Next Age

AC75
STARTUP
ACCELERATOR

Silver Economy meets Innovation

Ageing better, together.
Strategies and startups to tackle loneliness

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AC75 STARTUP ACCELERATOR

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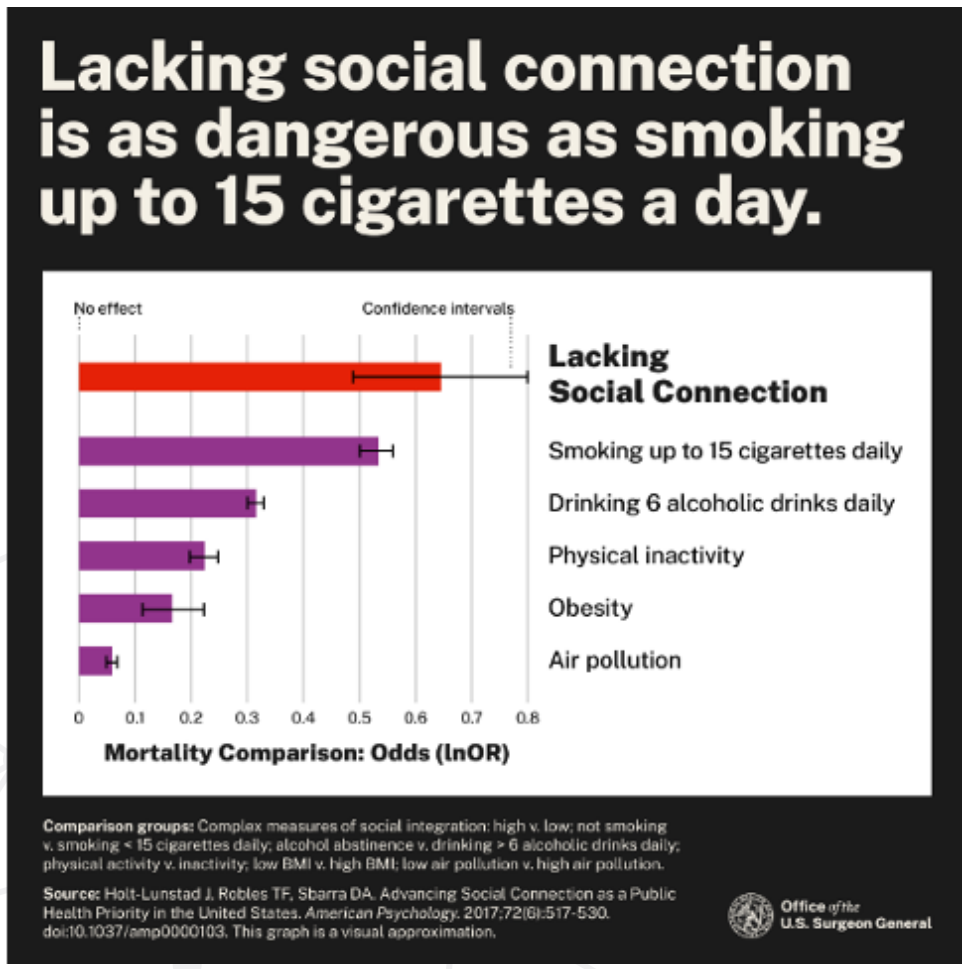
Acknowledgments

AC75 Startup Accelerator's effort has been made possible by the fundamental collaboration with its partners, that shared their knowledge and experience and discussed their vision about the potential of innovation in Silver Economy.
AC75 SA therefore acknowledges INRCA (IRCCS, Istituto Nazionale di Ricovero e Cura per Anziani), UnivPM (Università Politecnica delle Marche), the UK NICA (National Innovation Center for Ageing), Intesa Sanpaolo Innovation Center, Amplifon and the Silver Economy Network.

Introduction

Mario Pesaresi, AC75 Startup Accelerator

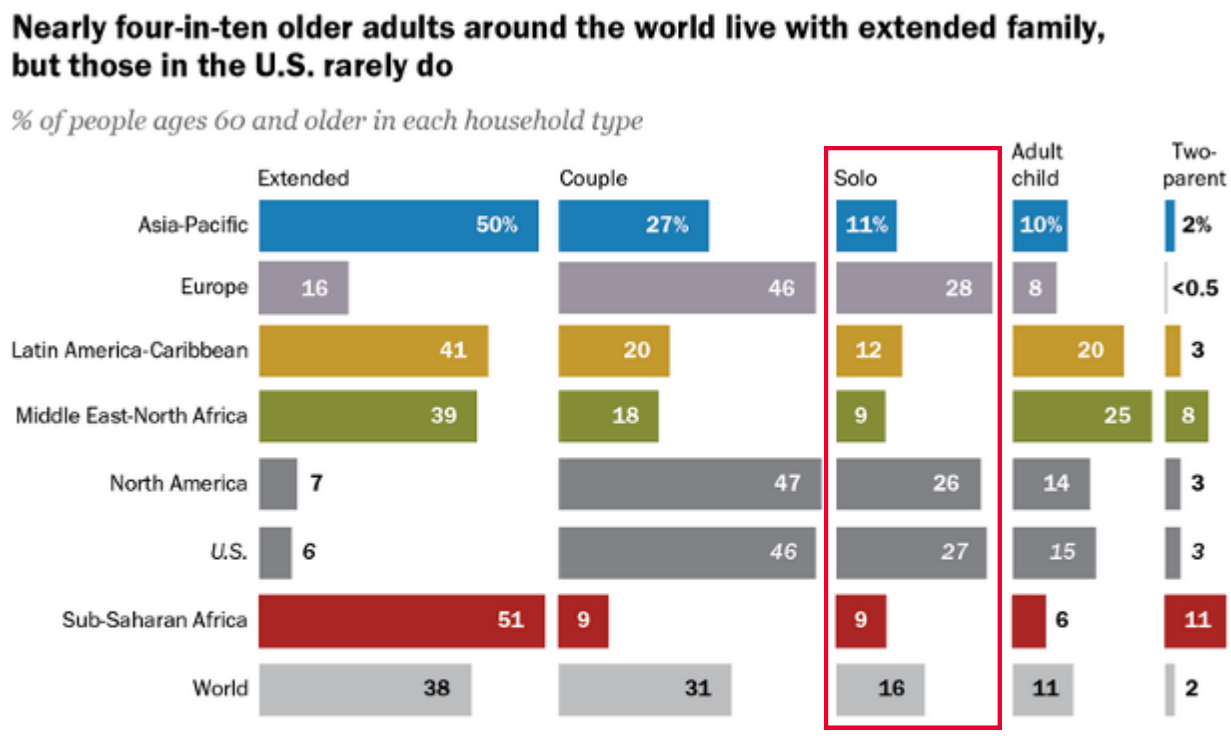
Loneliness and social isolation are significant issues that affect the welfare and health of older adults. According to the World Health Organization,[1] social isolation and loneliness are important, yet neglected, social determinants of the health of older people. This is a challenge for public health and policies for all the western countries as well as for Japan and China. Research shows that social isolation and loneliness have a serious impact on older people's physical and mental health, quality of life, and their longevity. In fact, the effect of social isolation and loneliness on mortality is comparable to that of other well-established risk factors such as smoking, obesity and physical inactivity as also stated in an insightful report from the Office of the U.S. Surgeon General.[2]



Some figures about the phenomenon of social isolation and loneliness allow to comprehend the relevance of the topic, its potential impacts and the need of interventions.

According to the PEW Research Center[3] Europe and the U.S. have a large portion of the over 60 population living alone. When considering Italy, the figure reported from ISTAT tells us that in 20 years (2021-2041) people expected to live alone will pass from 8.5 million to 10.2 million -nearly one person out of 5 in the general population- that means that 4.2 million people over 65 living alone in 2021 will become 6.1 million in 2041.

[1] "Social isolation and loneliness among older people: advocacy brief", WHO 2021
[2] "Our Epidemic of Loneliness and Isolation: The U.S. Surgeon General's Advisory on the Healing Effects of Social Connection and Community", Office of the U.S. Surgeon General 2023
[3] https://www.pewresearch.org/short-reads/2020/03/10/older-people-are-more-likely-to-live-alone-in-the-u-s-than-elsewhere-in-the-world/



However, social isolation and loneliness also present an opportunity for innovation at different levels: technological, social and organizational. Creating more age-friendly communities, by improving access to transportation, information and communication technologies, and the built environment, can help reduce social isolation and loneliness. A wide variety of face-to-face or digital interventions have been developed to reduce social isolation and loneliness among older people. Laws and policies that address marginalization and discrimination can also foster greater social connection.

In this context, cities, companies, organizations and institutions, as well as the population itself, can play a particularly significant role as a platform for experimenting solutions.

This report, according to AC75 Startup Accelerator's objectives, is willing to contribute to people, researchers, organizations, companies and investor awareness concerning the scenario to move forward to a more equal, fair and healthy society.

The report is composed of six chapter authored by AC75 Startup Accelerator's Partners in the Next Age Acceleration Program and it is structured as follows.

