

Report C

Ageing and wellbeing

A snapshot of older adults

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Production method

Reports C are brief documents on subjects chosen by the Bureau of the Congress of Deputies that contextualise and summarise the available scientific evidence on the analysed subject. They also inform about areas of agreement, disagreement, unknowns, and ongoing discussions. The preparation process for these reports is based on an exhaustive bibliographical review, complemented with interviews of experts in the field who subsequently conduct two review rounds of the text. Oficina C conducts this process in collaboration with the management team of the Spanish Parliament's Lower House Documentation, Library and Archive service.

To produce this report the Oficina C referenced 246 documents and consulted 23 experts in the subject. Of this multi-disciplinary group, 61% of the experts were from the field of social sciences (sociology, philosophy, economics, 22% from life sciences (biochemistry, medicine) and 17% from the area of engineering and technology. 91.3% work in Spanish institutions or centres, whereas 8.7% have affiliations abroad.

Oficina C is the editorial supervisor of this report.

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Summary C

The report in 5 minutes

Relevance

Spain is fourth in the European Union ranking of countries with the highest number of older adults. Currently, 20.1% of the Spanish population is over 65 and it is expected that this proportion will increase over the next 20 years as the baby boom generation reaches that age.

Longevity is an achievement and an opportunity but also represents a challenge. At a personal level, older adults face difficulties such as the loss of personal autonomy and independence, loneliness or the digital divide. But there is also a challenge for society, since ageing involves an increased number of retirement pensions coupled with greater use of the healthcare system and social services, the weaknesses of which were highlighted by the recent pandemic. The goal is not only to live more years but to do so in good conditions of health and wellbeing.

This report describes the factors that influence ageing and how experts believe the health, pensions and long-term care systems can adapt to face this demographic challenge.

The population of Spain over the age of 65 is very heterogeneous: it includes several generations, covers an age range of four decades and includes 16,000 people over 100 years old. The needs and capacities of this group are, therefore, different and changing.

Ageing is a multifaceted process, influenced by biological factors like maintaining health, autonomy and independence, as well as social and psychological considerations. Healthy, active ageing is the way to foster health and quality of life for older people.

Focal point

Financial capacity influences whether a person can access active, healthy ageing although, compared to other age groups, the risk of poverty among older adults in Spain is lower than average. This group's main source of income is retirement pensions. Spain has recently approved a new sustainability framework for the state pensions system that includes a progressive increase in maximum contributions and the option to use different parameters to calculate the contribution period. Older adults also constitute a source of new economic activities, what is termed the silver economy, which is expected to continue growing.

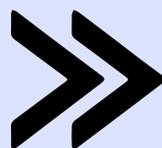
The environment can foster or inhibit healthy ageing. To promote the social inclusion and participation of older adults, the necessary services should exist and adapt to the needs of older adults both in social terms and in the urban environment.

Among the factors that hinder healthy ageing are age discrimination, the digital divide and loneliness, which make it more difficult for older adults to participate in society.

Ageism can also hold back effective public policies, and although the digital divide is narrowing, it makes access to everyday services more difficult.

Psychological wellbeing influences health and quality of life and vice versa. Although loss increases with age, the people who have protective psychological resources, such as the will to live, or who can redirect their life goals in the face of new circumstances, live their ageing process with more optimism and resilience. Conversely, loneliness shortens life expectancy, worsens health and generates less happiness. Periodic contact with close friends and family is a protective agent, whereas in Spain, living alone is an identified risk factor.

In biological terms, ageing is the consequence of an accumulation of molecular and cellular damage that varies considerably between individuals of the same age. Although part of the variability is due to genetic inheritance, this heterogeneity is mostly due to other factors such as gender (women live longer, but in a worse state of health and with more limitations), lifestyle (if a person has protective habits –like a healthy diet– or avoids risks –such as smoking), suffering from chronic disease or frailty (the reversible state before disability) and socioeconomic factors (educational level, type of work, neighbourhood or autonomous community).



On the horizon

Healthy lifestyles and the prevention and treatment of frailty are key elements to prevent chronic diseases and disability. European Commission studies highlight it is not population ageing that is the main reason for increased spending, but rather years of life spent in bad health with functional deterioration. The increased cost represented by this area of spending in Spain could be practically halved if the years gained were lived in good health. Physicians also note the advisability of increasing the number of geriatric specialists, improving health and



Image FOTCIENCIA Giant sea sponge© Adaris María López Marzo

social services coordination and using technology to expedite healthcare services for treatments where in-person attention is not necessary.

When people lose autonomy, they require care. Experts highlight that the COVID-19 pandemic brought to light shortfalls in the care system and note the need to transform the current model, adopting a comprehensive, person-centred care approach. Bearing in mind the preference to live at home, one change objective is to promote people obtaining support in their habitual environment, with the aid of technology, so that they can live longer in their homes or, ideally, never have to leave them. When dependency increases and care becomes more complex, residential care facilities and other forms of collective living are an alternative.

In Spain, the Autonomy and Dependency Care System (SAAD) assigns services and benefits after identifying the applicant's degree of dependency. Although its budget has grown in recent years, experts believe it should increase considerably to fall into line with

the European average. They also suggest simplifying the system's governance, shortening waiting times to obtain benefits or services, and eliminating inequalities that exist between the autonomous communities.

Whereas in other countries care depends to a greater extent on professionals, in Spain unpaid care by family members is more common. Both types of care remain largely the domain of women, whether in their role as partner or daughter, or on migrant women, who are generally untrained in healthcare provision.

Social change and a forecast rise in cases of dementia and other neurodegenerative diseases will necessitate further development of the professional care sector that can deal with complex care. Despite job offers, the professional care sector finds it difficult to attract and maintain personnel. One of the hurdles to developing employment in the care sector is the unreported provision of services, a common situation in Spain and other countries, which can lead to abuse and job insecurity.

Ageing and wellbeing

Introduction

Spain occupies the middle ground in terms of population age in Europe, with 20.1% of the population over the age of 65. This figure is expected to increase over the next 20 years.

The group of older adults covers several generations, is very heterogeneous and has needs that change with each decade of life. In old age, women are more numerous than men.

Spain is fourth in the European Union ranking of countries with the highest number of older adults, after Germany, Italy and France¹. In 2021, life expectancy increased to an average of 83 years, reaching 85.8 years for women². On the other hand, falling birth rates observed since the end of the 1970s have reduced the population of reproductive age³. Low fertility rates combined with increased longevity mean that Spain's population pyramid is being upended, with fewer young people and more older adults.

Currently, 20.1% of the Spanish population is over the age of 65 a proportion that puts the country slightly below the European average (21.1%), behind countries like Italy, Portugal and Finland, who head the list^{1,5}. This demographic situation will worsen in the near future if we take into account that people born in 1958, the first year of the Spanish **baby boom** generation, turn 65 in 2023¹. Although migration compensates negative population growth, if demographic projections continue⁶, expectations are that by the year 2050 the population over the age of 65 will represent 30.4% of the total⁷.

This group of older people bridges several generations, with ages that fall into different decades of life. This dynamic, heterogeneous population has needs and capacities that change over time^{8,9}. As women have higher life expectancy, there are 30.5% more women than men in this age group^{1,10}.

Longevity is an achievement and an opportunity but also represents a challenge. At a personal level, older adults face difficulties such as the loss of personal autonomy and independence, loneliness or the digital divide. But this also entails a challenge for society since ageing involves a greater use of the healthcare system and social services¹. The goal is not only to live more years but to do so in good conditions of health and wellbeing

Active healthy ageing

Ageing is a multifaceted process influenced by maintaining health, autonomy and independence as well as social and psychological factors. Active, healthy ageing is the way to foster health and quality of life in older adults and guarantee the system's sustainability.

