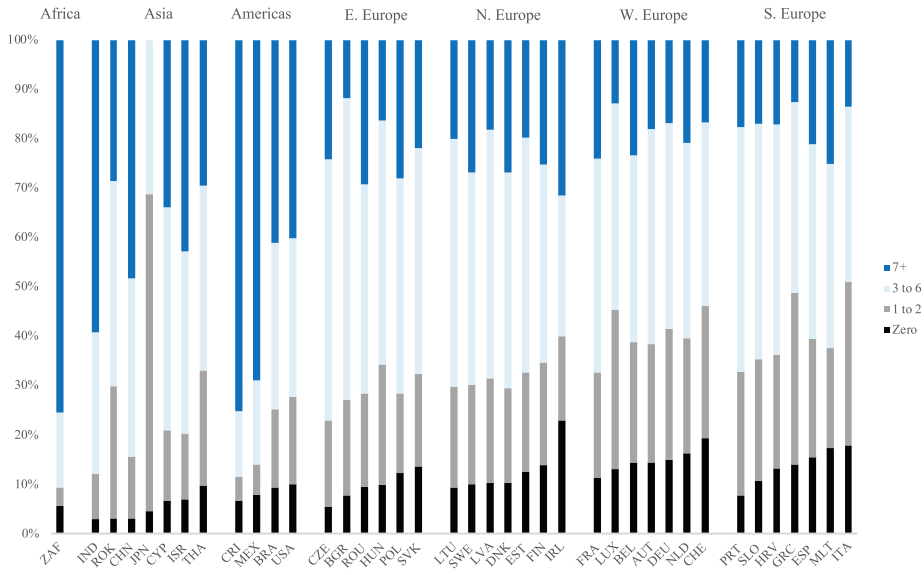
We aim to describe the characteristics of the contemporary population of midlife and older adults in each country. Note that the age distributions of adults aged 50 and above vary considerably across countries and may be associated with kin availability, particularly the same and older generation

TABLE 2 Availability of survey questions about the number of living kin of each type

Survey	Spouse/ partner	Children	Siblings	Grandchildren	Parents	Daughters and sons	Biological and non-biological children	Education of children	Living arrangements and co-residence
CHARLS	X	X	X	X	X	X	X	X	X
CRELES	X	X	NA	X	Mother only	X	X	NA	X
ELSI	X	X	X	X	X	NA	NA	NA	X
HAALSI	X	X	X	X	X	NA	NA	NA	X
HART	X	X	X	X	X	X	X	X	NA
HRS	X	X	X	X	X	X	X	X	X
JSTAR	X	X	NA	NA	X	X	NA	X	NA
KLoSA	X	X	X	X	X	X	NA	X	X
LASI	X	X	X	X	X	X	X	X	X
MHAS	X	X	X	X	X	X	X	X	X
SHARE	X	X	X	X	X	X	X	X	X

NOTE: "X" notes that the variables are available in that dataset. NA means that the measure is not available.
In JSTAR, there is no question about the number of grandchildren.
In MHAS, grandchildren are measured at the household, not individual level, from the harmonized data.
In CRELES, children's education is not available in Wave 1.
Some surveys only ask detailed questions about a subset of children, and we analyze all available data. For example, SHARE asks about the first four children and HART asks about the first 10 children.
Data on the number of biological and non-biological children are all self-reported. In China and Mexico, where questions on residential and nonresidential children are in separate sections, we sum the number of children of each type regardless of co-residence.

FIGURE 1 Number of descendants across countries



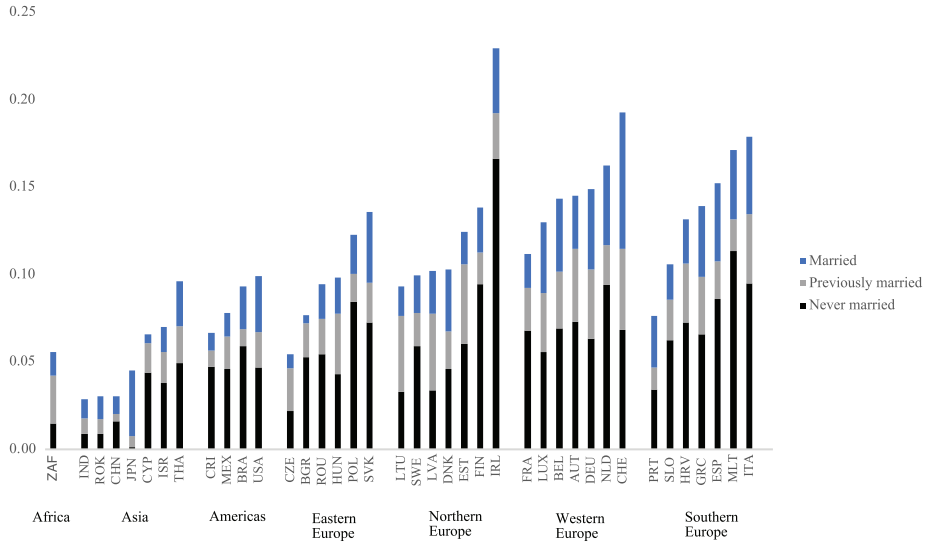
NOTE: In Japan, there is no measure for the number of grandchildren, which affects the number of descendants.
Numbers for this figure are available in Online Appendix Table A1.

kin. For our analysis, the difference in age structures of the various countries is part of what is interesting about each country, and we did not seek to remove that. Therefore, we weight all analyses but do not adjust for age differences between countries, as that is a key mechanism determining the typical family availability of its older adult population.

The first part of our analysis examines the distribution of descendants across countries (Figure 1). Then we examine the marital history of respondents with no descendants to see whether those lacking descendants are primarily those who never married (Figure 2). Second, we examine how SES structures the existence of various types of important kin in older adulthood: children, any sons and daughters, biological and non-biological children, highly educated children, co-residing children, and grandchildren. These results are shown in Figures 3–6 and Table 4. The third and final part of our analysis examines whether high SES older adults have more same and older generation kin and whether this compensates for having fewer descendants (Figure 7 and Table 5).

All analyses are conducted by country and weighted with each country's survey weights. For Thailand and South Africa, where there are no survey weights, each respondent is given equal weight. The surveys in our analysis have fairly high coverage of the variables in our analysis, and therefore low levels of missing data. Because of this, we present all results excluding respondents who were missing on those particular variables.

FIGURE 2 Marital status of those with no descendants



NOTE: Numbers for this figure are available in Online Appendix Table A2.

The main results are shown primarily through figures to facilitate cross-national comparisons. These figures are organized with countries grouped by U.N. region. All the underlying data for the figures in the main text are shown in the Online Appendix tables to facilitate access to specific results. We hope that the main results and the Online Appendix will be an invaluable tool to support research on aging families.

