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Cross-national variations in living alone over the life-course: comparative perspectives on an emerging issue

Albert Esteve* (corresponding author), David Reher**, Rocío Treviño*, Pilar Zueras*,
Anna Turu*

*Centre d'Estudis Demogràfics, Barcelona

** Universidad Complutense, Madrid

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ABSTRACT

Increasing proportions of persons living alone have come to be symptomatic in many ways of modern western societies because they represent the importance conceded to the individual and to individual goals at the expense, basically, of the family. Solo living has been interpreted within the context of the changing values and preferences, changing personal and conjugal realities, and the changing work contexts so often associated with the Second Demographic Transition. We know little about patterns and trends in living alone over the life course in much of the world because most research to date has concentrated on regional and national portrayals or on later life. This study provides a systematic look at the differences in living alone by age and sex in 113 countries. Our aim is to understand the extent to which behavior differs around the world and the implications this has for society. We also examine the relationship between trends in living alone and levels of human development. Results are taken from three massive datasets: census and survey microdata from IPUMS-international, Demographic Health Surveys and EU-Labor Force Surveys.

Keywords: living alone, life-course, family, households, development, world, aging.

Increasing proportions of persons living alone have come to be symptomatic in many ways of modern society. While often the result of the vagaries of life (spousal death, divorce or the availability of kin), personal choice is also a factor, at least in the developed world. Within the context of the changing values and preferences, the changing personal and conjugal realities and the changing work contexts (Jamieson and Simpson 2013; Klinenberg 2012; Lesthaeghe 2014), solo living represents, by implication, the importance conceded to the individual at the expense, basically, of the family and family-based residential arrangements (Reher 1998). Despite its relevance, we know little about living alone over the life course in much of the world. Most research has concentrated on regional and national portrayals (Klinenberg 2012; Park and Choi 2015; Podhisita and Xenos 2015; Raymo 2015; Yeung and Cheung 2015) and focused predominantly on later life (Bongaarts and Zimmer 2002; Macunovich et al. 1995; Padyab et al. 2019; Requena et al. in press; Reher and Requena 2017, 2018a; United Nations 2005). We lack large comparative studies that compare levels of living alone across societies, age groups and sex. To fill this gap, this study documents global patterns and trends in living alone by sex and age and investigates how these trends are related to different levels of human development and to the relative importance of the family in different societies. We use newly available big microdata that describes living arrangements for 113 countries, representing over 95% of the world's population. By leveraging these data, this study will produce comparative evidence by analyzing, for the first time, cross-national variations in living alone across age groups and sex over recent decades.

BACKGROUND

Living arrangements are largely a matter of choice and priorities and how they are conditioned by prevailing family systems, development, health and institutional contexts holding in any given society and by the way different events such as childbearing, leaving the parental home, marriage, partnering and divorce, and mortality affect the life course (Reher and Requena 2018a). They are also the result of the underlying demographic, social and economic contexts determining potential demand for coresidence. In an idealized family-based society, the percentage of people living alone would never be far from zero, because the priorities informing choice would invariably place value on family-based living arrangements above any other. This is seldom the case because the importance of family-based coresidence tends to vary across societies, making it a relative option, not an absolute one. Residential choices are thus a useful shortcut for gauging the importance of family systems as they mesh with a variety of situations and constraints. In many ways, living alone can be interpreted as the antithesis of the preponderance of the family in people's lives. On this point, however, it is important to remember that the importance of the family can be seen in terms other than coresidence, including meals in the parental household, frequent visits or calls to parents, or even the occasional intra-familial monetary and non-

monetary transfers either upwards or downwards. Caring for parents or having parents take care of grandchildren are important manifestations of the importance of family ties. In other words, the family can affect other areas of life that do not imply living arrangements. Despite this, coresidence represents the most direct –and one the most measurable– manifestation of family ties.

The specific contexts of coresidential choice can be quite different for people of different ages and in different societies. Existing research has largely focused on later life and, to a lesser extent, on young adults (Stone, Berrington, and Falkingham 2011). Here we focus this discussion on three different periods in people's lives. For each period, we select a representative age group: young adults (25-29), mature adults (50-54) and the elderly (75-79).

When young, the transition to full adulthood can be made in many different ways. For the majority of people, this need not involve ever living alone. A person living at home and moving directly into a marriage partnership is one example. The real difference appears in societies in which there is a more or less lengthy period between childhood and the onset of a new family, especially one when living alone is acceptable, possible and/or needed from an economic standpoint. This unique custom originated in Northern Europe during the Early Modern period, was a vehicle whereby young adults became independent, at least in part, of their parental families (Hajnal 1992; Laslett 1977;), and has been interpreted as evidence of the importance of the individual and of individual responsibility for the transition to adulthood in historical contexts (Reher 1998). In recent times, living alone among young adults is an essential part of the Second Demographic Transition and is associated with a diminished importance of family-based coresidence in the lives of young adults (Lesthaeghe 2014). The extent to which solo living among young adults is spreading to non-western societies remains poorly documented. It may also be characteristic of certain developing societies where young men need to migrate in search of work (Cheung and Yeung 2015), itself the result, at least in part, of rapid population growth at those ages.

The years of mature adulthood are those in which new families and households are formed, children are born and raised, and work, especially salaried work, becomes the sole source of support for the household. For these reasons, it is also a period of life in which living alone tends to be infrequent and, until now, has tended to be neglected by researchers. Never-married people, people without partners (divorced, separated, widowed or otherwise) and people who are not otherwise interested in or able to have families are all prime candidates for living alone (Demey et al. 2013). The decline in the importance of marriage and rising childlessness (Kreyenfeld and Konietzka 2017; Reher 2011) in much of the more developed world is an important cause of increasing levels of living alone in many societies.

As people enter later life, the pace of change accelerates. Generally, the elderly show higher levels of living alone (United Nations 2005), a situation often triggered by the prior death of a spouse. Health, kin availability, economic conditions and personal choices play a key role in living arrangements at later ages. Health, heretofore of only residual importance, becomes a key factor for coresidential choice (Reher and Requena 2018a). The availability (and proximity) of kin, especially direct kin (spouses and offspring), for potential coresidence is an important constraint. Spousal or partner mortality often leads to solo living. People's fertility histories may have also implications for coresidence in later life, especially today when levels of infertility tend to be very high in parts of the world (Dommaraju 2015; Hayford 2013; Reher and Requena 2017, 2018b). Never-married, divorced, widowed and childless people earmarked for living alone in later life are a potential burden both for their families and for health systems. The actual number of elderly in any given society is also important because it determines the potential demand for the support provided by the family or by institutions. Moments of rapid population aging will tend to yield increases in the incidence of living alone in later life. Contextualizing all of this is the economic ability of people to go it alone, the value placed on solo living, the willingness and ability of the family to intervene in the care of its elderly and, of course, the existence of policy-based resources for the management of aging.

As we have seen, for the three age groups considered here, living alone appears to be closely connected to marital status. The possibility that cross-national trends and differentials in living arrangements simply reflect differentials in rates of singlehood, marriage, divorce and separation, and widowhood across countries requires further scrutiny. In order to sharpen our focus on this issue, in this paper we will compare the observed percentages in living alone with standardized levels of living alone by marital status. If cross-national differences persist after standardization or are highly correlated with the observed values, it would indicate the presence of additional factors, beyond marital status, affecting the likelihood of living alone in different societies.

For each age group, we examine the relationship between living alone and levels of human development as indicated by the Human Development Index (United Nations 2016), for which we expect a positive relationship across all age groups based on available evidence (even after controlling for marital status). The idea of connecting family change with macro level measurements of development, modernization, economic growth and, more recently, ideational change has a long tradition in family studies (Goode 1963; Le Play 1871; Lestaheghe 2010; Parsons 1949; Ruggles 1987). According to this tradition, family life is likely to be affected by these macro changes; all of them leading to the weakening of family ties (Ruggles 2009; Ruggles and Heggeness 2008). Living alone is the quintessential example of this process. Development affects the incidence of living alone both directly and indirectly. It leads to greater individual wealth and the existence of more comprehensive public interventions in people's lives. Pension

systems, interventionist social policies, unemployment insurance, individual savings and publicly funded health care policies are all correctly associated with developed societies (Macunovich et al. 1995; McGarry and Schoeni 2000). Development also affects societies and values and is at the core of all modernization processes, though its pace and that of changing values need not be necessarily the same in different cultures (Raymo et al. 2015). Education is a good example of this and has been shown to have a strong and positive impact on living alone in most societies (Reher and Requena 2018a; Park and Choi 2015). The importance of the individual, the role of women in society and the type of developmental idealism discussed by Thornton (2001) are also important. Besides, as societies develop and modernize, they introduce legal reforms that wrest importance from the family. Laws governing divorce, abortion and mistreatment are examples of this. It is unquestionable that one of the main implications of all development processes is the gradual and possibly inexorable process of undermining the relevance of the family. Since it is clear that development is gradually affecting the entire world, it has been argued that it will eventually do away with the family, at least in its role as the main provider of social welfare and the source of values (Reher and Requena 2018a: 34). The world provides a natural experiment that yields a vast tapestry of differing levels of development and family, and constitutes an ideal scenario for testing many of these hypotheses.

