Qualitative Study Protocol

Research on Individuals Aged One Hundred and Over: Protocol from the Sevilla and Castilla y León Centenarian Studies

Juan Manuel García-González¹, and Alberto del Rey²

Abstract

Spain’s population of people aged 100 years and over has increased tenfold since the last quarter of the 20th century, exceeding 16,000 individuals by 2019. Despite this cohort’s growth, which has made centenarians a significant segment of Spain’s population in their own right, centenarians have remained little studied from the perspective of social sciences. A key challenge for research concerning centenarians is understanding their personal experiences of reaching this landmark age; such information could help to identify the sociodemographic and psychosocial factors that enable people to live such extraordinarily long lives. Given this context, the present article describes the research protocol followed in the projects SeviCent – Sevilla Centenarian Study and C&LCent – Castilla y León Centenarian Study, which are mainstream qualitative studies of people aged 100 years and over who reside in the regions with the lowest and highest life expectancy in Spain, respectively. The general aim of these studies was to analyze, through semi-structured interviews conducted between 2018 and 2019 that were based on a biographical and life-cycle approach, the physical, social, and emotional wellbeing of a cohort of centenarians who had no cognitive impairments. Specifically, based on the experiences of applying this protocol, the present study describes the methodological considerations—research design, sampling, interview script, indicators, fieldwork, and analysis plan—that should be included in future qualitative, social sciences–focused studies concerning very old people for whom the population segment is scarce, scattered, and fragile.

Keywords

centenarians, longevity, qualitative methods, interviews, oral biographies, background

Introduction

In Spain, life expectancy at birth has more than doubled over the past 100 years, from approximately 40 years in 1900 to 83.6 years in 2019 (Spanish National Statistics Institute, INE, 2020a). This increase has occurred concurrent to a democratizing of longevity, whereby people are now dying at increasingly similar ages (Bergeron-Boucher et al., 2015).

This trend has led to a sharp increase in the number of very old people in Spain. Since 1970, the number in their 80s has increased threefold, while the number of those in their 90s has increased fivefold (INE, 2020b). Globaly speaking, by 2050, the number of people aged 100 years or older is set to increase by 533,000 to 3.2 million (United Nations, 2020); in Spain, this increase will be from 12,000 to 100,000 (INE, 2020c). There has also been a qualitative increase in the health of very old people, who are increasingly aging in healthier conditions (Abellán et al., 2020).

Contributions to Current Understanding

The present research focuses on people residing in two regions of Spain, Andalusia and Castilla y León (C&L), who have reached the age of 100 years and have retained normal cognition. Many studies of centenarians have sought to discover how and why certain individuals reach this extraordinary age, notwithstanding the fact that most centenarians

¹Department of Sociology, Universidad Pablo de Olavide, Sevilla, Spain
²Department of Sociology and Communication, Universidad de Salamanca, Salamanca, Spain

Corresponding Author:
Juan Manuel García-González, Universidad Pablo de Olavide (Ed. 11). Carretera de Utrera, km. 1, Sevilla, 41013, Spain.
Email: jmgargon@upo.es
manifest diverse signs of cognitive impairment. Some studies, such as *The Georgia Centenarian Study* (Poon et al., 1992), *The New England Centenarian Study* (Perls et al., 1999), *The Okinawa Centenarian Study* (Willcox et al., 2006), *The Longitudinal Study of Danish Centenarians* (Andersen-Ranberg et al., 2001), and *The 100-plus Study* (Holstege et al., 2018), have investigated whether residing in specific geographical locations has an influence in this regard. Meanwhile, other studies have endeavored to identify specific factors related to extreme longevity (Andersen-Ranberg et al., 2001; Christensen & Vaupel, 1996; Herr et al., 2018; Maier et al., 2020; Motta et al., 2005). Most of these previous studies have employed quantitative designs, focusing on biological and physiological aspects and family background; meanwhile, a small number of studies have used qualitative designs to analyze psychosocial and psychoemotional aspects or centenarians’ personal biographies (Darviri et al., 2009; Hutnik et al., 2012; Reichstadt et al., 2010; Poon & Cheung, 2012; Poon et al., 2007; Ratan & de Vries, 2020; Struckmeyer et al., 2020; Wong et al., 2014); such approaches can clarify centenarians’ own understanding of their longevity and the aspects they themselves feel have enabled them to maintain their cognitive faculties. The studies that have adopted the latter approaches have identified several factors, including maintaining a positive outlook on life, keeping mentally and physically fit at all times, nurturing family and social relations (Wong et al., 2014), obtaining wellness and happiness and having an extroverted character (Jopp & Rott, 2006; Struckmeyer et al., 2020), and being resilient and controlling sources of frustration (Hutnik et al., 2012). However, there is difficulty generalizing these studies’ results, especially due to the cultural component inherent to longevity (Ekerdt et al., 2017). The issues presented by such methodological problems are the reason studies focusing on specific populations are much more common than comparative ones.