Ageing is a multifaceted process that is influenced by maintaining health, autonomy and independence as well as by social and psychological factors¹¹.

Although there are different concepts of what successful ageing involves, for decades now the World Health Organisation (WHO) and other international organisations have promoted **active healthy ageing** as a way to foster people's health and quality of life, and to reduce the impact of ageing in terms of health and social welfare^{9,11}. This document will go into depth about some of the factors that influence active, healthy ageing which continue to represent a challenge and an opportunity for society today.

- **Baby boom**: A demographic cohort in many countries around the world that includes people born during the period of higher birth rates recorded in the two decades after World War II. The demographic explosion occurred later in Spain than in other countries, and its boomer generation corresponds to births between 1957/8 and the mid-1970s.
- **Active ageing**: According to the World Health Organisation, this is the process of optimising opportunities for health, participation and safety to increase quality of life when ageing.
- **Healthy ageing**: the process of fostering and maintaining a functional capacity that facilitates wellbeing in old age, i.e., that each person can be and do what is important for them.

Psychosocial factors

Ageism

Ageism results in discrimination and prejudice towards older people due to their age. These ideas can take root in older people, who may perceive themselves as incapable and exclude themselves, which hinders active ageing. A good antidote to ageism and intergenerational tension is intergenerational contact.

Ageism is the set of stereotypic ideas and images that result in prejudice and discrimination against a group due to their age^{12,13}. Ignoring the heterogeneity of the group of older adults, and considering advanced age as synonymous with vulnerability and dependency changes perception of the process of ageing itself and is an obstacle to active ageing because this group of the population may perceive themselves as incapable and exclude themselves^{14,15}. These ideas also intensify the generation gap¹⁶ and can be a hurdle to formulating successful policies⁹. Ageist beliefs are sometimes reflected in the media, where pejorative or inappropriate terms (old people, the elderly, gramps, grannies, fossils, etc.) are sometimes employed to refer to this segment of the population^{15,17}.

In Spain, a quarter of older adults feel discriminated against due to their age¹⁸. They report, for instance, that healthcare professionals often justify ailments as being "due to your age"¹⁸. The same type of prejudice affects patients themselves, who may attribute treatable symptoms –such as fatigue– to age, when they could be due to heart disease or other conditions. This can mean they do not seek medical assistance or mention the ailment¹⁹.

The COVID-19 pandemic was presented as a problem affecting only older people. For instance, in the United Kingdom and other countries, it was suggested that only people over the age of 70 should be confined¹⁶. On the other hand, in the United States, the hashtag #boomerremover became popular, alluding to the death of members of the baby boom generation^{16,20}. These ageist attitudes are replaced by relationships of solidarity and kinship when we think of older adults as individuals, rather than in generational terms. Experts indicate that fostering contacts between older people and younger generations is a good antidote to intergenerational tension and ageism²¹.

Psychological and emotional wellbeing

Psychological wellbeing is connected with longer survival, better health and cognitive function.

Older adults face changes and loss and have a lower capacity for environmental adaptation; however, they can maintain their quality of life if changes are suitably met, and losses are compensated²¹. Although enormous psychological heterogeneity exists among people of an advanced age, throughout their lives they can accumulate resources that protect them and enable resilient ageing^{22,23}. Such resources include better emotional control, optimism, self-esteem, experience in problem solving and changed attitudes and beliefs about the meaning of life, which come with a growing awareness of limited remaining time²².

Evidence suggests that the psychological wellbeing of older adults (i.e., an evaluation of satisfaction with their own life, their state of mind and the meaning they give to their lives) influences their health and quality of life, and vice versa. Suffering from a chronic disease is associated with worse states of mind and a lower sense of purpose; in turn, better psychological wellbeing is associated with longer survival²⁴. Along these lines, some studies report that life satisfaction tends to decrease around four years before death^{25,26}. Other studies show that older adults who have a will to live are more resilient and optimistic, suffer less depression and have a more positive perception of their ageing process²⁷. There is also a correlation between psychological wellbeing and cognitive function^{26,28}.

On the other hand, when a person needs care, they may at times lose capacities due to disuse rather than because of lack of capacity²⁹. A person may experience what is known as excess disability, and this situation can worsen if the limitations that do exist receive positive reinforcement and attention. Capacities can be regained in a stimulating environment that promotes as much autonomy and independence as possible²⁹.

The incidence of loneliness increases from the age of 75, is prejudicial for health and entails both tangible and intangible costs. In Spain, one of the risk factors is living alone.

Experts stress the importance of preventive actions and the role of volunteers.

Loneliness

Loneliness is a subjective feeling of pain that results from a discrepancy between real and desired social connections³⁰. It is a reality associated with social isolation, which is the objective situation of having a minimum amount of contact with other people, whether friends or family³¹.

Throughout life, loneliness is more prevalent among young adults and older adults³². The latter group are the most vulnerable as they are more exposed to profound changes in their lifestyle and to painful life events³³. Whereas the population between the ages of 65 and 74 is the group that feels least lonely, from the age of 75 the incidence of loneliness increases to 12.2% and is higher among women than men³².

Living alone is not the same as suffering social isolation or loneliness, but it can facilitate both if a loss of autonomy and independence arises, if there are physical barriers in the home, or there is not a consolidated social or neighbourhood network³¹. Studies have detected that in Spain, living alone is one of the factors that has the highest correlation with loneliness among older adults³³. According to data published by the Spanish Statistical Office (INE) in 2021, there were 4.8 million people living alone, of whom 43.6% were over the age of 65, an increase of 6.1% compared to 2019³⁴. One-person households are frequently composed of women: 29.4% compared to 15.8% men¹. Among this group, widowhood is the predominant marital status from the age of 75, whereas men have a higher probability of dying married¹.

The social network of older adults becomes smaller, and the frequency of contacts reduces for reasons related with declining health and the loss of friends or relations, rather than because of the family network³¹. Due to historical social rejection³⁵ older LGBTI adults may have fewer family relationships, which they compensate with alternative support networks (friends, etc.)³⁶. These relationships are more difficult to maintain at later stages of life, which means that this community currently has a higher probability than the general population of living their final years alone³⁶.

People who feel lonely are less happy and cope worse with disability or after hospital discharge, visit healthcare providers more, and consume more medication³². Data indicate that social isolation and loneliness increase the risk of suffering cardiovascular diseases and having mental health problems^{30,32}, and even increase the risk of mortality if periodic contact with close friends and family is not kept up³⁷. A lack of social contact involves a risk for health that is comparable to, or in certain cases higher than, recognised risks such as smoking up to 15 cigarettes, obesity, a lack of physical activity or air pollution^{38,39}. This could be due to worse stress management or adopting harmful habits (not eating properly or less adherence to medical treatment)³⁰. In the face of this reality, experts suggest that asking patients about loneliness should become a routine question at medical visits.

In the United Kingdom one study reports that ignoring people who live with loneliness costs the country 9,500 pounds sterling per person per year more than if they had been properly cared for and accompanied³⁵. Calculations for Spain show that the tangible costs associated with this phenomenon were 14,141 million euros in 2021³². To address this problem, both the United Kingdom and Japan have created a Ministry for Loneliness⁴⁰. The UK has had a strategy on loneliness since 2018⁴¹ and a campaign to eliminate it⁴². In France, the Mona Lisa initiative (National Mobilisation against the Isolation of Older People) involves different social actors to achieve its objective⁴³. In Spain, the Ministry of Social Rights and 2030 Agenda has worked on a National Strategy against Loneliness since 2021⁴⁴. The Spanish National Organisation of the Blind's ONCE foundation has set up SoledadES, the National Observatory on Loneliness⁴⁵. There are also strategies at autonomous region level, and municipal plans to fight against this phenomenon⁴⁶⁻⁴⁹.