In examining this relationship, we do not aim to establish causality specifically. Ideally, any causal models would require the availability of additional variables and more accurate measures of health, availability of kin, economic conditions, welfare provisions and values. Beyond modernization or developmental theories in which family change responds to macro-level structural or ideational changes, considerable research has given support to the idea that cultural legacies persist in Western societies (Hajnal 1965; Inglehart and Baker 2000; Laslett 1965; Thornton 2005) and these provide a useful way of understanding the way living arrangements play out over the life course. It is important to remember that the family also constitutes a source of emotional support and identity for its members that may be more resistant to change than its strictly instrumental role. The links of this non-material dimension of the family and prevailing family systems and processes of change remains a relatively under-explored area of research. Research has shown that within similar levels of development, the value placed on the family may vary substantially. Diversity within Europe is a clear example of this pattern (Reher 1998; Reher and Requena 2018a; Padyab 2019). It is impossible to understand living alone properly without understanding the way it affects and is affected by prevailing family systems. Reflections on these potential influences are presented as an extension of our general description of levels in living alone across societies and will be used to inform our final discussion.

MATERIALS AND METHODS

This project mobilizes a wealth of anonymized individual-level microdata from contemporary population censuses and surveys worldwide. All of these data have been authorized for secondary use and individuals are not identified. This analysis mainly relies on nationally-representative scientific use data from a vast new archive of census microdata made available by the Integrated Public Use of Microdata Series - international (IPUMS-I) project (Minnesota Population Center 2018), in addition to complementary use of Demographic Health Surveys (DHS), Eurostat Labor Force Surveys (EU-LFS), and country-specific surveys or censuses not present in these archives (see Appendix 1). These datasets enable us to identify unipersonal households and provide information, among other variables, on age and sex. Unipersonal households do not pose major cross-national comparability challenges, although an unknown –but small- fraction of them might be underestimated. The analysis is based on persons residing in private households. Even when available, collective dwellings have not been included because they cannot be consistently identified across samples. To avoid the potential distortions caused by these dwellings, we restricted our analyses for single living among the elderly to people aged 75-79. From this age onwards, the percentage of elderly in collective households grows substantially and varies widely across societies.

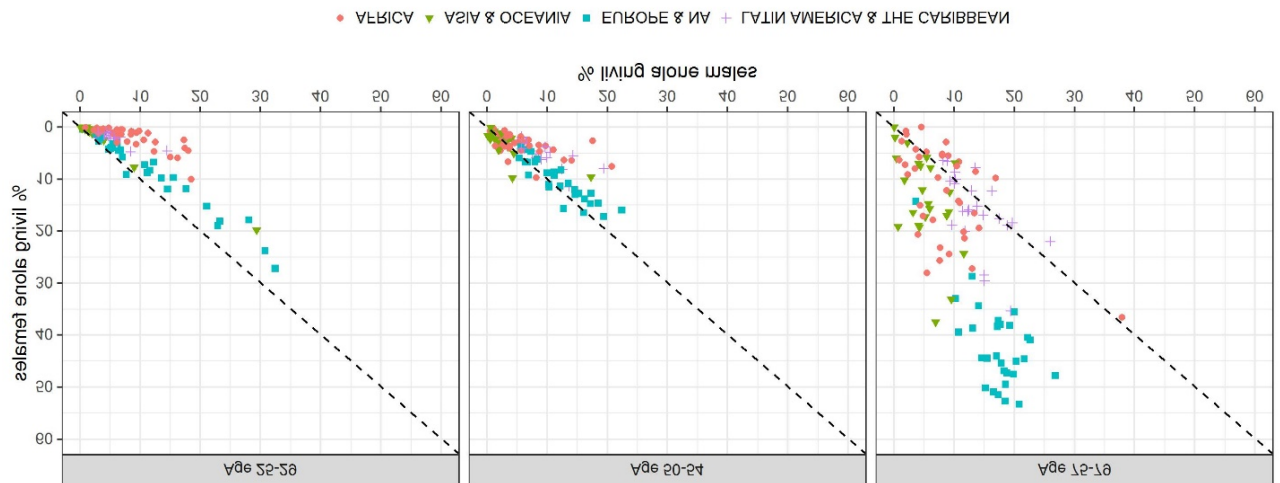
We have excluded those countries for which there are no data after 2000. For the selected countries, we included the two most recent data points. The primary IPUMS-I database provides data for 92 samples from 59 countries. Further coverage from Demographic Health Surveys adds 90 samples and 42 countries. The EU-LFS dataset contributes an additional 24 samples and 11 countries to secure almost complete coverage of Europe. The complete database includes 113 countries representing over 95% of the world's population. When two data sources were available for the same country and year, mainly censuses and DHS, preference was given to censuses because of their larger sample sizes, usually ranging between 1% to 10% of the total population. Despite some indication of certain data problems in the sub-saharan region, especially with respect to elderly people, to date there appears to be no systematic bias and no indication that the problems affect the actual registration of people living alone.ⁱ

We have also compiled data on development by means of the Human Development Index. These data constitute an important explanatory variable that will help us understand better the basic behavior observed. This paper only includes country-level analysis, but eventually our research will address the micro-determinants of living alone. In the presentation of our findings, nations are represented by dots color-coded into four macro regions: Europe and North America (29 countries); Asia and Oceania (24); Africa (37); and Latin America and the Caribbean (23).

RESULTS

Figure 1 contains scatterplots of the incidence of living alone among males and females for three age groups corresponding to young adults, mature adults and the elderly. The diagonal dashed line indicates equal percentages for men and women, with dots above those lines indicating higher percentages of women living alone and below, the opposite. It provides a useful visible introduction to the subject at a global scale. As expected, the correlation between both sexes at different ages is extremely high at all ages though actual levels for each sex may differ. Among young adults (25-29), the incidence of living alone is invariably higher among men, especially among men living in the developed world. In Germany and Switzerland, percentages are close to one third of the population (25-29). Most countries, however, crowd into the <5% category indicating that living alone at that age is an exception in most of the world. In several countries, mostly located in Africa and Asia, percentages are extremely low, especially for women (0-1%). The highest levels, in excess of 20% of men at that age living alone (and >15% for women), are found in a very few developed societies. Male-female differences are greatest in certain Central African nations where above 10-15% of males live on their own as opposed to almost no women.

Figure 1. Female and male patterns in living alone in 113 countries at ages 25-29, 50-54 and 75-79 (most recent available data since year 2000).



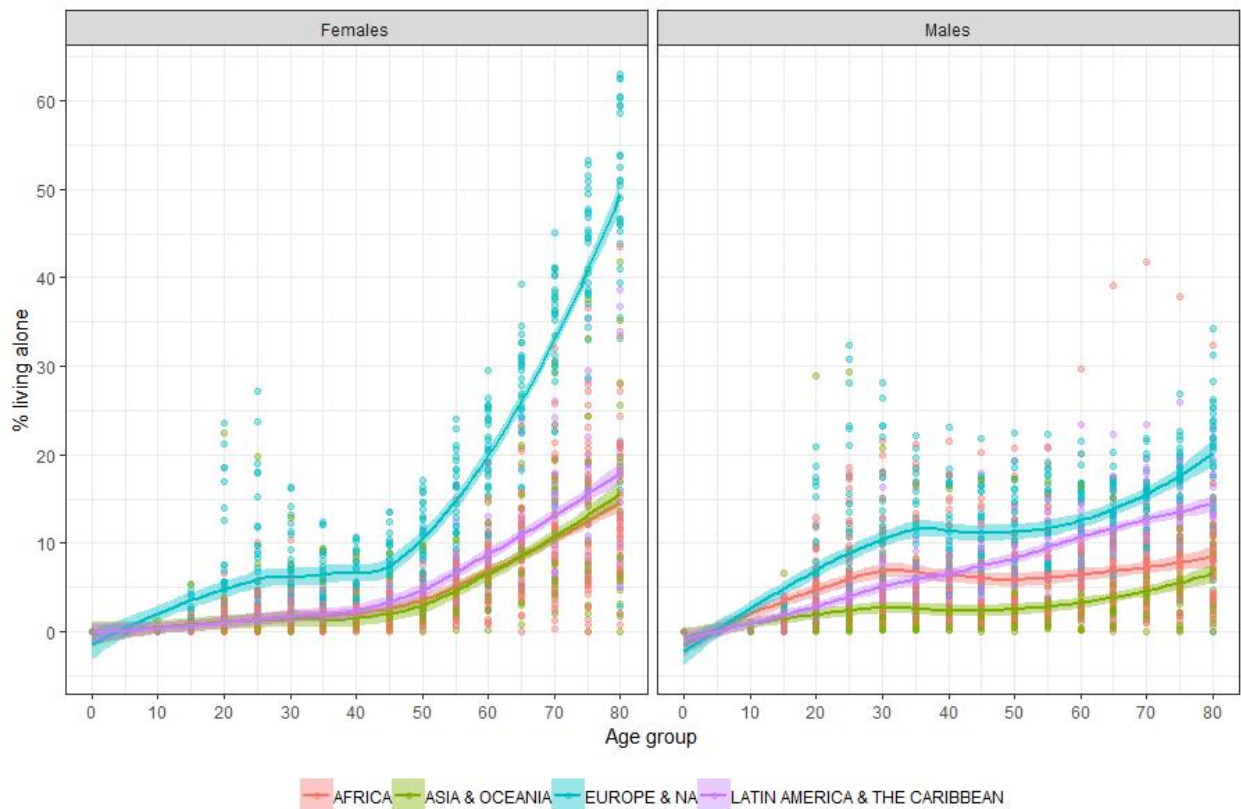
Source: Own calculations based on census and survey microdata from IPUMS-I, DHS and EU-LFS data.