Several studies have been conducted on centenarians in Spain, and several different perspectives have been applied across these studies, for example, demographic (García González, 2015; Reques, 2008), genetic (Rodriguez-Molinero et al., 2010), and medical (Clerencia-Sierra et al., 2020; Gimeno-Miguel et al., 2019; Ruiz et al., 2012). However, no previous studies have specifically adopted a sociological standpoint or a qualitative methodological design. Therefore, no studies have analyzed the population of centenarians who, upon reaching the age of 100 years, were fully aware of their extraordinary longevity and were capable of relating the personal, family, and social factors that may have influenced their ability to retain full cognitive functioning.

**Demographics of Centenarians in Spain: Andalusia and Castilla y León**

According to the Spanish National Statistics Institute (INE, 2020b), there were 3159 centenarians (8.37 per 100,000 people) in Spain in 1981, 4545 in 2002 (10.97 per 100,000), and an estimated 12,551 (26.5 per 100,000) at the beginning of 2020; further, projections indicate that there will be 50,000 centenarians in Spain by 2035 (103.0 per 100,000; INE, 2020c). Meanwhile, there were 1463 centenarians in Andalusia in 2020 (17.3 per 100,000), and projections indicate that the region will be home to 5677 centenarians by 2035 (66.6 per 100,000). In C&L, in 2020, there were almost 50 centenarians per 100,000 people (1190 centenarians), and it is estimated that this will increase to 208 per 100,000 by 2035 (4503 centenarians) (INE, 2020c).

These figures, along with other characteristics of centenarians, confirm that the centenarian population contains a unique identity. First, as shown by the above figures, they are still few in number, particularly in Andalusia. Second, this population is widely dispersed in geographical terms, and their numbers in each region are only revealed through the census, referred to in Spain as the Padrón Continuo (INE). Reliance on census data can be problematic, however, as it can record inaccuracies among volatile populations (i.e., those that frequently change their place of residence) and in those subject to high mortality; further, the census does not provide detailed information regarding respondents’ addresses or places of residence, which creates difficulties regarding contacting individuals, especially those residing in large municipalities. Third, centenarians’ extreme old age presupposes that they are in a fragile condition with a delicate state of health, and sometimes with impaired cognitive faculties, which creates difficulties regarding contacting them, as well as in regard to meeting and/or interviewing them. The fourth, and final, unique element of their identity is that their personal trajectories and their generation mean these people have witnessed virtually all of the enormous social upheavals that Spain underwent during the 20th and 21st centuries. Most of them have lived through the 1918–1919 flu pandemic, Primo de Rivera’s dictatorship (1923–1930), the Spanish Civil War (1936–1939), the severe hardships of the post-war period, and Francisco Franco’s dictatorship (1939–1975) and witnessed the far-reaching social and political changes introduced by Spain’s transition to democracy.

**SeviCent — Sevilla Centenarian Study and C&LCent — Castilla y León Centenarian Study**

To investigate the demographic framework underlying the increase in longevity, progressive population aging, and the number of centenarians in Spain, the SeviCent — Sevilla Centenarian Study was created in 2018. This is a localized, ecological, mainstream project, for which the main aim is to analyze the physical, social, and emotional wellbeing of a sample of centenarians living in the province of Seville (located in the region of Andalusia, Spain) through considering their individual biographies.

