SILVER ECONOMY

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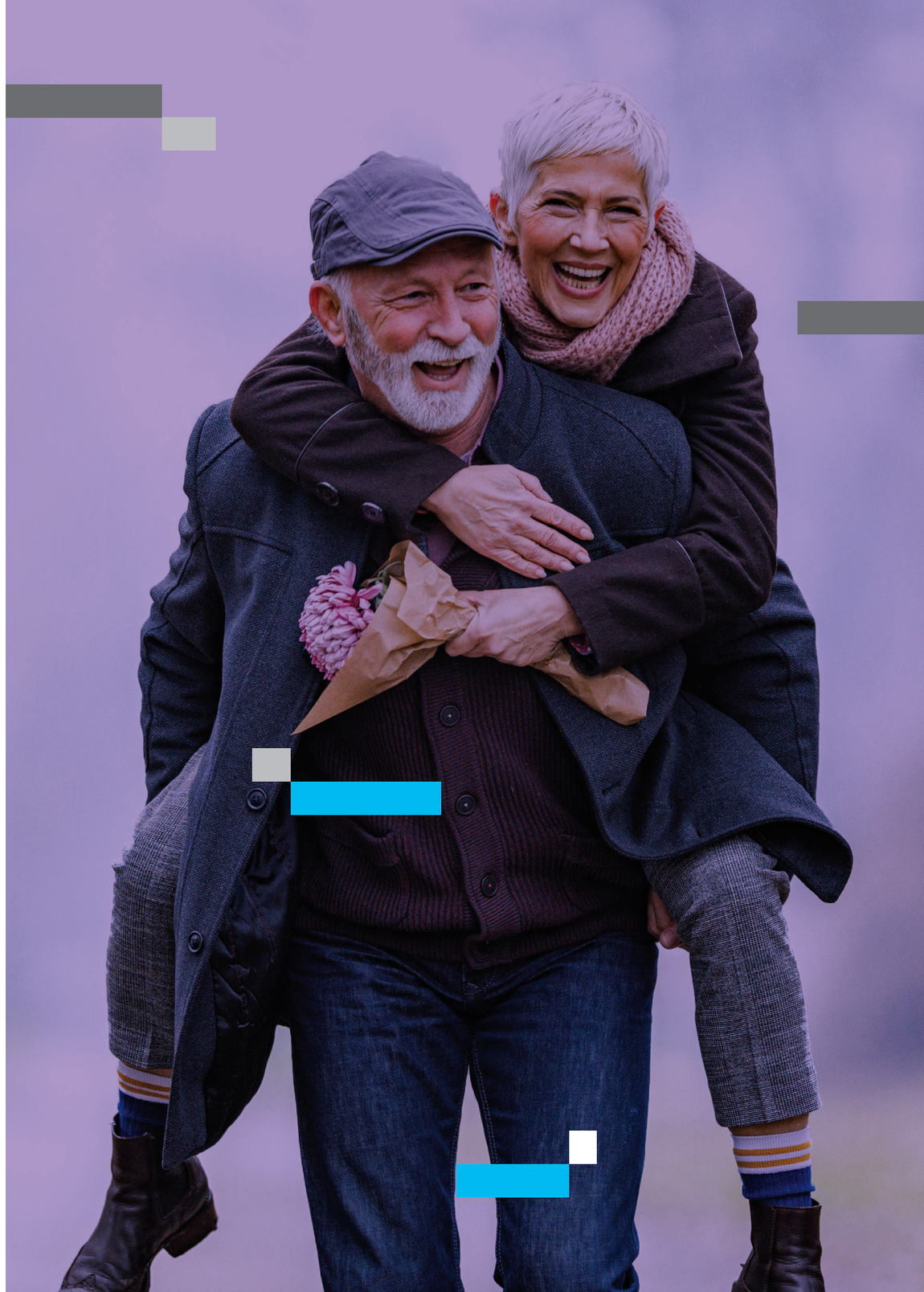


The worldwide population aging is going to be the most significant societal transformation of the human being.

Especially in industrialized Countries, the long wave of boomers is representing a cohort that has economic means, a rich social life, engages in physical and cultural activities and plenty of time to explore the world.

Just behind Japan, Italy is at the forefront of this societal change and we've asked ourselves if and how our Country and our common house, Europe, are preparing themselves to leverage the treasury of knowledge that Seniors represent.

This report investigates the current and future needs of such mature population, adopting a technology driven analysis approach.

Enjoy the read.

Intesa Sanpaolo Innovation Center

01 /

Sociodemographic aspects of the Silver Economy

According to the United Nations, the ageing of the population will prove to be one of the most significant societal transformations of the century, with profound implications for both the economy and the welfare state, as well as having a major impact on family structures and intergenerational ties.

The term **Silver Economy** refers to the set of economic activities linked to the production, consumption and trade of public and private goods and services dedicated to satisfying the needs of individuals belonging to the more mature (so-called '**Silver**') age groups of the population, which the European Commission identifies as **people over 50 years** of age.

The reasons for such a wide and heterogeneous economic boundary can be seen in the greater sensitivity of such individuals towards caring for their own health and planning their choices based on the future needs characteristic of a more mature age. This report investigates the solutions offered by technology to meet the current and future needs of such adults by adopting an analysis approach that considers age groups and user characteristics.

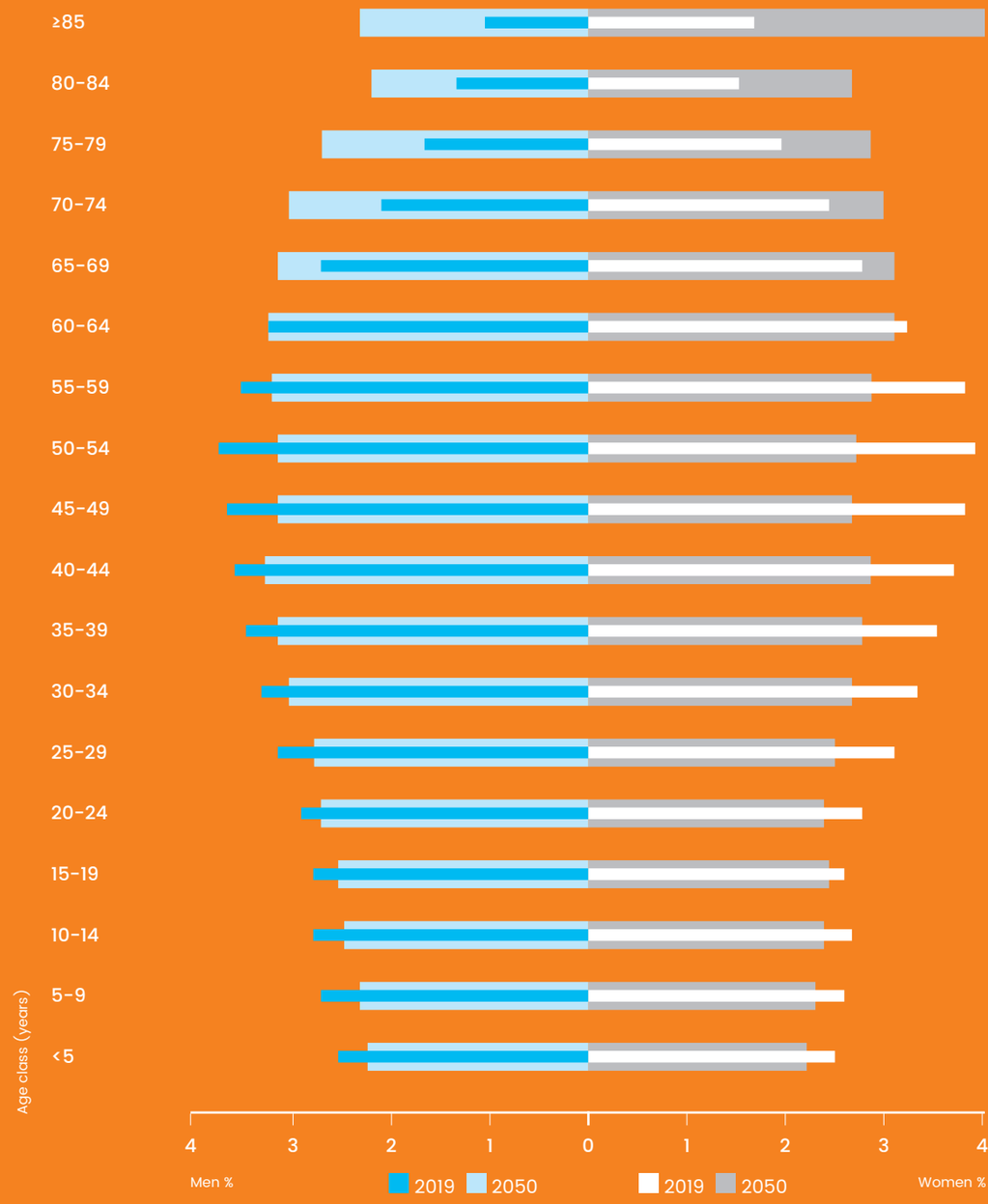
From a demographic point of view, at a global level long-term projections indicate that the population will become progressively older. Worldwide, the number of people aged 65 and over is growing faster than all other age groups. According to UN figures, by 2050 16% of the global population will be over 65 years old (compared to 9% in 2019), while for Europe and North America this ratio will rise to 25%. More developed regions experience this phenomenon most acutely.