In the first chapter, “Social isolation and loneliness among older people: the strategic value of technological and social innovation” produced as a joint effort by the research teams from INRCA and UnivPM, there is an introductory perspective about social isolation and loneliness in older age and about the strategic value of technological and social innovation in this field. First, social isolation and loneliness are introduced from a conceptual and empirical perspective. Then, a discussion is presented about how social and technological innovation may represent strategic levers to contrast social isolation and loneliness among older people. Finally, there are some concrete examples of interventions by referring to technological and social innovations implemented by UNIVPM and INRCA through specific projects aimed at supporting frail older people living at home and in care facilities against the risks of social isolation and loneliness.

The second chapter is a contribution from the UK National Innovation Center for Ageing: “Innovation against isolation and loneliness and the role of cities”. Il leverages on UK NICA experience embedded in the designed and wordwide promoted “City of Longevity” framework. While old age is often associated with loneliness out of principle or narrative convenience, the relationship between isolation and loneliness is dynamic and interconnected, where one dimension contributes to triggering the other with often devastating consequences. In order to stimulate system innovation, we must ensure that any solution designed to mitigate loneliness and isolation must target the underlying cause which is loss, in one of the six dimensions identified. And like treating similar devastating physical ailments like heart disease and diabetes, the most effective solutions support identification and preventative action. To prevent loss and keep older adults connected and engaged in their communities, we must re-think many aspects of society, from employment to education, transportation, housing and more. In this re-designing activity, the city bears most of the responsibility for the solutions and it is up to central, local, and hyperlocal public administrations to find the investments and provide the tools to implement them, that is not meaning that it is up to local (and hyper-local) governments to deliver the solutions but to build the ecosystem in which they can be born, proliferate and resolve. A function of knowledge, promotion of evidence, prioritization, and coordination in an economic and social context, that is radically different from when many of the policies that are still in place today were designed.

In the third chapter, the Silver Economy Network, presents “Smart Living & Co-housing in Europe: Current scenario and opportunities to address loneliness of an ageing society.” The demographic trend of the ageing population not only underscores the importance of addressing the well-being of the elderly but also highlights the need and opportunity for innovative solutions to foster social inclusion and mitigate health risks of such a growing tranche of the population.

In response to these challenges, cohousing is emerging as a compelling and holistic approach. Cohousing, grounded in principles of communal living and active community participation, offers a promising antidote to the perils of loneliness and social isolation among older adults. Benefits and examples are also illustrated as cohousing represents a transformative paradigm in addressing the complex challenges of loneliness and social isolation among older adults in Europe.

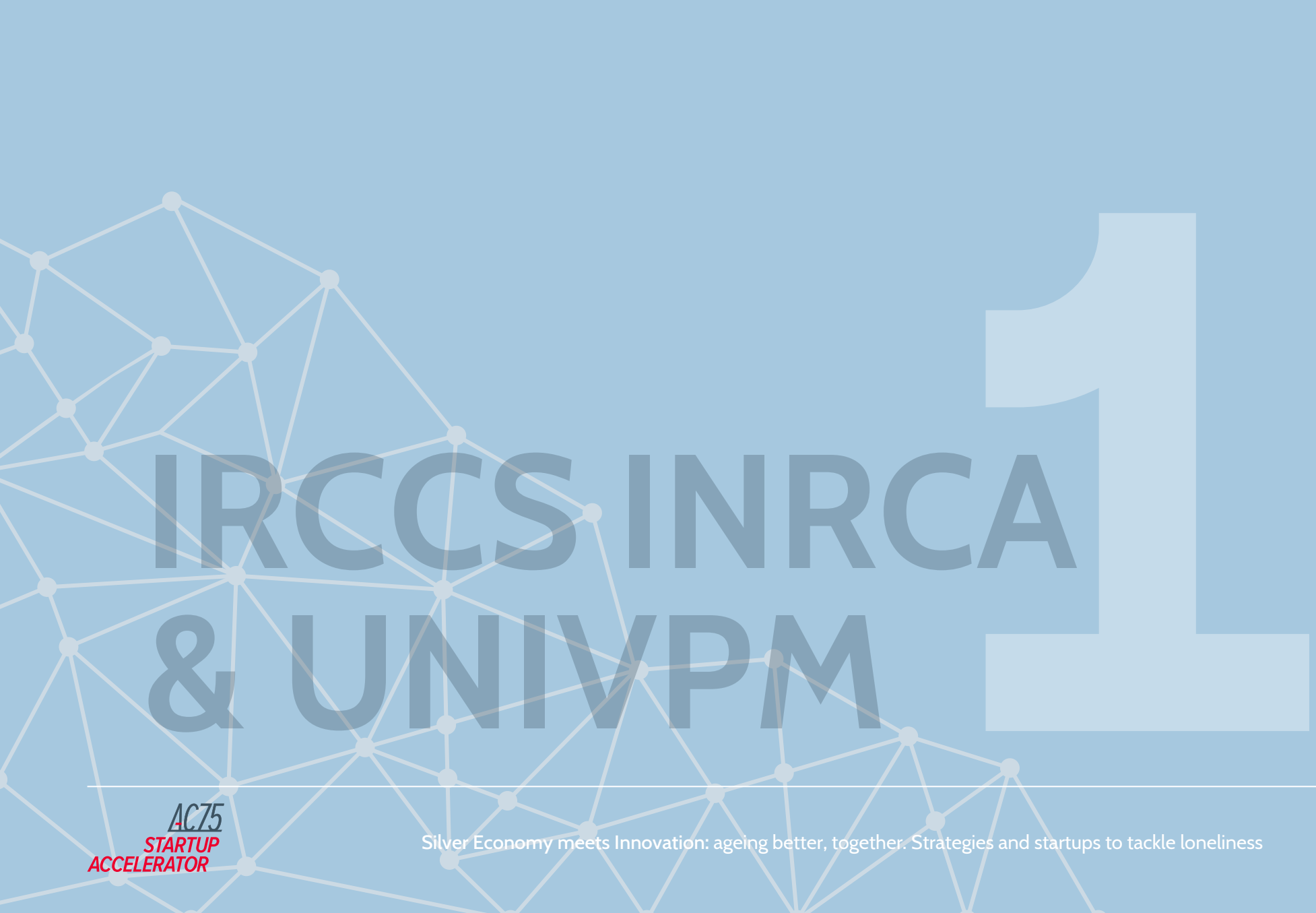
The fourth chapter, “Emerging innovations addressing elderly loneliness”, written by the team at Intesa Sanpaolo Innovation Center, is devoted to depicting a landscape of approaches, mainly based on the use of technology, to tackle loneliness and social isolation. With today's available technologies such as broadband connectivity, the use of voice assistants, wearables, robots and IoT devices, it is possible to provide a sense of protection and a fast and reliable communication method at a distance to enable the necessary effective communication with caregivers to cope with emergencies and to reduce the sense of detachment. Some of these technologies are directly related to the use in healthcare activities, such as virtual rehabilitation that is expected to be used more in many different area (cognitive, vision, audiologic, language). Other technologies like online platforms, virtual reality and artificial intelligence could make it possible to enjoy new experiences, such as virtual visits to museums while remaining at home, thus helping to combat loneliness for the less self-sufficient and to maintain a link with the outside world. Another area of technology to look out for in the future are humanoid robots and pet robots. These innovative devices are emerging as one of the future trends in assisting the elderly and combating loneliness, especially considering the change in family structure and the shortage of care workers. The importance of being able to continue living in one's own home is explained by the concept of “ageing in place”, denoting the ability to live in one's home and surrounding community safely, independently and comfortably, regardless of age, income or level of physical ability. This is where Ambient Assisted Living (AAL) comes in, which aims to make rooms architecturally accessible and equip them with sensors to collect environmental data in real time, making it possible to increase safety and autonomy. Finally, as seen also in other contributions, the growing ageing population in cities is leading to the emergence of “Age-friendly Cities”, which reflect the need to adapt urban environments to support the elderly population.

The fifth chapter, developed by AmplifonX and Publicis Sapient, “Understanding behavioural patterns of the 60+ population towards sensor-based technologies tracking health and wellness”, investigates the behaviour of the 60+ population towards sensor-based devices,

exploring the emerging patterns in tracking health and wellness and how attitudes and behaviours are currently evolving. This is also an attempt to explore patterns for adoption and acceptance of technologies in the elderly population as it could be crucial in many different areas of application as in the case of the contrast to loneliness. The emerging multifaceted approaches towards care and technology were used to define clusters of behaviours that took shape into six behaviour profiles. These profiles are characterized by different needs, enablers and blockers in their relationship towards self-care and its tracking. The research findings indicate that 60+ people are redefining their perception of physical and mental health, their role in society and their relationship with the healthcare system. Moreover, they have increasingly incorporated technology and digital solutions in their daily lives: they are expanding their awareness towards well-being practices, and they have new expectations for the quality of life they want to keep, ultimately redefining the meaning of ageing. The research establishes the concept of agency as key for the design of product-service systems for the 60+ population. Considering agency as a perspective and as a perception of the ability to perform and control the impact of their actions, leads to new visions of empowerment. Ageing for 60+ is defined by the ability to determine and protect their lifestyle.