SeviCent is a long-term project and involves ongoing fieldwork in both the province of Seville itself and
neighboring provinces. Given that very few qualitative studies have been conducted on centenarians in Spain from a sociological and emotional health perspective, this represents a pioneering study in the field of social sciences. As a result of the groundbreaking and informative nature of this study, a decision was made to replicate this study in other Spanish regions, beginning with the autonomous community with the highest number of centenarians and highest life expectancy in Spain; namely, C&L. This latter project is known as C&LCent.

**Objective**

Given the above background, this study’s primary purpose is to develop, based on consideration of the experiences gleaned from the SeviCent and C&LCent projects, a qualitative methodological design for studies of older people. This design focuses on the following methodological considerations that are applied in research of specific populations (both geographic and age-based): research design, sampling, interview script, indicators, fieldwork, and analysis plan. The goal is that the methodological design produced will act as a point of departure for the growing number of social science studies on centenarians that will be published in Spain in the short- and medium-term future and that it will accommodate a range of diverse research approaches in this context.

**Methods**

**Explanation and Justification of Method**

We divided our research into seven sections: research design, techniques and practices, scripts, contacting and sampling, fieldwork, analysis plan, and identified limitations.

Many previous studies on centenarians have involved longitudinal and mixed designs; this article concerns a qualitative design featuring biographical interviews. In transdisciplinary frameworks, a biopsychosocial approach can be expedient (Engel, 1977); this is supported by recent reviews of aging studies, such as those by Molton and Jensen (2010), Whitbourne and Whitbourne (2010), and Lehman et al. (2017). Adopting such a perspective affords a participatory (on the part of the participants) element to the study, and analysis of the associated data can allow researchers to interweave biological factors (generally referring to the state of physical health), behavioral factors (cognitive functions and mental health, physical activity, emotions and emotional health, resilience, etc.), and social factors (culture, employment, level of education, spirituality and religion, interpersonal and family relationships, care, etc.). These three factors should be interrelated in the context of a life-cycle perspective, which can afford understanding of their dynamic interrelationships, as well as their ramifications for physical, mental, and emotional health and, in the context of centenarians, longevity.

**Sampling and Recruitment**

The target populations of SeviCent and C&LCent were people aged 100 years and over who lived in the province of Seville and the region of C&L, respectively. This profile can be extended in terms of age and geographical location for use in other qualitative studies that concern very old people. To illustrate a general approach for contacting potential participants and sampling, the following is a description of the method applied in our specific projects.

The first step involved defining the target population. In our case, we used 2019 data for centenarians. At this time, Seville was home to 285 individuals aged 100 years or over (224 women and 61 men), while the region of Andalusia contained 2406 centenarians (615 men and 1791 women); in turn, C&L was home to 1590 centenarians (312 men and 1278 women), indicating a heavily feminized population.

The second step was sample selection with specific selection criteria. In the case of centenarians, we stipulated a need for them to possess sufficient cognitive capacity and physical and sensory capabilities to independently answer questions asked in a biographical interview.

For both projects, the sole sociodemographic inclusion criterion was having reached the age of 100 years. Age was verified using potential participants’ official birth certificates, which were provided by the civil register in their places of birth; this method had a 95% success rate. Their physical, sensorial, and cognitive states were assessed at two points: the first was 1 week before the interviews and was performed through consultation with the centenarian’s contact person, usually a family member or a staff member at the centenarian’s care home, depending on where he/she lived; the second assessment occurred on the day arranged for the interview, during which the interviewer performed a subjective appraisal of the interviewee’s visual, aural, and mobility functions. Cognitive function was also evaluated by administering the Mini-Mental State Examination questionnaire, with a score of 20 on this questionnaire or more required for inclusion in the sample (Folstein et al., 1975). Failure to score at least 20 in the Mini-Mental State Examination and/or poor visual, aural, or mobility functions constituted criteria for exclusion. Regarding cognitive capacity, some epidemiological studies have reported that approximately 30–40% of people aged over 90 years may have some form of dementia (de Pedro-Cuesta et al., 2009; Gavrila et al., 2009; Tola-Arribas et al., 2013), and that this rate increases with age and amongst women. Thus, logically, it can be expected that this rate is higher among centenarians; a conservative estimate would suggest that 40% of the centenarian population has dementia; this sharply reduced the potential population for our sample.