United Nations, Global Issues – Ageing

In addition, over the next 30 to 50 years the population in European Union countries is expected to shrink at the same time. This trend will lead to a **radical change in the structure of the population pyramid**. While in 2022 one out of every five citizens was over 60 years old, in the Europe of 2060 this population will represent more than one third of the total.

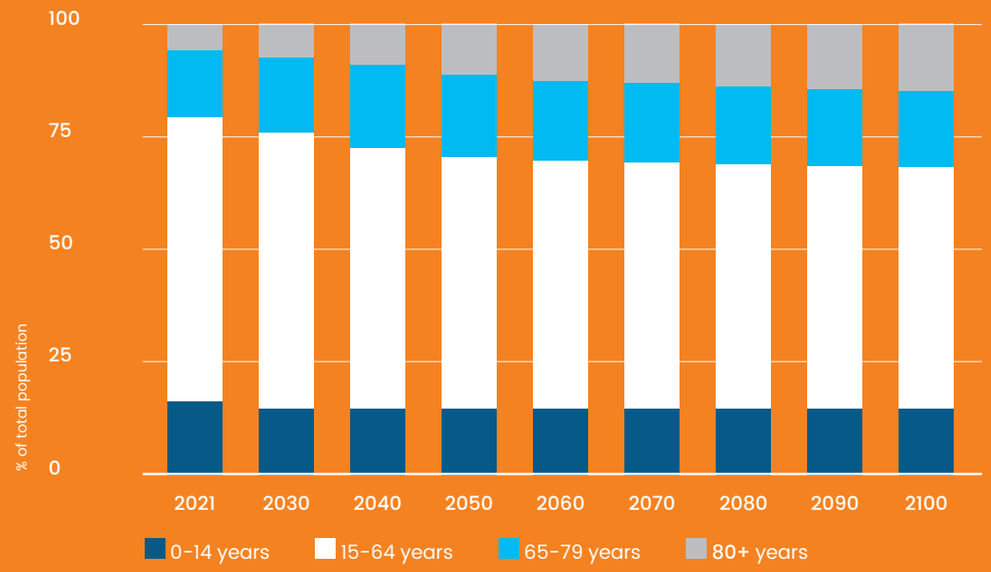
Population pyramid, EU-27, 2019 and 2050 (% share of total population)

Source: Eurostat

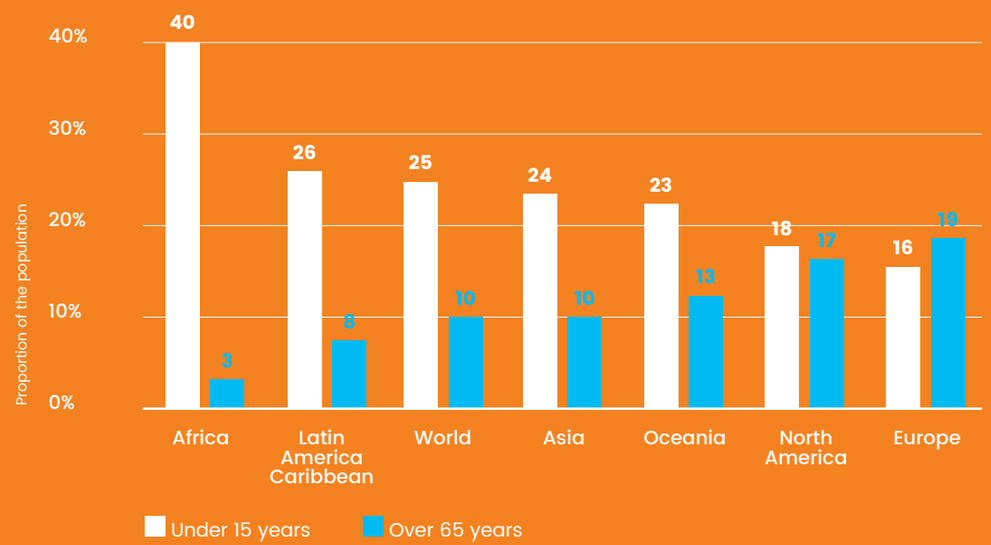


All data as of 1 January. 2019: estimates and provisional. 2050: population according to the 2019 projections, baseline variant (EUROPOP2019)

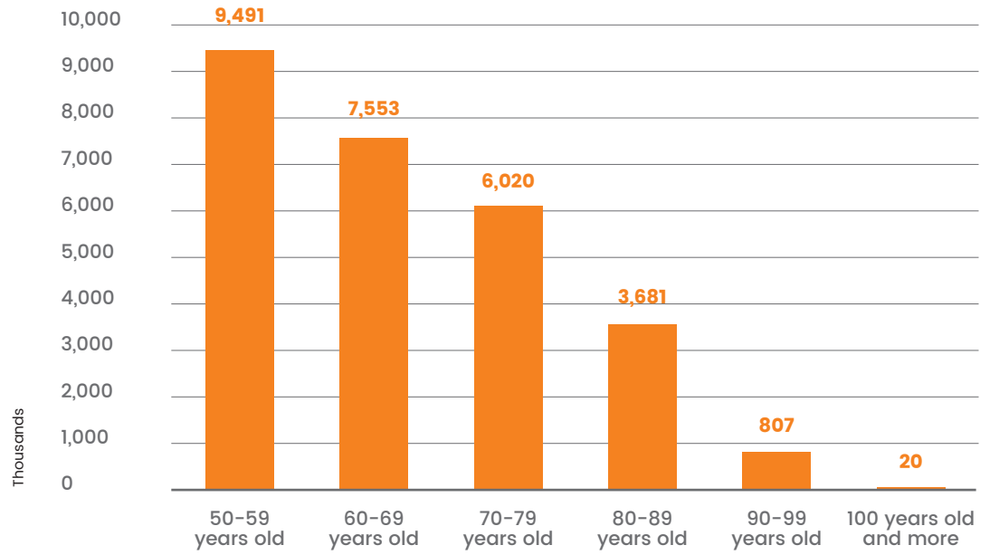
Population structure by major age groups, EU, 2021-2100
Source: Eurostat



