FEMALE SENIOR ONE-PERSON HOUSEHOLDS IN MALAGA MUNICIPALITY (SPAIN). TEMPORAL EVOLUTION AND INTRAURBAN SPATIAL DISTRIBUTION

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Abstract: The number of senior women (age 75 and over) living alone has multiplied notably in the municipality of Malaga. This population group can be considered as vulnerable, since living alone may have consequences on both physical and mental health. In this research, it is accounted, firstly, on the numerical evolution of this type of household in the municipality of Malaga, based on the data from the municipal register of inhabitants. Secondly, their intraurban spatial distribution, using the Location Quotient (LQ) for this was investigated. Results indicate, on the one hand, that effectively this type of household has increased remarkably, in proportion more than the total of senior women has. On the other hand, their spatial distribution in Malaga urban tissue is not homogeneous, and the neighborhoods with overrepresentation can be largely identified with the older ones. In this regard, the identification of clusters of neighborhoods where these households are overrepresented may be useful for planning within the context of ageing in place.

Keywords: solo-living; senior females; neighborhood; spatiotemporal analysis; Malaga (Spain)

1. Introduction

The increase in single-person households (as well as other non-family or single-parent households) is a growing reality across Spain (Delgado & Martínez, 2019; López & Pujadas, 2018), which can be framed within what has come to be known as the "Second Demographic Transition", initially proposed by Lesthaeghe and Van de Kaa (1986), with later contributions (Lesthaeghe, 2014, 2020; Zaidi & Morgan, 2021). This phenomenon has impacted the process of household formation and dissolution. This situation is not unique to Spain; rather, on a global scale, there is an increase in people living alone, which should be considered within the context of a generalized decrease in household size (Esteve et al., 2024).

In the increase of single-person households in Spain, the influence of the age structure of the population cannot be ignored, specifically the progressive aging process, whose influence on the formation of these single-person households was already highlighted at the end of the last century by Requena (1999). Aging at the top of the pyramid leads to an

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overrepresentation of women in advanced ages, so that they constitute a significant majority among single-person households composed of people aged 65 and over (Instituto Nacional de Estadística, 2021; López Villanueva et al., 2019; Vidal et al., 2017). In Europe, the elderly show higher levels of loneliness, often due to the death of a spouse (Esteve et al., 2020), with widowhood being especially common among women. This relationship is predominant since few people in these cohorts have never lived with a partner, as marriage was quite universal in this age group (Liu & Esteve, 2021). This virtual universality also means that the important distinction between single households and solo households (Mortelmans et al., 2022) loses significance among them.

Women aged 75 and over living alone will be in focus of this study. There are three main groups of reasons why there is a significant number of them: first, the decline in fertility levels, which has led to a decrease in the number of adult children with whom they could potentially share a home; second, economic reasons, where an increase in income levels allows them to live alone (in Spain, homeownership is a fundamental factor); and third, cultural reasons, where growing individualism leads to more situations of living alone (Dykstra, 2021). Regardless of the underlying reason or reasons, an important factor is also the systematic increase in life expectancy in good health (understood as a condition without functional limitations or disabilities), which in Spain in the past decade was around 73 years (Olmo & Herce, 2011). Not depending on others, or only needing them for specific activities, undoubtedly allows them to more frequently choose to live alone, leading to prolonged residential independence (López López et al., 2019). In this regard, it has been indicated that old persons who live alone have better perceived health than those who live accompanied (Henning-Smith & Gonzales, 2020). An apparent paradox in which underlies the fact that to live alone, one must be in good health, otherwise, alternatives are sought, such as living with children, moving into care homes, or sharing housing with a caregiver.

In any case, as years go by health deteriorates, and approximately from the age of 75, difficulties arise in performing daily tasks, making it necessary to have help to carry them out (Lázaro & Gil, 2005). People living alone become an especially vulnerable group, as living without company has consequences for their mental and physical health (Ong et al., 2016). Therefore, people aged 75 and over living alone are of special interest due to their vulnerability. This group of population has also experienced a significant numerical increase: in Spain from 4,166,683 in 2008 to 4,629,963 in 2021, and in Andalusia, from 620,776 to 711,449 in the same periods (Instituto Nacional de Estadística, 2023). This general trend can also be found at the municipality of Malaga, where this research will be focused; indeed, it has also experienced an aging process, which has accelerated since 2008. In that year the largest increase in the absolute number of people aged 75 and over was registered since the beginning of the century, reaching a total of 49,398 people in 2021, 8.55% of the total municipal population (Municipality of Malaga, 2006, 2021).