The small size and dispersed nature of the suitable population creates difficulties in terms of contacting and sampling. In any interview-based qualitative design, the sampling procedure should involve the minimum number of variables that affords the selection of profiles that accord with the research
purpose in question. SeviCent and C&LCent followed a standard theoretical sampling model comprising representativeness in terms of residential status (living alone, living with family, living with a carer, or living in a care home) and proportional quotas by sex. Standard sampling was performed using three procedures: first, by word of mouth between contacts and their social milieu; second, by systematic contacting using the addresses of public and private care homes (day centers and nursing homes); and third, through a review of announcements in the press and on television covering birthday celebrations or events arranged for centenarians.

Once a possible case of an individual aged 100 years or over had been identified, contact was made in one of three different ways: first, if the individual was institutionalized, contact was established with the social worker at the care home, who generally redirected us to a family member of the centenarian; second, if the individual lived at home, direct contact was made with a family member or carer; and third, in situations involving the media, contact was made with the journalist who reported on the story or, in the case of events in small towns or villages, with the local council.

Thus far, the cohort of centenarians with a sound cognitive state and suitable functional capabilities and who have undergone personal interviews has amounted to 21 individuals in the SeviCent project and 10 in the C&LCent project. The sampling and interview process was paused in response to the onset of the coronavirus disease 2019 pandemic, meaning the cohort size may have been larger in other circumstances.

Data Gathering

The most appropriate technique for collecting data concerning long life cycles is semi-structured personal interviews that are based on a biographical approach (Manderson et al., 2006). The flexible structure of such interviews, together with their ability to accommodate the expected non-chronological narratives of the interviewees (very common among people who have lived long lives), provides opportunities to link topics, stages in life, and mainstream narratives chronologically.

Biographical interviews conducted with centenarians necessitate a practical process of active and interactive listening, in which multiple obstacles must be overcome, most of which can be attributed to age, both the age gap between the interviewer and interviewee, and the latter’s own advanced age, and the dispersion involved in the recounting of a long life that features a wide array of narratives. Each interview should, therefore, be understood as a unique experience that uncovers a personal narrative (Sandelowski, 2002) and gives the sense (to both interviewer and interviewee) of a good conversation (Rice & Ezzy, 1999).

The relationships between interviewers and interviewees have a two-way impact, as there is a tendency for the latter’s answers to be adjusted based on the former’s characteristics (Groves & Magilavy, 1981). Our research revealed that biases can arise due to differences in age, gender, and the presence of both familiar and unfamiliar individuals during the interview. This necessitates constant augmentation of the interview’s script to identify key moments in the individual’s life and ensure a certain degree of consistency in the narration of events.

Variables and Working Scripts

Two kinds of data-gathering instruments were constructed for the SeviCent and C&LCent projects: a questionnaire and an interview script. Initially, two brief question sheets were used. These instruments collected a series of sociodemographic variables that helped the researchers obtain accurate information on each individual’s personal and social circumstances; the variables in question included date of birth, sex, education level, years of schooling, marital status, number of children, number of siblings, and age of family members. These instruments also measured variables concerning health status; this information was obtained directly from each individual centenarian (with or without the help of a family member or a member of staff at the care home) and did not require the presence of a health-care professional or medical tests. The health variables measured were self-perceived state of health; past and present habits regarding physical exercise, smoking, drinking, hygiene, and diet; illness history (i.e., whether the interviewee had previous medical diagnoses of high blood pressure, diabetes, cancer, lung complaints, cardiovascular diseases, and/or heart attack); history of illnesses during childhood and adolescence; history of major surgical procedures; nightly hours of sleep; and the six items from the Katz Index of Independence in Activities of Daily Living (bathing, dressing, toileting, transferring, continence, and feeding, respectively). To devote as much of the available time as possible to the interview, these two sets of questions were submitted beforehand by post or email.