Results

Sample characteristics

Table 3 shows sample characteristics of the respondents in our analytic sample. The mean age across all countries is 66, with a standard deviation of 10. There are more women than men across all countries, reflecting lower mortality throughout the life course for women in the countries in our sample. The percentage of the analytic sample in each country composed of women ranges from 55 percent to 61 percent. The percentage of respondents aged 50 and above who are either married or partnered ranges widely across countries. In South Africa, just half of respondents are currently partnered, and this ranges all the way up to 82 percent in Japan, with the average falling at two thirds. Of those who do not currently have a partner, many are previously married, either separated/divorced or widowed. This group ranges widely as well, from just 16 percent in Malta to 47 percent in South Africa. The average percentage of older adults who are previously married

TABLE 3 Demographic and educational characteristics of respondents 50+ across countries in the sample

Country	Mean age	*SD* age	Proportion women	Proportion partnered	Proportion previously married	Proportion never married	Proportion with contextually high education
Austria	66.54	10.45	0.54	0.65	0.28	0.08	0.26
Belgium	65.79	11.15	0.53	0.70	0.24	0.06	0.34
Brazil	63.34	9.52	0.54	0.61	0.27	0.13	0.28
Bulgaria	66.33	9.59	0.56	0.56	0.38	0.06	0.15
China	63.89	9.72	0.50	0.70	0.28	0.02	0.11
Costa Rica	71.03	8.10	0.53	0.60	0.32	0.08	0.14
Croatia	66.01	10.21	0.56	0.64	0.30	0.06	0.15
Cyprus	65.70	10.15	0.52	0.68	0.29	0.03	0.21
Czechia	65.24	10.00	0.55	0.70	0.27	0.03	0.13
Denmark	65.67	10.39	0.52	0.69	0.25	0.06	0.42
Estonia	66.41	10.69	0.60	0.54	0.37	0.09	0.26
Finland	66.67	10.19	0.53	0.61	0.29	0.10	0.45
France	65.97	11.43	0.54	0.67	0.25	0.07	0.23
Germany	66.35	10.55	0.54	0.67	0.27	0.06	0.30
Greece	66.84	11.10	0.54	0.71	0.24	0.05	0.21
Hungary	65.42	10.11	0.58	0.59	0.37	0.04	0.14
India	62.01	9.30	0.50	0.74	0.25	0.01	0.23
Ireland	64.45	10.15	0.52	0.55	0.30	0.15	0.40
Israel	66.01	10.12	0.54	0.72	0.25	0.03	0.35
Italy	66.65	11.19	0.54	0.67	0.25	0.08	0.31
Japan	65.04	7.00	0.52	0.82	0.18	0.00	0.14
Latvia	66.26	10.07	0.61	0.61	0.35	0.04	0.25
Lithuania	66.10	10.38	0.60	0.63	0.34	0.03	0.35
Luxembourg	64.57	10.78	0.52	0.66	0.28	0.06	0.16

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TABLE 3 (Continued)

Country	Mean age	*SD* age	Proportion women	Proportion partnered	Proportion previously married	Proportion never married	Proportion with contextually high education
Malta	66.43	9.46	0.52	0.77	0.16	0.07	0.58
Mexico	63.15	10.35	0.53	0.55	0.39	0.06	0.08
The Netherlands	64.40	11.21	0.52	0.67	0.25	0.08	0.26
Poland	65.70	9.94	0.56	0.61	0.32	0.07	0.11
Portugal	66.78	9.81	0.56	0.76	0.21	0.03	0.22
Romania	66.21	9.84	0.55	0.67	0.29	0.04	0.49
Slovakia	64.75	9.58	0.55	0.64	0.31	0.05	0.08
Slovenia	65.37	10.51	0.54	0.66	0.27	0.08	0.17
South Africa	66.14	11.11	0.53	0.50	0.47	0.03	0.12
South Korea	68.31	8.79	0.54	0.76	0.22	0.01	0.55
Spain	66.63	11.20	0.54	0.71	0.22	0.07	0.24
Sweden	66.74	10.44	0.52	0.66	0.25	0.08	0.34
Switzerland	66.16	10.29	0.53	0.69	0.26	0.06	0.17
Thailand	68.53	11.16	0.52	0.57	0.37	0.05	0.10
United States	66.30	9.86	0.54	0.65	0.28	0.07	0.31
MIN	62.01	7.00	0.50	0.50	0.16	0.00	0.08
MAX	71.03	11.43	0.61	0.82	0.47	0.15	0.58
AVERAGE	65.89	10.15	0.54	0.66	0.29	0.06	0.25

NOTE: Results are weighted, except for Thailand and South Africa where weights are not available.

is just under a third (29 percent). The smallest group are those older adults who have never married. Across all countries in our sample, the average for this group is 6 percent, but there is a huge degree of variation across contexts. This is less than 1 percent in Japan, one in 10 in Finland, and 15 percent in Ireland. The right section of Table 3 shows the percentage of respondents in each country with contextually high educational attainment.

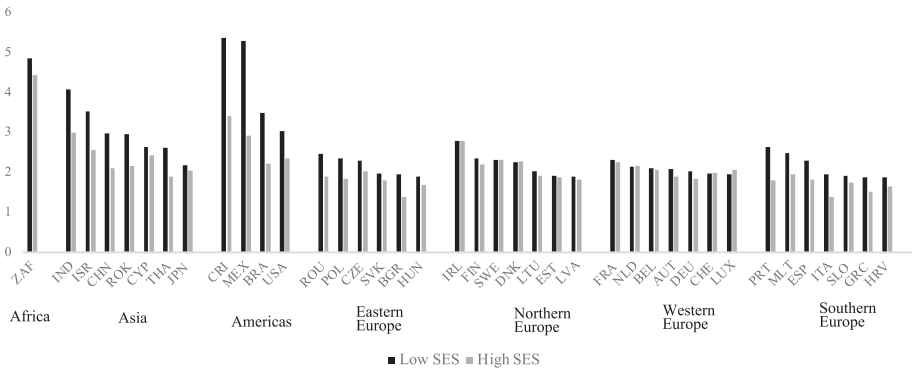
Educational attainment, marital status, and the existence of descendants

Figure 1 presents how older adults' number of descendants (children and grandchildren) varies across contexts, highlighting the proportion of older adults with zero, 1–2, 3–6, and 7 or more descendants. Results are organized by region, and within region, countries are sorted on the prevalence of no descendants (black bars). Those with no descendants are relatively few in many countries, comprising 6 percent in South Africa and 5 percent or less in most of the Asian countries (South Korea, Japan, Korea, China, and India). However, as you look at the European countries, it is much more common for older adults to have no descendants. Eastern European countries have a range of 5–14 percent with no descendants, Northern Europe (9–23 percent), Western Europe (11–19 percent), and Southern Europe (8–18 percent). Ireland is the country with the highest proportion of older adults with no descendants (23 percent). The modal category for three quarters of the countries is the group of older adults with three to six descendants (light blue). However, the modal category is seven and above for South Africa, all the countries in the Americas, India, China, and Israel (dark blue).

To what extent is the availability of descendants shaped by marital history? Are those lacking descendants primarily those who have never married? We examine this in two ways. First, we examine the mean number of descendants for those who have never married compared to those who have ever been married (previously married and currently married). Online Appendix Table A2 shows the mean numbers of descendants for these two groups. Across almost all countries examined, the mean number of descendants for those ever married is considerably higher than for those never married. The average across countries is 6.1 descendants among those ever married compared to 1.2 among those never married.

Another way of examining this question is to focus on the marital history of respondents with no descendants. Figure 2 shows that for about half of those with no descendants are never married (shown in black), about a quarter are previously married (shown in gray), and one quarter are currently married (shown in light blue). However, these overall results obscure a huge degree of variation across countries. In Ireland, 72 percent of those with no descendants have never married, so this is the primary channel to lacking descendants in this country. However, in South Africa and South

FIGURE 3 Mean number of children by socioeconomic status



NOTE: Numbers for this figure are available in Table 4.
• Twenty-four Countries where SES differences are statistically significant $p < 0.05$: Austria, Brazil, Bulgaria, China, Costa Rica, Croatia, Czechia, Germany, Greece, India, Israel, Italy, Japan, Malta, Mexico, Poland, Portugal, Romania, Slovenia, South Africa, South Korea, Spain, Thailand, and the United States.
• Fifteen countries where SES differences are not significant: Belgium, Cyprus, Denmark, Estonia, Finland, France, Hungary, Ireland, Latvia, Lithuania, Luxembourg, the Netherlands, Slovakia, Sweden, and Switzerland.

Korea, the never married group is quite small, and the other channels prevail.

Next, we examine SES differences in having descendants in older adulthood: having children, sons, and daughters, biological versus non-biological children, education of children, co-residence with children, and grandchildren.