In the sixth and final chapter, curated by AC75 Startup Accelerator, some cases and examples are reported for strategies and startups in the field of socialization and the contrast of loneliness. Three areas of activities are highlighted: digital platforms to help seniors in socializing especially choosing common interests and activities; companion robotics as tools to reduce the sense of loneliness in a wellness and healthcare perspective; initiatives related to new ways to organize villages or cultural activities as opportunities to have a better life. The presence of a relatively scarce number of examples -for example concerning lifelong learning, cultural experiences and entertainment- can be considered as a signal of the room available for innovation and startups willing to leverage socialization and connectedness as a means of wellbeing and healthy ageing.

Social isolation and loneliness among older people: the strategic value of technological and social innovation



Social isolation and loneliness among older people: the strategic value of technological and social innovation

By Georgia Casanova, Lorena Rossi and Sara Santini - IRCCS INRCA
and Marco Arlotti, Agnese Brunzini, Michele Germani - UnivPM

Introduction

This chapter provides an introductory perspective about social isolation and loneliness in older age and about the strategic value of technological and social innovation in this field. Firstly, we introduce social isolation and loneliness from a conceptual and empirical perspective. Secondly, we discuss how social and technological innovation may represent strategic levers to contrast social isolation and loneliness among older people. Finally, we present concrete examples of interventions by referring to technological and social innovations implemented by UNIVPM and INRCA through specific projects aimed at supporting frail older people living at home and in care facilities against the risks of social isolation and loneliness.

Social isolation and loneliness: a conceptual and empirical framework[4]

Social isolation and loneliness represent two complex conditions shaping older people quality of life. The complexity refers not only to conceptual definitions, but also to interdependencies and intersections characterizing these two specifics conditions. For example, what relationship exists between the "objective" condition of social isolation and the "subjective" condition of loneliness? How are such conditions potentially related to specific individual features, like frailty, physical and mobility impairments, or contextual conditions?

According to the literature, social isolation is defined by a lack of connections with others and/or a limited number of significant relationships (Cacioppo et al., 2011; Zavaleta, 2014). Loneliness, instead, is defined as a personal experience arising from a subjective sense of unfulfilled social needs (Peplau and Perlman, 1982).

The relationship between social isolation and loneliness is far from obvious. For instance, being embedded in a network of dense social relations is certainly a necessary condition, but it is not a sufficient condition to contrast loneliness. Also, other factors play a crucial role: the frequency of social relations/contacts, the ways through which social interactions took place within the network of older people, the internal variety of social relationships that allows older people to take advantage from a wider and diversified set of meaningful relations and/or emotional attachments.

[4] This section has been written by Marco Arlotti (UNIVPM) and Sara Santini (IRCCS INRCA, Centro Ricerche Economico Sociali per l'Invecchiamento).

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This implies that having a limited number of social contacts doesn't necessarily result in loneliness; rather, the perception of the satisfaction derived from these relationships plays a pivotal role in determining feelings of isolation (Motta, 2021).
Because of the many objective and subjective determinants of social isolation and loneliness, it is important to understand the meanings attached to these two concepts by the older persons themselves. A recent (jet unpublished) study carried out by Santini and Casanova (in press) pointed out that in a group of 132 community-dwelling older persons aged 75 and over and living in Northern Italy, social isolation was associated to the concept of “guilt”, while loneliness was most associated to the semantic area of “death”, “fear” and “disease”. This result confirms the twofold and mixed nature of these concepts that belong both to the social sphere (i.e. the sense of guilt foresees the judgement of another person) and to the subjective and emotional ones (i.e. fear is a subjective emotion).
Despite these distinct definitions and meaning, there is a tendency to use social isolation and loneliness interchangeably in everyday language (Barac, 2021).

The overlapping of the two concepts may also depend on the numerous and not fully measurable influencing factors. For instance, social isolation and loneliness can be intrinsically related to individual conditions. According to the literature, frailty conditions affecting older people, particularly physical and mobility limitations, reduce the possibility of maintaining and building social relationships, thus favoring social isolation (Cornwell et al., 2008) and, sometimes, loneliness (Dykstra et al., 2005; McPherson et al., 2006), especially among the oldest ones (Dykstra, 2009; Yang, Victor 2011). At the same time empirical findings also show a much more complex picture (Ranci, Arlotti, Lamura, Martinelli 2023).
Indeed, older people affected by strong physical limitations can also be embedded in dense networks of social contacts and relations, guaranteeing intensive social interactions and confidence, thus with a limited risk of social isolation in spite of critical individual fragility. From this point of view, the precarious physical condition, and the consequent need for help, may represent crucial factors stimulating the activation of social relations, also extended well beyond the family network. At the same time older people affected by only minor limitations in terms of frailty, may present more problematic social conditions. Precisely because in these cases, older persons are still largely self-sufficient, such condition can entail less attention from others, with negative effects in terms of social isolation and loneliness.
In addition to individual features, also contextual pre-conditions may shape very differently how social isolation and loneliness are experienced by older people.

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Contextual cultural factors, including normative representations of care, may play a crucial role in this regard: being born, growing up, living and aging in a community in which older people were traditionally cared for at home by family members may create in today older people the normative expectations that they must be assisted in the same way. Therefore, different care arrangements centered, for instance, on external caregivers (e.g. family care assistant), instead of children (in-law), can be not accepted and then it can become a source of frustration that can make older people feeling alone (Dong et al., 2011; Simon et al., 2014).

At the same time, also structural contextual pre-conditions may have different implications. For example, living in peripheral rural areas characterized by strong spatial isolation does not necessarily mean for an older person being more exposed to the risk of experiencing loneliness, if such context embodies strong community ties. At the same time, spatial peripherally may entail social isolation, and consequently also loneliness, particularly when social connectedness is strongly limited, or also deeply undermined, by scant opportunities coupled with difficult access to ICT and digital technologies due to structural contextual adversities.

Comparative data about European countries shows how older people living in Southern and, especially in Eastern Europe, seem to be greatly affected by social isolation and loneliness conditions than their counterparts living in Northern and Western European countries (Sandu et al. 2021). The Italian case is quite illustrative of such critical conditions. In 2018, the share of older persons potentially socially isolated, i.e. who reported the absence or only the presence of one person to discuss intimate and personal matters, was around 50%, among the highest values in Europe (see Figure 1).

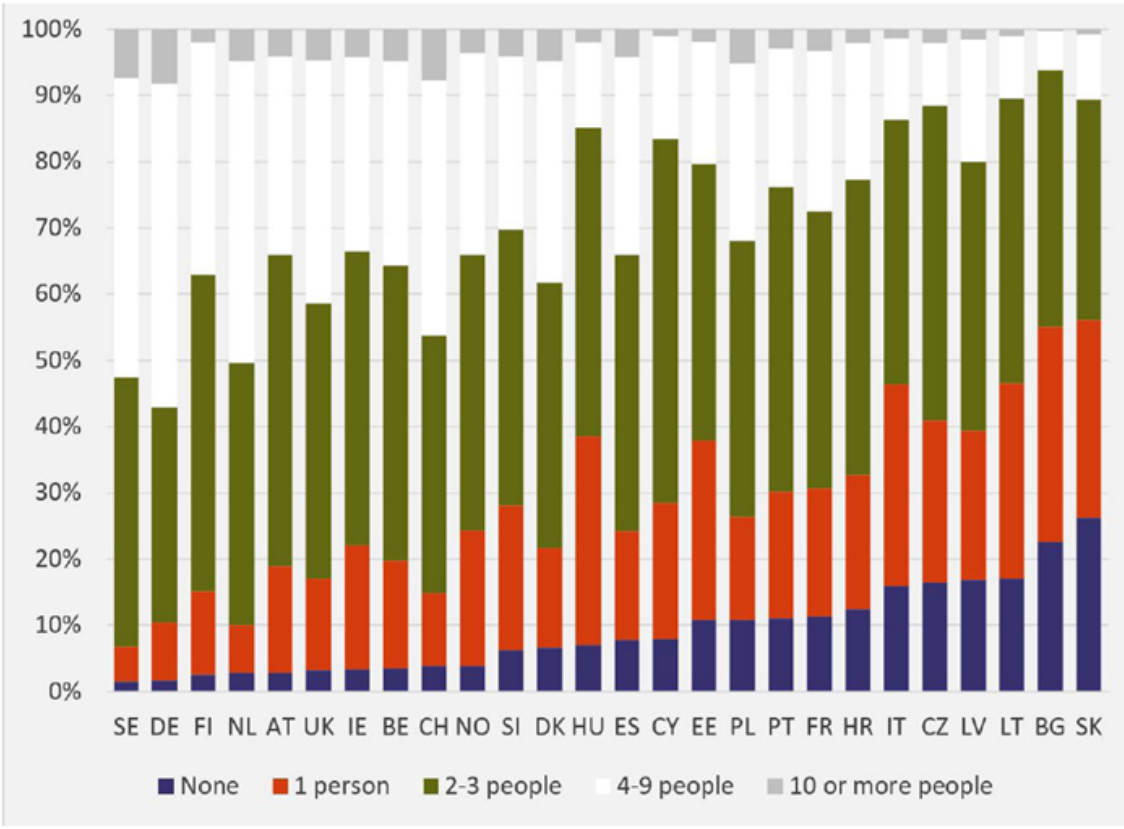

Figure 1 – Share (%) older people aged 65 and more by reported number of people with whom to discuss intimate and personal matters, 2018

Source: Sandu et al. (2021).