The second data-gathering instrument was the interview itself. For each biographical interview, three semi-structured scripts were drafted. First, an extensive script containing topics, subtopics, and possible backup questions; this provided us with flexibility for subsequent research development. Second, an abbreviated script adapted from the longer one that featured topics related to the centenarian’s life narrative and their emotional health. Third, a practical interview script for use in the fieldwork; this featured an ordered list of topics and questions and was customized for each researcher in the team.

The first part of the interview involved determining the interviewee’s life story; we used their remembered experiences to reconstruct their life narratives. The second part concerned psychosocial and psychoemotional aspects, focusing on the traditional dimensions of quality of life: physical wellness, emotional wellbeing, interpersonal relationships, social inclusion, personal development, material wellbeing, and independence. The specific aim was to explore subjective aspects of the interviewees’ personalities; their views of the future; their opinion of old age, aging, and their exceptional
longevity; their understanding of happiness and sadness; their sources of joy and frustration throughout their lives, and especially in old age; their social and family networks; the sense and meaning they have given, and continued to give, to life; and their general attitudes toward their past and present lives.

**Preparation and Development of Fieldwork**

The fieldwork was undertaken following the basic guidelines proposed by Manderson et al. (2006), and García González and Fernández Muñoz (2016), whose texts contain specific procedural strategies for studies involving very old people.

The interviews were held at the centenarians’ own homes or at the institutions where they were living. Sin (2003) has previously reported that setting affects an interview’s dynamics, direction, and content. In the case of very old people, who generally have restricted mobility or a degree of dependence, it is vital for meetings to suit their unique circumstances and to help increase their sense of wellbeing. Conducting interviews in interviewees’ own homes not only equalizes power relationships and ensures a relaxed, comfortable, and friendly atmosphere, but also provides non-verbal clues regarding these individuals’ living conditions. Using an interviewee’s own home as a setting increases their trust, and the furnishings or photos in the home can also reveal personal details. Only in one of the cases did the interviewee prefer to hold the meeting outside of his/her home, opting for a coffee shop he/she visited regularly.

All meetings were attended by people external to the research, either family members or staff at the care homes. Before the interview commenced, these external attendees were asked not to interrupt at any time and to allow the centenarian to answer for himself/herself. If necessary, such as in instances when the centenarian had difficulty understanding or hearing a question, the family members/staff were asked to provide assistance. The presence of family members sometimes influenced the interviewee, especially at the beginning of the conversation and when discussing relatively personal matters, although we did not find that they caused any significant bias in the overall development of the interviews.

Furthermore, our experiences indicated to us that interviews involving two interviewers obtain more in-depth content. In such cases, one researcher took an active role and conducted the main interview, while his/her colleague played a background role, taking and passing notes, ensuring that all topics in the script were addressed and, on a more technical level, ensuring that the recording instruments were working properly.

In general, the interviews went smoothly, with no serious communication issues, deviations from the script, or neglecting of topics, and all direct questions were answered. Regarding the steps taken to gather information on complex matters, such as the meaning of life, the interviewees’ appreciation of their own longevity, and sources of frustration or sadness throughout their lifetimes, two strategies proved to be effective. One was the use of silences that were much longer than normal but that allowed the centenarians to collect their thoughts and recount their experiences; the other was asking certain questions more than once during the interview; this allowed us to confirm certain complex information and more deeply investigate relatively abstract aspects, particularly during those stages in the encounter in which a climate of trust and a degree of familiarity had been developed.

Although it is advisable, when conducting interviews with a biographical approach, to hold several long sessions (Pujadas Muñoz, 2002), this can be difficult when interviewing centenarians or other very old people. The interview’s length should be adapted to the interviewee’s physical strength and capabilities: in the case of centenarians, general physical fatigue can combine with the unusual situation of being interviewed to prompt emotional tiredness. Consequently, on average, our interviews lasted 60 minutes (the shortest was 30 minutes and the longest was 130 minutes). All interviews, with the prior permission provided in the informed consent, were audio recorded.