Children: Figure 3 shows the mean number of children by SES across countries. In more than 60 percent of countries in our analysis, low SES older adults have significantly more children. These differences are quite large in most of the Asian, Eastern European countries, and in the Americas, as well as some countries in Southern Europe (e.g. Portugal, Malta, Spain, and Italy). However, in some European countries, there is no difference in number of living children by respondents' SES (Belgium, Cyprus, Denmark, Estonia, Finland, France, Hungary, Ireland, Latvia, Lithuania, Luxembourg, the Netherlands, Slovakia, Sweden, and Switzerland).

Sons and daughters: Table 4 shows the proportion of older adults by SES that have at least one son and at least one daughter, respectively. In most countries, there are no significant differences by SES in the likelihood of having at least one son or one daughter. Those that are statistically significant are bolded in Table 4. We can see that in countries where there are differences, low SES older adults are more likely than their highly educated counterparts to have at least one son and at least one daughter, likely driven primarily by their higher fertility. Figure 4 highlights India, China, and South Korea, countries with highly gendered norms around instrumental and financial support to older adults, making the availability of sons an important measure to examine. In all three countries, low SES respondents

TABLE 4 Characteristics of respondents regarding children, by respondent socioeconomic status

	Mean number of children		Any sons		Any daughters		Any biological children		Any non-biological children		Child with secondary education or more		Child with tertiary education		Lives alone		Co-resides with child	
	Low SES	High SES	Low SES	High SES	Low SES	High SES	Low SES	High SES	Low SES	High SES	Low SES	High SES	Low SES	High SES	Low SES	High SES	Low SES	High SES
Austria	**2.08**	**1.90**	0.65	0.63	0.63	0.60	0.85	0.83	0.08	0.09	0.68	0.70	**0.29**	**0.51**	0.31	0.33	0.18	0.20
Belgium	2.10	2.07	0.65	0.64	0.67	0.63	0.85	0.82	0.09	0.07	0.73	0.75	**0.47**	**0.62**	0.28	0.25	**0.18**	**0.25**
Brazil	**3.49**	**2.22**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.21	0.21	**0.32**	**0.37**
Bulgaria	**1.94**	**1.38**	**0.73**	**0.60**	**0.67**	**0.53**	**0.93**	**0.81**	0.02	0.00	0.90	0.81	**0.26**	**0.53**	0.33	0.37	0.24	0.15
China	**2.97**	**2.11**	**0.86**	**0.74**	**0.74**	**0.68**	0.95	0.96	**0.03**	**0.01**	**0.58**	**0.90**	**0.19**	**0.58**	0.11	0.13	0.57	0.55
Costa Rica	**5.35**	**3.41**	**0.87**	**0.82**	0.86	0.83	0.93	0.91	0.06	0.05	NA	NA	NA	NA	0.10	0.08	0.57	0.56
Croatia	**1.87**	**1.66**	**0.63**	**0.54**	0.65	0.66	0.87	0.83	0.02	0.04	0.83	0.81	**0.30**	**0.64**	0.24	0.22	0.39	0.36
Cyprus	2.64	2.42	0.75	0.70	0.74	0.78	0.92	0.92	0.01	0.04	0.91	0.95	**0.64**	**0.85**	0.21	0.14	0.35	0.38
Czechia	**2.28**	**2.02**	0.72	0.62	0.69	0.72	0.94	0.93	0.09	0.07	0.87	0.89	**0.31**	**0.69**	0.24	0.21	0.27	0.29
Denmark	2.25	2.27	0.69	0.69	0.69	0.71	0.85	0.88	0.14	0.16	**0.76**	**0.83**	**0.44**	**0.64**	**0.34**	**0.26**	**0.12**	**0.17**
Estonia	1.92	1.87	0.62	0.64	0.63	0.62	0.86	0.86	0.09	0.09	**0.72**	**0.80**	**0.35**	**0.57**	**0.39**	**0.33**	**0.16**	**0.22**
Finland	2.35	2.19	0.64	0.64	0.68	0.67	0.84	0.84	**0.05**	**0.11**	0.82	0.85	0.54	0.63	**0.40**	**0.28**	0.14	0.18
France	2.31	2.26	0.68	0.69	0.67	0.71	0.87	0.89	0.06	0.08	**0.74**	**0.82**	**0.47**	**0.68**	**0.30**	**0.22**	**0.22**	**0.28**
Germany	**2.03**	**1.84**	0.65	0.63	0.64	0.61	**0.84**	**0.80**	0.08	0.09	0.72	0.73	**0.30**	**0.49**	**0.32**	**0.28**	0.19	0.21
Greece	**1.88**	**1.52**	0.66	0.62	**0.65**	**0.53**	**0.87**	**0.80**	0.01	0.02	0.75	0.73	**0.47**	**0.56**	**0.23**	**0.17**	**0.31**	**0.43**
Hungary	1.89	1.69	0.65	0.63	0.65	0.56	0.90	0.84	0.03	0.05	0.86	0.84	**0.27**	**0.69**	0.26	0.22	0.37	0.35
India	**4.08**	**3.00**	**0.89**	**0.83**	**0.88**	**0.84**	**0.97**	**0.96**	**0.01**	**0.01**	**0.56**	**0.88**	**0.17**	**0.56**	**0.04**	**0.02**	**0.72**	**0.76**
Ireland	2.79	2.79	**0.63**	**0.72**	0.62	0.66	0.95	0.91	0.05	0.09	**0.68**	**0.80**	**0.55**	**0.71**	**0.35**	**0.26**	**0.33**	**0.40**
Israel	**3.53**	**2.56**	0.78	0.75	0.78	0.72	0.92	0.92	**0.02**	**0.07**	**0.80**	**0.93**	**0.62**	**0.79**	0.22	0.23	0.25	0.22
Italy	**1.94**	**1.39**	**0.63**	**0.54**	**0.60**	**0.51**	**0.85**	**0.75**	0.02	0.01	**0.60**	**0.66**	**0.17**	**0.34**	0.27	0.26	**0.35**	**0.41**
Japan	**2.18**	**2.05**	0.76	0.71	0.71	0.73	NA	NA	NA	NA	**0.64**	**0.85**	**0.38**	**0.72**	NA	NA	NA	NA
Latvia	1.89	1.82	0.64	0.64	0.61	0.66	0.89	0.92	0.04	0.05	**0.84**	**0.92**	**0.36**	**0.67**	0.27	0.31	0.22	0.15

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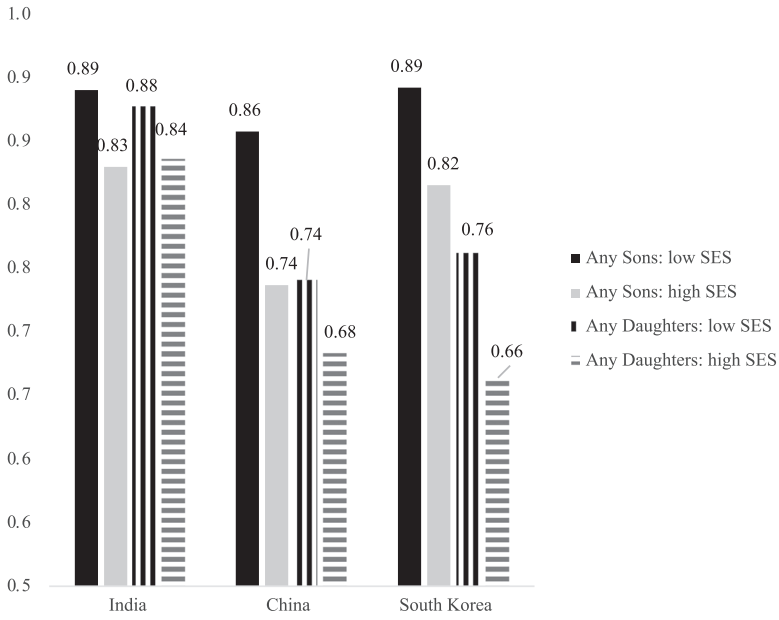
TABLE 4 (Continued)