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Such scenario is also confirmed when indicators about loneliness are considered. For example, in 2016, about one third of older persons living in Italy reported feeling lonely: the third highest value in Europe (see Figure 2).

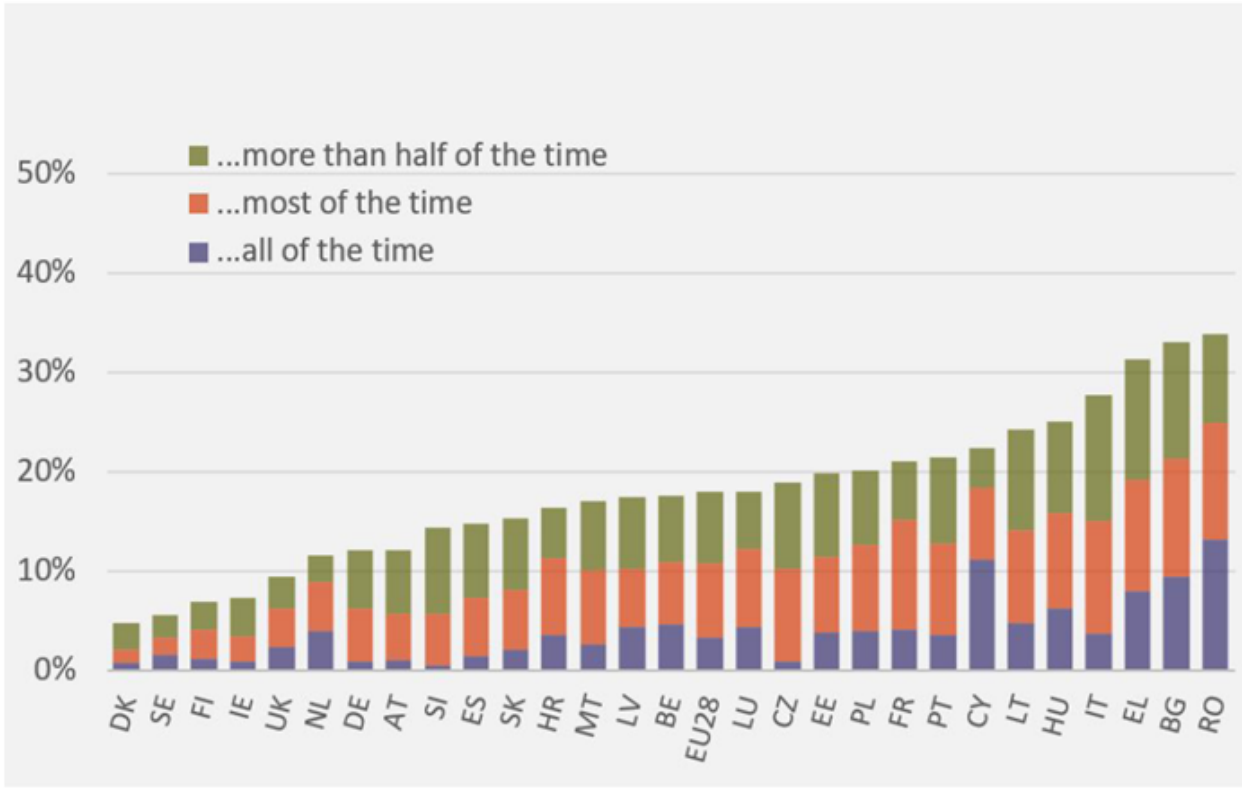

Figure 2 - Share (%) older people aged 65 and more reporting feeling lonely, 2016.

Source: Sandu et al. (2021).

In countries, like Italy, a critical combination of individual features and contextual preconditions seem to play a crucial role in shaping the problematic impact affecting older people quality of life, in terms of social isolation and loneliness conditions.

In this regard, social connectedness can be considered an effective "antidote", by re-centring older people's agency and resourcefulness to adapt to social circumstances, remaining socially active in later life (Cornwell et al., Reference Cornwell, Laumann and Schumm2008; Register and Scharer, Reference Register and Scharer2010).

Social connectedness, however, can also be experienced very differently across genders and cultures and influenced by structural factors (e.g. transportation and access to services) as already mentioned above (Gardner, 2014). Moreover, ethnicity and different cultural background may affect the willingness of older people to socialise and put in connection with others (Morgan et al., 2021).

If it is quite easy to involve healthy older people in community-based project inspired to the paradigm of active and healthy aging (e.g. social farming, volunteering, etc.), it is not so for frail older persons who have physical and cognitive limitations. Addressing the social needs of this group through social and technological innovations is the today main challenge.

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How is a social innovation strategy related to technologies and to the contrast of social isolation and loneliness?[5]

In 2010, Murray underlined how social innovation is needed because societies are in a period of transformative innovation due to the role of technology (particularly ICT), the influence of culture and values (putting people first with a more excellent democratic choice) and the disjunction between current institutions and the requirements of new ones (Murray et al., 2010).

In 2013, the European Commission defined "Social Innovation" as any new idea (including products, services and models that simultaneously meet social needs more effectively than alternatives) that creates new social relationships or collaborations, i.e. positive for society and improves society's ability to act (European Commission, 2013).

In the technology and innovative era, the European Commission top-down definition appears relevant to identify better how and to what extent technological innovations may produce social benefit and make extra social value. The social innovation concept pushes for a changed approach to policies because to be considered innovative, it must be "effective" in meeting social needs and replicable at an economical cost (Borzaga & Bodini, 2014).

In this framework, not all new technologies are innovative or they promote social innovation. However, the social relevance of the ageing issue makes technologies applied to the different areas of ageing issues (e.g. active ageing and Long-term care) easily defined as "social innovation promoters". Indeed, social innovation and ageing issues have three common aims:

(a) the improvement of individuals' psycho-physical health and well-being;

(b) improvement of the quality of life (e.g. social inclusion conditions).

(c) the optimization of opportunities at both micro (individual) and macro (societal) levels. (Casanova et. al.2020).

The last years have seen a notable surge in studies on social isolation and loneliness, particularly in the wake of the COVID-19 epidemic (Van Beek & Patulny, 2022). This research has brought to light the negative effects of loneliness on people's lives, societies, and governments throughout the globe. Research demonstrates how a lack of social connections affects one's physical and mental well-being and relates to social inequalities (Barreto et al, 2023). As a result, loneliness has received much attention at the policy level. For instance, the United Kingdom of Great Britain and Northern Ireland (GB) (HM Government,2020) and Japan (Murayama et al. 2023, 2021) both appointed Ministers for loneliness in 2018, whereas Japan appointed one in 2021. "Loneliness and social isolation pose crucial challenges to the cohesion, economy and mental and physical health in 21st century societies across the world," said a news release jointly released by the EU Commissioner and the Japanese Minister of Loneliness (European commission, 2021).

[5] This section has been written by Georgia Casanova (IRCCS INRCA, Centro Ricerche Economico Sociali per l'Invecchiamento).

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Technology, social isolation and loneliness are often shown as having an ambiguous relationship: technology becomes both a cure and a cause of social isolation and loneliness. For example, the Internet can strengthen relationships when it is used for social connections, but it can also make loneliness worse when it is used to avoid social interaction (Nowland, 2018).
The research on the impact of technology on social isolation and loneliness is divided. ON the one hand, for a long time, technology was viewed as a decisive element in the decline of good human bonds (Bowlby 1973), particularly due to online communications and relationships (Caplan, 2003).
On the other hand, various technology treatments for older adults effectively reduce and avoid social isolation and loneliness. In particular, the literature emphasizes the helpful impact resulting from the use of:

- Mainstream and specially adapted technologies (e.g., mobile phones, laptops or Skype) (Zamir et al., 2018; Prophater et al., 2021; Murugan et al.,2022).
- the remote provision of services (Gorenko et al.,2021)
- virtual senior centre (Gadbois, 2022)
- Internet Information Station (Mullins et al., 2020)

Practical strategies to contrast social isolation and loneliness among older people: the Smart Village, Mosaico, Focaal and EMILIO projects implemented by UNIVPM and INRCA[6]

Marche Polytechnic University (UNIVPM) has been promoting and participating in regional and national strategic projects for years, with the aim of creating a new model of personalized home health and social care to radically improve the quality of life of elderly people, especially those living alone, keeping them independent and active in the social context.
The model called "SMART VILLAGE" (https://smartvillageproject.it/) is mainly aimed at the management of elderly users in pre-frail and frail conditions, who can live alone and still have a good degree of physical and cognitive autonomy. In these cases, it is necessary to be able to monitor the evolution of the person's state to detect warning signs of acute events and disabling pathologies. The synergy of IoT technological solutions (such as wearables, environmental sensors, and robotic systems) capable of monitoring patients in real time, with inclusive service models in the health and social fields, allows building a sustainable and effective care system.