Population of selected age groups of world population and in regions in 2022
Source: Statista



Italian population over 50, 2022, ISTAT
Source: Calculations by LINKS Foundation using ISTAT data

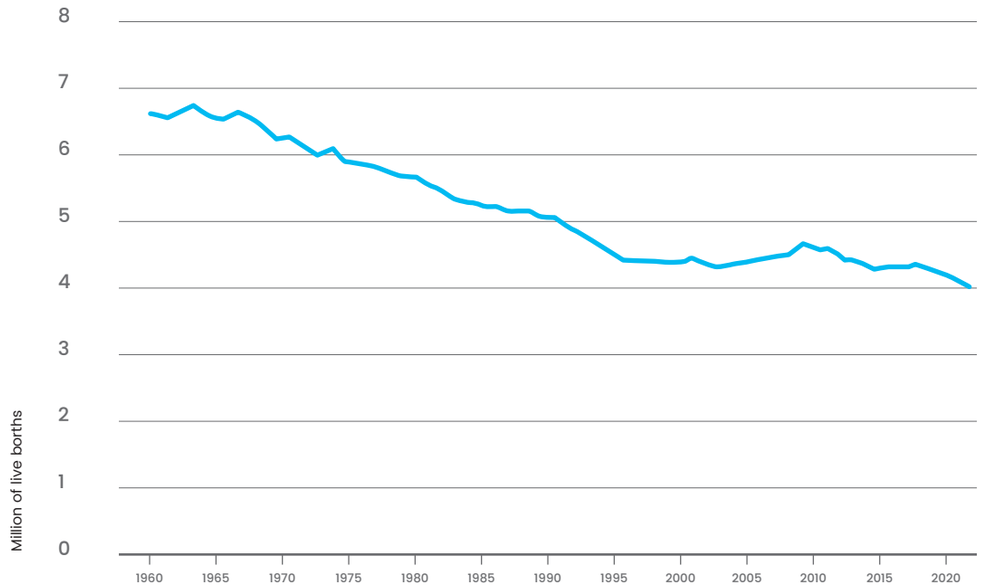


Although population ageing is a widespread trend in all developed regions of the world, the process is more pronounced in Europe. At 19%, Europe was the continent with the highest proportion of over-65s in relation to the population in 2022, higher than North America's 17% and Oceania's 13%. In addition to the direct comparison with other macro-regions, it is also interesting to draw a comparison to the global average value of 10%: **Europe has almost twice as many over-65s as the global average**.

A deeper analysis of the continent shows how the European average value represents a synthesis of **extremely different situations at the level of individual nations**. While Ireland, Luxembourg and Cyprus recorded a percentage of over-65s in the total population of around 15% in 2022, Italy and Greece recorded the highest values in Europe, at 24% and 23%, respectively. In particular, this percentage puts Italy in third place in the world in 2022 among the countries with the highest number of over-65s, preceded only by the Principality of Monaco and Japan. These percentages are expected to grow in the years to come: according to projections by ISTAT (the Italian National Institute of Statistics), by 2050 the share of over-65s in the total Italian population will be between 32 and 37%.
According to ISTAT data collected on 1 January 2022, out of an **Italian population of 58.9 million, as many as 27.6 million (or 46.8%) are people over 50 years of age**.

Number of live births, EU, 1961-2020

Source: Eurostat



Excluding French overseas departments before 1998. Including Mayotte from 2014

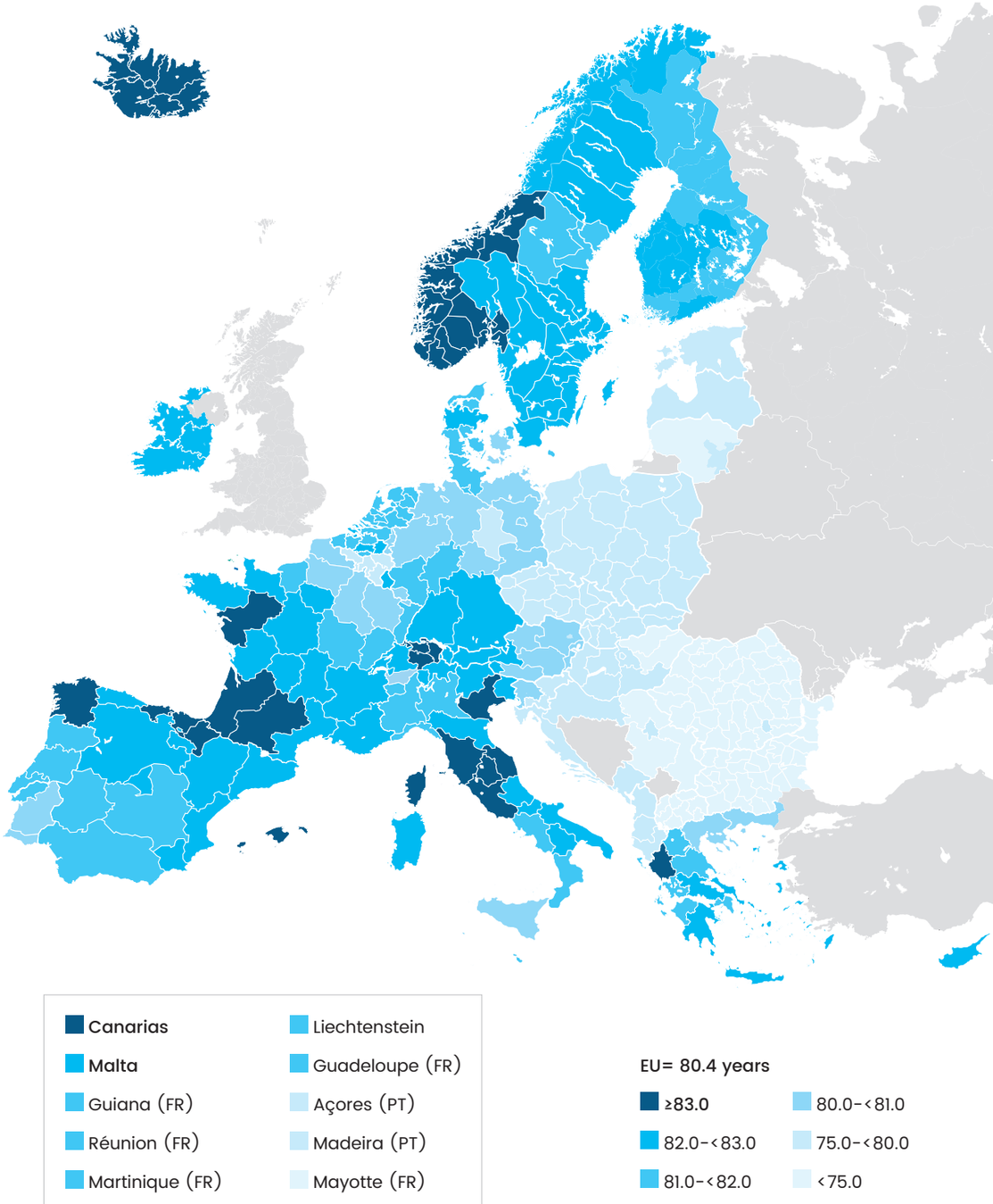
The global phenomenon of an ageing population is driven by several factors, including in particular: ageing baby boomers, reduced fertility and increased life expectancy.