	Mean number of children		Any sons		Any daughters		Any biological children		Any non-biological children		Child with secondary education or more		Child with tertiary education		Lives alone		Co-resides with child	
	Low SES	High SES	Low SES	High SES	Low SES	High SES	Low SES	High SES	Low SES	High SES	Low SES	High SES	Low SES	High SES	Low SES	High SES	Low SES	High SES
Lithuania	2.03	1.92	0.68	0.70	0.67	0.63	0.88	0.91	0.05	0.06	0.86	0.91	**0.53**	**0.75**	0.27	0.27	0.26	0.22
Luxembourg	1.95	2.07	0.65	0.65	0.63	0.67	0.86	0.82	**0.05**	**0.11**	0.73	0.74	**0.35**	**0.60**	0.26	0.22	0.32	0.36
Malta	**2.48**	**1.94**	0.69	0.63	**0.68**	**0.56**	0.86	0.79	0.00	0.01	0.81	0.80	**0.30**	**0.52**	**0.23**	**0.13**	**0.38**	**0.51**
Mexico	**5.28**	**2.92**	**0.85**	**0.75**	**0.85**	**0.70**	**0.92**	**0.85**	0.07	0.03	**0.74**	**0.97**	**0.31**	**0.79**	0.11	0.12	0.67	0.64
The Netherlands	2.15	2.15	0.68	0.64	0.64	0.67	0.71	0.71	**0.06**	**0.10**	**0.55**	**0.70**	**0.26**	**0.44**	**0.37**	**0.25**	0.19	0.25
Poland	**2.35**	**1.84**	0.69	0.61	0.68	0.63	0.88	0.85	0.02	0.02	0.82	0.81	**0.40**	**0.73**	0.22	0.19	0.32	0.24
Portugal	**2.63**	**1.81**	**0.74**	**0.52**	0.70	0.81	0.90	0.94	0.06	0.04	**0.60**	**0.87**	**0.39**	**0.66**	0.14	0.20	0.28	0.34
Romania	**2.47**	**1.90**	0.72	0.69	**0.71**	**0.57**	0.92	0.88	0.05	0.04	**0.72**	**0.84**	**0.17**	**0.45**	**0.21**	**0.10**	**0.47**	**0.39**
Slovakia	1.96	1.80	0.68	0.71	0.62	0.55	0.86	0.86	0.02	0.04	0.85	0.87	**0.35**	**0.68**	0.27	0.20	0.30	0.28
Slovenia	**1.91**	**1.75**	0.65	0.63	0.66	0.60	0.89	0.87	0.04	0.05	0.84	0.84	**0.45**	**0.62**	0.23	0.24	0.34	0.33
South Africa	**4.86**	**4.44**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.11	0.09	**0.72**	**0.78**
South Korea	**2.96**	**2.16**	**0.89**	**0.82**	**0.76**	**0.66**	NA	NA	NA	NA	0.96	0.97	**0.74**	**0.92**	**0.19**	**0.06**	**0.25**	**0.41**
Spain	**2.30**	**1.82**	0.67	0.63	0.65	0.59	0.85	0.82	0.01	0.02	**0.48**	**0.65**	**0.29**	**0.50**	0.22	0.18	0.40	0.40
Sweden	2.31	2.31	0.70	0.70	0.72	0.72	0.87	0.88	0.14	0.17	**0.79**	**0.85**	**0.47**	**0.57**	**0.38**	**0.26**	**0.08**	**0.21**
Switzerland	1.97	1.99	0.61	0.58	0.62	0.61	0.80	0.76	**0.07**	**0.11**	0.69	0.69	**0.38**	**0.50**	**0.30**	**0.21**	**0.17**	**0.23**
Thailand	**2.62**	**1.89**	**0.71**	**0.63**	**0.71**	**0.62**	**0.87**	**0.84**	0.01	0.02	**0.57**	**0.77**	**0.41**	**0.68**	NA	NA	NA	NA
United States	**3.03**	**2.34**	**0.76**	**0.68**	**0.76**	**0.68**	**0.88**	**0.82**	**0.27**	**0.19**	**0.92**	**0.85**	**0.73**	**0.81**	**0.24**	**0.20**	**0.36**	**0.28**
MIN	1.87	1.38	0.61	0.52	0.60	0.51	0.71	0.71	0.00	0.00	0.48	0.65	0.17	0.34	0.04	0.02	0.08	0.15
MAX	5.35	4.44	0.89	0.83	0.88	0.84	0.97	0.96	0.27	0.19	0.96	0.97	0.74	0.92	0.40	0.37	0.72	0.78
AVG	2.59	2.14	0.71	0.67	0.69	0.65	0.88	0.86	0.05	0.06	0.75	0.82	0.39	0.63	0.25	0.21	0.32	0.35

NOTE: Respondent's socioeconomic status is measured with contextual education.
NA means the measure is not available.
Bolded numbers show that the differences by SES are statistically significant $p < 0.05$

FIGURE 4 Proportion with any sons and any daughters by respondent socioeconomic status for selected countries



NOTE: Data for this figure and all the rest of the countries are available in Table 4.

are more likely to have both sons and daughters than high SES respondents. We will note that for India and China, the gap by SES in the likelihood of having a son is larger than that for daughters. It may be that in these societies that value sons highly, the highly educated have less traditional values, making them less picky about the gender of their children; urban/rural differences in education levels are also a likely determinant for similar reasons. One remarkable finding is that a sizable group of older adults in these contexts are without any sons. Almost one in five of high SES respondents in India and one quarter of high SES respondents in China do not have any sons, which may lead to social changes in caregiving norms and behavior.

Complex families and non-biological children

Table 4 shows the proportion of older adults with any non-biological children and any biological children by SES. The differences across countries and within countries reflect the level of divorce and remarriage in these cohorts as well as the reporting of step and adopted children. It is fairly uncommon in most countries for older adults to have any non-biological children, with the average being 5–6%. The United States is an outlier in this regard with, by far, the highest prevalence of non-biological children among older adults. In the United States, almost one in five (19 percent)

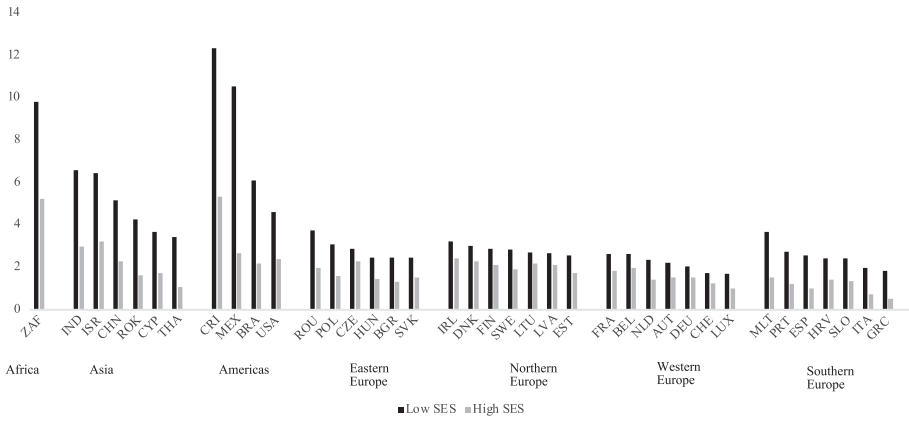
high SES older adults and more than a quarter low SES older adults (27 percent) have non-biological children. Switzerland (11 percent), Sweden (17 percent), Finland (11 percent), Denmark (16 percent), and Luxembourg (11 percent) also have a significant share of high SES older adults with non-biological children. Interestingly, in some countries, unlike the United States, non-biological children are significantly *more* common among high SES older adults than low SES (e.g., France, Israel, Luxembourg, the Netherlands, and Switzerland).