Further studies are necessary to ascertain which actions are the most effective, although some researchers suggest participative, group activities⁵⁰. To combat what is a complex

subjective perception, among other suggestions, experts recommend preventive actions and the role of volunteers, to set up networks of neighbours, for instance, since loneliness requires unpaid emotional support⁵¹.

Economy

In Spain, the risk of poverty among people over 65 is lower than the national average.

Almost 90% of this group are homeowners, many of whom help family members. The economic situation of older adults, the silver economy, could foster the development and growth of new economic activities.

On retirement, a person's principal income comes from pensions, private income, social welfare benefits and the intergenerational transfer of assets⁹. In Spain, the risk of poverty among people over the age of 65 is 18.7%⁵², which is 1.9 points above the European average, but lower than average risk in Spain (20.4%)⁵² and far from the risk of poverty for people under the age of 16 (27.7%)⁵². The likelihood of experiencing this circumstance is higher among people who had low incomes, interrupted their working life, had part-time jobs or were self-employed⁵³. Some of these situations are common factors in the working lives of women in the European Union, which explains why their pensions are an average 29.5% lower than those of men⁵³. Immigrants may also be at greater risk of poverty in old age, as they have generally contributed to state social insurance for fewer years⁵³.

On the other hand, net wealth in Spain reaches its maximum among the population between the ages of 65 and 74, a figure that increased for this group in the 2017–2020 period⁵⁴. People over the age of 65 also have the lowest percentages of **material need**⁵⁵. In addition, according to data for Spain, in 2017, 89.2% of people over the age of 65 were homeowners⁵⁶.

Despite the lower consumption observed in one-person households composed of people over the age of 65⁵⁷, older adults also represent a source of new economic activities. For instance, in 2022, 39.4% of people over the age of 65 travelled, mostly within Spain⁵⁸. Spain also received 8.2 million older tourists in 2019⁵⁹. The "silver economy" also has the potential to expand the market in areas such as care and support technologies, cosmetics and fashion, culture, mobility and banking^{53,60}. Projections suggest that this sector will grow 5% per year, reaching 5.7 billion euros by 2025⁵³.

The silver economy is also important in unpaid terms: older adults often give financial or emotional support to their families and relations or are carers themselves. For instance, almost half of people over the age of 65 have given financial assistance to their family members⁶¹. They are also involved in other tasks: among those who help their family members on a regular basis (28.2%), over half state that this occupies between 2 and 10 hours per week⁶¹. According to 2018 data, 14.9% of families in the European Union depend on grandparents to care for their grandchildren⁶². In Spain, with data for 2015, around 35% of people over the age of 65 care for their grandchildren at least several days per week⁶³. Moreover, almost a quarter of carers for older adults are over the age of 65 themselves, and care for their forebears⁶⁴. Another consideration is that in the case of separations or situations of need, 8% take in family members⁶¹. Likewise, outside of the family context, older people contribute to increasing social capital by participating in volunteer organisations⁶⁵.

Environment

An environment that is respectful with older people and has a positive attitude to ageing will result in benefits for the whole community

An age-friendly environment is key when it comes to fostering active ageing because it encourages the participation of older adults in society, is good for their health and makes them feel safe⁶⁶. This kind of environment also benefits the whole community because, among other things, it offers towns that are clean, safe and easy to move around, have green spaces, ramps, smooth pavements, places to rest, accessible buildings, public lavatories and regular, economical public transport connecting areas with most services^{53,66}. As well as

· **Material need**: the proportion of the population living in homes without at least 3 of 9 listed elements (one meal of meat, chicken or fish at least every two days, a phone, able to go on a one-week holiday every year, etc.). This parameter is studied by the Spanish Statistical Office in its Standard of Living and Living Conditions survey.

an improved urban environment, creating a favourable social environment is necessary^{9,66}.

On the other hand, we should consider that in small towns, where the percentage of older adults is usually higher than average due to emigration of younger people and to the

Quality of life of a small town, social and healthcare services for older people are under-represented⁶⁷, which makes home care more difficult when situations of dependency arise⁶⁸.

Digital divide

In Spain, the Charter of Digital Rights enshrines the right of every person to access digital environments, promoting public policies that reduce inequalities of access and fostering participation in public affairs⁶⁹.

Despite the difficulties experienced by people over the age of 75 in accessing internet, which also reduced in 2022¹, the percentage of users over the age of 65 continues to rise⁷⁰ and is currently at 60%. This narrowing of the divide is attributable to improvements in digital infrastructure and the accessibility of devices, social distancing measures imposed during the pandemic, and a demographic component of people over the age of 65 who have already used internet¹.

Even so, three in every ten older adults in Spain who do not use internet, state they have not been able to complete a basic administrative process because there was no option for an in-person appointment⁷⁰. And almost 77% of this age group do not use online banking services⁷⁰. Thanks to lobbying from older people and other groups, banks have endorsed a protocol –which could spread to other sectors– with measures to guarantee financial inclusion, with in-person or phone-in customer services⁷¹.

When developing new technologies there should be input from users who are older adults because studies show that most of this group feel more comfortable using technologies that they had used on a regular basis between the ages of 10 and 25, which is when the mental models of how tools and devices work are created⁷². On the other hand, over 60% report a lack of training or interest in going online⁷⁰.

Biological, health and social welfare factors

Although stages and periods of development are genetically programmed and practically identical for all human beings from conception to adulthood, from the age of 30 the ageing process is heterogeneous⁷³.

Biological basis

Ageing occurs in all organisms after reproductive maturity has been reached and when growth ends⁷³. This is a multi-factor process that results from a decrease in the energy used to maintain cellular function⁷⁴. This loss of physiological capacity results in recognisable signs⁷⁵. These so-called hallmarks of ageing appear over time and can be experimentally decelerated, stopped, or reversed⁷⁵. In brief, they are:

Accumulation of genetic lesions in DNA. These derive from cell exposure to external agents, such as chemical substances, radiation or specific biological agents. The cellular mechanisms in charge of repairing genetic damage can lose efficiency with age, which enables the accumulation of mutations and an acceleration of ageing⁷⁵.

Telomere shortening. Chromosomes end in repetitive DNA sequences (telomeres) that stabilise and prevent their fusion^{76,77}. However, these sequences get shorter with each cellular division due to the inability of most cells to copy them completely⁷⁸. This shortening implies persistent damage, which can induce cell death and impose a limit on the number of times cells can divide^{76,79}.

Although the number of older people who access internet and other technologies is rising, some people still experience difficulties, which can limit their autonomy and independence, and hinder social inclusion.

Ageing occurs in all organisms due to a multi-factor process leading to a loss of physiological capacity and visible signs of age. These “pillars” or “hallmarks” of ageing appear over time and can be experimentally decelerated, stopped or reversed.

Although, to date, most knowledge comes from animal models, some approaches in the fight against ageing are being tested in clinical trials. The goal is not immortality, but to live more years in conditions of good health and wellbeing

Telomere shortening is associated with age, and the speed with which it occurs predicts life expectancy in many species^{80,81}. Lifestyle habits that damage DNA accelerate telomere shortening because they foster cellular division a to replace damaged cells^{79,82,83}.

Shortening is also related to some diseases that have been treated in mice, activating the expression of an enzyme that can lengthen telomeres and maintain their length (telomerase)^{84,85}. Although systemic activation of telomerase in some murine models increases the incidence of tumours⁸⁶, its specific expression in certain tissues does not increase the risk of cancer^{84,85,87}. It has also been shown that gene therapy with telomerase does not increase the incidence of cancer, even in murine models genetically predisposed to develop the disease⁸⁸. Currently, both Spanish and foreign companies are testing gene therapy with telomerase in clinical trials⁸⁹.