The term 'Baby Boomer' refers globally to people born between 1946 and 1964. The meaning of the term refers to the spike in population growth that accompanied the economic growth following the end of World War II. In Italy, the phenomenon was particularly relevant, as the 1950s and 1960s saw Italy experience miraculous economic recovery marked by strong growth and technological development following the initial post-war reconstruction phase. These socioeconomic circumstances created the ideal conditions for demographic growth: for four years (1946, 1947, 1948 and 1964), there were births in excess of one million units, almost double the approximately 550,000 in the 1980s and 1990s and more than double the 399,400 births in 2021. With the ageing of such a representative part of the population and the lack of a new demographic push, it is natural to see an average ageing of the population as an effect.

Although on a continental level there has been a general steady decline in the birth rate over the last 60 years, even with regard to the fertility rate calculated as the average number of children per woman, large differences can be seen between European states. **While the European average value in 2020 is 1.5 children per woman, France's value of 1.83 represents the highest fertility rate recorded on the continent, while**

Life expectancy at birth, 2020 (years, by NUTS 2 regions)

Source: Eurostat



Italy, with a value of 1.24, ranks third to last, ahead only of Spain and Malta. Even when looking at the average age at which women give birth to their first child, Italy lags behind: while in Europe the average value is 30.9 years, in Italy the value is 32.1, surpassed only by Ireland (32.4), Spain (32.3) and Luxembourg (32.3).

Regarding life expectancy at birth, **the European population is living longer and longer: over the past 50 years**, **life expectancy has increased by about a decade**. Since the last century, a number of factors have contributed to this, such as rising living standards, increased food availability, healthier lifestyles, as well as considerable advances in healthcare and medicine. According to Eurostat, life expectancy at birth in the European Union rose from 77.6 years in 2002 to 81.3 years in 2019, an increase of 3.7 years over this period.

Eurostat - Life expectancy across EU regions in 2020

The general increase in the age of the population has led to a debate on the definition of elderly. **While the United Nations places 60 as the threshold age for the transition to 'elderly' status, considering geographic areas with low life expectancy, the World Health Organisation states 65 instead.** The age of 60 is no longer an exceptional age: whereas in the past (150 years ago) this threshold was reached by only 25% of the population of Western Europe, in 2018 it was reached by 93% of the population.
These considerations allow us to understand the greater breadth of the concept of old age than in the past, which has led sociologists and demographers to divide the phenomenon into segments: 'elderly' becomes a broad term that encompasses age subgroups such as the young elderly (64-74 years), the elderly (75-84 years), the very old (85-99 years) and centenarians (over 99 years).
This report refers to Silver individuals in line with the European Commission's definition, i.e., individuals over 50 years of age.

Beyond the quantitative aspect, the increase in life expectancy brings the issue of these individuals' quality of life to the forefront. Great sensitivity to the issue has been shown by the most authoritative national and supranational institutions by introducing the concept of **'active ageing', defined as the process of optimising the opportunities inherent in the health, participation and security of seniors in order to improve their quality of life**. Indeed, the direct link between an active life and greater physical and mental health, as well as the perception of living a more satisfying life, has been scientifically proven. Both the World Health Organisation and the European Commission promote the dissemination of policies to foster active ageing in order to create an inclusive society for all ages and the sociocultural and economic development of the more mature segments of the population.
There is thus a substantial difference between active and healthy ageing, considering the former as instrumental in aspiring to the latter, which is its goal.

Governo Italiano - Invecchiamento Attivo

OVERALL INDEX

ACTIVE AGEING INDEX

The Active Ageing Index (AAI) is a tool to measure the untapped potential of older people for active and healthy ageing across countries. It measures the level to wich older people live independent lives, participate in paid employment and social activities as well as their capacity for active ageing.

Source: UNECE

DOMAINS	Employment	Participation in society	Independent, healthy and secure living	Capacity and enabling environment for active ageing
INDICATORS	Employment rate 55-59 Employment rate 60-64 Employment rate 65-69 Employment rate 70-74	Voluntary activities Care to children and grandchildren Care to infirm and disabled Political participation	Physical exercise Access to health services Independent living Financial security (three indicators) Physical safety Lifelong learning	Remaining life expectancy at age 55 Share of healthy life expectancy at age 55 Mental well-being Use of ICT Social connectedness Educational attainment
	ACTUAL EXPERIENCES OF ACTIVE AGEING			CAPACITY TO ACTIVELY AGE

In 2012, the European Commission and UNECE (United Nations Economic Commission for Europe) created the Active Ageing Index (AAI) to provide a quantitative measurement of the phenomenon.
The index is based on 22 indicators, which are in turn grouped into 4 major areas:

- employment
- participation in society
- independent, healthy and secure living
- capacity and enabling environment for active ageing.

Active Ageing Index project

It can thus be seen how the increase in life expectancy and the average age of the population lead to the quality of health accompanying ageing as a central element of the Silver Economy: living as long as possible while maintaining a good state of (physical and mental) health involves overcoming economic, social and technological challenges.

Eurostat data show that, for European citizens, an increasing number of years are lived in a state of satisfactory physical health

The number of life years spent in good health varies by gender and country, but on average for the EU it stood at 64.5 years for women and 63.5 years for men in 2020. Over the age of 65, about half of all people acquire a disability, a figure that increases as people enter the older age groups: according to ISTAT data for 2021 in Italy, the percentage of people in good health decreases from 59.6% of those aged between 60 and 64 to 47.3% of those aged between 65 and 74.

Furthermore, again for 2021, ISTAT reveals that the incidence of chronic diseases in the population is over 51% for the 55-59 age group, while it affects about three quarters of the over-65 population. Many of these individuals face the challenges of reduced mobility and their quality of life depends on how inclusive and accessible society and the environment are, considering also that one third of over-75s have a severe limitation of autonomy.

From these analyses contextualised within this demographic trend, it can be deduced that **fostering the autonomy of seniors, in addition to improving their quality of life, will be essential to ensure the sustainability of the national welfare system and at the same time represent an enormous labour and business opportunity**. The *Ragioneria Generale dello Stato* (State General Accounting Department) has estimated the number of non-self-sufficient persons over 65 in Italy at 2.5 million, 312,000 of whom are housed in nursing homes. In general, in 2021, the Italian state incurred an expenditure of approximately 31 billion euro, which represents 1.9% of the national gross domestic product in 2020 (of which approximately 75% for persons over 65 years of age). In the long term, this percentage is projected to grow significantly, reaching 2% as early as 2040 and reaching 2.4% of GDP between 2050 and 2055.