The population aged 75 and over resides in households of various types, and among all of them, a very specific group will be focused: women living alone, i.e., single-person households composed of women aged 75 and over, referred to hereafter as "seniors". As has been seen, this is a particularly vulnerable group, so it is important to know not only how many such households there are, but also where they are located within the urban fabric. In this context, the objective of the following pages is twofold: first, to show the numerical evolution of single-person households formed by seniors in the municipality of

Malaga between 2006—the first year for which the necessary statistical information is available—and 2021, the most recent date for which such information is available. Secondly, to indicate the basic outlines of the intra-urban spatial distribution in both years, at the neighborhood scale.

The originality of the research lies, first, in the choice of the study population. The population aged 65 and over will not be investigated, as most researches do (United Nations, 2023), since this group is extremely heterogeneous regarding their health conditions (Rodríguez, 2018), levels of dependency (Espinosa et al., 2005), and even, and increasingly, their relationship with activity (the legal retirement age in Spain is currently 66 years and 6 months). As it has been indicated, the focus has been only on the population aged 75 and over, an age at which health problems are already present, and the need for support, even for daily tasks, is also increasing (Ministerio de Sanidad, Política Social e Igualdad, 2011). Secondly, the entire population aged 75 and over residing in the municipality will not be of interest, but only in the women of this age group who live alone. This is a novel approach since it is more common to work with the older population, or at best, with households where one member is elderly, without identifying households potentially more vulnerable based on the age characteristics of their members. Lastly, it is also innovative in terms of the spatial unit selected: most research that considers the intra-urban distribution of households—regardless of their composition—takes the census tract as the spatial reference unit, which brings comparability problems when the research includes a diachronic component (Openshaw, 1984). Furthermore, the use of census tracts as proxies of neighborhoods often results in flawed findings (Sperling, 2012). In this research, neighborhoods will be used, geo-differentiating the Municipal Register of Inhabitants information on them; a spatial unit whose boundaries, in the case of Malaga municipality, remain stable, and which also has sociological significance, unlike the census tract (Ocaña, 2005). A total of 349 neighborhoods have been identified in the municipality, a number that has remained without changes in our period of study, as well as their boundaries.

2. Sources and methodology

The necessary information for this research has been obtained from the Municipal Register of Inhabitants (Municipality of Malaga, 2006, 2021). Households existing in the municipality in both years were first identified, based on the definition of household provided by the National Statistics Institute: "Group of people residing in the same family dwelling" (Instituto Nacional de Estadística, 2001, p. 24) with the requirement that these people share some common expenses eliminated since 2001.

The thematic breadth available in the Municipal Register of Inhabitants is very limited, but among the variables present are age and sex. Using these, from the identified households were extracted those single-person households composed of women aged 75 and over (seniors), the object of this study. The dates selected are 2006 and 2021, the first and last years for which the necessary information is available.
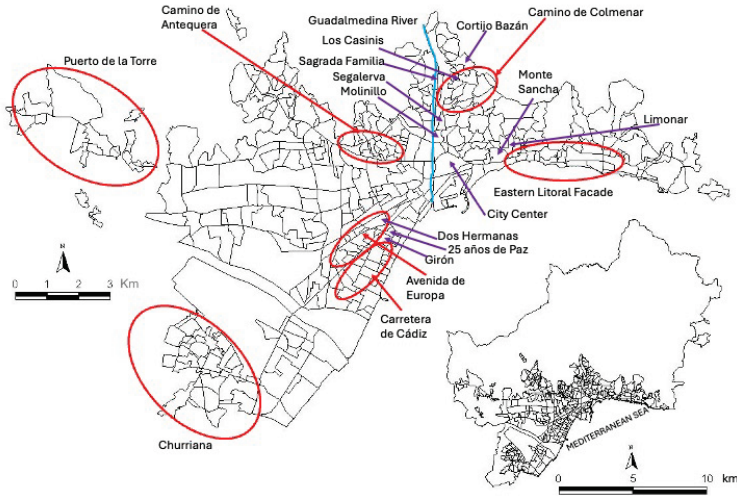
Figure 1. Location of the main toponyms referred in the text.