Age-related changes in gene expression. Gene expression is the process by which cells are given instructions and it is modulated through different strategies that also change over time. These changes affect processes that become dysregulated with age, such as inflammation⁷⁵. Communication of these messages also accelerates over time, which leads to a higher rate of errors in genetic instructions, opening the door to interventions or treatments that slow down the process⁹⁰.

On the other hand, the modifications that gene expression undergoes during development are reversible. So, adult stem cells can be genetically modified to reprogramme their gene expression and recover lost information⁹¹; reprogramming rejuvenates them, and they recover properties similar to those of stem cells or embryonic stem cells, with the ability to generate different types of cells and repair tissues^{75,92}. Reprogrammed cells are currently used to develop models of complex diseases and to improve diagnostic capacity. In the future, they could lead to new treatments, for instance, in retinal diseases^{93,94}.

Defective proteins and other cell waste. Incomplete, defective or damaged proteins, misfolded proteins or proteins whose function has finished must be repaired or eliminated to guarantee proper cell function. If this does not happen, they accumulate and form depositions or plaques that are often found in aged brains, cataracts or diseases like Alzheimer's and Parkinson's⁷⁵. It is also important to eliminate other larger cell components like **mitochondria** or other organelles that have stopped working properly. The elimination and recycling of proteins and other damaged cell components by means of more or less selective processes is called autophagy⁹⁵. Autophagy activity drops with age, promoting ageing⁷⁵. Selective pharmacological activation has managed to attenuate the disease in two mouse models with Alzheimer's⁹⁶, rejuvenating and maintaining the function of stem cells in both human and mouse blood⁹⁷. Examples of the activating molecules for autophagy are **spermidine**^{95,98} and **metformin**⁹⁹. Along the same lines, exercise, sleep and calorie restriction, as well as other dietary actions such as introducing periods of fasting, also activate autophagy⁹⁵ as shown in animal models⁷⁵. Some steps, such as calorie restriction, which prolong life in mice, offer promising results in humans, although there is still no data regarding longevity⁷⁵.

Metabolic dysregulation. Metabolism changes over time. During youth, the availability of nutrients and **anabolic** reactions contributes to growth. During adulthood, an excess of nutrients promotes inflammation, inhibition of autophagy and ageing⁷⁵. One possible action, tested in animal models, consists of pharmacologically modulating the cellular components involved in evaluating and signalling the availability of nutrients⁷⁵. Another option, as previously mentioned, is caloric restriction.

Mitochondrial dysfunction. The role of mitochondria is to produce energy. Their deterioration can alter this function, also causing inflammation and cell death, making a progressive

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- **Mitochondria:** the organelles that produce energy for cell function through the oxidation of organic compounds.
 - **Spermidine:** a natural compound that induces general autophagy and has been shown to increase longevity in mice, flies, yeasts and worms. It occurs naturally in many foods of animal and vegetable origin, such as wheat germ, broccoli or mushrooms.
 - **Metformin:** a medicine used to treat type II diabetes with few side effects, which also induces autophagy. This drug acts on several levels and is being tested in the first clinical trial that targets ageing.
 - **Anabolism:** the metabolic process of constructing larger molecules.

contribution to ageing⁷⁵. Paradoxically, reversibly compromising mitochondrial function can generate beneficial reactions that increase longevity in some experimental models⁷⁵.

Loss of tissue regenerative capacity. Eliminating **senescent cells** lengthens the life of mice and has therapeutic effects on various diseases in animal models⁷⁵. Nevertheless, with age, the immune system becomes less efficient at eliminating senescent cells¹⁰⁰ and they accumulate. Several recently concluded or currently ongoing clinical trials assess the therapeutic effects of various molecules targeted at eliminating specific senescent cells (senolytics) in different diseases¹⁰¹.

On the other hand, stem cells experience the same stress factors as other cells and deteriorate over time. This loss of function directly reduces their capacity to renew and repair tissues and is the cause of ageing⁷⁵. As already mentioned, cell reprogramming can rejuvenate adult stem cells and restore their potential.

Impaired intercellular communication. With age, the defects generated in individual cells end up affecting signalling and coordination between cells, which causes systemic changes. For instance, a blood transfusion from aged mice to young mice causes symptoms of ageing¹⁰², whereas the factors in the blood of young mice can restore the capacity to renew and repair tissues in older mice¹⁰³.

Chronic inflammation. Many of the imbalances mentioned generate systemic inflammation that increases with age and generates diverse pathologies such as osteoarthritis or atherosclerosis and the decline of immune function⁷⁵. Studies have shown many examples of anti-inflammatory treatments that improve health and prolong longevity in mice. Some compounds are being tested in clinical trials^{75,104}.

Disruption of gut microbiota. Not only do gut flora help digest foods, they also protect us from pathogens, produce beneficial substances and communicate with the central and peripheral nervous system¹⁰⁵. If this two-way communication is broken, diseases such as diabetes may arise. With age, the microbiome changes and loses diversity. Several actions have been the subject of study (probiotics, faecal transplants), confirming the connection between age and imbalances. Likewise, research indicates the benefits of maintaining a microbiota typical of young organisms to care for the health of organs as diverse as the brain or the immune system, and to prolong life^{75,106,107}.

According to experts, intense work is being done at international level to delay or revert ageing and find cures for the degenerative diseases associated with it. The goal is to live in better health until the end of our lives.

Prevention of chronic diseases and socioeconomic factors to live longer with health.

Ageing due to the accumulation of molecular and cellular damage varies widely between individuals of the same chronological age. Although part of this variability is due to genetic inheritance, the heterogeneity mostly corresponds to other factors such as gender, lifestyle (if protective habits –like a healthy diet– are followed, or risk factors –like smoking– are avoided), socioeconomic factors or suffering chronic diseases like diabetes, osteoarthritis, heart disease and cognitive deterioration⁹.

Despite the fact that women live longer, their healthy life expectancy at 65 years is slightly lower (11.5 years for women compared to 11.6 years for men in 2020)¹⁰⁸, which indicates that they live more years but in worse health, with more limitations¹⁰⁹. In Spain and other countries, while the mortality rate for men is usually higher for almost all age groups¹¹⁰, women spend

Ageing can vary considerably among individuals of the same chronological age. This is mostly due to aspects like gender, lifestyle, socioeconomic factors (educational level, type of work, environment...) or chronic disease.

Women spend more of their lives with limitations and a worse state of health, particularly women with a low educational level.

· **Senescent cells:** Faced with stress or damage, cells may enter into senescence. In this state, they stop dividing to avoid the proliferation of damaged cells, and are eliminated by the immune system, which enables tissue repair. These cells are involved in many diseases such as cystic fibrosis, Alzheimer's or Parkinson's, and are also a cause of ageing.
· **Microbiota:** the community of living microorganisms resident in a specific niche.

more of their lives with chronic morbidity¹¹¹, with a worse perception of their own health¹¹² and cognitive difficulties¹¹³ like dementia, including Alzheimer's¹¹⁴. A study of the population of England predicts that if current trends continue, dependence-free life expectancy will increase in men and reduce in women¹¹⁵. This difference may be due to factors that are biological (hormonal protection, genetics), behavioural (healthy habits or risk behaviour) and social¹⁰⁹. Related with this, studies in Spain observe that women with a low educational level spend more years of life in worse health¹¹³. In Europe, having a higher educational level is also associated with a lower probability of deteriorating health¹¹⁶ whereas it is less probable that women with a low educational level will recover robust health¹¹⁷. Likewise, studies have observed that people with a higher educational level participate more in active ageing activities, such as volunteering, paid work or the care of grandchildren¹¹⁸. Researchers suggest that this higher degree of activity may contribute to explaining better levels of health among people with a higher level of education; they also indicate the usefulness of targeting groups who have a lower educational level to stimulate active ageing among them¹¹⁸.