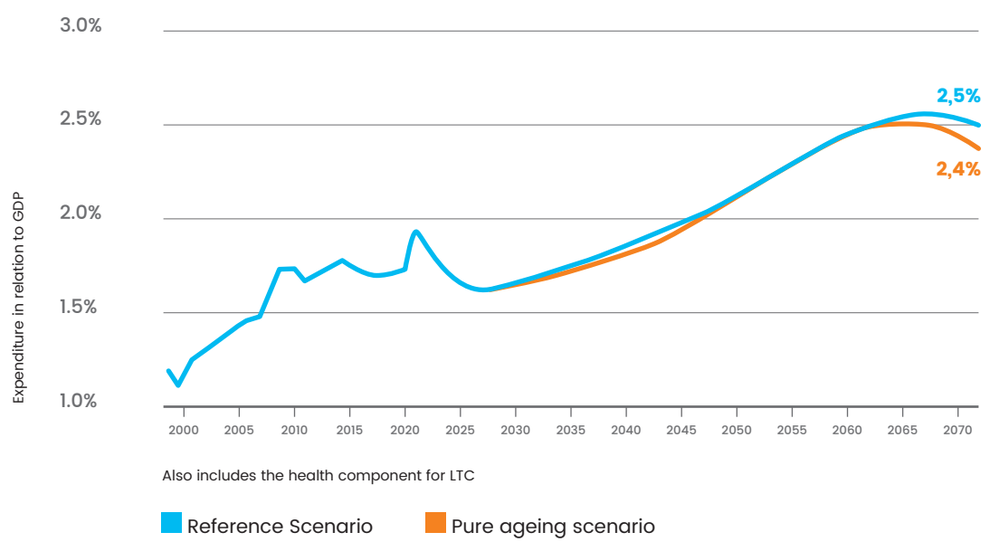
In Italy, the larger number of people dependent on the welfare system is supported by a decreasing number of adults of working age.
Based on INPS (National Institute for Social Security) and ISTAT data, there are about 16 million pensioners in Italy; in the same year, there were more than 22.5 million workers, resulting in a ratio of pensioners/employed persons of around 1.4, a value close to the 1.5 indicated as the threshold to guarantee the medium to long-term stability of the pension system.

By analysing the composition of spending for seniors, several sources agree that at both the European and Italian levels they pay more attention than other age groups to spending on housing, furniture and home-related services, food and health services.

Over 80% of over-50s own at least one home

Despite their significant property assets, this group's housing does not seem to be adequate to cope with the problems of non-self-sufficiency and disability.
According to a survey presented by Itinerari Previdenziali, out of a sample of 5,000 senior respondents, only 22% of those aged between 50 and 74 stated that they live in a home prepared to support the care of a person with mobility difficulties or disabilities, a percentage that rises to 28.2% for over-75s. It can therefore be seen that housing in terms of a Silver Economy perspective represents a great market opportunity for **home automation technologies**,

Public expenditure on Long Term Care - National base scenario
Source: State General Accounting Department



the Smart Home on the one hand, and for **telemedicine** and the use of **household robots** on the other.
Seniors' ability to be mobile and to move around, especially within cities, is also an essential aspect of ensuring their autonomy and social inclusion. The 2019 European Health Interview Survey (EHIS) found the presence of mobility problems for Italy, particularly related to difficulties in leaving the house, accessing buildings or using private or public transport.
ISTAT reports that more than 4 million of over-65s (31.5%) have mobility issues due to health reasons or functional limitations.
In relation to this context, especially in urban areas, a number of trials are underway concerning urban regeneration policies that aim to foster inclusion, socialising and active ageing. Innovation through technological solutions will offer tools to improve the accessibility of cities and the use of means of transportation for seniors through adaptive interfaces for the use of content and information, proximity services and autonomous mobility services.

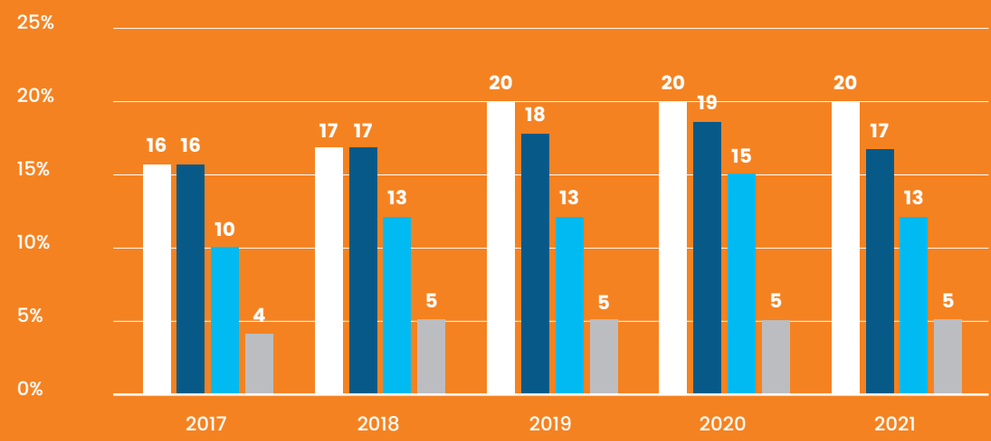
Diving into further detail on the Italian context, Confindustria studies on national household consumption confirm how seniors focus their spending on those goods and services useful for preserving their physical and mental health, avoiding alcohol and tobacco, for example, and favouring food spending (which also indicates greater attention to quality) and health.

Centro Studi Confindustria - L'economia della terza età: consumi, ricchezza e nuove opportunità per le imprese

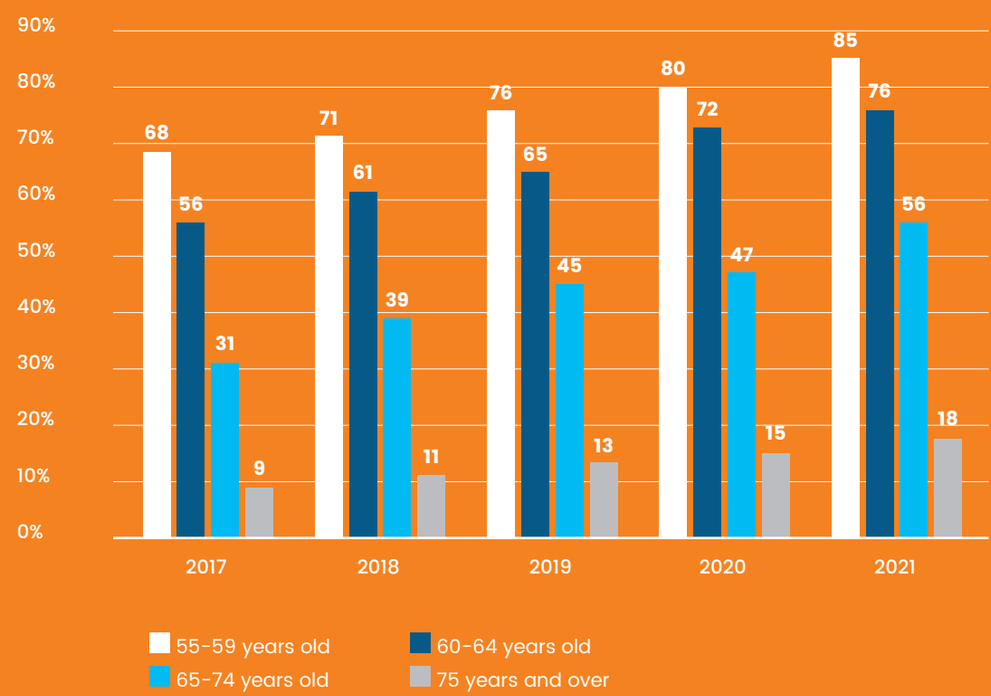
Compared to a decade ago, seniors spend more on cultural activities (theatre, cinema and museums) and exercise.
Consumption is also driven by behaviour: for example, it can be seen that, for all senior age groups, the number of people engaging in physical activity continuously has increased over the last five years (also considering the period impacted by Covid-19).
In this regard, the health and wellness innovations explored in Chapter 5 address both the issue of monitoring biological parameters (including during exercise) with devices and wearables for mobile health, and mental health using immersive technologies that enable continuous care.