**Ethics**

The protocol study of the projects was approved by two ethical research committees: Andalusia’s Ethical Portal for Biomedical Research (Portal de Ética de la Investigación Biomédica de Andalucía) and the Ethical Committee at Pablo de Olavide University. All those involved in this research were fully informed of the aims and processes of the research, participated on a voluntary and anonymous basis, and held no interests in the study outcome. The research was conducted with the necessary permissions and pursuant to legislation on data protection and research. All data collection was performed in accordance with the specific standards stipulated in the Declaration of Helsinki. Each participant received a factsheet with full details on the project and their involvement and signed an informed consent form that clarified their right to withdraw from the study at any time.

**Data Analysis**

We are currently conducting analysis on the data. All interviews have been fully transcribed and reviewed independently by the researchers. We used qualitative sequential discourse method for the analysis (Denzin & Lincoln, 2011), which allowed us to perform conceptual codification based on the interview transcripts. Applying Hsieh and Shannon’s (2005) model, this procedure comprised two phases. First, coding: by reviewing each semantic unit (paragraph or group of paragraphs), the words or phrases most representative of the essence of the discourse were selected to create codes. Second, categorization: the codes were grouped into categories; that is, broader entities that can include several concepts.
Two members of the research team conducted the analysis independently of each other, after which they compared their coding and categorizations. Any potential discrepancies were resolved through discussion or, if necessary, by the arbitration of a third researcher. The codes and categories included in the semi-structured interview guide facilitated the initial analysis. The empirical material is being analyzed using thematic analysis (Braun & Clarke, 2006). This process is being conducted with the help of Atlas.ti software.

Several interviews for both SeviCent and C&LCent were video-recorded for a scientific documentary called “To live to be 100 years old” (A vivir que son 100 años); this documentary was organized by the General Foundation of Spain’s Higher Council for Scientific Research (Fundación General del Consejo Superior de Investigaciones Científicas) and was screened at the Science Museum (Museo Casa de la Ciencia) in Seville (from October 1st, 2018, to July 14th, 2019) and at the Science Museum (Museo de la Ciencia) in Valladolid (from March 29th, 2019, to June 30th, 2019).

Limitations of the Study

The SeviCent and C&LCent studies encountered four limitations that could be common to any qualitative research involving very old people. First, we needed to verify the centenarians’ ages to ensure that they were indeed at least 100 years of age. This required applying an age-verification protocol in which we requested their birth certificates from the civil registry located in the centenarians’ self-reported places of birth (Gómez-Redondo & García, 2010).

Second, considering the centenarians’ fragile state, we needed to repeatedly make contact with the individuals’ milieu (in some cases, up to 12 times) in order to arrange meetings, and even once a meeting had been arranged, it often could not be held because of illness or even the death of the prospective interviewee. Based on such occurrences, and considering this population’s small size, we strongly recommend that the time between contact and interview be as short as possible.

Third, the interviews were conducted with consideration of each centenarian’s physical and emotional state at the time of the conversation; such consideration is a necessity when interacting with people of such ages. Indeed, on several occasions we found, upon arriving to conduct the interview, that the individual’s state of health was not initially suitable for undergoing the interview; however, ultimately, successful interviews were held for all but four of these cases. To reduce the risk of such occurrences, we recommend contacting the interviewee’s representative on the day before and even the day of the interview to confirm that the interviewee is available to undergo the interview.

Fourth, most of the individuals interviewed had different degrees of hearing impairment, which could hinder the flow of the conversation and even lead to some awkward situations for the interviewer, such as having to raise his/her voice or move physically closer to the centenarian. A family member or member of staff at the care home was sometimes asked to help an interviewee understand a question, although this did not influence the interviewee’s answers or their narrative.

Conclusions

This article presents a protocol that has been designed for and applied to the study of centenarians. The characteristics of the study’s target population, comprising individuals who are of a very old age, few in number, highly dispersed, difficult to contact, and extremely fragile, and the study goal of recording, in their own words, these people’s lives and the experiences that underpin such extraordinary longevity, necessitated the adaption of traditional qualitative research protocols and instruments.