Analysing data for Spain in this context, we find that men who had a managerial position at the age of 50 had a life expectancy 10 years longer than men with routine jobs, and this difference was 11 years in the case of women¹¹⁹. Life expectancy also varies between autonomous communities¹²⁰, and there are even differences of several years between districts in the same large city^{121,122}. These data show the importance of social inequality and highlight the role of environment, neighbourhood and the community in healthy ageing.

Prevention of frailty

Healthy ageing depends both on intrinsic capacity (physical and mental capacities of the individual) and the environment, which conditions this capacity⁹. Disability arises or does not arise from the interaction between a person's capabilities and the demands of their context¹²³. If a situation of biological or social stress occurs (a disease, the loss of a loved one, a change of home, etc.), leaving the individual with capacities that do not meet the environmental challenges, disability appears, which may lead to dependency¹²³. The possibilities of recovering from an established disability are scarce^{124,125}, which is why in recent decades emphasis has been on acting at an early stage of the process of frailty in order to avoid or delay disability^{126,127}. **Frailty**¹²⁷ is a reversible state in which a person is vulnerable but does not have disability. In Spain, the Frailty Trait Scale (FTS-5) has been validated and is used to evaluate frailty. This scale measures 5 characteristics (body mass index, degree of physical activity, walking speed, grip strength and balance), aids diagnosis of the degree of frailty, and can be used to monitor its progression¹²⁸. Depending on certain parameters, if a person is diagnosed as frail or pre-frail, different actions can be prescribed, which may include multicomponent exercise programmes (resistance, strength, balance and flexibility)¹²⁹, changes in diet, or personalised management of chronic diseases by healthcare professionals, in particular, geriatric specialists (see **Box 1**)¹³⁰.

The prevalence of frailty in Spain is 18% in people over the age of 65, with variations of 2.5–6% in people between the ages of 75–80 and 18–38% in people over 85¹²⁷. In addition to the effects on individual quality of life, frailty is a better predictor of healthcare spending than age or comorbidity *per se*¹³¹. Calculations for Spain indicate a cost of almost 2,500 euros per year for each frail person, double the expenditure on a person with robust health^{127,132}. A study of over 6 million participants resident in the United States identified that the population of frail older people (8.6% of the total) was responsible for over 40% of expenditure, half of which was preventable^{133,134}.

The European Union undertook the ADVANTAGE Joint Action that focussed on frailty with the participation of 22 Member States and 38 organisations, led by Spain. The goal was to

· **Frailty**: is the age-related progressive deterioration of the physiological systems, which causes a reduction in intrinsic capacity reserves, leaving higher vulnerability to stress factors and increasing the risk of a series of adverse health outcomes

The prevention of frailty and recovery of robust health for frail people are key strategies to prevent or delay disability.

The prevalence of frailty, one of the predictors of healthcare spending, is 18% in people over 65 in Spain

define a common strategy for Europe, which would cover the prevention, detection, evaluation and management of this condition¹²⁶. The consensus document of the Ministry of Health on the prevention of frailty is based on its conclusions¹²⁷.

Geriatrics is a transversal speciality that emphasises personal autonomy and evaluates medical, functional and social aspects. Although it is generally agreed that more geriatric specialists are necessary, the deficit is partially balanced out by internal medicine physicians.

Box 1. Geriatrics

Geriatrics is a transversal speciality that does not focus on the organ to be treated, but on a person over the age of 65 years who may present several diseases with a progression conditioned by psychological or social factors¹³⁵. Rather than on disease, it places emphasis on functional autonomy, focussing on holistic care for older people. This area of medicine covers all aspects, coordinating multiple conditions and calling on a range of specialists, primary care and social services¹²³.

The speciality has been recognised in Spain since 1978¹³⁶. The Spanish National Health System has a similar number of geriatric and allergy specialists¹³⁷. While there are 167 paediatricians for each 100,000 children under the age of 15, there are 16 geriatric specialists per 100,000 people aged 75 or older¹³⁷. A recent report found that 75% of expert staff questioned stated that geriatrics is a specialist area with a deficit of physicians¹³⁷. Such is the case that some autonomous communities have no geriatric specialists at all¹³⁷. According to the professionals interviewed, attempts are made to compensate for the lack of geriatric specialists by using internal medicine physicians, who also take on the comprehensive care of older patients with acute diseases but do not address functional or social aspects. When both specialities coincide, they work together closely. Geriatric care provision is also unequal in different European countries¹³⁸.

Response to population ageing

Pensions are the main source of income for most older people. Spain has recently approved a new framework for sustainability of the public state pension system

Adaptation of the pension system

Pensions are the main source of income for most older adults¹². In 2023, the average retirement pension was 1,375 euros per month¹. Although there are differences between the autonomous communities, the average amount is over 1,000 euros in all regions¹. According to the experts consulted, as well as being contributory, pensions are the main instrument for the redistribution of wealth and act against income inequality¹³⁹. In the face of demographic change, in order to achieve a fair, adequate sustainable pension system, the European Commission proposes several measures that different countries could adopt: prolonging the duration of working life (as in other European countries¹⁴⁰ in 2027, the retirement age will be 67 years in Spain, 65 if contributions have been made for a minimum of 38.5 years¹⁴¹); establishing flexible retirement regimens; restricting early retirement; extending access to pensions to more types of workers; modifying contribution periods or increasing maximum insurance contributions⁵³. Spain has recently approved a new framework of sustainability for the state pensions system that includes a progressive increase in maximum contributions and the option to use different parameters when calculating the contribution period¹⁴².

In addition to fostering the system's sustainability, working and volunteering promote the active, healthy ageing of the population who wish to continue working⁹. Experts recommend the elimination of discriminatory regulations that oblige a person to give up their job at a specific age.

Models show that increased spending is attributed to years of life in a worse state of health rather than population ageing.

Increased healthcare spending costs in Spain could be reduced by almost half if the population's increased longevity were accompanied by good health.

Preventing chronic diseases and disability improves quality of life and contributes to the sustainability of the healthcare system.

Adaptation of the healthcare system

The arrival of antibiotics, changes in lifestyles and improved socioeconomic conditions have brought changes in predominant health problems, with a decrease in acute transmissible diseases and an increase in the chronic conditions¹⁴³ that are more prevalent among older people (77.6%)¹⁴⁴. Likewise, demographic changes will probably increase the demand for healthcare services⁵³. For instance, an increase in the number of independent people is projected for the population of England over the next 20 years; however, estimates also indicate that the number of people requiring complex care will likewise increase because more people will live to the age of 85, when the prevalence of dementia, dependency and comorbidities is greater^{115,145}. Although projections for increased spending vary, all scenarios considered by the European Commission foresee an increase in healthcare costs for Spain higher than the EU average¹⁴⁶. Nevertheless, models highlight that population ageing in itself is not the main reason for higher spending, it is years of life lived in bad health with functional deterioration that accounts for the increase¹⁴⁶. Increased healthcare spending costs in Spain could be reduced almost by half if the increased longevity of the population were accompanied by good health¹⁴⁶. This is a key factor to achieve sustainability of the system and reduce the impact of functional deterioration and chronic diseases¹⁴⁷. Indeed, although chronic conditions affect considerable percentages of other age groups, they principally affect older adults¹⁴⁸, account for 70–80% of healthcare spending in Europe, and are, to a large extent, preventable¹⁴⁹.