Regarding the spatial unit to which this information is assigned, several options are available: on one hand, the census tract, on the other, the neighborhood, which is the option selected. Working with the neighborhood has several advantages over using the census tract. Besides being a spatial unit delineated in Malaga municipality based on historical, morphological, and development criteria (giving it a sociological meaning that the census tract lacks, being merely an administrative boundary), its main advantage is that once established, its boundaries do not change. Thus, the Modifiable Areal Unit Problem (Openshaw, 1984), which significantly affects the census tract is avoided, with certainty that, in a diachronic study like this, the recorded variations are due to changes in the variable and not, even partially, to changes in the spatial reference unit. All this information has been processed using simple but adequate statistical tools for our objectives, the Location Quotient (LQ). This is a statistical tool that allows for the identification of areas with an over-representation of the variable under study. Values higher than one indicate such over-representation, while values lower than one indicate the opposite situation. Its calculation formula is:

$$LQ = \frac{X_i/T_i}{X/T} \qquad (1)$$

where X_i represents the number of female senior one-person households in neighborhood i; T_i is the total number of households in neighborhood i; X is the total number of female senior one-person households in the municipality, and T is the total number of households in the municipality. It shows the neighborhoods where there is an overrepresentation of seniors living alone, calculated based on the total number of registered seniors in each neighborhood, so its interpretation is not influenced by the increase in the number of both population groups mentioned in the previous section.

To outline the basic patterns of the spatial distribution of these households, the results have been mapped (via ArcMap), using a synthesis tool that is simple to calculate but very appropriate for our purposes. Since most neighborhoods in Malaga municipality include at least one senior or single-person household composed of seniors, it is more appropriate to identify neighborhoods with an overrepresentation of single-person households composed of seniors rather than merely providing a percentage distribution or a more elaborate distribution, such as one based on the mean and standard deviation, for example.

3. Results and discussion

3.1. Temporal evolution of the number of households

According to the Municipal Register of Inhabitants (Municipality of Malaga, 2006, 2021), single-person households covered by our study have grown over the 15 years by 78.8%, a figure very similar to those composed by seniors living alone (76.81%). According to the same source, a pace of increase of these two types of household has been substantially higher than those corresponding to the total amount of households (32%), and to the total of seniors (13.3%).

The basic magnitudes of single-person households composed of seniors, in terms of average and median age, show an increase of nearly one year, reaching 83.31 in 2021 compared to 2006. This aging trend aligns with the previously mentioned increase in life expectancy, which is known to be higher among women. Furthermore, reflecting this aging trend, the median age has increased even more significantly. In 2006, the median age was 81 years—half a year lower than the average age. Fifteen years later, it rose to 83, almost equaling the average age. Therefore, not only has the number of seniors living alone increased, but this group has also aged over time.

It is interesting to compare seniors living alone with the overall group of seniors who share a household with one or more persons (Table 1). It is unsurprising that their number is considerably larger than those living alone, but beyond this obvious point, it is worth noting that this group, unlike the former, has not aged significantly during our study period. Indeed, the average age has increased by less than 0.3 years, while the median age has remained the same in both years (Table 1).

Table 1. Basic magnitudes of the total registered seniors

Year	N° of seniors	Increase (%) 21/06	Average age	Middle age
2006	27,252	13.3	82.1	81
2021	30,878		82.39	81

Note. Data in the table are calculated based on *2006 and 2021 Municipal Register of Inhabitants by neighborhoods*, by Municipality of Malaga, 2006, 2021 (https://datosabiertos.malaga.eu/dataset/padron-de-habitantes-por-barrios-2006; https://datosabiertos.malaga.eu/dataset/padron-de-habitantes-por-barrios-2021). In the public domain.

Lastly, it is essential to consider one more element: as previously indicated, the percentage increase in the number of seniors living alone has been 76.81%, a very high figure, especially when compared to the modest increase experienced by the total number of elderly women (13.3%). The issue of the increased possibility of living alone was already noted for as early as the 1980s and 1990s by Abad and Rodríguez (2002). Indeed, authors indicate that the incorporation of individuals over 75 years old to the household of their sons or daughters was delayed between one decade and the next (1990s/1980s) due to a decrease in the need for assistance among this elderly population. Besides that, the authors state that the incorporation of women into the labor market has reduced the time they could potentially dedicate to elder care (namely their parents or parents-in-law), a circumstance that also delayed the incorporation of seniors to their son´s and/or daughter´s households. And in cases where elderly individuals received external

assistance, this incorporation might not occur at all. We could assume that this process has continued in the researched municipality and may be, at least partially, the basis for the significant increases in seniors living alone.