Highly educated children: Table 4 next presents SES differences in having at least one educated child. We see that over three quarters of older adults in our sample have at least one child with secondary education, and in exactly half of the countries in our sample, higher SES parents are significantly more likely to have at least one child with secondary education, while in the other half, there are no differences by parents' SES. The differences by parents' SES are largest in magnitude in China, India, Mexico, Portugal, Thailand, and Spain. When we turn to having at least one child with tertiary education, in all but one country we see large differences by parents' SES whereby more educated parents are more likely to have a child with tertiary education compared with their less educated counterparts. Moreover, we see huge variations across countries. South Korean older adults are the most likely to have a child with tertiary education. In this context, 92 percent of high SES Koreans and 74 percent of low SES Koreans have a highly educated child. This is much less common among older adults in most European countries, where about 60 percent of high SES and 40 percent of low SES older adults have highly educated children. Inequality within countries is high; on average, there is a 23 percentage point difference in having a highly educated child by older adult SES. Inequalities within countries are largest in Mexico and Hungary.

Living arrangements and co-residence with children: Table 4 presents the proportion living alone and the proportion co-residing with at least one child, both by SES. In most countries, there are no SES differences in living arrangements. However, in 40 percent of countries, we see SES differences in living alone, where low SES older adults are more likely to live alone than their high SES counterparts. Similarly, in 40 percent of countries, we see that co-residence with children varies by SES, and in almost all of the countries where we see differences high SES older adults are more likely to co-reside with a child than low SES older adults.

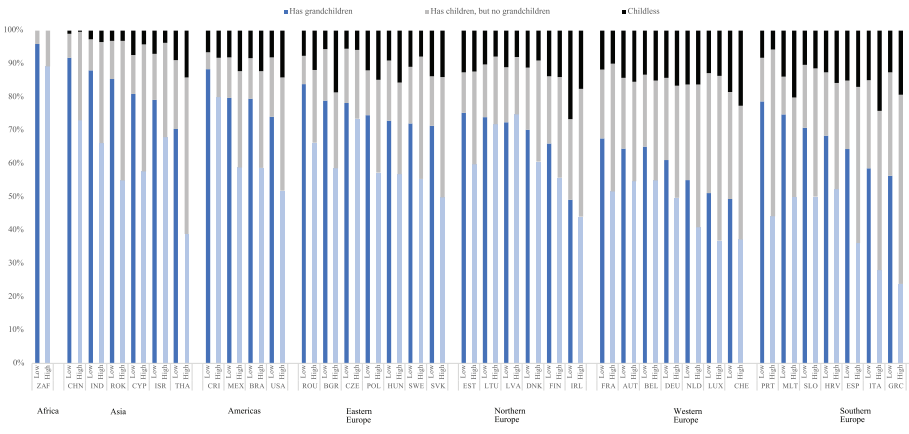
Grandchildren: The last type of kin we examine is the number of grandchildren and the reasons behind not (yet) being a grandparent. Figure 5 shows that across all but two of the countries examined, low SES older adults have significantly more grandchildren than high SES older adults. Differences by older adults' SES are particularly distinct in the regions where people have more grandchildren, Africa, Asia, and the Americas while differences tend to be smaller in Europe.

FIGURE 5 Mean number of grandchildren by socioeconomic status



NOTE: Numbers for this figure are available in Table A3.
SES differences in the mean number of grandchildren are statistically significant $p < 0.05$ in all countries except Finland and Latvia.

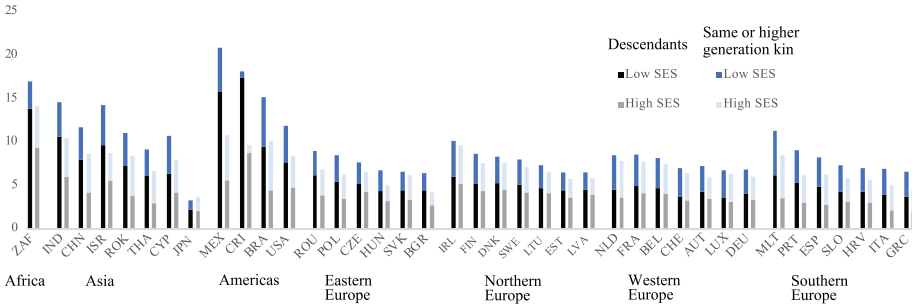
FIGURE 6 Grandparenthood by socioeconomic status



NOTE: Data are available in Table A3.
High SES proportion with grandchildren shown in light blue. Low SES is shown in darker blue. These are statistically significantly different by SES in 32 of 38 countries (See Table A3 for all statistical test results).

How does SES shape the availability of grandchildren? Figure 6 shows in blue (at the bottom) the proportion of older adults by SES with any grandchildren. Grandparenthood is much more common in countries in Africa, Asia, and the Americas and less prevalent in European countries. Moreover, SES differences are stark across most countries, with low SES (blue) older adults far more likely to have any grandchildren than high SES older adults (light blue). The figure breaks down the reasons for not (yet) being a grandparent into two groups. The first, shown in black at the top, is that the older adults are childless, and therefore not "at risk" of having grandchildren. The

FIGURE 7 Mean number of kin by socioeconomic status



NOTE: Data for this figure are available in Table 5. Kin includes children, grandchildren, siblings, partners, and parents.
In 34 of 39 countries examined, low SES respondents have significantly more total kin than high SES respondents. (See Table 5 for all statistical tests.)
In 36 of 39 countries, low SES respondents have more descendants than high SES respondents. For same and higher generation kin: of the 39 countries: In eight countries, low SES have significantly more, in nine countries high SES have significantly more, and in 22 countries there are no differences.

second reason, shown in light gray, is that respondents have children, but these children have not yet had children. Thus, these older adults may become grandparents in the future, but may not if all of their children remain childless, or if their children wait to have children until after the respondents die. Across all countries, SES differences are much larger for the gray bars than the black ones, indicating that differences by SES in childlessness among today's older adults are much smaller than the SES differences in having children but not (yet) grandchildren.

Socioeconomic differences in kin from all generations

The earlier analysis shows that low SES older adults have more descendants than high SES older adults. However, we may see the opposite pattern for the same generation and older kin due to the positive association between SES and health/mortality. This last part of our analysis examines whether high SES older adults have more same generation or older generation kin and whether this makes up for their smaller networks of descendants. Figure 7 shows SES differences in total kin by generations. The black (low SES) and gray (high SES) bars at the bottom are descendants (children and grandchildren), and the light and darker blue bars are same generation and older generation kin (partner, siblings, and parents). We can clearly see that low SES older adults have more total kin, on average, across countries. These differences are statistically significant in 34 of 39 countries. Table 5 reports the average number of kin of various types and generations by adult SES. The first column shows the total kin of all generations (i.e., children, grandchildren, siblings, partners, and parents), and low SES older adults have more descendants in 36 of 39 countries. However, the