Prevention strategies for chronicity and frailty highlight the role of comprehensive, coordinated and continuous care^{127,149}. Recommendations include strengthening primary care and geriatrics services and reinforcing the role of nursing staff in the systematic, comprehensive evaluation of people over the age of 75. It is also necessary to apply technological solutions for patient monitoring and to improve communication between healthcare professionals, as is a better coordination between health and social welfare services^{127,144}. In this regard, the Evaluation Report for the Strategy to Tackle Chronicity includes the need to continue and improve access to intermediate care hospitals¹⁴⁴ where patients can recover lost function (for instance, with stays of one month to recover from a hip fracture) as long as they are well provided with resources and connected with other services, like acute care hospitals and their geriatric services, primary care and social services¹⁵⁰. Some studies recommend the introduction of acute geriatric care units in general hospitals and intermediate care geriatric units in different healthcare zones^{151,152}. On the other hand, the new models propose treatment of chronicity at home with the support of the healthcare system and technology (see the Support Technologies section).

One study that analyses public healthcare spending in Spain indicates that higher spending is associated with more years lived in good health, which emphasises the importance of healthcare management in the prevalence and prevention of diseases¹⁵³.

Long-term care

Who cares

Long-term care refers to the activities carried out by others to ensure that people who have lost intrinsic capacity (or who are at risk of losing it) can maintain a level of functional ability consistent with their basic rights, fundamental freedoms and human dignity⁹.

Whereas in countries like Denmark or Sweden, care depends to a large extent on professionals, in Spain and other countries like Italy or Korea, unpaid care given by the family bears the load¹⁵⁴; this principally depends on women (73.6%) in their role as partners or daughters⁶⁴. At advanced ages, as a consequence of increased life expectancy, there is a progressive inclusion of men who care for their partners¹⁵⁵. Concerning age, 46.9% of carers in Spain are aged between 50 and 66, and are, therefore, of working age⁶⁴.

Unpaid care in the family environment largely depends on women in their role as partners or daughters. Women's participation in the labour market, changes in family structure, and longer periods of care make it more difficult to provide care in the family environment, generating a demand for professional care services

Data for 2018 show that 10.2% of women stated they had left their job to devote themselves to care compared to 3.8% of men¹.

Home careers are often migrant workers with no care training. Care is expected to become more complex, with an increased demand for trained staff. A hurdle to developing care sector employment is the unreported provision of services, which is common in Spain and other countries and can lead to abuse and job insecurity.

The professional care sector has difficulty attracting and maintaining staff.

Women's participation in the labour market, changes in family structure, and longer periods of care –which can be over 10 years in the case of dementia or similar diseases– make it less possible to provide care in the family environment and generates a strong demand for professional care services^{145,155}. The European Care Strategy estimates that by 2050 the EU will need an extra 1.6 million workers to maintain the same levels of coverage⁶⁷. It also foresees that care will become more complex, which will lead to an increase in the demand for workers trained in managing chronic diseases and dementias^{115,145}. In Spain and other European countries like Cyprus and Austria, home care is mainly provided by immigrant workers who also undertake housework and have no training as caregivers¹⁵⁶. One of the obstacles to creating employment in this sector is the unreported provision of services, which some calculations place at 70% of all housework and care services in Spain and Italy^{157,158}. Private reports estimate that the underground economy affects over 30% of carers¹⁵⁹, which may lead to situations of exploitation or abuse and the lost training opportunities^{158,160}.

Based on data for 2021, it is estimated that 452,026 people are in paid work in dependency care in Spain. Of this number, 77.4% are women. The most common contractual situation is contracts that are full-time permanent (38.82%) followed by full-time temporary (20.16%), part-time permanent (20.04%), or part-time temporary (18.66%). Workers usually have at least secondary education¹⁶¹.

In countries belonging to the Organisation for Economic Co-operation and Development (OECD), the long-term care sector, whether home-based or in residential care, pays low salaries and has difficulties competing with the healthcare sector to attract workers. In Spain, 9% of care workers are looking for another job compared to 2% of hospital workers¹⁵⁸. Faced with this lack of professional carers, experts recommend not only improving pay conditions but also offering other types of benefits and training that make the job of carer more attractive and give it more social prestige.

Care should be based on principles of good treatment^{162,163}. However, some studies suggest that 10% of older adults suffer abuse and identify social support as a protective factor^{164,165}. Contact with healthcare professionals or social services represents a good opportunity to detect situations of abandonment or abuse, whether physical, psychological sexual or financial, and involve an interdisciplinary team to handle the case¹⁶⁶. The organisation Unión Profesional suggests the creation of a new figure, with pertinent qualifications and a corresponding professional association, who would have extra training and work from the private sector to manage the needs of older adults, coordinating the necessary professional services¹⁶⁷.

The Autonomy and Dependency Care System (SAAD)

SAAD assigns services and benefits to people in situations of dependency. It is dependent on social services, has a complex governance system and, despite an increasing budget, needs more funding to face the risks of ageing and attain the European average.

Different copayments, incompatibilities and waiting times exist depending on where a dependent person lives.

Law 39/2006 on the promotion of autonomy and care for people in situations of dependency (LAPAD) created the Autonomy and Dependency Care System (SAAD) within the framework of social services, not the social security system, as some experts demand^{161,168}. According to experts, governance of SAAD is complex, and the regulations system should be simplified to solve ambiguities related to powers and responsibilities, and unequal, excessively long-winded regulations¹⁶¹. The SAAD is controlled by the General State Administration, the Territorial Council, the autonomous communities and local authorities, the latter with limited powers but great responsibility in managing home care and community services¹⁶¹.

Although it is calculated that potential demand is higher, as of February 2023, over 1,860,000 people use the system, of whom approximately 1.5 million have the right to a benefit⁶⁴. It is estimated that spending per beneficiary in 2021 amounted to 8,321 euros¹⁶¹.

Women comprise 63% of applicants. In addition, more than 70% are over the age of 65, with two thirds of that number over 80⁶⁴.

In 2021, SAAD was funded with 0.82% of the GDP (10,000 million euros). The European average is around 1.7% of GDP, although some Nordic countries and the Netherlands head the list, devoting 3.5% of their GDP to this area¹⁶⁹. The SAAD assessment report recommends adapting benefits and services to people's needs, since now growth is based on low intensity services¹⁶¹. In general, there is consensus amongst experts that spending on dependency care will have to increase in coming years to confront the risks of ageing¹⁶¹. A recent study indicates a rise of 1% in total spending on dependency would increase the per capita GDP 0.20% in the next period and reduce healthcare spending 0.6%¹⁷⁰.

In recent years, the budget for dependency care increased 40.5% between 2020 and 2021 and 34.57% in the following year^{161,171}.

The SAAD assigns services and funding after identifying the degree of an applicant's dependency, determining their financial capacity and defining a precise plan of the services or benefits that will be provided. The process takes an average 338 days, but there are large discrepancies between the autonomous communities. Four of the regions complete the process within the legally established time period (6 months) and some autonomous communities take less than half that time. However, the slowest ones exceed the deadline and may take as long as 2.5 years to complete the process^{64,161}.

On the other hand, each autonomous community has the power to decide the rules for user participation in certain copayments, or implement incompatibilities between benefits, which has led to a situation of 17 different models, with discrepancies determined by the place where the dependent person is resident^{64,161}.

Transformation of the care model

According to the European Care Strategy, which is being adapted to the Spanish context¹⁷², planning of services for older people should be comprehensive, person-centred and continuous⁶⁷. Comprehensive care implies bearing in mind different aspects of older adults' lives (biomedical, psychosocial, environmental)¹⁷³. It should also be continuous, adapting to their changing needs, and person-centred⁶⁷. The latter implies user participation in the process, and an appreciation of each person's individuality, values and environment¹⁷³. In addition, according to the people interviewed for this report, coordination between social services and healthcare can expedite comprehensive care, simplify procedures and improve the effectiveness of response, as observed in other countries during the pandemic^{67,174}.