However, this analysis can be taken a step further by distributing this population into age groups recommended by the International Psychogeriatric Association (García & García, 2005): 75–84 years, 85–89 years, and 90 years and older, and examining the increases experienced by these groups during our study period. The results for both seniors living alone and the total group of seniors are shown in Table 2.

Table 2. Distribution by age groups of single-person households formed by seniors and the total group of seniors, and percentage increase (2021/2006)

Year	Group	75–84	Increase (%)	85–89	Increase (%)	90+	Increase (%)
2006	Households	1,825	58.9	529	110.2	307	125.73
2021	Households	2,900		1,112		693	
2006	Seniors	19,346	7.44	4,655	33.29	3.251	19.53
2021	Seniors	20,787		6,205		3.886	

Note. Data in the table are calculated based on *2006 and 2021 Municipal Register of Inhabitants by neighborhoods*, by Municipality of Malaga, 2006, 2021 (https://datosabiertos.malaga.eu/dataset/padron-de-habitantes-por-barrios-2006; https://datosabiertos.malaga.eu/dataset/padron-de-habitantes-por-barrios-2021). In the public domain.

It is possible to observe that all the age groups considered have experienced an increase in their numbers in both contingents. However, it is also evident that the percentage increases are substantially higher in single-person households in all cases. Additionally, focusing on these households, the increases are greater as the population they refer to gets older. The Population Register does not indicate the marital status of these women, unlike the Census. Based on this last source (Instituto Nacional de Estadística, 2023), in Malaga municipality only 483 women aged 75 or over living alone were divorced, while 8,577 were widows. So we could suggest that this situation reflects the conversion of two-person households into single-person households due to the death of one member—presumably a male. In other words, we have witnessed the emergence of households of widows, resulting from higher life expectancy among women and the willingness and ability of these seniors to remain in their homes alone, preferring this option over others such as moving into a nursing home, introducing other people into their home, or leaving it to reside elsewhere.

Moreover, living alone is not just a consequence of the forced will to choose this form of residence; it also includes the economic capacity to do so. In this regard, the last economic crisis Spain has experienced does not seem to have significantly affected households headed by individuals aged 65 or older; these households would have better weathered its effects (Laparra, 2010; López & Renes, 2011). First, in Malaga municipality 8,736 women aged 75 years or more living alone were landlords, from a grand total of 10,917 (Instituto Nacional de Estadística, 2023). Being the owner of their dwelling facilitates living alone. And second, the extension of the pension system, and the near universalization of non-contributory pensions, ensure a minimum income in Spain. Furthermore, if the woman receives a widow's pension, "the elasticity of money can be surprising" (Pérez, 1995, p. 10).

3.2. Spatial distribution of households and their temporal evolution

The number of neighborhoods with an overrepresentation of single-person households composed of seniors was 203 at the begging of our observed time period (2006), the number that slightly increased to 214 in 2021 (the end of observed time period). As a percentage of the total number of neighborhoods in the municipality, they represented 58.5% in the first date and 61.6% in the second one. As shown in Figures 2 and 3, the spatial distribution of neighborhoods with overrepresentation was very similar in both years (identification of the main toponyms can be found in Figure 1).