[6] This section has been written by Michele Germani, Agnese Brunzini (UNIVPM) and Lorena Rossi (IRCCS INRCA, Ufficio per il trasferimento Tecnologico).

The relevant Territorial Health Authorities, the Social Territorial Areas, multiple Municipalities in the Marche hinterland, INRCA (IRCCSS center for research on active aging), the general practitioners of the territory, the social cooperatives and various local businesses interested in technologies and the provision of services, actively collaborate in the Smart Village project. A key role for the model's success is the mediation of social operators capable, on the one hand of training the elderly on the technology usage, and, on the other, of organizing and managing systematic and personalized activities for sociability, keeping the elderly as an active part of the community.

Over 75 subjects are enrolled in the model through a multidimensional screening which includes a cardiological, physiatric, nutritional, psychological, and social evaluation, and the calculation of a frailty index, dynamically variable over time. Based on this assessment, a personalised kit of self-monitoring devices and a series of care services are assigned to each user. The services range from recreational activities to personal care, to the transport of people and goods, to nutritional education sessions, adapted physical activity, speaking and listening groups, and so on. These are combined with a plan of telemedicine interventions, with periodicity depending on the degree of frailty. Indeed, the model is oriented towards the prevention of acute events (already from the screening phase) and of the onset of physical and cognitive diseases through constant monitoring.

This model is provided via a modular web-based software platform, specifically designed, and developed by UNIVPM, as part of the "MOSAICO" project, together with the companies that act as technology providers. The platform consists of 3 main modules that stands for: i) user evaluation and personalised assignment of services and technologies; ii) monitoring and analysis of clinical and social data; iii) management of health and social services.

From the technological point of view, innovative low-cost off-the-shelf devices and sensors are mainly used for the self-monitoring. Environmental sensors mainly dedicated to the identification of falls, capable of sending raw and/or or pre-processed data to existing repositories, are also used. These devices allow monitoring blood pressure, heart rate, ECG, weight, BMI, glycemia, falls, steps, saturation, and temperature. Other more specific parameters are measured by specialised personnel through the telemedicine service.

These technologies can be combined with the newest assistive robotics (AR) systems, which are also capable of assisting people with physical or cognitive disabilities in daily activities, to improve their independence and quality of life. Socially assistive robots (SAR) help the user through interaction. Telepresence and companion robots are particularly effective both for monitoring, entertaining and preventing risk situations for primary users (i.e., elderly people at home), and for supporting figures such as caregivers and healthcare professionals.

Through the use of various robots and specific sensors, as part of the "FOCAAL" project, the best strategies are being studied to support the elderly, mitigating the sense of loneliness, strengthening weakened cognitive levels, constantly monitoring the nutritional condition helping follow an adequate diet, supporting the monitoring of physiological parameters, carrying out televisits with GPs or specialists, supporting safe navigation within the living environment, detecting the presence/absence of the user and send alerts to caregivers.

Thanks to the study and development of specific protocols for usability, user experience, acceptability, trust and technostress assessments, specifically adapted to the involvement of users with low digital literacy, it is possible to analyze the use (and the response to the use) of self-monitoring devices, assistive robots, user interfaces of software platform. The main aim is to optimize these technologies according to the principles of Human-Computer Interaction, Human-Machine Interaction and User-Centred Design, with the goal of hindering the digital divide. Furthermore, the possibility of testing these technologies in special laboratories created in the Fermo hinterland, thanks to the collaboration with the Municipalities, offers the elderly the opportunity to approach these innovative systems gradually and comfortably, in a safe environment, before inserting them into their homes, reducing the negative feelings towards instruments that are away from their own cultural background.

The EMILIO Project (https://www.emilio-aal.eu/), led by IRCSS INRCA, is aimed to enhance self-reliance and counteract social isolation of older people living in care facilities. It will manage a comprehensive set of web services, supporting various use cases to increase their Comfort, Vitality and Safety.

Researchers have started from a literature analysis investigating how voice assistants (VAs) could have potential benefit in reducing loneliness and social isolation of elderly population, overcoming existing barriers with other digital technologies through easier and more natural human-computer interaction.

Studies directly addressing the impact that using a voice assistant has on the social isolation and loneliness of older adults find positive and promising results and provide important information for future research, interventions and policy development in the field of geriatric care and technology.

In addition, the co-design activities highlighted that vocal assistants can have a role in counteract loneliness by engaging older people in conversations providing a sense of companionship, especially for those who live alone. In addition, these assistants can tell stories, play music, or engage in casual chats, providing a source of entertainment and mental stimulation.

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Voice assistant can also empower standard communication tools facilitating virtual social interactions with friends and family. This is especially valuable for those who may be physically isolated or unable to meet in person.

Innovation against isolation and loneliness and the role of cities.

UK National Innovation Centre for Ageing

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Innovation against isolation and loneliness and the role of cities.

Nic Palmarini, Director - UK's National Innovation Centre for Ageing

The four horsemen vs. the wonder drug

We know very well who are the Four Horsemen of the Apocalypse who - typically in late adulthood - come banging on the door of our lives and who amount to over 80% of deaths in people over 50 who do not smoke: Atherosclerotic disease (comprised of cardiovascular disease and cerebrovascular disease), Cancer, Neurodegenerative disease (Alzheimer's disease being the most common) "Foundational disease", a spectrum of everything hyperinsulinemia to insulin resistance to fatty liver disease to type 2 diabetes.

We know just as well that to counter them, besides the science on which the redeeming business model of cure is based, there is only one actual wonder drug: prevention. The literature is vast and consolidated on choices and virtuous behaviours: sleeping well, staying active, a balanced diet, keeping the mind engaged and sustained by a purpose, and a strong network of relationships.

On the first four aspects, much technology has made its fortune in recent years by exploiting the mobile + IoT boom boosted by increasingly effective and sophisticated machine learning systems thanks to the mass of data generated by us, with thousands of applications combined with sensors to measure performance, metabolism, stress or the level of attention, in other words, our quantified self. Much less, however, has been done to help us live 'with' and 'in' a society whose social and economic dynamics are prone to exacerbate phenomena such as isolation and loneliness. It must be admitted social connection - the structure, function, and quality of our relationships with others - is still an underappreciated contributor to individual and population health, community safety, resilience, and prosperity. Technology-supported innovation solutions have mainly focused on care - formal or informal - led by the American trailblazers (the historic Papa and Honor, the now defunct Heroes, and the rising star CareYaya), which have inspired hundreds of start-ups all over the world that have literally copied their logic and services, and then declined some aspects of it until arriving at the various' grandchildren rental' we have in Italy. A mainly "care-like" approach, we were saying. Without forgetting the founding pillars of Apple, Meta, Google, and Amazon - the enablers of the digital dynamics of relationships - who invest in innovation to promote relationship, engagement, participation, and inclusion?

In fact, the first question would be: what kind of society finds itself renting grandchildren to make up for its lack of essential interaction? To answer - however superficially and without opening what would be a necessary chapter on the founding values of each culture - we are obliged to refer to an 'advanced Western society', even in its relational decline. It is no coincidence, in fact, that grandchildren rentals are the clone of what, eight years ago, it seems like a geological era, Chuck McCarthy observed in Los Angeles as a dramatic social phenomenon and - to that - responded with The People Walker.[7] Faced with the emergence of the isolation of men and women in the inner cities as well as in the suburbs of middle-class America, and well before the phenomenon was amplified by a devastating event such as the COVID-19 pandemic, McCarthy accompanied hundreds of strangers on foot for thousands of miles walking people who were isolated in their home and without anybody to have a walk with, to earn a few extra bucks and get himself out of the house more too.

"Twice a week for the past month, I've paid an underemployed actor $30 an hour to walk me through the hills of L.A. like a Labrador. Chuck McCarthy isn't a dog walker, though; he's a people walker."

Attesting to a cultural difference between the smooth social fabric of U.S. megacities where larger cities are basically two-tiered (a wealthy downtown professional class relies on inexpensive labourers who can't afford to live near their workplace or drive a car; who are forced into long commutes creating a sort of a social vacuum) and that of old Europe is as obvious as it is necessary. Europe, particularly Italy, has a profoundly different urban context, population distribution and social fabric. Without going into the merits of factors such as population density per square kilometre or the role of the Church, one fact suffices: in Italy, among people aged 75 and over, 51% live no more than one kilometre from their nearest child and 20% live with them. Only 8.9% have no children and live alone, and only 0.9% have children far away abroad.[8]

[7] https://en.wikipedia.org/wiki/The_People_Walker
[8] https://www.istat.it/it/files//2020/04/statisticatoday_ANZIANI.pdf

And yet, eventhough this figure is all in all an exceptional dimension, isolation is a phenomenon that - in the face of a society that is progressively older, urbanized and increasingly enveloped in the violent polarization of its digi-social loops - shows all its disturbing pervasiveness.