Among mature adults (50-54), the incidence of living alone is mostly higher among men, but less uniformly so than among young adults. Again, levels are highest in nations of Europe and North America though the overall clustering of dots is greater than earlier in life. There continue to be many nations, mostly in Asia and Africa, hovering near the 0% mark indicating that in many societies living alone at that age does not exist. In Africa, some of the more developed countries (Botswana, Kenya or South Africa) show higher levels of men living alone than the regional averages suggest, and much higher than those among women. In several Latin American nations, levels are similar to those holding in Southern Europe, with the highest levels holding in some Caribbean nations and in Argentina and Uruguay.

Among the elderly (75-79), things change rather dramatically. The incidence of living alone is much higher at this age, often two to three times higher than among mature adults. It is far higher among women than among men, due for the most part to differential mortality at those ages. Despite this, in a few nations, located mainly in sub-Saharan Africa and the Caribbean, levels among males are slightly higher than among females. Overall levels are highest in Europe and North America, with some notable exceptions such as the island nation of São Tomé and Príncipe in Africa and Iran and Cyprus in Asia. The overall disparities in behavior are far higher in later life than they are for other ages with a small group of nations hovering near zero and another more numerous group with levels 30-50% for women and 15-25% for men. Asian nations tend to have the lowest levels of living alone for this age group.

Figure 2 shows the same basic data from a life-cycle perspective. Here we chart the percentage of men and of women living alone by five-year age groups with each bar showing the exact percentage represented by color-coded dots. Smoothed lines are the regional means and have been included to facilitate the interpretation of results.ⁱⁱ These results deserve careful scrutiny. Among women, the exceptionality of Europe and North America is clear at every age. Higher levels of living alone are already visible among adolescents (15-19) and persist throughout life. At 25, a plateau is reached corresponding to the start of reproductive life and lasting until the age of 50, after which levels increase sharply. In the other macro regions, women live mainly with others until approximately 45 when numbers increase substantially until the end of life. This increase is much faster among women in Europe. Elsewhere, after 50 there is a slightly higher incidence of living alone among females in Latin America compared to other regions, but differences are only modest.

Figure 2. Patterns in living alone in 113 countries by age and sex (most recent available data since year 2000). Includes continental smoothed lines.



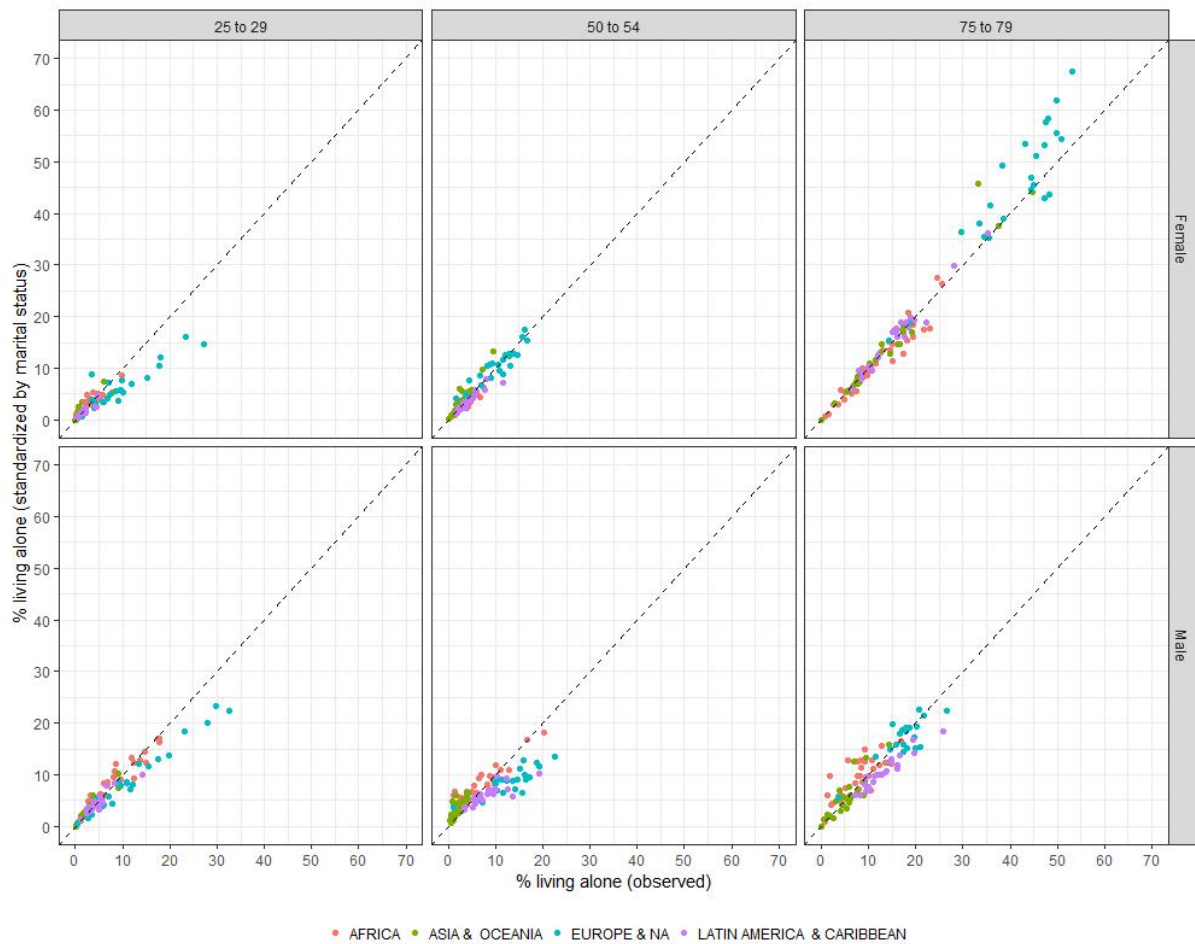
Source: Own calculations based on census and survey microdata from IPUMS-I, DHS and EU-LFS data.

Among men, patterns are generally similar to those of women, but there are also important differences. In the developed world, levels are invariably higher than elsewhere but the differences with respect to other nations are more muted than among women. Once again, they are higher among men in Latin America than elsewhere, at least after 40 years of age, though earlier in life living alone is more frequent in Africa. Like women, living alone is lowest in Asian societies. When comparing both panels of this figure (males and females), higher levels of living alone favor women starting at 45 in Europe, 55 in Asia, 65 in Africa and after 70 in Latin America. Clearly, living alone is highest among the elderly, is mostly a matter of women in later life, and is much higher in Europe and North America than it is any place else in the world.

Figure 3 shows the incidence of living alone by age and sex derived from observed data and when standardized by the cross-national average distributions by marital status of each age group and sex, thus enabling us to assess the importance of marital status for living alone around the world.ⁱⁱⁱ In this straightforward portrayal, values above the diagonal line correspond to societies where

standardized levels of living alone are higher than observed ones, with the opposite holding when they are below the diagonal lines. For the most part, values hover near this line, suggesting that marital status has little to do with the differences shown in Figure 1. Only in Europe and North America is the situation somewhat different. For young adults (25-29) of both sexes and for middle-aged men (50-54) observed values are always higher suggesting that disparities in marital status are not the reason for the relatively high values observed in those nations. Among elderly women in the developed world, the opposite occurs suggesting that the already sky-high rates of living alone would have been even higher had marital status been included. Despite this, however, it should be remembered that the overall levels of living alone among elderly women in the developed world are so much higher than in any other world region that, even among them, marital status plays only a limited role in explaining the observed cross-national differences. Despite the important differences in the relative weight of partnered, divorced and widowed populations in the three age groups analyzed here and despite the importance of marital status for living alone (everywhere never-married and currently unmarried people are far more likely to live alone), the overall cross-national differences in the likelihood of living alone are largely unaffected. The cross-country differences in living alone even within the same marital status persist and these differences are highly correlated with the overall differences in the incidence of living alone. For this reason, the following figures make use of non-standardized values.