The centenarians’ extremely long lives, featuring a historical background of dramatic events and marked by the deaths of most of their direct family members, parents, siblings, and often their children, means the interview script must be developed with the utmost sensitivity, prioritizing a seamless narrative over an in-depth focus on the most dramatic and traumatic episodes.

Acknowledgments

We are grateful to all the centenarians and their families who took part in the interviews, as well as the staff of the old care homes and to all the researchers and PhD students who performed part of the sampling and fieldwork.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: This research was funded by Junta de Andalucía (Grant PRY184/17); Interreg V-A España-Portugal (POCTEP) 2014–2020 program; CENIE project (Grant 0348_CIE_6_E); Spanish Ministry of Science, Innovation and Universities [Grant RTI2018-098455-A-C22]; and Junta de Castilla y León [Grant SA047G19].

ORCID iDs

Juan Manuel García-Gonzalez https://orcid.org/0000-0001-5738-1893

Alberto del Rey https://orcid.org/0000-0002-4262-5557

Notes

1. There is an important point to note regarding the figures provided by the INE. In 2016, there was a change in the process of gathering and treating statistics concerning population data (Estadística de Cifras de Población); this resulted in a reduction of almost 5000 from the recorded number of centenarians in Spain as a whole,
with Andalusia showing a reduction of 1400 and in the province of Seville (which is located within the region of Andalusia), a reduction of approximately 25%. As our population estimates were based on these population data (Cifras de Población), and as the census seemed to overestimate pre-2016 numbers of centenarians by approximately 25%, we have opted to base our analysis on the most conservative figures.

2. Video available at https://youtu.be/E65NkxHzNSQ
3. Video available at https://www.youtube.com/watch?v=rhBiAy6szAc

References

Abellan, A., Ayala, A., & Pujol, R. (2020). Un perfil de las personas mayores en España 2020. Indicadores estadísticos básicos [A profile of older adults in Spain 2020. Statistical indicators]. Informes Envejecimiento en red, 25, 1-39. http://envejecimiento.csic.es/documentos/documentos/enred-indicadoresbasicos2020.pdf.

Andersen-Ranberg, K., Schroll, M., & Jeune, B. (2001). Healthy centenarians do not exist, but autonomous centenarians do: A population-based study of morbidity among Danish centenarians. Journal of the American Geriatrics Society, 49(7), 900-908. https://doi.org/10.1046/j.1532-5415.2001.49180.x.

Bergeron-Boucher, M.-P., Ebeling, M., & Canudas-Romo, V. (2015). Decomposing changes in life expectancy: Compression versus shifting mortality. Demographic Research, 33, 391-424. https://doi.org/10.4054/demres.2015.33.14.

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. Qualitative Research in Psychology, 3(2), 77-101. https://doi.org/10.1191/1478088706qp063oa.

Christensen, K., & Vauple, J. W. (1996). Determinants of longevity: Genetic, environmental and medical factors. Journal of Internal Medicine, 240(6), 333-341. https://doi.org/10.1046/j.1365-2796.1996.d01-2853.x.

Clerencia-Sierra, M., Ioakeim-Skoufa, I., Poblador-Plou, B., Gonzalez-Rubio, F., Aza-Pascual-Saledo, M., Machón, M., Gimeno-Miguel, A., & Prados-Torres, A. (2020). Do Centenarians die healthier than younger elders? A comparative epidemiological study in Spain. Journal of Clinical Medicine, 9(5), 1563. https://doi.org/10.3390/jcm9051563.

Darviri, C., Demakakos, P., Tigan, X., Charizani, F., Tsiou, C., Tsagkari, C., Chliaoutakis, J., & Monos, D. (2009). Psychosocial dimensions of exceptional longevity: A qualitative exploration of centenarians’ experiences, personality, and life strategies. The International Journal of Aging and Human Development, 69(2), 101-118. https://doi.org/10.2190/ajh.69.2.b.

de Pedro-Cuesta, J., Virués-Ortega, J., Vega, S., Seijo-Martínez, M., Saz, P., Rodríguez, F., Rodríguez-Laso, A., Reñé, R., de las Heras, S. P., Mateos, R., Martínez-Martín, P., Manubens, J. M., Mahillo-Fernández, I., López-Pousa, S., Lobo, A., Reglá, J. L., Gascón, J., García, F. J., Fernández-Martínez, M.,..., & del Barrio, J. L. (2009). Prevalence of dementia and major dementia subtypes in Spanish populations: A reanalysis of dementia prevalence surveys, 1990-2008. BMC neurology, 9(1), 55-59. https://doi.org/10.1186/1471-2377-9-55.