Isolation and loneliness are not the same thing

Social isolation and loneliness are often cited as one Siamese brothers, inextricably linked. But they are not the same thing.

We have often associated old age with loneliness out of principle or narrative convenience because, all things considered, it is more effective and easier to narrate. Loneliness is a feeling that develops when there's a perceived difference between desired and actual levels of social interaction, meaning, and relationships. Loneliness is a subjective state and more easily strikes the imagination because it appeals to that feeling we all know well, that fear we all had as children when, for a second, we lost sight of the reassuring face of mum or dad. We felt lost, abandoned, and deprived of that need for care that accompanies puppies of all species like the whole life suddenly has no meaning. We felt lonely. Imagining an older man alone strikes at the heart because it strikes at our childhood self.

And so, we talk about the 'pandemic of loneliness', not distinguishing it from isolation, which instead refers to social relationships, social roles, group membership and the social interactions that ensue. Not only that, isolation relates to not only 'presence' but also to inclusion. Its form is, therefore, more insidious and more challenging to portray. People living alone can still feel content with their level of social activity, and people physically surrounded by others can still feel lonely and disconnected. The relationship between isolation and loneliness is dynamic and interconnected, where one dimension contributes to triggering the other with often devastating consequences. But the triggering process seems straightforward. An observational Harvard study published in SSM–Population Health sought to find out if one problem might be more dangerous than the other. Researchers analyzed the health data of almost 14,000 people (ages 50 or older) who were followed for four years. Both loneliness and isolation were associated with poor health outcomes. But, social isolation was a stronger predictor of physical decline and early death. Loneliness was more predictive of mental health issues, such as depression or feeling that life had no meaning.[9]

In ancient times, humans relied on social bonding and communication with others for "mutual aid and protection"; becoming socially isolated was essentially a risk to one's survival and almost a sentence to death. Today, we have enough data to give dimension to the evidence that common sense has always suggested. The lack of social connection poses a significant risk to individual health and longevity.

[9] https://www.sciencedirect.com/science/article/pii/S2352827323001246

Loneliness and social isolation increase the risk of premature death by 26% and 29%, respectively. More broadly, lacking social connection can increase the risk of premature death. In addition, poor or insufficient social connection is associated with an increased risk of disease, including a 29% increased risk of heart disease and a 32% increased risk of stroke. Furthermore, it is associated with increased risk for anxiety, depression, and dementia. Additionally, the lack of social connection may increase susceptibility to viruses and respiratory illness".[10]

Although these data refer to late adulthood, which is the subject of our interest on this occasion, to think that loneliness and social isolation are phenomena of old age is a distortion, again, driven by common stereotypes such as thinking of young age as that of lightness, carefreeness, social relations and therefore free from the phenomena of disconnection and participation. We know very well that this is not the case, and recent data, in some worlds, suggested by the Pandemic, have indeed shown us the extent and seriousness of these phenomena for the younger generations with a particular risk of social isolation not only experienced but also simply perceived. These include and are amplified by changes in peer development, autonomy development, identity exploration, cognitive maturation, social perspective development, and physical maturation. This is baggage whose weight then spills over throughout life with consequences that are still difficult to measure objectively longitudinally but which to ignore would be a colossal mistake both contextually and prospectively. It, therefore, becomes clear that in the face of this scenario, social isolation and the resulting risk of loneliness no longer represent a mere contextual dimension to the horsemen of the apocalypse: they are often its initiator and silent accelerator.

Innovation means fighting the root causes.

As we usually do, addicted to a pathology-centric and cure-centric model (the current medical and pharmacological business model), we focus on the effects with little interest in the causes. If we do not focus on the causes, in fact, not only do we content ourselves with promoting palliative forms whose efficacy is yet to be proven (least of all, in this case, the idea of a 'magic pill' that 'cures'

[10] Our Epidemic of Loneliness and Isolation: The U.S. Surgeon General's Advisory on the Healing Effects of Social Connection and Community, 2023

isolation or loneliness makes sense) but we also actually limit the development of that innovation capable of suggesting system solutions instead of praesidium solutions.
In our analysis of root causes, 'Loss' appears to be the main trigger factor.[11]

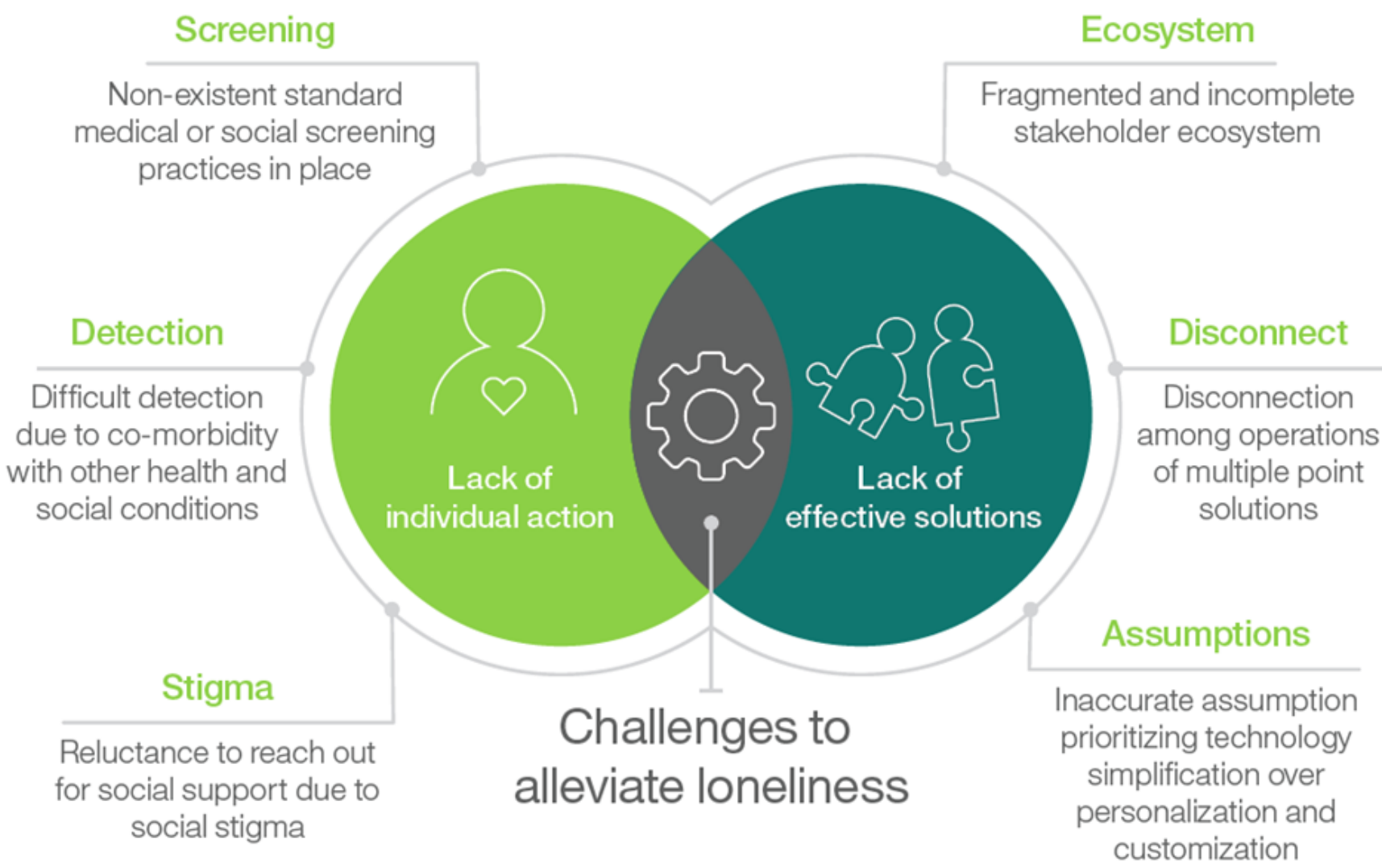
- Loss of physical and mental ability: Health issues can limit one's ability to attend and participate in social activities with others;
- Loss of family and friends: Social networks naturally shrink over time if not maintained, eventually leading to isolation;
- Loss of professional identity: Many underestimate retirement's emotional impact from the sudden reduction of daily social interactions;
- Loss of recognition in media and market: Aging stereotypes perpetuate older adult portrayals as dependent on others and non-contributing;
- Loss of social status: The concept of ageing often becomes associated with loss of social status, recognition, and value;
- Loss of a purpose in life: Difficulty in finding purpose after retirement can be an isolating experience that drives societal disconnect;

Therefore, if we want to stimulate system innovation, we must ensure that any solution designed to mitigate loneliness and isolation must target the underlying cause – loss. And like treating similar devastating physical ailments like heart disease and diabetes, the most effective solutions support identification and preventative action.
To prevent loss and keep older adults connected and engaged in their communities, we must re-think many aspects of society, from employment to education, transportation, housing and more. Researchers, advocacy groups, and public health workers need better tools to aggregate and mine data, identify at-risk people and communities, and deploy interventions more quickly. And when loss does occur, older adults need tools and support to build and enhance their social capital in the same way they might nurture financial capital. Serving older adults involves many stakeholders – family, caregivers, healthcare practitioners, and social workers – all of whom want to work in a more connected way but lack the underlying structure or tools to do so.