Most of these neighborhoods were in the pericentral area, including the central neighborhood itself in 2021, with a set of what could be termed "radial expansions" originating from it. One of these expansions corresponds to the eastern coast of the municipality; another, to the north, includes a set of neighborhoods east of the Guadalmedina River, consisting of housing expansions that emerged along the Camino de Colmenar, many of which were self-built in the 1970s. Continuing counterclockwise, there is another concentration in the northwest, composed of neighborhoods along the old Camino de Antequera and the oldest parts of the Puerto de la Torre core, which is now coalescing with the urban continuum. The next concentration, in the southwest, includes a set of neighborhoods along the old Carretera de Cádiz and Avenida Europa, with numerous housing developments from both the autarkic period and the 1950s and 1960s. Finally, the Churriana core in the furthest southwestern part of the municipality completes the distribution.
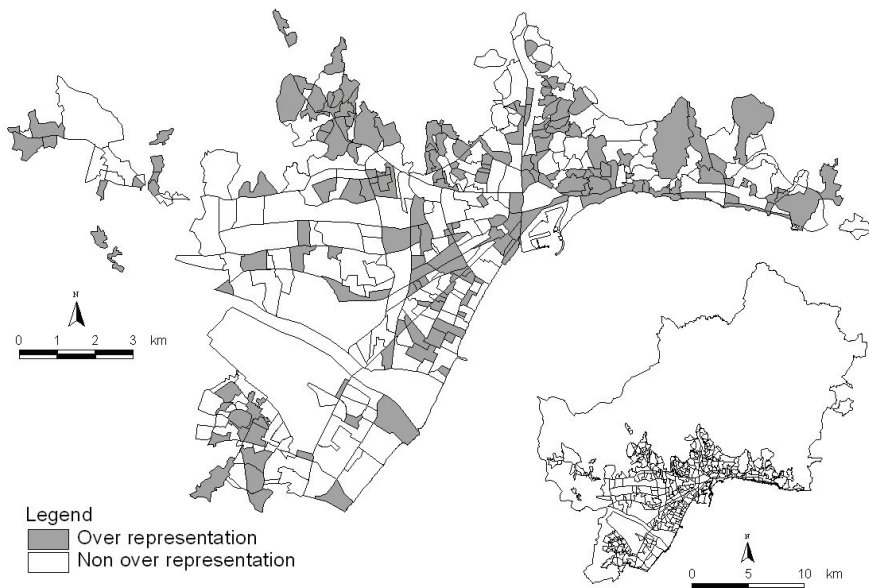

Figure 2. Neighborhoods with and without overrepresentation of senior one-person households in 2006.
Note. Data in the figure are calculated based on *2006 Municipal Register of Inhabitants by neighborhoods*, by Municipality of Malaga, 2006 (https://datosabiertos.malaga.eu/dataset/padron-de-habitantes-por-barrios-2006). In the public domain.

Figure 3. Neighborhoods with and without over representation of senior one-person households in 2021.
Note. Data in figure are calculated based on *2021 Municipal Register of Inhabitants by neighborhoods*, by Municipality of Malaga, 2021 (https://datosabiertos.malaga.eu/dataset/padron-de-habitantes-por-barrios-2021). In the public domain.
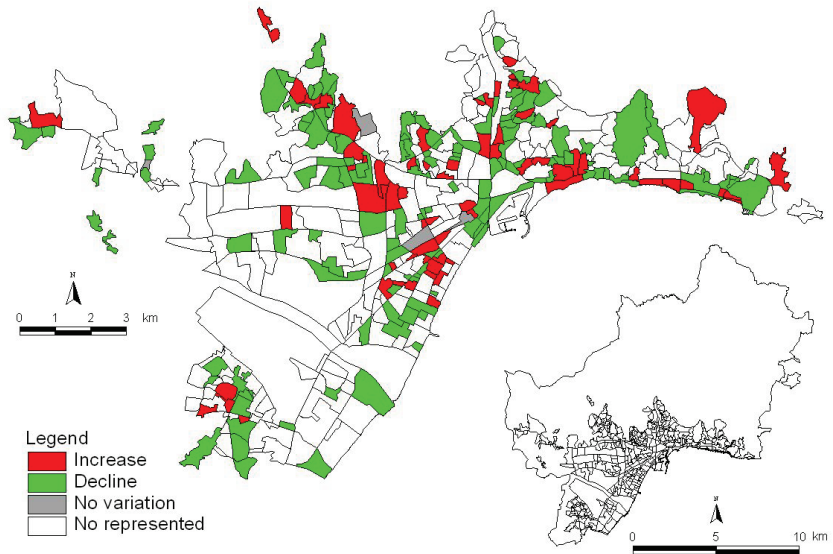

Figure 4. Evolution of over representation levels of senior one-person households by neighborhood 2021/2006.
Note. Data in the figure are calculated based on *2006 and 2021 Municipal Register of Inhabitants by neighborhoods*, by Municipality of Malaga, 2006, 2021 (https://datosabiertos.malaga.eu/dataset/padron-de-habitantes-por-barrios-2006; https://datosabiertos.malaga.eu/dataset/padron-de-habitantes-por-barrios-20021). In the public domain.

In Figure 4, the evolution of the LQ values between both years is shown: higher values in 2021 compared to 2006 indicate an increase in overrepresentation; conversely, a decrease in these values indicates a reduction in overrepresentation. Alongside these, there is a very small number of neighborhoods (four) where the difference in values is almost negligible.