Denzin, N. K., & Lincoln, Y. S. (Eds.). (2011). The SAGE handbook of qualitative research. Sage.

Ekerdt, D. J., Koss, C. S., Li, A., Münch, A., Lessenich, S., & Fung, H. H. (2017). Is longevity a value for older adults? Journal of Aging Studies, 43, 46-52. https://doi.org/10.1016/j.jaging.2017.10.002.

Engel, G. (1977). The need for a new medical model: A challenge for biomedicine. Science, 196(4286), 129-136. https://doi.org/10.1126/science.196.4286.129.n3.

Folstein, M. F., Folstein, S. E., & McHugh, P. R. (1975). “Mini-mental state”. Journal of Psychiatric Research, 12(3), 189-198.

García González, J. M. (2015). La transformación de la longevidad en España de 1910 a 2009. Centro de Investigaciones Sociológicas.

García González, J. M., & Fernández Muñoz, J. J. (2016). La escucha de la experiencia: Aplicación de las entrevistas en profundidad con trasfondo biográfico a personas mayores. In R Focinho, S Mairos Ferreira, & V Nuno Anjos. Conversas de Psicologia e do Envelhecimento Ativo 2016 (pp. 59–67). Associação Portuguesa Conversas de Psicologia.

Gavril, D., Antúnez, C., Torno, M. J., Carles, R., García Santos, J. M., Parrilla, G., Fortuna, L., Jiménez, J., Salmerón, D., & Navarro, C. (2009). Prevalence of dementia and cognitive impairment in Southeastern Spain: the Ariadna study. Acta Neurologica Scandinavica, 120(5), 300-307. https://doi.org/10.1111/j.1600-0404.2009.01283.x.

Gimeno-Miguel, A., Clerencia-Sierra, M., Ioakeim, I., Poblador-Plou, B., Aza-Pascual-Saledo, M., González-Rubio, F., Rodríguez Herrero, R., & Prados-Torres, A. (2019). Health of Spanish centenarians: A cross-sectional study based on electronic health records. BMC Geriatrics, 19(1), 226. https://doi.org/10.1186/s12877-019-1235-7.

Groves, R. M., & Magilavy, L. J. (1981). Increasing response rates to telephone surveys: A door in the face for foot-in-the-door? Public Opinion Quarterly, 45(3), 346-358. https://doi.org/10.1086/268669.

Gómez-Redondo, R., & González, J. M. G. (2010). Emergence and verification of supercentenarians in Spain. In H. Maier, J. Gampe, B. Jeune, J.W. Vauple, & J.M. Robine (Eds.), Supercentenarians (pp. 151, 171). Springer.

Herr, M., Jeune, B., Fors, S., Andersen-Ranberg, K., Ankri, J., Ani, Y., Cubaynes, S., Santos-Eggimann, B., Zekry, D., Parker, M., Saito, Y., Herrmann, F., & Robine, J.-M. (2018). Frailty and associated factors among centenarians in the 5-COOP countries. Gerontology, 64(6), 521-531. https://doi.org/10.1159/000489955.

Holstege, H., Beker, N., Dijkstra, T., Pieterse, K., Wemmenhove, E., Hulsman, M., Scheltens, P., & Scheltens, P. (2018). The 100-plus study of supercentenarians in Spain. In H. Maier, J. Gampe, B. Jeune, J.W. Vauple, & J.M. Robine (Eds.), Supercentenarians (pp. 151, 171). Springer.

Hsieh, H.-F., & Shannon, S. E. (2005). Three approaches to qualitative content analysis. Qualitative Health Research, 15(9), 1277-1288. https://doi.org/10.1177/1049732305276687.