Figure 3 Observed and standardized (by marital status) female and male patterns in living alone in 113 countries at ages 25-29, 50-54 and 75-79 (most recent available data since year 2000).

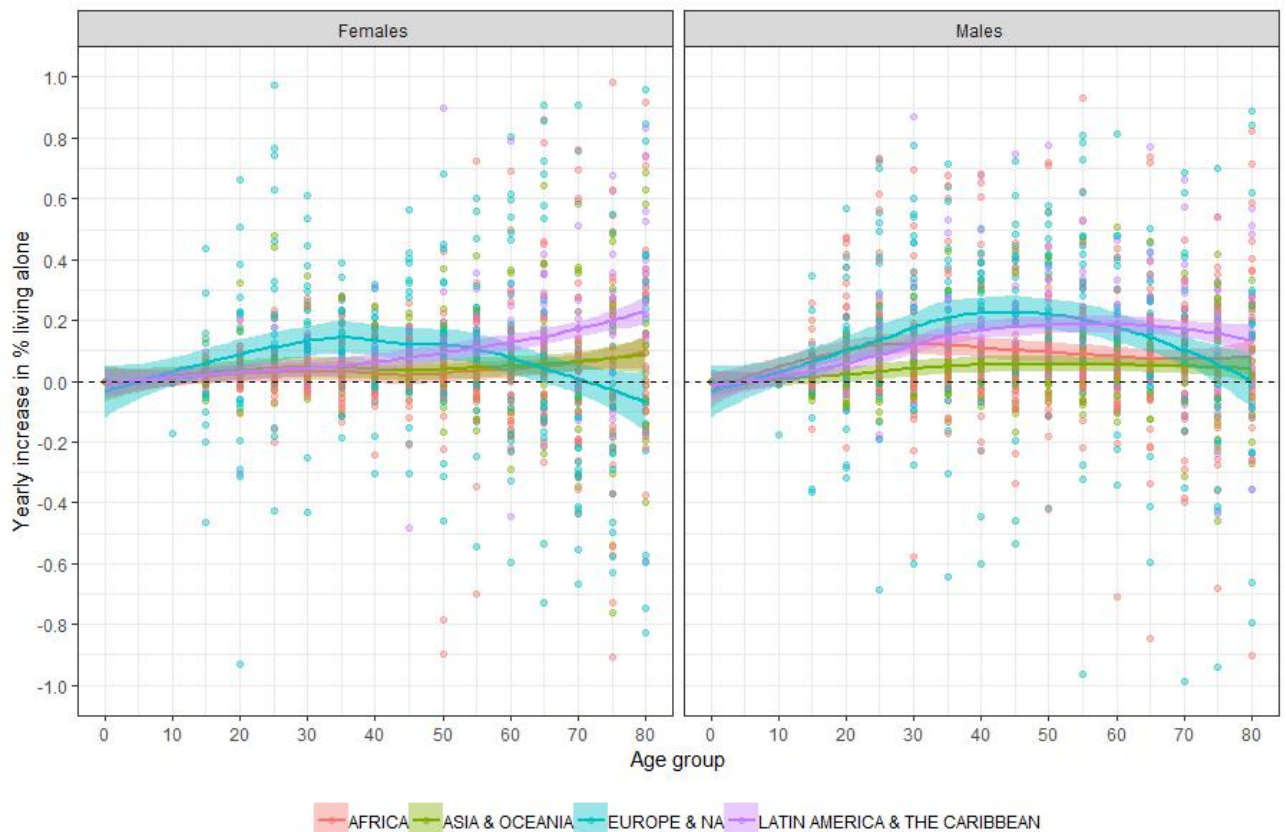


Source: Own calculations based on census and survey microdata from IPUMS-I, DHS and EU-LFS data.

We have attempted to assess change over time in patterns of living alone in an approximate way based on the two most recent data points for any given country and estimated by dividing the difference in percentage points between both dates by the interval in years between them. This is no more than an approximation because it is based on empirical estimates that often are not separated by the same interval, may also correspond to different starting and ending dates and makes estimating any non-linear pattern of change impossible (see Appendix 1 for exact dates).^{iv} Despite this, the results are of considerable interest. In Figure 4, each color-coded data point represents the yearly increase or decrease of percentage living alone for any given age and sex, with colored lines showing smoothed regional means. These data offer strong evidence that the incidence of living alone among females during adult life is only increasing in Europe and North America, with important intraregional differences and, generally, with little change elsewhere. At older ages, however, the increases in Latin America are much stronger and are coupled with greater intraregional uniformity, while in Europe rates of increase have declined to near zero and

are even negative beyond age 75. Among males, mostly there are generalized increases over most of the life cycle with the exception of Asia where there is no sign of change. Increases are strongest before 60 and much lower during later life. Overall, the rates of change are greater among males, with the exception of the elderly in Latin America where growth among females is much higher.

Figure 4. Yearly increase in percentage living alone in 93 countries by age and sex (based on most recent available period of observation). Includes smoothed lines by continent.

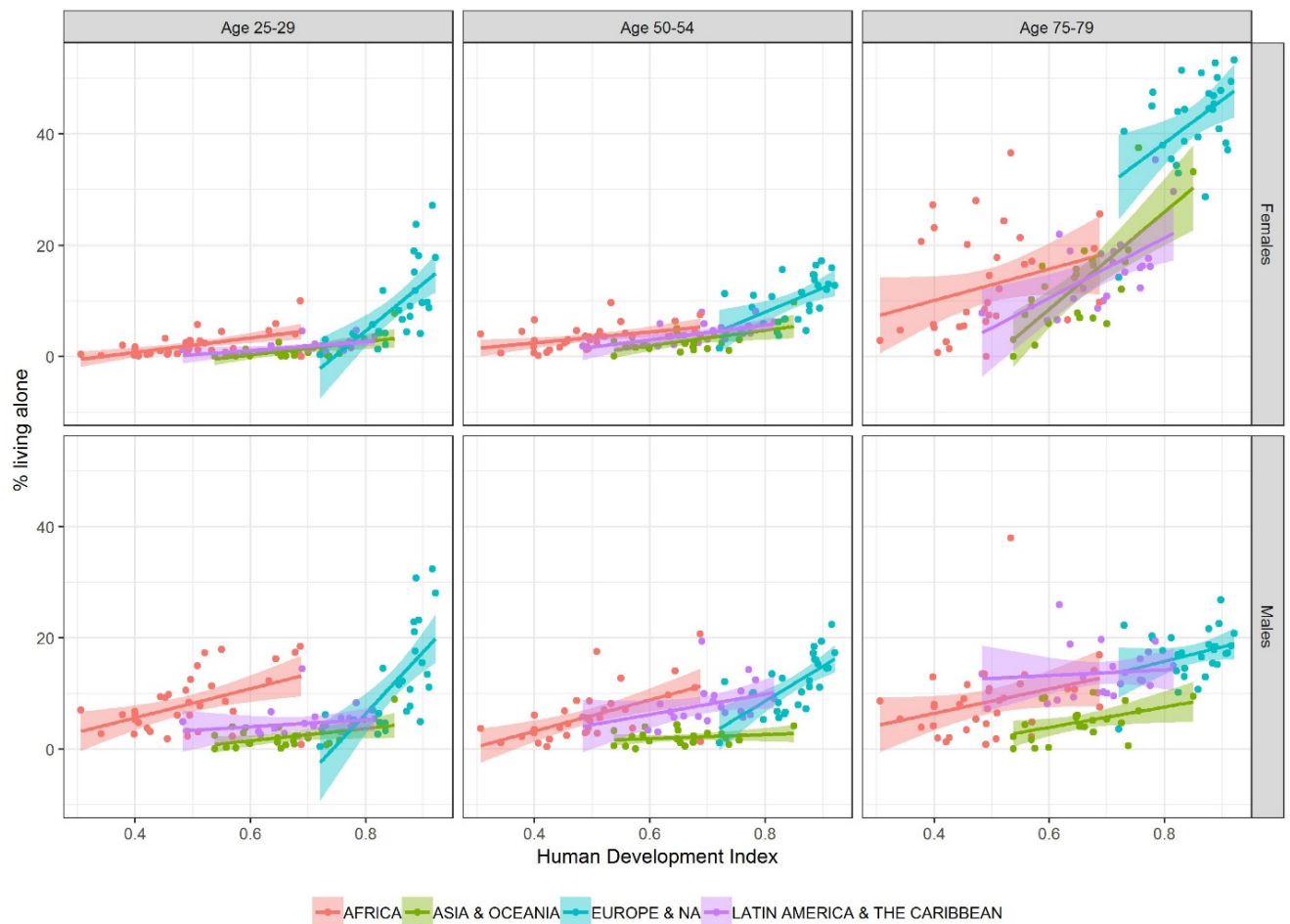


Source: Own calculations based on census and survey microdata from IPUMS-I, DHS and EU-LFS data.