In line with a much more active lifestyle than in the past, seniors' needs and requirements are evolving: ISTAT data confirm the trend towards greater participation of seniors in some kind of activity or employment, such as new hobbies, volunteering, travel, or perhaps maintaining a part-time job.

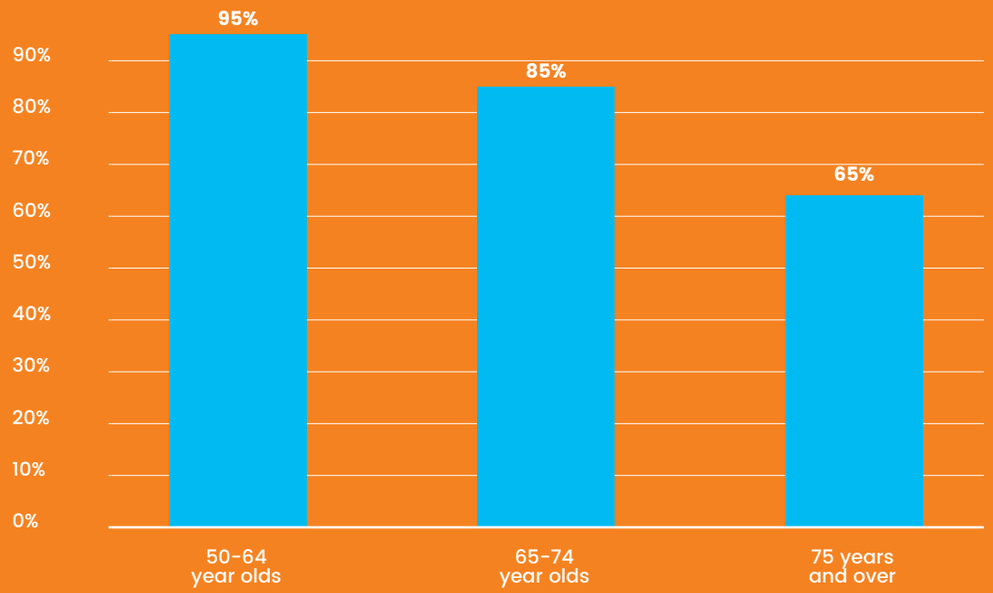
People over 55 who are continuously physically active 2017-2021
Source: Calculations by LINKS Foundation using ISTAT data



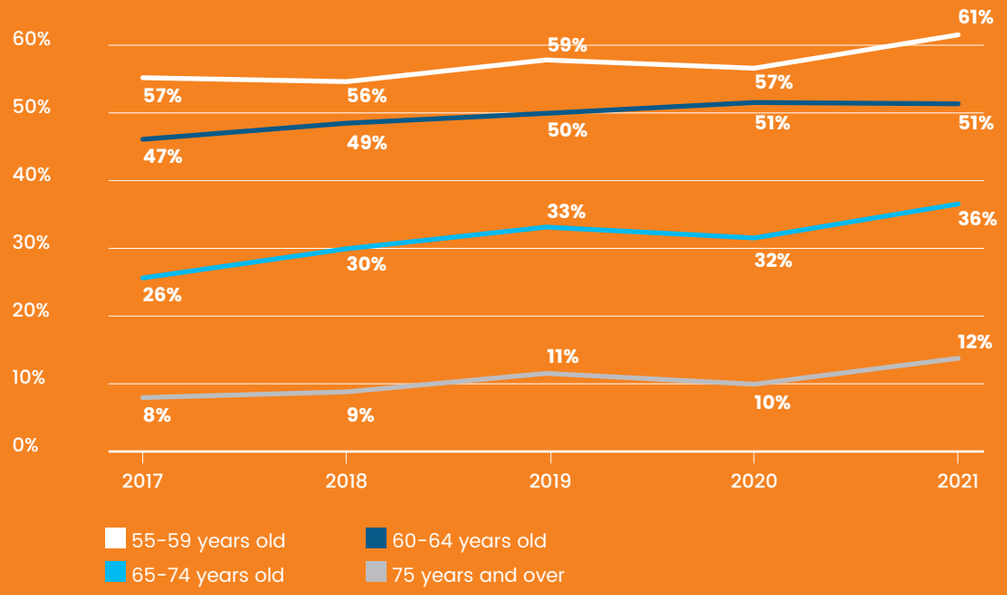
People over 55 who use the Internet in Italy, 2017-2021
Source: Calculations by LINKS Foundation using ISTAT data



People over 50 who use smartphones in Italy, 2022
Source: Itinerari Previdenziali



People over 55 who use personal computers in Italy, 2017-2021
Source: Calculations by LINKS Foundation using ISTAT data



The Italian senior is a person who lives in his own home, has the economic means and time available to help family members, has a rich social life, engages in physical activity, goes on holiday and is increasingly involved in cultural activities