There are fewer neighborhoods where an increase in overrepresentation has been recorded, but their spatial distribution is clearer than those in the opposite situation, so they will be in focus. At least four groupings of such neighborhoods can be clearly identified: the first comprises the center and the oldest neighborhoods of the eastern expansion—Monte Sancha, Limonar. The second is immediately north of the center, including neighborhoods like Molinillo and Segalerva. Further to the north, there is a set of neighborhoods that have seen an increase in overrepresentation, corresponding to housing developments from the autarky period (the years before 1959)—Sagrada Familia—or the oldest portions of self-built housing previously referenced—Los Casinis, Cortijo Bazán. Completing the list of these groupings of neighborhoods that have experienced an increase in overrepresentation is the one located in Carretera de Cádiz, composed of some of the oldest neighborhoods in the area—Dos Hermanas, Quirón, 25 años de Paz—and the grouping that overlays some of the oldest parts of the Churriana core.

Thus, it appears there is a relationship not only between the location of neighborhoods with an overrepresentation of single-person households composed of seniors—a pattern that has remained essentially stable throughout our study period—but also between the location of these neighborhoods and the period of their emergence. Apparently, the oldest neighborhoods—and, presumably, those with older population—have experienced increases in overrepresentation. This phenomenon is compatible with the previously indicated process of female population aging and the possibility of continuing to live alone or choosing this residential option once their household is no longer composed of two persons following the spouse's death.

4. Conclusion

A significant increase in single-person households composed of women aged 75 or older has been found, far surpassing not only the corresponding total of women in this age group, but also the total number of households in the municipality. As of 2021, these single-person households amount to a total of 4,075, compared to a relatively modest 2,661 recorded in 2006. To contextualize this finding, it can be pointed out that by the close of the previous century, it was observed that solitude is not only a prevalent aspect of the living conditions of the elderly in Spain, but also a defining characteristic of the Spanish family structure (Sánchez, 1996). In this context, the growth in the number of households among older age groups would represent a continuation of the process of aging in solitude, which, according to the same author, would inevitably result in an increase in the number of households comprised of individuals aged 80 and above. This phenomenon seems to have materialized in the researched municipality over the course of the study period.

However, this notable increase in senior single-person households that has been recorded in Malaga municipality is not solely due to the aging process; widowhood also underlies this phenomenon. The starting point is a context in which women tended to marry older men (Abad & Rodríguez, 2002; Pérez, 1995), a fact that, coupled with the longer life expectancy of women, results in the man's death and the gradual transformation of elderly couples into households where the woman is the sole occupant. A circumstance that is

facilitated by the fact that the great majority of these women living alone are the owners of their houses.

Finally, regarding the spatial distribution, it seems there is a relationship between the presence of overrepresented households—and the increase in their levels during our study period—and the age of the built environment. This circumstance had already been highlighted by López (1991) in the case of Madrid, or Sánchez-González (2009), for Granada. Concerning the total single-person households, the spatial distribution within the urban fabric of Malaga municipality is not homogeneous. Indeed, as Natera et al. (2022) and earlier Jordá & Lucendo (1996) have shown, there is a certain relationship between the time of the urban fabric's emergence and the presence of these single-person households. This relationship can be found in a set of neighborhoods that were once part of the periphery of the urban fabric, sometimes even disconnected from it, such as Sagrada Familia, Girón, or Veinticinco Años de Paz. These neighborhoods were built between 1955 and 1965 and were originally inhabited by a young population. Today, from the original households that occupied the dwellings, only the old women, now living alone, remain, leading to the overrepresentation.

In future studies it necessary to delve deeper into these aspects using information derived from the recent 2021 Census of Population and Housing. Thematically, it will be useful to add variables such as the marital status of the elderly—and its intercensal evolution—or to compare the household structure corresponding to 2021 with that of previous Censuses. Spatially, exploring the extent to which intercensal comparisons of these same variables can be made will be important, given that working with the changing census sections will be necessary. Additionally, the well-known limitations of the 2011 Census when it comes to obtaining information on very small population contingents, such as senior single-person households in each census section, must be considered.

To conclude, the identification of neighborhoods with an overrepresentation of single-person households composed of seniors has significant implications for urban planners. Indeed, in a context where ageing in place is a growing aspiration not only among the elderly, but also among government authorities, there is no doubt that the knowledge gained regarding the location of such households can be used as a tool to target investments in these areas of overrepresentation, with the aim of making them more age-friendly for this elderly population.

Acknowledgements

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