Living alone at different ages is charted in terms of the level of development in each society in Figure 5. The indicator used, the Human Development Index, is a mix of income, education and mortality often used by international organizations. While not perfect, it represents overall development acceptably well. The figure itself includes trend lines for each region showing the degree to which the expected link holds within each macro region. As expected, the more developed a country is, the higher the levels of solo living. This link, however, differs by age, sex and region. It is sharper in Europe and North America than it is in other macro regions, though among elderly females it is very important everywhere, especially in Asia and Oceania. Among

the elderly, the correlations are far higher among women than among men where they are rather weak. The difference between Europe and other world regions is most visible among young adults, a pattern also visible, though less so, among mature adults. In Asia and in Latin America, this link is only clear among elderly females, and much less so at other ages or among males. Generally, the correlation between living alone and development is highest among the elderly and stronger among women than among men.

Figure 5. Human Development Index and patterns in living alone in 113 countries by sex at ages 25, 50 and 75 (most recent available data since year 2000). Includes regression line by continent.



Source: Own calculations based on census and survey microdata from IPUMS-I, DHS and EU-LFS data.

DISCUSSION AND CONCLUSIONS

Living alone is all about the role of the individual and individual expectations in society, as they are constrained by culture and by economic and demographic realities, health, policy and institutions at different stages of life. The precise combination of these forces varies by age and sex, but they are always present in one way or another. Where the value placed on the individual

is high, levels of living alone will also be high, and where the value of family coresidence, support and control is high, the incidence of living alone will be lower. This basic dichotomy is clearest in early life, but it is present throughout, as residential choice is increasingly affected by issues related to health, institutional support, availability of kin, economic autonomy and a whole host of other factors. Behind this basic tapestry of choice and constraints, levels of development and the importance of prevailing family systems act as important background variables.

In this paper we have shown that there are enormous differences in the incidence of living alone around the world though, generally, family-based living arrangements prevail, with the partial exception of women during later life. During early life (25-29), values range between 0% and 32% (Germany has the highest values), among mature adults (50-54), between 0% and 19% (UK levels are highest) and in later life between 0% and 53% (Switzerland, Netherlands and UK are highest). On a global scale, living alone is relatively infrequent for most people. Among young adults, 81% of the 113 nations in this sample show levels of single living among women $\leq 5\%$, in 56% it is $\leq 5\%$ for both women and men and in 63% it is $\leq 2\%$ among women. A similar pattern persists among mature adults (50-54) with values of 67%, 44% and 29% respectively. Only in later life do these extremely low percentages of living alone increase. Our analysis has shown that Asia emerges as the most familial of all both among men and women, followed at slightly lower levels by Latin America and, at least among women, by Africa as well. In this last continent, however, solo living among young males is somewhat more frequent than in other less-developed regions. On all counts, levels holding in Europe and North America are by far highest.

These basic disparities exist despite the importance of marital status as a determinant for living alone. The fact that cross-national differences in living alone after standardization by marital status are highly correlated with the observed data is fitting proof of this. It indicates that unpartnered individuals (the ones most likely to live alone in any given country) are likely to be in many different living arrangements around the world. As shown in the literature, the incidence of coresidence with parents among young and single persons and coresidence with children among older and widowed persons differ substantially across countries, even within continental regions and in historical times (Esteve and Liu 2018; Ruggles 2010; Szoltysek et al. 2019).

The central role of the individual and the family in society can be best observed among young adults because, basically, at this age institutional contexts and health issues are not a factor. Except in strongly agricultural economies where young adults are expected to work the land of their parents, at this age people tend to live alone because they want to, they are allowed to, they need to or they have the wherewithal to do so. While among the elderly, the stakes for people and society are much higher, especially in societies in which the weight of the elderly and its growth over time is strong and is accompanied by shifts in values, among young adults we can see the reality of this very fundamental trade off in contemporary society much more clearly. On this

point, our results have shown that men have broken this mold earlier and more decisively than women, though in the most developed world levels of living alone among women are also quite high, an indication that the pace of change may be much more rapid among women than it is among men.

The revolution of individualism and individual choice, so dear to our understanding of modernization in the developed world, has hardly begun in much of the rest of the world, at least if this is judged in terms of the incidence of living alone among young adults. Since a dramatic change in the position of women in society is a component part of this process, we can expect it to lead eventually to equal numbers of men and women living alone at this age. While Europe and North America may be almost there on this count, elsewhere the change of the position of young women in society remains but a promise for the more or less distant future. The ratios between the incidence of men and women living alone during young adult life (25-29) tell this story clearly. Based on regional means, this ratio is 1.39 in Europe and North America, 2.73 in Latin America, 3.74 in Asia and 7.4 in Africa. The relative differences by sex in living alone in the less-developed world are far higher among young adults than at any other age. The result is a situation in which living alone at this age is far higher in the Western developed world with moderate differences by sex due at least in part to differences in the timing of marriage. In much of the rest of the world, however, overall levels are far lower and sex differentials are several times greater, especially in Africa where they are truly off the scale. The low levels of solo living together with the vast differences between men and women suggest that this revolution has hardly begun in most world regions where people, mostly women, tend to co-reside with kin. While economic factors may be part of the explanation for this behavior, their impact may pale by comparison to cultural factors related to the traditional role of the family in people's lives, especially young women.

It is difficult not to pay special attention to the incidence of living alone in later life. It is at that age that the largest array of factors intervene in determining residential choices and it is at that age where these choices have the most far-reaching implications for society. It is also an age where the incidence of living alone skyrockets, especially among women. Age and sex, spousal death, health, individual savings, the existence of pensions, the availability of kin, the existence of institutions as a legitimate residential option, the willingness of the family to provide or manage support, together with people's preferences and expectations, all come into play at a key moment of people's lives. Underlying this tapestry of constraints and preferences, population growth among the elderly, especially among people without a spouse or partner and those with no offspring, determines the actual demand for support existing in any given society.

During their old age, people will experience the entire gamut of life, from the very best to the very worst. The extremely high levels of living alone at this stage of life existing in much of the

developed world can only be explained by this mix of factors that has made single living an option, at times the preferred one, for many people. It should be remembered, however, that living alone in later life may not mean the same in different societies. Where elderly on their own maintain close residential proximity to their kin, or where kin hire and manage outside help for their vulnerable elderly, are examples of this. In the individualistic societies of Northern Europe and North America, residential proximity has been shown to be lower than it is in the strong-family regions of the developed world (Bordone 2009). In much of the rest of the world, we know relatively little about a subject that may have considerable importance when assessing the extent to which elderly people are actually vulnerable. It is also true that in the developed world, at least for the present and with health permitting, the preferences of the elderly and their ability to live alone are likely to be greater than in much of the rest of the world. A good example of this is shown by the fact that, when controlling for differences in marital status, the distance between Europe and North America and the rest of the world has increased rather than narrowed. In any case, on this point it is worth considering that changes in individual-based values may surpass the pace of institutional change.

The results presented here indicate that a cap may exist on living alone during later life and that much of the developed world has reached or is close to reaching it. In recent years, levels of single living among the elderly have declined in many societies and growth has slowed in others. Reductions in mortality differentials by sex and recent changes in the importance of marital dissolution is an important part of this change because they tend to reduce the pool of unmarried and un-partnered seniors (Keilman and Christiansen 2010). Beyond this, stable or declining rates of living alone in later life take place despite the skyrocketing numbers of people in the oldest age groups (+80) in national populations. Levels of about 35-55 percent of elderly women living alone may mark this hypothetical ceiling. Even in the select group of the very low mortality societies of the developed world, however, there are differences on this point. In the strongly individualistic societies, levels of living alone in later life have indeed begun to diminish, though elsewhere in low-mortality familistic societies (such as those of Southern Europe) it continues to increase albeit at a slower pace than in the past.^v

In other parts of the world, in the future we expect that increases in living alone in later life will accelerate in those societies where it is still below the high-water mark reached in the developed world. Societies immersed in rapid economic development amid breakneck demographic change are prime candidates for this sort of change. Beyond family systems, values and policy, however, in world regions where mortality in later life remains relatively high and sex differences are either great or increasing, rates of living alone in later life should increase, especially among women, and any hypothetical cap on living alone will remain very much a trend for the future. Beyond

any change in the incidence of living alone, however, the force of population aging will lead to substantial increases in the actual numbers of people living alone in later life.