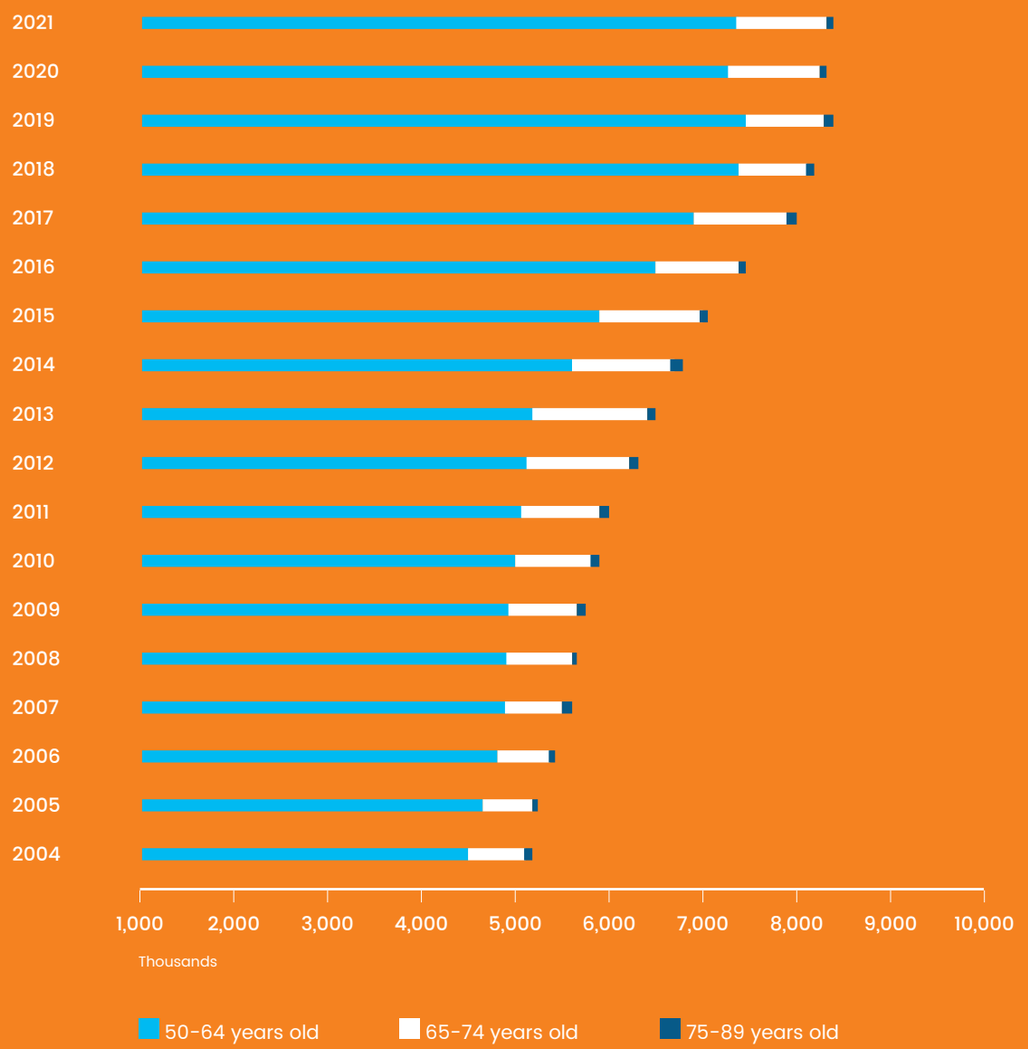
This generates a diverse and growing demand for goods and services, which is beginning to differ significantly from what the statistics captured only a decade ago.

Indeed, the profile of a senior appears to be increasingly closer to the digital economy: although data confirmed the trend also in the past, the recent Covid-19 pandemic proved to be a further push towards Internet.

This evidence was confirmed and further investigated by the Itinerari Previdenziali survey, according to which 26.6% of over-50s interviewed declared an increased use of computer technology, while 30.1% admit a propensity to make online purchases. The same survey points out that 85% of Italian seniors say they use a smartphone, a percentage that reasonably sees the more mature age groups less inclined to use devices. ISTAT data on personal computer use also confirm that seniors are increasingly digitalised: for the over-55 age group, the percentage of individuals not using them dropped by about 10 percentage points between 2014 and 2021.

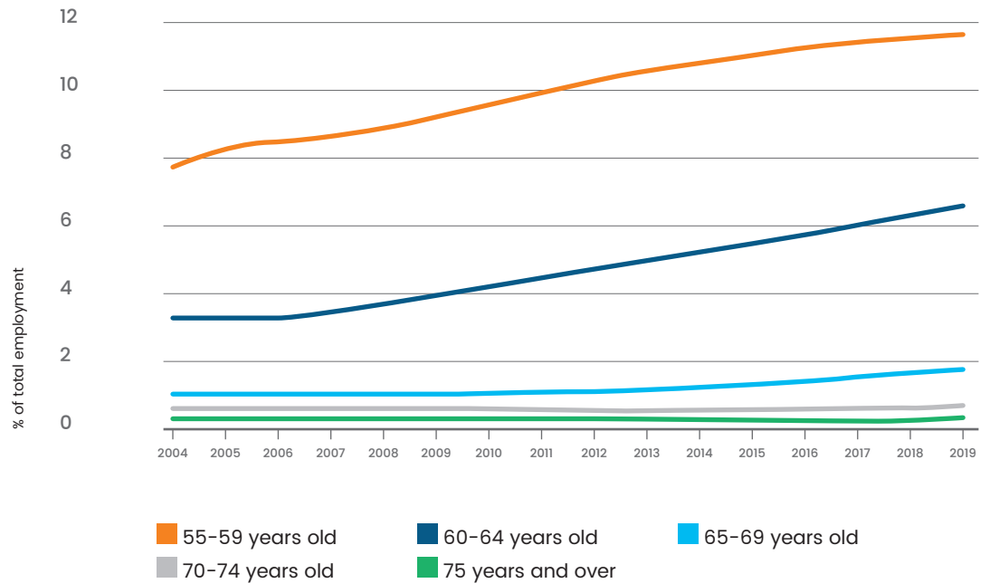
Based on this analysis, it can be seen that the evolution of seniors' demand for goods and services will also see a considerable change in the way it is met, as over-50s become **progressively more digitally savvy**.
It is therefore strategic to reflect on the **relationship that seniors have – and will have in the next 5–10 years – with technology,** which in the past has been only partially effective in satisfying this segment, but which will be decisive for the future development of the Silver Economy.
It is possible, in fact, to detect two very different situations in this broad segment of the population: on the one hand, 'analogue' seniors who require highly customisable technologies and interfaces to adapt to the needs and in some cases the weaknesses of an inexperienced user with usability limitations; on the other hand, 'digital' seniors who enthusiastically adopt technology, use it extensively in their daily lives and are in all respects comparable to younger generations as a target audience.
This digital literacy also facilitates the trend whereby seniors are more able to continue to generate income than in the past, keeping active in employment.

Change in the number of employed persons over 50 in Italy, 2004-2021
Source: Calculations by LINKS Foundation using ISTAT data



The share of employed persons aged 55 and over in the total number of employed persons in the EU-27 increased from 12% to 20% between 2004 and 2019

Older persons in employment, by age class, EU-27, 2004-2019
Source: Eurostat



A similar dynamic can be observed for Italy, whereby between 2004 and 2021 the employment rate as a percentage for people in the 50-74 age group rose from 28.9% to 42.7%.

While in 2004 there were 4.85 million employed people over 50, ten years later, also due to changes in the social security system, this figure was closer to 7 million, an increase of 43%. By 2021, there were 8.7 million people over the age of 50 who were employed, representing 38.6% of the total number of workers.

Whether one is active or inactive in terms of employment is an important watershed, differentiating seniors' characteristics, needs and requirements.

There is a difference between the 50-64 age group (in which the employed make up 60 per cent), for which the importance of the working sphere is more relevant, and the over-65s (in which the employment rate falls to 5%), the age threshold that generally determines the transition from a professionally active life to retirement.
Innovation in the field of '**ageing@work**', as we will see in chapter 2, includes solutions to support the productivity of senior workers by favouring their digital inclusion, offering new tools for the mental and physical wellbeing of the worker, and facilitating lifelong learning even after the age of 50.

Appendix
Digital Ageism

The term Ageism refers to all stereotypes, prejudices and discrimination based on age

When this phenomenon is encountered in software design, it is called **Digital Ageism**.
The increasing digitalisation of everyday life creates a central role for IT applications, whether they are directly used by end-users or operating autonomously to manage a complex system, analyse events and phenomena, send reports and make decisions.
Software has a key role in the current historical and economic context, where **every decision is increasingly data-driven** and based on information derived from collected and processed data. Data collection enables new forms of in-depth knowledge of a phenomenon and increases the efficiency or effectiveness of a given process.
How these decisions are made and how the information is processed is not neutral.
Algorithms may contain biases that result from the way they were written: software may reflect the biases of the society, economies, and people who wrote them and selected the data that those algorithms use to learn. In other words, programs can give more weight to some variables and less to others, contributing to the inequality of the so-called **algorithmic bias**.