Currently, there's no effective or accurate way to screen for isolation or loneliness – no standard tool or protocols exist. Loneliness can often hide in plain sight as it often presents with other conditions such as poverty or depression. And in North America and northern Europe, cultures that can place a high value on independence and stoicism, there's a real stigma to admitting to loneliness and an unwillingness to seek help.

[11] N. Palmarini, H.Fraser, S.Zinck et alter, "Loneliness and aging: Navigating an enduring crisis", Institute for Business Value Press, 2017-2020

There is also a pervasive assumption that older adults are reluctant to use technology, but did we ask them? Did we provide a meaningful, usable, accessible technology for them?



Abstract from Loneliness and aging: Navigating an enduring crisis [12]

As usual, where we see an issue related to ageing, we should also be open-minded enough to see the opportunity since - given the global economic system in which our society is rooted - the only way to reduce inequalities and scale solutions that can help a broader population is to identify the opportunities for the potential stakeholders. Which might not be "the usual suspects". There is enormous opportunity across multiple sectors, and no one industry or organization will have a "magic button" for this issue – instead, the best solutions will cut across industry silos, from universities working with communities to create inter-generational housing for students and seniors, to telecom providers working with electronics vendors on virtual town-square projects, to self-driving vehicles – whose more enthusiastic audience may be older adults, because the reward to risk ratio is so high.

[12] N. Palmarini, H.Fraser, S.Zinck et alter, "Loneliness and aging: Navigating an enduring crisis", Institute for Business Value Press, 2017-2020

The potential of cognitive and IoT technologies to deliver data integration, personalization, natural language processing and scalability will be essential to support these solutions.

How do we create a new kind of village?

Three main questions can drive innovation:

How do we create a new kind of village?	*To help older adults feel more engaged with others and their community.*
How can we achieve new insights for detection and intervention?	*To discover new ways to address and alleviate isolation and loneliness.*
How can we help older adults rebuild their social capital?	*To continue social vibrancy and vitality in later life.*

Innovators and start-uppers should start from these three questions to challenge their business ideas [13]

Even if isolation and loneliness can happen in every context – a crowded condo, a school room, a dance hall, a public park in a village or a neighbourhood -it is also true that we are part of the global urbanization trend that suggests that the "new kind of village" described before resembles more and more to cities.

For the first time in human history, in 2008, most of the world's population was living in urban rather than rural contexts, and rapid global urbanization means cities are the dominant environment in which we will live not only as younger people but also into later life. Cities are the symbolic and physical representation of the intersection of our cognitive, affective, and behavioural components and the highest expression of the evolution of our intelligence and social systems we have created.

This – seems an unstoppable trend – makes cities more exposed to the consequences of age-related social and demographic changes, the different stages of individual human experience and social interaction. "With more complex social composition and variation in living standards, and the greater degree of human design and initiative that their functioning requires (for example, in terms of mobility, digital environment and built environment), they have the potential to help us accelerate the understanding of not only how we mitigate, adapt, or manage

[13] N. Palmarini, H.Fraser, S.Zinck et alter, "Loneliness and aging: Navigating an enduring crisis", Institute for Business Value Press, 2017-2020

changes in society but also proactively influence it and transform from passive, adaptive, assisting containers, to being active tools for our through life well-being, health - our longevity. Cities have a fundamental role and clear opportunity to suggest forward proposals rather than reactive responses to living longer, better lives, with better social circumstances and sustainable, economic growth".[14]
Benjamin Barber and others have suggested that cities could succeed in various areas of public life where nation-states have struggled to make progress.

> *The challenge of democracy in the modern world has been how to join participation, which is local, with power, which is central. The nation-state once did the job, but recently, it has become too large to allow meaningful participation even as it remains too small to address centralized global power... The solution stands before us... Let cities, the most networked and interconnected of all our political associations, defined above all by collaboration and pragmatism by creativity and multi-culture, do what states cannot".*[15]

Furthermore, "City and local governments are in a prime position to tackle the social determinants of health because of the breadth of their responsibilities over a defined geographical area, with powers cutting across different areas of public policy. This ability to take a place-based approach is important because of the way that health needs and outcomes are distributed spatially. In most cities, the greatest levels of need are concentrated in neighbourhoods where poverty levels are highest and social outcomes are poorest. Improving health outcomes in these areas requires multi-sectoral
action and leadership from those with an overarching responsibility for place".[16] Most of the actions taken by city governments impact the health of citizens, and most of that is not about health care per se but about transport systems, urban design, planning and all the other functions and tools that city governments have at their disposal.

It is a mistake to think of the city as a unicum. There is a central government of the city, which is what we need to strategically direct policies. Still, the city is an aggregate of villages, of communities with such specific peculiarities that they have repercussions on the health and lives of citizens. Take London, for example. The highest life expectancy for both women is in Kensington and Chelsea, with 84.1 for men and 87.9 for women.

[14] N.Palmarini, L.Corner, "City of longevity: a new paradigm for cities in a longevity society", 2023, NICA.
[15] B.Barber, "Strong Democracy: Participatory Politics for a New Age", University of California Press, 2013
[16] C.Naylor, D.Buck, "The role of cities in improving population health", the Kings Fund, 2018

The lowest life expectancy is found in Barking and Dagenham for both men (77.0 years) and women (81.7 years). This makes it a whole seven years less than in Kensington for male residents. The next lowest was Greenwich, Newham and Lewisham. Healthy life expectancy for women ranges from 57.8 years in Tower Hamlets to 70.1 years in Wandsworth. In contrast, for men, life expectancy ranges from 58.1 years in Barking and Dagenham to 70.2 in Richmond upon Thames.[17] It is clear that while London is narrated and imagined as the city we all know for the Big Ben or Piccadilly Circus, it is also evident that it is made by so many different nuances so well described by data on healthy life expectancy.

So, in these contexts, we must develop innovation policies to combat isolation and loneliness, but with a central government that identifies a common goal, which can only be the health-adjusted life expectancy of its citizens or HALE. In the recent past, for too long, we have focused on measuring life expectancy tout-court. Still, the transition we are experiencing from an ageing society to a longevity society requires us to imagine policies and services that aim to create not only a citizenry that lives long but does so healthily. I will not dwell on why this is a crucial step, as I would like to emphasize how this must become the pivotal' policy effectiveness' objective to be shared between city departments. Every single initiative, from a more effective sewage system to the redesign of public transport to speed limits in city centres, must always and in any case be contextualized and measured against its corresponding 'Return in Healthy Longevity'. Suppose we establish this KPI as our focus. In that case, we can not only easily understand where to prioritize our interventions (perhaps Chelsea can be placed in the queue compared to Tower Hamlet) but also more quickly understand the drivers of the reasons for such a difference. Economic and social factors (per capita income and education) underlie these macro-differences but understanding "how" and "how much" these factors, along with all the other components that impact our health, influence isolation - which, as we have said, is probably the spark from which loneliness is amplified - is what can allow us to intervene quickly.

Historically, the moral thermostat of politics is fixed on a point somewhere between duty and prudence. Unhinging this dynamic is intrinsically complex, and perhaps the only way to do so is to unlock a basic principle, namely to formally acknowledge that, as we have said, no one industry or organization will have a 'silver bullet' for this issue, and therefore to involve each actor in a hybrid model not by offloading responsibility onto one another, but by coordinating interaction with one another and developing an ecosystem opposed to the current fragmented and partial one.

[17] https://trustforlondon.org.uk/data/life-expectancy-borough/

By leveraging data and technology to establish an absent shared screening and detection model. Who can tell if a person is isolated? How can we distinguish whether depression is caused by loneliness rather than by other factors? Who communicates the data with whom? Who cares to act? Just the usual charities or voluntary groups in the area? And even if so, can we systematize volunteering? Can we launch campaigns to combat the stigma associated with old age and the shared celebration of independence as a symbol of a healthy and progressive society? Are we sure that it is only up to the U.N. or a ministry to run such campaigns? Wouldn't it be more effective and pervasive if brands were the ones to convey this message?

Isolation and loneliness should be tackled with the same vigour we strive for a net-zero footprint. Where everyone is involved, where everyone offers joyful communications to keep our planet habitable. Where everyone sells an opportunity with a return on their investment, which is not merely social, it is economic. The opportunity for innovation is contextualized (mostly) in cities and concerns every business sector.

The city, the enabler of innovation.