TABLE 5 Total number of kin, by generation, and type

	Total		Descendants		Same and higher generation kin		Siblings		Partner		Parents	
	Low SES	High SES	Low SES	High SES	Low SES	High SES	Low SES	High SES	Low SES	High SES	Low SES	High SES
Austria	**6.04**	**4.97**	**4.25**	**3.40**	**3.00**	**2.55**	**2.05**	**1.52**	0.64	0.67	0.34	0.38
Belgium	**6.94**	**6.57**	**4.69**	**4.05**	3.49	3.46	**2.50**	**2.23**	**0.68**	**0.72**	**0.33**	**0.52**
Brazil	**15.11**	**10.09**	**9.47**	**4.41**	5.66	5.70	**4.86**	**4.61**	**0.60**	**0.64**	**0.30**	**0.50**
Bulgaria	**5.09**	**3.48**	**4.40**	**2.70**	**2.03**	**1.47**	**1.27**	**0.57**	0.56	0.55	**0.21**	**0.37**
China	**11.68**	**8.60**	**7.99**	**4.15**	**3.70**	**4.45**	**2.77**	**3.20**	**0.68**	**0.85**	**0.24**	**0.44**
Costa Rica	**18.09**	**9.61**	**17.40**	**8.74**	**0.70**	**0.87**	NA	NA	**0.59**	**0.70**	**0.11**	**0.18**
Croatia	**5.84**	**4.79**	**4.26**	**3.04**	2.71	2.61	**1.83**	**1.49**	**0.62**	**0.73**	**0.26**	**0.40**
Cyprus	**8.54**	**7.02**	**6.34**	**4.14**	4.33	3.84	**3.24**	**2.36**	0.68	0.68	**0.43**	**0.80**
Czechia	**6.00**	**5.18**	**5.15**	**4.28**	**2.51**	**2.24**	**1.54**	**1.10**	0.70	0.74	**0.28**	**0.41**
Denmark	**7.04**	**6.33**	**5.24**	**4.54**	3.06	3.01	**2.11**	**1.86**	**0.66**	**0.73**	**0.31**	**0.42**
Estonia	**5.43**	**4.91**	**4.45**	**3.60**	**2.02**	**2.14**	**1.31**	**1.14**	**0.52**	**0.60**	**0.20**	**0.40**
Finland	**7.53**	**6.30**	5.18	4.32	3.45	3.20	2.53	2.18	0.57	0.65	0.35	0.38
France	**7.22**	**6.61**	**4.92**	**4.08**	3.61	3.63	**2.61**	**2.30**	**0.66**	**0.73**	**0.39**	**0.63**
Germany	**5.75**	**5.10**	**4.04**	**3.34**	2.79	2.67	**1.84**	**1.56**	**0.65**	**0.71**	**0.31**	**0.41**
Greece	**5.49**	**4.13**	**3.73**	**2.02**	2.87	2.77	**1.86**	**1.46**	**0.70**	**0.76**	**0.31**	**0.56**
Hungary	**5.63**	**4.14**	**4.33**	**3.15**	**2.44**	**1.85**	**1.76**	**0.96**	**0.57**	**0.68**	0.28	0.58
India	**14.52**	**10.40**	**10.65**	**5.97**	**3.96**	**4.51**	**3.10**	**3.38**	**0.70**	**0.86**	**0.21**	**0.35**
Ireland	9.07	8.56	5.97	5.21	4.18	4.38	3.57	3.49	**0.49**	**0.65**	**0.16**	**0.27**
Israel	**11.24**	**7.20**	**9.61**	**5.52**	**4.64**	**3.18**	**3.79**	**2.08**	0.72	0.71	**0.22**	**0.43**
Italy	**5.74**	**4.43**	**3.92**	**2.11**	2.94	2.89	**2.05**	**1.56**	**0.66**	**0.72**	**0.25**	**0.63**
Japan	**3.29**	**3.68**	**2.18**	**2.05**	**1.11**	**1.63**	NA	NA	**0.80**	**0.97**	**0.31**	**0.66**

/...

TABLE 5 (Continued)

	Total		Descendants		Same and higher generation kin		Siblings		Partner		Parents	
	Low SES	High SES	Low SES	High SES	Low SES	High SES	Low SES	High SES	Low SES	High SES	Low SES	High SES
Latvia	5.10	4.78	4.53	3.95	1.99	1.91	1.16	1.00	0.61	0.64	0.23	0.27
Lithuania	**5.86**	**5.43**	**4.71**	**4.09**	2.63	2.46	**1.81**	**1.55**	0.62	0.65	0.21	0.26
Luxembourg	6.04	5.84	**3.64**	**3.10**	3.07	3.20	2.03	1.87	**0.65**	**0.73**	**0.40**	**0.62**
Malta	**9.01**	**7.10**	**6.14**	**3.49**	5.12	5.00	**4.29**	**3.72**	**0.69**	**0.82**	**0.13**	**0.47**
Mexico	**20.81**	**10.77**	**15.83**	**5.58**	4.98	5.19	4.24	4.15	**0.54**	**0.64**	**0.32**	**0.49**
The Netherlands	**7.50**	**7.05**	**4.49**	**3.57**	3.94	4.22	2.99	3.01	**0.64**	**0.75**	**0.35**	**0.47**
Poland	**6.92**	**5.31**	**5.42**	**3.45**	3.03	2.81	**2.14**	**1.59**	**0.60**	**0.70**	**0.28**	**0.52**
Portugal	**7.10**	**4.99**	**5.34**	**3.01**	**3.71**	**3.14**	**2.71**	**1.82**	0.75	0.77	**0.25**	**0.55**
Romania	**7.16**	**5.28**	**6.19**	**3.86**	2.75	2.97	2.07	1.85	**0.56**	**0.79**	**0.13**	**0.33**
Slovakia	5.12	5.01	**4.39**	**3.34**	**2.20**	**2.85**	1.30	1.43	**0.63**	**0.78**	**0.27**	**0.64**
Slovenia	**6.22**	**5.13**	**4.30**	**3.08**	**2.98**	**2.74**	**2.07**	**1.55**	**0.65**	**0.70**	**0.27**	**0.49**
South Africa	**16.92**	**14.18**	**13.79**	**9.33**	**3.16**	**4.86**	**2.48**	**3.75**	**0.48**	**0.63**	**0.21**	**0.51**
South Korea	**10.99**	**8.38**	**7.21**	**3.78**	**3.77**	**4.61**	**3.02**	**3.31**	**0.63**	**0.87**	**0.12**	**0.42**
Spain	**6.63**	**5.44**	**4.83**	**2.80**	3.39	3.46	**2.49**	**2.19**	0.69	0.74	**0.25**	**0.57**
Sweden	**6.76**	**6.11**	**5.12**	**4.18**	2.83	2.94	**1.90**	**1.75**	**0.64**	**0.71**	**0.31**	**0.50**
Switzerland	**6.08**	**5.45**	**3.70**	**3.24**	3.29	3.13	**2.26**	**1.89**	**0.67**	**0.77**	**0.38**	**0.49**
Thailand	**9.13**	**6.64**	**6.06**	**2.97**	**3.08**	**3.67**	**2.36**	**2.66**	**0.57**	**0.66**	**0.18**	**0.36**
United States	**11.88**	**8.39**	**7.63**	**4.75**	**4.25**	**3.65**	**3.27**	**2.49**	**0.62**	**0.72**	**0.36**	**0.45**

NOTE: Respondent's socioeconomic status is measured with contextual education.
Same generation and higher generation kin include siblings, partners, and parents.
NA means that the measure is not available.
Bolded numbers show that differences by education $p < 0.05$

differences by SES are much smaller for the same generation and higher kin. In eight countries, low SES older adults have more, but in nine countries high SES older adults have more, and in the majority (22) of countries, there are no significant differences in same and higher generation kin by SES. In most countries in our analysis, low SES older adults have significantly more siblings. However, high SES older adults are much more likely to have a partner in most countries and also more likely to have parents alive. If we add up the same generation and older generation kin (i.e., siblings, partner, and parents), we see that this partially, but not fully, compensates for those with high SES having fewer descendants.

It is important to note that a portion or perhaps all of the SES differences we find may owe to age, sex, or other compositional features. Assessing the extent to which such compositional features may account for SES differentials in kin availability is an important project for future work, but to maintain our descriptive focus and in keeping with our other analyses we do not attempt it within the scope of this article.