Iran provides an extreme example of frenetic change. In the five-year period between 2006 and 2011, the incidence of living alone went from 15.7% to 19.0% (65-69), 24.0% to 29.2% (70-74), 29.5% to 37.5% (75-79), and 31.7% to 41.8% (80+). The scale of change is staggering in this country with high levels of education, extremely low fertility, relatively low mortality and rapid economic growth, and is possibly unrivaled any place else in the world. The enormous differences in patterns of change among the elderly in Iran takes place despite the fact that differences by sex in life expectancy continue to be relatively low (United Nations 2017) and suggest that other forces, possibly related to the pace of social change, may be at work. Yet the same does not happen among young adults where, despite some indication of rather timid change during the same period (women 0.3% → 0.6%, men 1.3% → 1.6%), extremely low levels of living alone continue to prevail. A pattern of rapid change in the elderly living alone coupled with little change among adults is visible in much of the world today. From the standpoint of modernization processes in the West, change is only partial because it does not include younger people. Whether or not these shifts in later life portend similar changes in early life sometime in the future is a matter of speculation, though important changes in the near future cannot be discarded.

The wave of aging currently sweeping parts of the world, and in store for many other countries in the more or less distant future, will lead to increasing percentages and numbers of elderly people in society. By implication, even though the increase in the incidence of living alone in later life may slow or even reverse in some areas, the actual number of people living alone will rise substantially in the coming decades. This constitutes, now or in the future, an important challenge for society and for policy. It will also pose major challenges for families and family systems. The traditional family will be especially sensitive to the unique combination of ever-growing numbers of elderly persons and, in particular, of potentially vulnerable elderly on their own. Indeed, the rise of living alone in later life in parts of the world, especially among the oldest old, constitutes a fitting testimony of the difficulties facing families with increasing numbers of elderly members and fewer adult members willing and able to attend to their needs. Will this spread elsewhere? Likely it will, especially as the number of elderly in societies dramatically increases in the not so distant future.

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Appendix:

Appendix 1. Characteristics of the samples used in the analysis and basic data on living alone

Country	Year	Source	Percentage living alone						Human Development Index*
			Men			Women			
			25-29	50-54	75-79	25-29	50-54	75-79	
AFRICA									
Benin	1996	DHS	6,8	4,0	6,3	0,3	2,5	5,4	
Benin	2011	DHS	9,8	4,5	11,6	0,7	3,1	20,1	0,46
Botswana	1991	IPUMS	13,1	12,0	10,5	5,9	3,6	8,4	
Botswana	2011	IPUMS	18,5	20,7	16,9	10,0	7,6	9,8	0,69
Burkina Faso	1993	DHS	4,7	1,3	5,2	0,5	0,4	7,3	
Burkina Faso	2014	DHS	6,8	3,0	4,2	0,5	0,6	5,7	0,40
Burundi	2010	DHS	2,6	2,7	5,0	0,7	3,6	23,2	
Burundi	2012	DHS	2,7	3,3	13,0	0,3	1,8	27,2	0,40
Cameroon	1991	DHS	9,2	5,8	18,1	2,0	5,2	3,7	
Cameroon	2011	DHS	12,5	5,1	10,9	2,8	2,9	14,6	0,50
Chad	1996	DHS	5,4	1,5	3,6	0,4	7,2	22,1	
Chad	2004	DHS	7,0	3,7	8,7	0,5	4,0	2,9	0,31
Comoros	1996	DHS	1,0	0,9	3,9	0,2	0,9	3,0	
Comoros	2012	DHS	3,2	3,1	0,9	0,6	1,3	6,3	0,49
Congo	2005	DHS	4,2	2,8	13,5	0,5	1,6	9,9	
Congo	2011	DHS	8,6	7,1	13,4	0,8	4,2	16,6	0,56
Cote Ivoire	1994	DHS	9,5	5,7	1,7	1,1	1,1	6,1	
Cote Ivoire	2011	DHS	9,4	3,9	8,0	1,1	1,6	5,4	0,44
Democratic Republic of the Congo	2007	DHS	3,9	3,2	8,4	0,5	3,5	19,4	
Democratic Republic of the Congo	2013	DHS	3,7	3,8	4,3	0,5	3,6	15,0	
Egypt	2000	DHS	1,4	0,8	4,1	0,1	1,6	18,7	
Egypt	2014	DHS	0,9	1,4	7,6	0,1	3,7	25,6	0,69
Ethiopia	1994	IPUMS	3,7	1,4	3,7	1,4	4,5	16,6	
Ethiopia	2007	IPUMS	6,2	2,2	4,0	2,0	4,5	20,7	0,38

Appendix 1 (b). Characteristics of the samples used in the analysis and basic data on living alone

Country	Year	Source	Percentage living alone						Human Development Index*
			Men			Women			
			25-29	50-54	75-79	25-29	50-54	75-79	
Gabon	2000	DHS	10,0	8,5	12,0	3,1	3,5	7,2	
Gabon	2012	DHS	17,4	11,0	14,1	4,1	4,4	19,4	0,68
Guinea	1999	DHS	4,2	1,7	-	0,1	0,5	8,2	
Guinea	2012	DHS	4,8	1,1	2,0	0,1	0,2	0,8	0,41
Kenya	1993	DHS	13,4	7,0	11,2	2,7	3,3	23,3	
Kenya	2014	DHS	18,0	12,8	11,7	4,5	6,3	21,4	0,55
Lesotho	2004	DHS	5,1	8,2	8,9	4,5	3,3	16,6	
Lesotho	2014	DHS	6,1	8,6	10,4	2,9	3,5	7,5	0,50
Liberia	2008	IPUMS	6,2	6,1	8,0	1,8	2,9	5,2	0,40
Madagascar	1992	DHS	1,6	3,7	2,3	1,2	3,9	27,6	
Madagascar	2013	DHS	3,1	2,9	6,5	1,2	3,7	17,8	0,51
Malawi	1992	DHS	5,2	5,2	10,1	1,6	1,4	14,2	
Malawi	2014	DHS	6,1	8,8	5,4	0,5	4,7	28,0	0,47
Mali	1998	IPUMS	2,6	1,5	2,5	0,4	1,5	6,5	
Mali	2012	DHS	3,8	0,5	1,3	0,4	0,7	2,7	0,42
Morocco	1994	IPUMS	2,5	2,0	2,6	0,4	2,2	10,6	
Morocco	2004	IPUMS	2,3	2,1	2,3	0,5	1,9	9,1	0,57
Mozambique	1997	DHS	4,1	4,8	9,8	2,1	9,8	25,4	
Mozambique	2011	DHS	5,3	3,5	7,6	1,1	6,6	23,2	0,40
Namibia	1992	DHS	3,5	7,0	5,7	0,2	1,9	7,4	
Namibia	2013	DHS	12,3	9,7	10,8	4,7	3,6	6,6	0,63
Niger	1992	DHS	2,9	0,3	1,5	0,3	0,9	12,1	
Niger	2012	DHS	2,8	1,2	5,4	0,2	0,7	4,8	0,34
Nigeria	1999	DHS	10,0	2,6	2,2	2,8	4,0	6,0	
Nigeria	2013	DHS	17,3	7,0	9,2	2,5	3,6	24,4	0,52

Appendix 1 (c). Characteristics of the samples used in the analysis and basic data on living alone

Country	Year	Source	Percentage living alone						Human Development Index*
			Men			Women			
			25-29	50-54	75-79	25-29	50-54	75-79	
Rwanda	1992	DHS	5,3	1,5	6,7	0,4	0,8	7,2	
Rwanda	2014	DHS	8,5	3,8	7,3	1,4	1,4	9,7	0,49
Sao Tome and Principe	2008	DHS	11,3	8,2	37,9	1,1	9,7	36,6	0,53
Senegal	1992	DHS	2,1	1,8	0,9	0,3	0,5	1,2	
Senegal	2014	DHS	2,3	5,6	4,6	0,6	1,8	-	0,49
Sierra Leone	2004	IPUMS	3,5	3,5	3,3	0,7	1,7	3,4	
Sierra Leone	2013	DHS	3,2	1,8	2,1	0,5	1,2	1,4	0,43
South Africa	1998	DHS	6,7	4,8	10,2	2,9	3,5	10,0	
South Africa	2011	IPUMS	16,2	14,1	10,7	5,9	6,4	14,2	0,64
South Sudan	2008	IPUMS	1,7	2,1	3,6	0,5	3,5	4,3	
Sudan	2008	IPUMS	1,9	2,4	3,5	0,4	2,8	8,0	0,46
Swaziland	2006	DHS	15,0	17,5	1,8	5,7	2,6	7,3	0,51
Uganda	1995	DHS	6,4	11,0	18,8	1,8	3,6	7,2	
Uganda	2014	DHS	10,6	2,9	13,5	2,5	3,7	8,6	0,49
United Republic of Tanzania	1992	DHS	6,8	5,0	4,2	1,0	2,1	7,2	
United Republic of Tanzania	2012	IPUMS	7,8	5,7	8,7	2,8	4,5	12,2	0,51
Zambia	1992	DHS	4,0	3,4	4,8	0,6	3,8	12,5	
Zambia	2013	DHS	6,8	3,8	4,9	1,4	3,8	17,1	0,57
Zimbabwe	1994	DHS	9,9	8,8	6,6	3,1	2,4	6,6	
Zimbabwe	2010	DHS	9,3	6,9	9,0	3,2	2,4	5,5	0,45
ASIA & OCEANIA									
Armenia	2000	DHS	0,9	0,4	4,2	0,1	6,2	14,1	
Armenia	2011	IPUMS	0,8	2,0	8,8	0,4	4,3	17,0	0,73
Bangladesh	1999	DHS	0,0	0,2	-	0,1	2,1	5,2	
Bangladesh	2014	DHS	0,2	0,1	0,2	0,1	1,7	2,0	0,58