The Ministry of Social Rights and 2030 Agenda, in collaboration with different groups, is currently preparing a de-institutionalisation strategy for older adults and other groups¹⁷⁵. The goal is to change the model of care so that people obtain support in their habitual environment and can live more time at home or even, in the best case, not have to leave the home. This strategy aligns with the preference for ageing at home expressed by 95% of older people¹⁷⁶. The operational phase is set to begin in 2024, although work is already underway on actions under the auspices of the Social and Care Economy PERTE¹⁷⁷. To make this possible in an effective way, with a comprehensive person-centred care (CPC) approach, a network of diverse, flexible supports needs to be generated in the environment, coordinated by case managers with involvement of the authorities¹⁷⁸. This would involve taking advantage of services near the home, using basic and advanced telecare (see below), fostering accessibility in both homes and the environment, as well as offering financial and psychological accompaniment and support to carers who are family members, which would include respite services^{67,173}. Along these lines, the financial benefit to fund personal care can delay admission to a residential care facility between 2.5 and 5.3 years, depending on individual circumstances¹⁷⁹.

The home environment can change as a person ages. The offer of housing for older adults, which covers a wide range of options in other European countries, is in its early days

Experts propose the CPCC (comprehensive person-centred care) model to structure the different stages of care, which would benefit from more coordination between social services and healthcare.

During a first stage, people should obtain support in their habitual environment, staying at home as long as possible or even remaining there.

Care in the home can occur in different types of dwelling, with many alternatives available in other European countries. When dependency increases, one option is transfer to a residential care facility. These should become more homelike to offer their residents a full life.

in Spain¹⁸⁰. For instance, several countries offer **cohousing**¹⁸¹ solutions, although in Spain only a few autonomous communities have specific regulations for this type of project¹⁸²⁻¹⁸⁴. While cohousing implies the participation of residents in management and activities, other alternatives minimise their collaborative commitment¹⁸⁰. Options range from multi-generational housing to lifelong housing that provide care services when dependency arises¹⁸⁰.

When dependency advances and care becomes too complex for the family, older adults can move to a residential care facility. The benevolent-assistance nursing home model that predominated in the 1970s has been replaced by residential solutions that combine the atmosphere of a hotel and a hospital¹⁸⁵. According to data from December 2020, Spain has 384,251 places in residential care facilities, of which 20-25% are unoccupied¹. Over 70% of establishments are private care homes and the remainder are publicly managed¹⁸⁶, although many private homes have a varying number of places subsidised by public authorities. Of the private facilities, 22% are large scale, with 100 or more places¹⁸⁶, which experts warn may make care provision more difficult.

Although the power to authorise centres resides with autonomous communities, in July 2022 the SAAD Territorial Council established common criteria for the accreditation and quality of centres and services¹⁸⁷. Experts highlight the need to increase transparency regarding the quality of residential care facilities in order to contribute to stricter requirements and improve services¹⁸⁸. The average annual price of a place in a public care facility is €20,685, which is very similar to the cost of the private equivalent, but there are large differences between different parts of Spain and the cost may be double this amount in certain autonomous communities¹⁵⁵. The user's contribution has to be added to this amount and is usually 40% or 36% depending on whether the centre is subsidised or public, respectively¹⁵⁵.

Experience during the COVID-19 pandemic revealed the shortfalls of the care system (see **Box 2**) and was a wake-up call to transform the model and base it on CPCC, with more than 1000 experts signing a declaration for change^{189,190}. They advocate the transformation of residential care facilities to a more homelike model that allows the people who live there, even those who are more dependent, to have a full life^{191,192}.

The CPCC model in gerontology is based on changing the way in which the residential care facility's staff relate to older adults in their daily lives, and in generating an environment that fosters the new model¹⁹³.

The first dimension of change implies understanding the life story, interests and values of residents. It also requires promotion of their autonomy and independence, allowing them to take decisions about their daily lives. The new model attempts to avoid uniform care solutions (e.g., regarding times for going to bed and waking up) and treats each resident individually so as to promote their physical and emotional wellbeing, which includes limiting the use of physical or pharmacological restraints^{19,193}. The Spanish Society of Geriatrics and Gerontology has called for a legal prohibition on immobilising older adults, except in urgent, documented and medically supervised cases, which should only be for a limited time¹⁹⁴. This is another step along the same lines as the instruction recommending that prosecutors monitor the use of this kind of restraint¹⁹⁵. The new model also seeks to protect different facets of residents' privacy¹⁹³.

Changes in the environment to promote the CPCC model consist, among other steps, in planning a variety of non-infantilising activities in a comfortable environment, where residents have access to their belongings and participate in the decoration of their rooms¹⁹³. Residents should also be in touch with their family and friends and come into contact with the neighbouring area. The CPCC approach can only be effectively applied if the organisation includes it in its values, trains workers in the model and modifies its organisation in order to do so^{192,193}. Experts also highlight the advisability of legislating in favour of setting up

· **Cohousing**: self-managed communities where the members have a stable residence in a collective environment that combines private spaces (dwellings) with others whose use is collective, common or social.

boards of residents and families, bodies that would guarantee them a voice in the decision-making of their centres. This form of participation already exists in the Netherlands and some Spanish residential care facilities¹⁹⁶.

In Spain, people over 60 represented more than 90% of deaths during the COVID pandemic.

Older adults who lived in residential care were particularly vulnerable, revealing the system's shortfalls on an international level.

Based on latest data, almost 10% of people living in residential care in Spain died.

A ban on visits, closure of services and cancellation of activities also had a negative impact.

Box 2. The impact of COVID-19 on older adults

In Spain people over the age of 60 years represent 22.7% of the confirmed notified cases of COVID-19 (more than 3 million as of April 2023)¹⁹⁷. With a death rate of 3.6% among this age group in Spain, they constituted 90% of the total deaths¹⁹⁷, with similar percentages in other countries¹⁹⁸.

People who lived in residential care facilities were more vulnerable and experienced high death rates^{199,200}. Moreover, due to the exceptional situation many of these people died without the company of their families, and few people were able to attend funerals²⁰¹. In Spain, 9.86% of the population that lived in residential care facilities died from COVID-19 (data up to February 2022)^{199,200}. Countries like the United States, Belgium, Slovenia and some countries of the United Kingdom reported rates that were higher than those of Spain, whereas others, like Germany (3.38%) or France (7.78%) experienced a lower proportion of deaths in residential care^{199,200}. In the first wave, deaths in residential care facilities represented 52% of all coronavirus deaths in Spain. After protection and control measures (vaccines, tests, protocols, etc.), sufficient control was achieved to reduce this percentage to 12% during the last periods for which there are data^{199,200}. This situation, which became known internationally as a *perfect storm*, derived from several factors²⁰². On the one hand, people who live in residential care facilities usually have various health problems, making them more vulnerable to infections, which in turn have more adverse consequences²⁰². Moreover, communal living, which involves shared common spaces and sometimes even room sharing, makes it difficult to maintain social distancing, which is not feasible in some care activities, such as helping to dress or shower²⁰². On the other hand, some of the staff that rotated between floors or entered and left the facilities were asymptotically infected. This, combined with design features such as long corridors, a lack of protective equipment and the initial lack of knowledge about the infection, could have helped spread contagions^{202,203}. Internationally, there is a reported correlation between deaths in residential care facilities and the level of infection in the community¹⁹⁹, i.e., the higher the prevalence of the virus among the population in general, the higher the number of deaths in residential care facilities. Among other factors, this meant that death rates were not uniform; while some residential care facilities did not record any deaths for COVID-19 or compatible symptoms, others recorded outbreaks with a high number of contagions or deaths²⁰⁴. Another risk factor was the size of facilities: in Spain we observed a higher risk of death in residential care facilities with more than 100 places²⁰⁵. Additionally, in areas where the healthcare services were more stretched due to COVID-19 (e.g., some regions of Spain, Italy, Belgium, the USA and China) the initial triage criteria established for the pandemic gave priority to care for patients who it was supposed would live more years with quality of life, an assessment that was based on criteria such as age, autonomy or the presence of other conditions²⁰⁶⁻²⁰⁸. These criteria limited the access of older people to healthcare resources. Experts suggest reconsideration of the suitability of such criteria for future emergencies^{206,209,210}. The international scientific community is still debating whether the decisions taken in different countries during the first wave of the pandemic violated the rights of the older adults who lived in residential care facilities^{211,212}.