Discussion

This analysis examines global diversity in the kin constellations available to midlife and older adults, offering a unique lens on the connections between sociodemographic changes and central considerations in aging (e.g., caregiving support, managing health and disability, and social integration). Looking to the future, various aspects of population health will depend, in part, on kin availability and family support for those in midlife and beyond. From our cross-national analysis of the kin available to contemporary midlife and older adults, we highlight five findings.

First, our findings clearly show that more advantaged older adults have smaller but more educated kin networks. We have found socioeconomic inequalities in older adults' families, whereby high SES older adults have significantly *fewer* children in most (61 percent) countries and significantly *fewer* grandchildren in almost all contexts. High SES older adults also become grandparents much later because of fertility postponement of their own generation and their children. The more educated wait longer to become a grandparent, and many will never become one as childlessness increases among their children's generation. Having a smaller kin network may indicate risks of unmet care needs for older adults, as fewer younger kin would be available for support. However, these high SES older adults have a much higher likelihood of having a partner and at least one educated child, who may be important resources for caregiving. Further work is needed to directly connect the size and socioeconomic characteristics of kin networks to older adult health and well-being, but the results presented here suggest that there is substantial room for kin availability differentials to play a consequential role.

Second, across diverse settings, there is a subset of aging adults without *any* younger kin (children or grandchildren). Although the percentage of older adults in this group is quite small (3 percent) in the world's two most populous countries, India and China, it reaches almost a quarter (23 percent) of adults 50 and above in Ireland and between 15 percent and 20 percent in some European countries (Switzerland, Malta, the Netherlands, Germany, Italy, and Spain). Based on our analysis of two thirds of the world's population of older adults, our estimate is that 5.9 percent of older adults today in the countries in our sample have no descendants (calculation is shown in Online Appendix Table A6). Of those with no descendants, two thirds do not currently have a partner. This group with no partner and no descendants comprises 4 percent of the population of older adults globally that we examine. This is important to highlight because many contemporary social and health policies assume that older adults are immersed in family networks and transfers, an assumption that will be increasingly tested in the future. Policymakers in many contexts will have to pay special attention to the subset of older adults who are not sitting within family networks of potential caregivers.

Third, we document that there are few countries where many older adults have non-biological children. Some Scandinavian and northern European countries have moderate rates of non-biological children, and in some of these contexts it is more common among high SES older adults to have non-biological children. The United States is an outlier in the high prevalence of having non-biological children in older adulthood and also in its socioeconomic patterning. In the United States, it is much more common for low SES older adults to have non-biological children (27 percent) compared with high SES older adults (19 percent), and both rates are much higher than we see in any other country. United States-based research raises concerns about older adults in stepfamilies lacking care from adult children in later life since they are less likely to receive care than those with only biological children, and because of their socioeconomic disadvantage, making them less likely to be able to pay for care (Patterson et al. 2022). However, the fact that the United States is such an outlier strongly suggests that debates about the capacity for stepfamilies to "fill the gap" in perceived caregiving deficits for aging adults with few family members are United States centric and have limited applicability in other contexts.

Fourth, in most countries, there are no large differences in older adults' likelihood of having at least one son, or at least one daughter. What about in countries where sons are traditionally relied upon? Our analysis finds that older adults of low SES in China and India are much more likely to have sons than those with higher SES, potentially reflecting different norms towards the reliance on these traditional gender roles in childbearing and support from adult children. However, it is important to note that there are substantial minorities of older adults in both China and India without

sons. One quarter of high SES Chinese older adults and almost one in five high SES Indian older adults have no sons, and the numbers are not insignificant among low SES older adults (14 percent in China and 11 percent in India). Will norms shift so that care will come from somewhere else? Existing research says yes, and that daughters will begin to provide similar or even more support to older adults (Xie and Zhu 2009; Zhou, Verdery, and Margolis 2019), but how this plays out differently among low and high SES older adults remains to be seen.

On this topic of sonless and daughterless families, it is important to keep in mind that many of today's narratives about sonless or daughterless families do not pertain to today's population of older adults, but rather they are projections about future cohorts. The families of today's older adults were shaped by the demographic and educational changes over the last 30–50 years. It will become more prevalent for older adults in China, South Korea, and India to be without daughters and to have unmarried sons because of marriage market squeezes (Guilmoto 2012). This will likely come to fruition for the older adults of the next 20 years. Research using population projections can be key to understanding when these changes are coming (e.g., Verdery 2019).

Last, our results reflect the context of global educational expansion but show that its impacts are contorted when looking within individuals' families. Much like how the experience of child loss persists in the population long after mortality rates decline (Smith-Greenaway et al. 2021; Smith-Greenaway and Trinitapoli 2020), the presence of educated children in families is not a mere summary of educational expansion rates. More than three quarters of older adults in our sample have at least one child with secondary education, and this is more likely for high SES parents in half the countries in our sample. However, we also find a much greater degree of inequality within and across countries in whether older adults have a child with tertiary education (13 or more years). How the probability of support from adult children and the quality of that support varies by children's education across contexts is not well understood, but there are assumptions that having children with more education is beneficial (S. S. Park, Wiemers, and Seltzer 2019; Sohn 2023). There may be benefits for older adults having highly educated children, such as better access to health information and higher quality care for complex medical issues (Friedman and Mare 2014). At this point, where there is great inequality in older adults' SES in having a child with tertiary education, the quality of help from children may exacerbate inequalities in aging. However, with continued educational expansion, this source of inequality should dissipate.

Relatedly, although more educated children are more likely to live further from where they grew up, our analysis shows that in most (60 percent) countries, there are no differences by SES in the likelihood of co-residence with at least one child. In the 40 percent of countries where we do find SES

differences in co-residence, it is high SES parents that are more likely to be co-residing with children. In only two countries, the United States and Romania, there are high SES parents disadvantaged in terms of co-residence.

Data recommendations

In analyzing data for this study, we were confronted with several challenges pertaining to cross-national family data on midlife and older adults. Here, we discuss the ways that such data could be improved to be more useful for research.

The available data on marital history and marital changes between interviews should be cleaned and harmonized to facilitate cross-national analysis of partnership change in later life. Marital history is a key contributor to family structure in older adulthood, yet many surveys do not capture respondents' comprehensive marital histories or changes between survey waves. Some, but not all, surveys include explicit measures of marital history. The Survey of Health Aging and Retirement in Europe does not have this as a regular survey question but rather relies on a life history module that includes this data for the past. However, this is not updated for each wave, and therefore for these countries, changes in marital status between waves are not fully captured. For our current analysis, we rely on measures of current marital status which are comparable across all surveys, to examine the never married, previously married, and currently partnered respondents. Although there is no inherent problem with this, it does flatten the complexity of marital histories earlier in life. With surveys that have multiple waves, we should be able to easily measure changes in marital status across waves, especially if we examine changes in partner ID (if the partner is included in the survey) to see whether there are partnership changes across waves. However, with many surveys lacking partner IDs, this is difficult to do in a cross-national analysis. A harmonization effort would help with this.

The available data on child loss should be collected and harmonized to examine this phenomenon across contexts. When attempting to examine child loss as a pathway to small families in later life, we found that there is no reliable, easily harmonizable data on child loss across all the surveys in our analysis. Some surveys capture measures of children ever born and children surviving, but most surveys capture only surviving children. Moreover, it is not possible to examine the timing of child loss in many surveys. Some include the age of the child at the time of death. In other surveys, one can examine changes in the number of living children from wave to wave. We know from the Demographic and Health Surveys that in countries with high infant and child mortality, the maternal risk of losing a child before age 49 is one in three (Smith-Greenaway et al. 2021); however, the maternal risk of losing a child before 49 is not negligible even in low mortality contexts

(Smith-Greenaway et al. 2021). Losing a child in later life is an increasingly important topic in the context of rising midlife mortality and deaths of despair in some countries (Zheng, Lawson, and Anderson 2017). Losing a child can have strong negative effects on older adults' well-being, which can vary depending on the life course stage when child loss occurs (Umberson 2017; Umberson et al. 2017; Umberson and Donnelly 2022). A data harmonization effort can inform our understanding of child loss as a pathway to small family networks in older adulthood and its effects on older adult well-being.