Appendix 1 (d). Characteristics of the samples used in the analysis and basic data on living alone

Country	Year	Source	Percentage living alone						Human Development Index*
			Men			Women			
			25-29	50-54	75-79	25-29	50-54	75-79	
Cambodia	2000	DHS	0,3	0,2	2,0	0,2	1,9	5,2	
Cambodia	2014	DHS	0,3	0,6	4,4	0,3	1,6	7,5	0,56
China	2000	IPUMS	3,9	4,0	9,3	1,4	2,1	12,5	0,59
Cyprus	2001	LFS	6,7	2,8	10,1	3,3	6,0	40,8	
Cyprus	2011	LFS	9,0	4,2	9,5	7,7	9,8	33,2	0,85
Fiji	1996	IPUMS	1,7	1,6	6,7	0,6	1,9	5,2	
Fiji	2007	IPUMS	2,0	2,8	5,4	0,7	1,4	5,9	0,70
India	1993	IPUMS	3,1	2,5	4,1	0,2	3,5	5,3	
India	2009	IPUMS	4,0	2,3	1,7	0,4	3,5	10,2	0,57
Indonesia	1995	IPUMS	2,0	0,9	4,0	0,7	3,5	17,2	
Indonesia	2012	DHS	2,3	1,4	3,1	0,6	2,4	16,4	0,68
Iran (Islamic Republic of)	2006	IPUMS	1,1	1,0	5,3	0,3	1,8	29,5	
Iran (Islamic Republic of)	2011	IPUMS	1,6	1,7	6,9	0,6	3,0	37,5	0,76
Japan	1995	JAPAN STATISTICS BUREAU	24,2	9,1	6,1	10,3	6,0	19,3	
Japan	2015	JAPAN STATISTICS BUREAU	29,3	17,3	11,6	19,8	9,7	24,4	0,95
Jordan	2004	IPUMS	2,1	1,4	4,3	0,2	1,8	17,4	
Jordan	2012	DHS	1,1	0,9	0,7	0,0	1,1	19,2	0,74
Kyrgyzstan	1999	IPUMS	2,0	3,9	7,2	1,6	4,6	21,8	
Kyrgyzstan	2012	DHS	1,2	4,4	5,7	0,7	5,0	14,8	0,65
Malaysia	1991	IPUMS	4,8	2,8	6,8	0,9	2,6	10,4	
Malaysia	2000	IPUMS	3,9	2,8	4,7	1,3	2,5	12,1	0,73
Maldives	2009	DHS	0,2	1,2	4,1	0,1	0,8	7,0	0,65
Mongolia	2000	IPUMS	2,9	2,6	9,1	0,6	2,0	16,3	0,59
Nepal	1996	DHS	0,2	0,8	3,1	0,1	1,5	7,6	
Nepal	2011	DHS	2,4	3,3	2,2	0,3	2,8	3,0	0,54

Appendix 1 (e). Characteristics of the samples used in the analysis and basic data on living alone

Country	Year	Source	Percentage living alone						Human Development Index*
			Men			Women			
			25-29	50-54	75-79	25-29	50-54	75-79	
Pakistan	1998	IPUMS	1,0	1,4	2,7	0,1	0,7	2,6	
Pakistan	2012	DHS	0,1	0,6	0,0	0,1	0,1	-	0,54
Philippines	1995	IPUMS	1,1	1,7	5,6	0,4	1,4	8,5	
Philippines	2013	DHS	0,9	2,4	10,2	0,2	1,2	6,9	0,68
State of Palestine	1997	IPUMS	0,8	0,9	2,7	0,1	2,4	16,6	
State of Palestine	2007	IPUMS	0,8	0,5	4,0	0,1	2,3	18,9	0,66
Thailand	2000	IPUMS	3,9	3,4	6,1	2,6	3,8	7,8	0,65
Timor-Leste	2009	DHS	1,0	1,5	0,4	0,1	1,4	6,0	0,60
Turkey	1993	DHS	0,8	1,2	2,5	0,1	1,3	12,5	
Turkey	2003	DHS	1,5	1,2	5,2	0,9	1,7	17,3	0,68
Uzbekistan	1996	DHS	0,3	1,8	4,2	0,3	3,3	19,3	
Viet Nam	1999	IPUMS	1,0	1,3	4,4	0,5	3,3	11,1	
Viet Nam	2009	IPUMS	2,0	1,9	5,9	1,2	4,4	15,7	0,65
EUROPE & NA									
Albania	2008	DHS	0,4	1,2	3,6	0,4	1,5	14,3	0,72
Austria	1991	IPUMS	12,4	9,5	17,0	9,7	11,3	53,7	
Austria	2011	IPUMS	22,9	17,2	15,5	18,9	14,7	44,4	0,88
Belarus	1999	IPUMS	4,1	8,6	16,6	2,3	10,6	49,8	
Belarus	2009	IPUMS	5,2	10,2	19,9	3,9	11,0	47,5	0,78
Belgium	2001	LFS	13,7	12,6	21,9	11,3	11,8	49,1	
Belgium	2011	LFS	17,6	16,2	17,8	11,8	13,8	45,4	0,89
Bulgaria	2001	LFS	3,4	5,8	19,1	1,9	5,5	35,0	
Bulgaria	2011	LFS	5,2	10,0	20,3	4,1	8,8	45,0	0,78
Canada	2011	IPUMS	13,5	14,6	17,2	9,8	12,0	38,4	0,91

Appendix 1 (f). Characteristics of the samples used in the analysis and basic data on living alone

Country	Year	Source	Percentage living alone						Human Development Index*
			Men			Women			
			25-29	50-54	75-79	25-29	50-54	75-79	
Czech Republic	2001	LFS	5,2	6,9	20,8	3,4	10,0	52,6	
Czech Republic	2011	LFS	12,2	10,3	16,6	6,7	11,5	50,9	0,86
France	1999	IPUMS	18,2	11,6	17,8	14,6	12,7	49,7	
France	2011	IPUMS	21,1	18,5	18,3	15,2	14,6	46,9	0,89
Germany	2005	LFS	31,7	15,7	18,6	22,7	13,3	52,4	
Germany	2011	LFS	32,4	22,4	18,5	27,2	16,0	49,5	0,92
Greece	1991	IPUMS	5,8	3,7	10,2	3,9	4,9	28,4	
Greece	2011	IPUMS	11,6	8,0	10,7	8,3	6,7	39,4	0,86
Hungary	2001	IPUMS	7,8	9,5	19,1	6,4	10,8	47,7	
Hungary	2011	IPUMS	6,4	8,3	17,0	4,5	6,2	44,0	0,82
Ireland	1991	IPUMS	5,7	10,3	20,9	3,3	6,2	37,3	
Ireland	2011	IPUMS	5,0	11,1	22,6	4,1	8,7	40,9	0,90
Italy	2001	IPUMS	5,8	7,4	16,6	4,2	6,0	47,8	
Italy	2011	LFS	10,8	11,2	18,8	7,2	9,2	47,3	0,88
Latvia	2001	LFS	9,0	11,9	30,3	5,4	14,0	49,4	
Latvia	2011	LFS	7,0	13,5	20,0	5,7	10,8	35,5	0,81
Lithuania	2002	LFS	3,9	7,7	33,8	5,0	9,5	38,4	
Lithuania	2011	LFS	14,5	12,7	17,3	11,9	15,7	51,5	0,83
Luxembourg	2001	LFS	15,9	11,2	24,7	8,3	11,0	56,5	
Luxembourg	2011	LFS	23,2	15,3	15,2	18,1	12,8	50,2	0,89
Malta	2011	LFS	2,7	6,8	14,0	1,3	4,4	34,4	0,82
Netherlands	2001	LFS	22,5	13,4	20,9	15,8	11,5	64,3	
Netherlands	2011	LFS	28,1	17,3	20,8	17,8	12,8	53,3	0,92
Poland	2002	IPUMS	10,9	10,1	16,3	8,0	9,1	39,4	