The pandemic also had negative consequences for the people who survived infection. For instance, older adults admitted to hospital showed a functional deterioration that they did not spontaneously recover from as months passed and the closure of day hospitals prevented them from accessing services like rehabilitation²⁰⁹.

Older adults who were not infected suffered functional and cognitive deterioration due to the lockdown²⁰¹. In residential care facilities, health measures reduced social interaction, halted daily activities and restricted contact with family members^{213,214}. The ban on visits, which in many cases continued even after the situation was more controlled, resulted internationally in an increase in loneliness, disorders affecting mood, loss of function and higher rates of prescriptions for antidepressants and antipsychotics²¹⁵. On their part, families felt guilt, fear and stress for their relative²¹⁵. These changes particularly affected people with dementia, who were disoriented and suffered more neuropsychiatric symptoms derived from their disease^{216,217}.

Within residential housing, what is known as a “coexistence unit” (*unidades de convivencia*) is particularly suitable for people with dementia. These units are organised like a home, with a maximum number of 15 residents who live together and are accompanied by their carers, with whom they are familiar^{145,176,192}. This type of accommodation is found in western Europe, particularly in Nordic countries, and is becoming more common in North America. The units combine private areas (a room and bathroom decorated with the inhabitant’s belongings) with common areas to foster relationships, mutual support and social inclusion. Carers accompany the residents and perform daily tasks with them, playing a role that is different to that of the classic care model¹⁷⁶. The pilot projects put into practise in Spain have met high degrees of satisfaction from residents, professionals and families¹⁷⁶.

Support technologies

Developing or reconfiguring technology to adapt to the needs of older adults can improve their mood, autonomy and independence, access to the digital world, inclusion in their families or the work environment, facilitate their rehabilitation or other at-home therapies, improve their carer’s wellbeing and represent a tool for healthcare professionals.

The aim is not to replace human care but to enhance it.

Developing or reconfiguring technology to adapt it to the needs of older adults can improve their mood, autonomy and independence, access to the digital world, inclusion in their families or the work environment. They can also facilitate rehabilitation or other at-home therapies and improve the carer’s wellbeing²¹⁸⁻²²². On the other hand, technology can help healthcare professionals to predict problems in a more exact way (sensors of vital signs for risk of falls, frailty or state of health)^{223,224}, facilitating early intervention. Experts suggest endorsement of technology with a certification system. This would guarantee that the product is effective and has been designed for ease of use, bearing in mind the users will be older people²²⁵.

Within the innovations to promote the autonomy and independence of older people, telecare allows them to raise the alarm quickly and effortlessly in cases of emergency. In Spain, this service depends on each regional autonomous community and on town councils and is used by almost one million people²²⁶. Advanced telecare can also be a preventive tool when it includes home automation, with the installation of fall and motion sensors, smoke, gas or leak detectors that contribute to a safer home and to detecting situations of risk²²⁷. This service and other commercial options can provide mobile geolocation devices that accompany the user when they leave home^{228,229}. Experts consider that such technologies may allow an older adult to live in their own home longer if they are used in concert with response services staffed by people who act when a problem is detected.

The field of robotics can also contribute, although the perception of robots as carers is a controversial topic²³⁰⁻²³². However, technologies are not destined to substitute people, but to reduce the load in tasks that are routine and automatable. The role of robots is conceived as augmenting human work^{231,233,234}. Due to the wide variety of situations, there is no generic robot that can solve all care problems, but different platforms are working to respond to specific needs²³⁰.

On the one hand, work is underway on robots that can help a carer with physical tasks like feeding, showering or dressing the user²³¹. In such cases, the aim is to develop robots using soft, flexible materials that are safer, adapt better to the environment and can even repair themselves²³⁵.

According to experts, the development of robots for social care has progressed further because no physical interaction is required. The focus here is on developing intelligent, interactive machines that provide a social service rather than perform tasks^{231,236}. An example of this is the companion robots that are already used in some countries²³⁷. Some have the form of animals and elicit a calming response similar to that achieved with animal therapy, but with the advantage of not requiring care or potentially causing harm²³⁷⁻²⁴⁰. These robots respond to touch, learn to behave as the user likes and, at times, serve to keep the user amused.

Entertainment robots usually have a humanoid appearance and can play games or tell jokes^{231,241}. Others encourage the user to perform tasks or follow an exercise programme

Without the need to enter into physical contact²³⁶. The presence of a robot is more fun and motivating than a screen, which means that treatment adherence is more successful²³³, although more studies with social robots are necessary to verify that user interest endures in the long term²⁴¹. Thanks to artificial intelligence, robots are being trained that not only have robust natural communication with humans, but can also interpret gesture, tones of voice or even intentions, offering a personalised experience²³⁶. So, to focus on the care of people, social robots could be tailored to user tastes, and be given a personality that pleases and motivates the user^{241,242}.

In 2017 the European Parliament proposed giving autonomous robots the legal status of an "electronic person"²⁴³, but the European Commission rejected this proposal. Currently, robots are regulated by each area's legislation and the European Artificial Intelligence Act^{244,245}. As well as being effective, these technologies should have levels of protection that guarantee a safe, easy and respectful use of the user's personal data²⁴⁶.

Key concepts

- More than 20% of Spanish citizens are over the age of 65 and it is expected that this proportion will grow over the next 20 years. The population of older adults is very heterogeneous and includes various generations with different, changing needs.
- Ageing is a multifaceted process influenced by maintaining health, autonomy and independence as well as by social and psychological factors. Active, healthy ageing is the way to foster health and quality of life among older adults. Different biological and psychosocial factors can make this process easier or more difficult. For instance, older adults are one of the groups most vulnerable to loneliness, are at risk of suffering age discrimination and some have difficulties accessing technology.
- Biological, medical and social research are essential to understand how each person ages, and it is hoped that these areas will contribute to people living longer in good conditions of health and wellbeing. Healthy life expectancy is influenced by certain factors like gender, and others that are socioeconomic, such as educational level, type of job or environment.
- In addition to the prevention and treatment of frailty, healthy lifestyles are key to prevent chronic diseases and disability. European Commission studies highlight that years of life spent in bad health with functional deterioration, rather than population ageing, is the main reason for increased spending. The increased spending on healthcare in Spain could be practically halved if the years gained were lived in good health.
- Women are still the main providers of both paid and unpaid care for dependent older people.
- It is common for home care to be provided by migrant workers who usually do not have training for caregiving. It is expected that care will become more complex and the demand for trained staff will increase. One of the hurdles to developing employment in the care sector is the unreported provision of services, a common situation in Spain and other countries, which can lead to abuse and job insecurity. The professional care sector finds it difficult to attract and maintain staff.
- The COVID-19 pandemic highlighted shortfalls in the care system and the need to transform the model towards comprehensive person-centred care. One goal is for people to receive support in their habitual environment and live longer in their own homes. When dependency increases and care becomes more complex, residential care facilities and other forms of collective living are an alternative.
- In Spain, the Autonomy and Dependency Care System (SAAD) assigns services and benefits after identifying the applicant's degree of dependency. Although the SAAD budget has grown considerably in recent years, experts consider it needs to substantially increase to reach the European average. They also suggest simplifying the system's governance, shortening waiting times to obtain benefits or services, and eliminating inequalities that exist between the different autonomous communities.

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