Data sources from additional geographic regions should be collected and harmonized. The global reach of our analysis is made possible by the wide and expanding geographic availability of aging studies. Our analytic sample has high coverage of North America, Europe, and Asia with moderate coverage in Latin America, low coverage in the Middle East (only Israel is included), Africa (only South Africa is included, and it is not nationally representative), and no coverage of Oceania. The countries not included in our analysis make up one third of the population of today's older adults around the world. We should not assume that older adults in these contexts are similar to those in our analysis. For example, although many assume that the United States and Canada are similar, Canada has a much higher rate of older adults with no partner and children than the United States (Margolis et al. 2022; Margolis and Verdery 2017; Verdery et al. 2019). Moreover, the Middle East and North Africa are demographically distinct in their underlying demographic rates from other world regions and also differ on family norms and values, leaving an important gap. Last, data are only available for one country in Sub-Saharan Africa, and we hope that existing data sources can be used to study aging families and new sources can be developed.

Limitations and future research

One limitation we encountered is that, as of now, it is not possible to examine changes over multiple birth cohorts for many countries because of the time-limited nature of some of the surveys. Although the U.S. HRS dates back to 1992, allowing cross-cohort analysis at the same ages, the same is not possible for most other countries in our analysis. However, in the coming years, as more data accrue on the aging cohorts in these studies and new cohorts are added to studies like CHARLS and LASI, we will be able to examine changes over time and cohorts in the family network change.

A second issue with examining older adults across such varied contexts is that the age distributions of adults aged 50 and above vary so much. In this analysis, we decided that because the differences in age structures of the various countries are part of what is interesting about each country, we did not seek to remove that by adjusting for age. However, future research may want to remove the effects of age structure in understanding variation

in kin structure across places or over time, and this can be done with a life table analysis to remove age structure.

A third issue to be explored in future research is the geographic proximity of kin for older adults. The measurement of proximity to children varies both across surveys and within surveys over time. Our analysis examines co-residence with at least one child by SES, but future research with data including harmonized proximity measures could expand on this by assessing differences in proximity to non-co-resident children.

Conclusions

Around the world, countries with aging populations will need to decide how to design social and health policies to promote population health. The shape of family networks and the types of available kin are an important factor that shapes the policy content (Freedman et al. 2024). There is great diversity in kin networks for older adults around the world in terms of size and shape, and how they vary within a country based on older adults' SES. Policymakers in diverse contexts should design policies, taking into account that the implications of having small family networks in older age, in part, depend on whether older adults with small families are socioeconomically advantaged or disadvantaged.

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Data availability statement

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CHARLS: This analysis uses data or information from the Harmonized CHARLS dataset and Codebook, Version D as of June 2021 developed by the Gateway to Global Aging Data. The development of the Harmonized CHARLS was funded by the National Institute on Aging (R01 AG030153, RC2 AG036619, R03 AG043052). For more information, please refer to https://g2aging.org/. CHARLS is supported by Peking University, the

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CRELES: This analysis uses data or information from the Harmonized CRELES dataset and Codebook, Version A as of August 2016 developed by the Gateway to Global Aging Data. The development of the Harmonized CRELES was funded by the National Institute on Ageing (R01 AG030153, RC2 AG036619, R03 AG043052). For more information, please refer to www.g2aging.org. This document uses data from the CRELES, released in June 2016. The CRELES Pre-1945 Cohort Study (CRELES Waves 1–3) was conducted by the University of Costa Rica's Centro Centroamericano de Población (CCP) in collaboration with the Instituto de Investigaciones en Salud (INISA), with the support of the Wellcome Trust (grant 072406). The CRELES 1945–1955 Retirement Cohort Study (CRELES Waves 4 and 5) was conducted by the University of Costa Rica's Centro Centroamericano de Población, in collaboration with the University of California at Berkeley, with funding from the U.S. National Institute on Aging (grant R01AG031716).

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Health and Retirement Study, (RAND HRS Family Data 2018 (V2)) public use data. Produced and distributed by the University of Michigan with funding from the National Institute on Aging (grant number NIA U01AG009740). Ann Arbor, MI, (July 2023). RAND HRS Family Data 2018

(V2). Produced by the RAND Center for the Study of Aging, with funding from the National Institute on Aging and the Social Security Administration. Santa Monica, CA (July 2023).

JSTAR: The Japanese Study of Aging and Retirement (JSTAR) was conducted by the Research Institute of Economy, Trade and Industry (RIETI), Hitotsubashi University, and the University of Tokyo.

KLOSA: This analysis uses data or information from the Harmonized KLoSA dataset and Codebook, Version D.2 as of July 2021 developed by the Gateway to Global Aging Data. The development of the Harmonized KLoSA was funded by the National Institute on Aging (R01 AG030153, RC2 AG036619, R03 AG043052). For more information, please refer to https://g2aging.org/. This document uses the English version of data from KLoSA Waves 1, 2, 3, 4, 5, 6, and 7 as of July 2021. KLoSA is organized by the Korea Employment Information Service (KEIS).

LASI: (LASI) Wave 1, CESR Technical Report, University of Southern California, Los Angeles, https://cesr.usc.edu/research/publications. This document uses data from the 2017—2019 Wave 1 of LASI. LASI is a joint project of three partnering institutions: the International Institute for Population Sciences (IIPS), Harvard T.H. Chan School of Public Health (HSPH), and the University of Southern California (USC). LASI Wave 1 was funded by the Ministry of Health and Family Welfare, the Government of India, the National Institute on Aging (R01 AG042778), and the United Nations Population Fund, India. This analysis uses data or information from the Harmonized LASI dataset and Codebook, Version A.2 as of October 2021, developed by the Gateway to Global Aging Data (DOI: https://doi.org/10.25549/h-lasi). The development of the Harmonized LASI was funded by the National Institute on Aging (R01 AG042778, 2R01 AG030153, 2R01 AG051125). For more information about the Harmonization project, please refer to https://g2aging.org/.

MHAS: This analysis uses data or information from the Harmonized MHAS dataset and Codebook, Version C as of September 2022 developed by the Gateway to Global Aging Data in collaboration with the MHAS research team. The development of the Harmonized MHAS was funded by the National Institute on Aging (R01 AG030153). The Harmonized MHAS data files and documentation are for public use and available at www.MHASweb.org. The MHAS (Mexican Health and Aging Study) receives support from the National Institutes of Health/National Institute on Aging (R01 AG018016) in the United States and the Instituto Nacional de Estadística y Geografía (INEGI) in Mexico. For more information about the Harmonization project, please refer to www.g2aging.org. This document uses data from the MHAS datasets as of July 2020. The MHAS (Mexican Health and Aging Study) is partly sponsored by the National Institutes of Health/National Institute on Aging (grant number NIH R01AG018016) in the United States and the Instituto Nacional de Estadística y Geografía

(INEGI) in Mexico. Data files and documentation are for public use and available at www.MHASweb.org.

SHARE: This analysis uses data or information from the Harmonized SHARE dataset and Codebook, Version F as of June 2022 developed by the Gateway to Global Aging Data. The development of the Harmonized SHARE was funded by the National Institute on Aging (R01 AG030153, RC2 AG036619, R03 AG043052). For more information, please refer to "https://g2aging.org/".

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