Appendix 1 (g). Characteristics of the samples used in the analysis and basic data on living alone

Country	Year	Source	Percentage living alone						Human Development Index*
			Men			Women			
			25-29	50-54	75-79	25-29	50-54	75-79	
Poland	2011	IPUMS	4,7	6,3	13,1	4,2	6,7	38,7	0,83
Portugal	1991	IPUMS	2,4	2,9	12,0	2,2	4,6	30,7	
Portugal	2011	IPUMS	4,8	5,6	10,2	4,2	3,8	33,0	0,82
Republic of Moldova	2005	DHS	3,1	6,9	19,3	2,7	9,2	38,2	
Romania	1992	IPUMS	4,0	5,1	14,9	2,5	6,9	38,1	
Romania	2011	IPUMS	5,4	5,4	17,7	3,2	5,9	37,9	0,80
Slovakia	2001	LFS	1,2	4,3	16,5	1,5	5,1	33,4	
Slovakia	2011	LFS	3,3	6,7	14,6	2,2	6,7	44,4	0,84
Slovenia	2002	IPUMS	4,0	8,1	12,1	3,4	6,7	40,2	
Slovenia	2011	LFS	7,7	12,3	21,6	9,1	8,2	44,6	0,88
Spain	1991	IPUMS	2,7	3,7	9,7	1,9	2,8	28,1	
Spain	2011	IPUMS	6,8	7,3	13,0	4,4	4,7	28,7	0,87
Switzerland	2000	IPUMS	30,8	16,1	18,5	23,8	16,4	52,7	0,89
Ukraine	2001	IPUMS	6,2	9,7	18,0	3,9	10,8	41,8	
Ukraine	2007	DHS	6,2	12,2	22,2	3,0	11,3	40,5	0,73
United Kingdom	1991	IPUMS	10,6	9,0	22,6	6,1	8,2	53,6	
United Kingdom	2011	LFS	15,5	19,4	26,8	9,7	17,2	47,8	0,90
United States of America	2000	IPUMS	11,6	12,6	17,9	8,0	13,7	42,9	
United States of America	2010	IPUMS	11,2	14,6	17,3	8,7	13,0	37,2	0,91
LATIN AMERICA & THE CARIBBEAN									
Argentina	1991	IPUMS	3,7	6,3	12,4	1,7	4,7	26,6	
Argentina	2010	IPUMS	5,5	9,0	15,0	3,6	6,2	29,6	0,82
Bolivia (Plurinational State of)	1994	DHS	4,5	2,7	14,6	0,9	2,8	15,1	
Bolivia (Plurinational State of)	2008	DHS	6,7	6,8	18,9	2,0	3,7	18,9	0,64
Brazil	1991	DHS	2,2	3,2	8,0	0,9	3,1	15,4	

Appendix 1 (h). Characteristics of the samples used in the analysis and basic data on living alone

Country	Year	Source	Percentage living alone						Human Development Index*
			Men			Women			
			25-29	50-54	75-79	25-29	50-54	75-79	
Brazil	2010	IPUMS	3,7	7,6	11,8	2,0	5,2	20,0	0,72
Chile	1992	IPUMS	2,3	5,1	9,5	0,9	3,4	12,6	
Chile	2002	IPUMS	4,0	6,2	11,4	1,6	4,2	16,2	0,78
Colombia	1995	DHS	1,9	4,3	7,6	0,5	1,3	7,6	
Colombia	2010	DHS	2,6	5,1	10,0	1,2	3,1	10,9	0,70
Costa Rica	2000	IPUMS	2,6	5,7	11,4	0,9	3,6	13,5	
Costa Rica	2011	IPUMS	3,1	6,8	12,4	2,1	4,1	15,9	0,76
Cuba	2002	IPUMS	4,6	9,9	10,3	1,7	5,9	10,0	0,69
Dominican Republic	1991	DHS	3,5	6,5	10,8	0,2	3,5	9,7	
Dominican Republic	2013	DHS	5,8	9,7	9,6	2,2	3,8	18,9	0,71
Ecuador	2001	IPUMS	3,3	6,0	10,0	1,4	3,2	11,3	
Ecuador	2010	IPUMS	4,2	8,5	14,8	1,6	4,6	17,0	0,71
El Salvador	1992	IPUMS	5,5	4,3	8,4	1,1	2,0	7,8	
El Salvador	2007	IPUMS	2,9	6,0	12,9	0,9	3,8	12,2	0,66
Guyana	2005	DHS	3,4	5,1	12,5	0,9	2,3	7,4	
Guyana	2009	DHS	2,7	8,2	26,0	1,0	5,9	22,0	0,62
Haiti	1994	DHS	2,5	4,3	8,8	0,9	2,4	6,9	
Haiti	2012	DHS	4,9	5,8	13,5	1,2	1,9	7,8	0,48
Honduras	2005	DHS	2,1	3,8	7,4	0,4	1,6	7,1	
Honduras	2011	DHS	3,2	3,1	8,9	0,8	1,9	6,6	0,61
Jamaica	1991	IPUMS	11,6	16,1	19,0	3,6	5,0	15,8	
Jamaica	2001	IPUMS	14,4	19,4	19,7	4,6	8,0	18,4	0,69
Mexico	1995	IPUMS	1,7	3,4	7,5	0,6	2,0	13,0	
Mexico	2015	IPUMS	3,1	5,7	12,3	1,1	4,1	16,3	0,76

Appendix 1 (i). Characteristics of the samples used in the analysis and basic data on living alone

Country	Year	Source	Percentage living alone						Human Development Index*
			Men			Women			
			25-29	50-54	75-79	25-29	50-54	75-79	
Nicaragua	1995	IPUMS	0,9	3,2	6,2	0,3	1,3	6,2	
Nicaragua	2005	IPUMS	1,1	3,4	8,2	0,4	1,8	6,4	0,60
Panama	2000	IPUMS	4,6	9,8	16,6	1,6	4,4	11,9	
Panama	2010	IPUMS	5,6	10,4	16,3	2,0	4,8	12,3	0,76
Paraguay	1992	IPUMS	3,4	4,6	10,4	0,9	2,4	12,3	
Paraguay	2002	IPUMS	3,7	5,7	9,3	1,1	2,1	10,4	0,64
Peru	1993	IPUMS	4,1	5,2	10,7	1,1	3,2	11,5	
Peru	2012	DHS	4,3	6,6	13,8	0,9	3,1	15,2	0,73
Puerto Rico	2000	IPUMS	3,7	9,1	19,3	2,3	10,2	29,7	
Puerto Rico	2010	IPUMS	5,1	13,6	15,0	2,3	11,5	28,5	
Trinidad and Tobago	2000	IPUMS	5,0	10,2	20,1	1,7	4,1	18,8	
Trinidad and Tobago	2011	IPUMS	5,5	14,3	17,5	2,6	5,5	17,6	0,77
Uruguay	1996	IPUMS	4,7	8,5	16,2	2,1	6,0	25,2	
Uruguay	2011	IPUMS	8,4	12,4	19,4	4,8	8,1	35,4	0,78
Venezuela (Bolivarian Republic of)	2001	IPUMS	2,4	5,9	10,1	1,0	2,5	8,7	0,68

Source: * UNITED NATIONS (<http://hdr.undp.org/en/indicators/137506>) ; IPUMS census reference date

ⁱ These problems include age heaping as well as the estimation of the actual numbers of elderly persons. The extent to which these problems affect other areas of the census is not clear but caution is warranted when interpreting the results for the sub-saharan region. On this subject, see Randall and Coast (2016), Velkoff and Kowal (2007) and National Bureau of Statistics (2013).

ⁱⁱ Regional trend lines are based on unweighted national data. Weighting trends by the population size of each country leads to similar results that are available to researchers upon request from the authors. The unweighted data are preferred because our goal is to portray overall levels of country variability within regions rather than general regional trends.

ⁱⁱⁱ In this figure, divorced/separated and widowed are grouped because Labor Force Surveys do not differentiate between the two. Standardized levels of living alone are not affected by the grouping of these two categories.

^{iv} As a control for the reliability of this figure, an additional figure was generated based only countries where the period of observation was 10 years. In this revised figure, apart from fewer countries and with the partial exception of Africa, the results were largely the same. This figure is available to interested parties directly from the authors of this paper.

^v A good example of this is provided by the recent comparison between Sweden and Spain (Padyab et al 2019).