As far back as 1996, one of the first computer definitions of bias stated that *"... we use the term "bias" to refer to computer systems that systematically and unfairly discriminate against certain individuals or groups of individuals in favour of others. A system discriminates unfairly if it denies an opportunity or a good or assigns an undesirable outcome to an individual or group of individuals on grounds that are unreasonable or inappropriate."* (Friedman, B., & Nissenbaum, H. (1996). Bias in computer systems. ACM Transactions on Information Systems, 14 (3), 330-347).
In the field of Artificial Intelligence, biases can often arise from the data and statistics that are used to train it. AI *learns* to analyse and make decisions precisely because of the data it is fed in the training phase, data that may contain biases as they result from actions carried out by humans. The use of these sources of information contributes to the indirect propagation of bias also in AI.
Biases can be very diverse, depending on the contexts considered. Among the most common are those related to **gender**, **race** and **age**. There have been numerous cases of AI facial recognition software applying bias and making glaring errors.

Racial Discrimination in Face Recognition Technology

Unlike with people's age, discrimination related to race or gender begins to be consciously perceived and addressed, even with tools designed to evaluate how much an AI-based solution contains such biases. The **StableBias** project, developed by the US startup Hugging Face together with Leipzig University, has led to the release of interactive tools that allow anyone to assess how much a certain bias, whether ethnicity- or gender-related, is present in three popular Text-to-Image generative AI models.

Stable Bias: Analyzing Societal Representations in Diffusion Models

Taking it one step further, biases can also be countered by developing solutions that, intentionally and provocatively, implement a diametrically opposite one.

The **MissJourney** platform does exactly that: it is a generative AI that, contrary to the best-known Text-to-Image environments, generates images of female-only professionals, whatever profession is required, whether drivers, engineers, police officers or accountants, mechanics, CEOs, and so on.

MissJourney

The relationship between older people and technology is inherently more difficult than with younger generations, both because of a lower usage habit and because interfaces do not normally take into account the physical limitations of older people.
The consequent reduction in the use of technology means not only that the opportunities offered by innovation are underutilised, but also that the development of innovation is further removed from the needs of seniors. In the case of AI-based applications, this distance is also due to the way they are trained: AIs learn through datasets that contain on average little information from older users compared to the total data, precisely as a result of the limited use that they make of the technology.

A vicious cycle is created whereby applications continue to be modelled on the needs of the most frequent users, i.e., young people, while keeping the barrier of use high for older users, who will therefore always provide little information about themselves.
The reduced representation of the needs and unique aspects of seniors in the creation and learning phases of Artificial Intelligence, statistical models and machine learning applications can lead to **digital ageism**, i.e. discrimination that leads to the creation of *digital* services and applications that do not take into account the real needs of the senior population. The very concrete result of digital ageism is that older people will perceive these applications as very difficult to use, contributing to the expansion of **technophobia**.

One of the most tangible outcomes of digital ageism in the online platform and app market is the polarisation of offerings for seniors, which essentially covers everything related to health and almost does not consider very interesting sectors such as leisure and entertainment. This approach effectively solidifies and continues the "cycles of injustice" that exclude seniors, as this section of the population will tend to use fewer apps and portals that are *not* designed according to their needs and consequently will produce less data for future versions of digital services.
Digital ageism is particularly relevant in the area of **user interfaces** of digital applications and services, such as online platforms. The interfaces and AI systems that increasingly manage them are programmed by mainly young technicians and UX designers who, unless carrying out specific interviews, do not take into account the needs of seniors, also because of a real lack of awareness about what the differences between them and older users are. This approach tends to implicitly reinforce the stereotypical perception that seniors cannot proactively and effectively use new digital services, and therefore require the help of family members and caregivers.

A concrete example we can see every day is the **CAPTCHA** (Completely Automated Public Turing test to tell Computers and Humans Apart) system, i.e., the questions and answers that appear on websites and digital services to ascertain that the user is a human and not a computer. In most cases, CAPTCHAs require the user to analyse text and images that are not quite so easy to identify. CAPTCHAs are considered difficult and subject to bias of various kinds, including cultural ones: some images can be easy to identify only for certain cultural groups. CAPTCHAs may discriminate against older users because they do not take into account the increasing visual, auditory and even cultural limitations that arise as people age.
The role of software interfaces is particularly strong in China, where in 2021 the government promoted practical actions to make them more accessible and usable for the country's 85 million disabled individuals and more than 260 million over-60s.

Alibaba Deploys Artificial Intelligence To Help Bridge Digital Divide

Digital ageism can firstly be countered by shining a spotlight on it.
The **awareness** of this socio-technological phenomenon is the first step towards managing it. In many areas, knowledge of these dynamics is still limited today, in 2023, both because of the speed of technological evolution compared to the past and because of the limited ability of legislation to detect these changes as they occur. This awareness concerns all players involved: the senior population, programmers, the companies that develop algorithms and AI, and legislators.
Knowledge of these dynamics can lead to the correction of age bias disruptions through **a better selection of sources used for the training and implementation phase of AIs**.

Another much-debated approach is the possibility of opening up the design phase of digital applications to end users, such as seniors in this specific case, through a shared design process called **co-design**. Users participate in the co-creation of a digital product or service, highlighting their needs and specificities from the early stage of development.
In Europe, the debate on how to manage AI to promote ethical development is being driven forward by public and private bodies. The European Commission has partially addressed this issue by promoting the **Digital Services Act**, which came into force in November 2022 and aims to create a fair and secure digital online environment. The Commission has also set up the **High-level expert group on artificial intelligence** to create guidelines on the creation and operation of AIs.

The Digital Services Act: ensuring a safe and accountable online environment

High-level expert group on artificial intelligence

AlgorithmWatch, a German non-profit company, is developing *the AI Ethics Guidelines Global Inventory*, a database of good AI programming and conscious management practices. Particular attention is paid to the issue of **automated decision-making (ADM),** which encompasses all those actions that an AI can take independently and that can create distortion or inequities in case of AI bias.

AlgorithmWatch

Chapter 2 introduces the **theme of how AI can convey a negative bias related to the age of people in the workplace**, both in the human resources management phase and in the recruitment phases.
Many applications used by HR personnel are AI-based and potentially include bias, such as those listed above.
The issue has been raised publicly in many areas, not only for age discrimination, since the issue of discrimination is universal and almost always relates to the way in which an AI is trained. A 2020 study by the University of Melbourne showed that an experimental algorithm for personnel search activities even exacerbated gender differences in favour of men in the selection of certain profiles, such as data analyst: Algorithms tended to prefer male candidates because the majority of data analysts in the statistics were male and therefore being of that gender seemed a statistically desirable quality.

A similar bias may also exist from an age perspective (studies investigating age-related algorithmic bias in the workplace are currently limited). In the tech sector, this trend tends to increase due to the speed of evolution of digital technologies. In some areas of technology, even an over-45 can be considered as "old".
In the HR sector, bias mitigation, for example in the case of age-related bias, is possible through AI-proposed outcome **ranking systems.** They can be structured so as to be inclusive and to take into account all variables useful to define a worker's characteristics. In addition, AI itself can be used to detect bias and other potentially harmful behaviours implemented by other AIs, automating the bias removal process.

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