It would seem, therefore, that the city bears most of the responsibility for the solutions and that it is up to central, local, and hyperlocal public administrations to find the investments and provide the tools to implement them. At least, this is how it should be in the welfare state that we have, perhaps at one point in history, idealised in an eternal debate between hyper-liberalism and the nanny state. This is a distorted representation. As Michael Lyons says: "The local government is not an agency responsible for delivering a specific set of statutory services. Rather, it is a government unit responsible for the well-being of a community and a place, and independent of, whilst also being connected to, the wider system of government".

In other words, it is up to local (and hyper-local) governments not to deliver the solutions but to build the ecosystem in which they can be born, proliferate and resolve. A function of knowledge, promotion of evidence, prioritisation, and coordination. In an economic and social context, it is radically different from when many of the policies that are still in place today were designed. A context plagued by new forms of isolation and loneliness exacerbated by new social dynamics, digital ones above all. A context in which solutions based on the intelligent interpretation of data are no longer a possibility but the baseline on which to build solutions. This is what local authorities should do: indicate the priorities and where they are most urgent and stimulate the market to innovate. One example above all.

In 2011, Michele Vianello, Deputy Mayor of Venice, argued that "building a WIFI network in a municipality is not dissimilar to building a nursery or kindergarten".[18] Compared to Vianello as a universal right of citizenship, Broadband access explains well which axes it can and should evolve. It is not very different from public school children's right to healthy nutrition. More data will become available if the city increasingly moves its services to digital ones. This data can then be the basis for measures and effectiveness of our interventions.
Providing broadband access will be strategic and socially essential to provide access to services and receive feedback from citizens. Tel Aviv, Barcelona, Perth, Wellington, Osaka, Tallinn, Helsinki, Milan, or Leeds, Bradford, Oxford, Manchester, Salford, York, Edinburgh, Cardiff and Newport, all cities which have been equipped with free public Wi-Fi, are excellent examples. However, a lot more can be done from an infrastructural point of view (diffusion, and – moreover, speed and signal reliability), sharing with the public (access information) and usability (ease of access).
Since the risk is what Citizens Advice in the UK found: during the first lockdown, certain groups, including people with children, disabled people, people from Black, Asian or ethnic minority backgrounds, those who were shielding and young people were particularly struggling with their broadband bill. Towards the end of 2022, an estimated 2.3 million people had fallen behind on their broadband bill, according to the charity.[19] How can we suggest access to education, information, and data if we can't grant the bare access? How can we keep people connected? How can we prevent them from being at risk of total isolation (physically and digitally)? We know it might sound against any current market logic. Still, probably – following Vianello's provocation – it is time Telco provided free broadband access to people (at least those at risk? But, who are they? Is age the only KPI?) and develop services to sustain costs using data and technology to create low-cost systems for analysing isolation risk, or developing hybrid 'town squares' with increasingly customised community-based content, resources and services that can finally intelligently bring together the physical and digital, connecting places and people. This is the innovation that the authorities should stimulate by involving all industries. From Electronics, Consumer Goods, & Retail to Target new markets with enhanced insight into consumer behaviour and preferences, to real estate providing novel inter-generational living solutions and empathic homes, to healthcare developing active screening for early signs of loneliness with integration to social services, to travel and transportation improving mobility with self-driving vehicles, offering new experiences with VR travel libraries or more intelligent shared services, to government and business redesigning retirement concepts and create new work and volunteer opportunities, to education offering new curriculum and skills training.

[18] https://www.michelevianello.net/wifi-gratuito-diritto-universale-cittadinanza/
[19] https://www.citizensadvice.org.uk/about-us/about-us1/media/press-releases/more-than-one-in-six-struggling-to-afford-broadband/

by precise criteria based on data from local operators. The results? In 2023, NYSOFA issued a report[20] showing a 95% reduction in loneliness and a significant improvement in well-being among older adults using the platform. ElliQ users throughout New York have also consistently demonstrated exceptionally high levels of engagement over time, interacting with their ElliQ over 30 times daily, six days a week. More than 75% of these interactions are related to improving the older adults' social, physical and mental well-being, not to mention giving ElliQ a revenue 'pipeline' to convince other investors to invest in the company and thus give it a chance to develop more and more sophisticated technologies based on Machine Learning that will benefit more and more people. These results have allowed to serve from about a thousand homes to over twenty thousand planned in the coming months. All are funded with the New York State budget as part of a package of programmes through NYSOFA to address social isolation and provide support for caregivers.

So, will the solution to isolation and loneliness be a cognitive robot in our homes? Of course not. It will be more cohesive and inclusive communities, city neighbourhoods redesigned in the spirit of Barcelona's Superilles, more effective tools to manage volunteering, programmes to engage commuters to be part of the social fabric around their Office and not only where they reside, campaigns to promote interdependence instead of stigmatising it, solutions to learn how to recognise isolation and identify it, harnessing local touch points as catalysts for engagement and - of course - it will also be technologies capable of being there when it is unfortunately impossible to do so in person.

Involving and selecting innovation in all its forms - digital, process, financial - having the courage to experiment with it and support it, helping it to prove its effectiveness: this, too, is the role of cities and their administrators if we really want to imagine how to tackle and solve loneliness with the tools that our ingenuity makes available to us, every day.

[20] https://aging.ny.gov/system/files/documents/2023/08/nysofa-and-elliq-engagement-report-july-2023.pdf

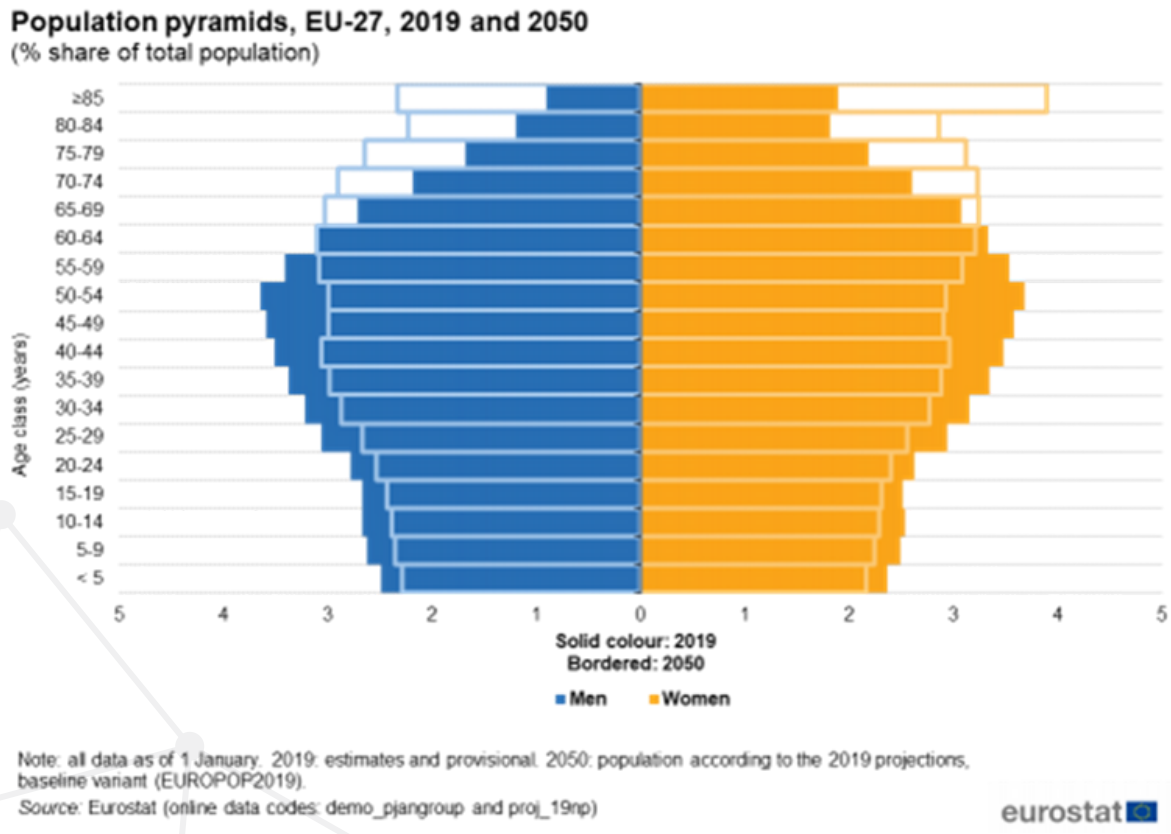
Smart Living & Co-housing in Europe: Current scenario and opportunities to address loneliness of an ageing society.

3

Smart Living & Co-housing in Europe: Current scenario and opportunities to address loneliness of an ageing society.

Felice Lopane, Francesco Barbieri - Silver Economy Network

As the demographic landscape of Europe undergoes slow yet consistent shifts in aging, particularly evident in Italy where almost one quarter of the population is aged over 65 (Statista, 2023), the issue of loneliness and social isolation among seniors has become a theme of interest in the realm of policy and public health. This demographic trend not only underscores the importance of addressing the well-being of the elderly but also highlights the need and opportunity for innovative solutions to foster social inclusion and mitigate health risks of such a growing tranche of the population. In response to these challenges, co-housing is emerging as a compelling and holistic approach.

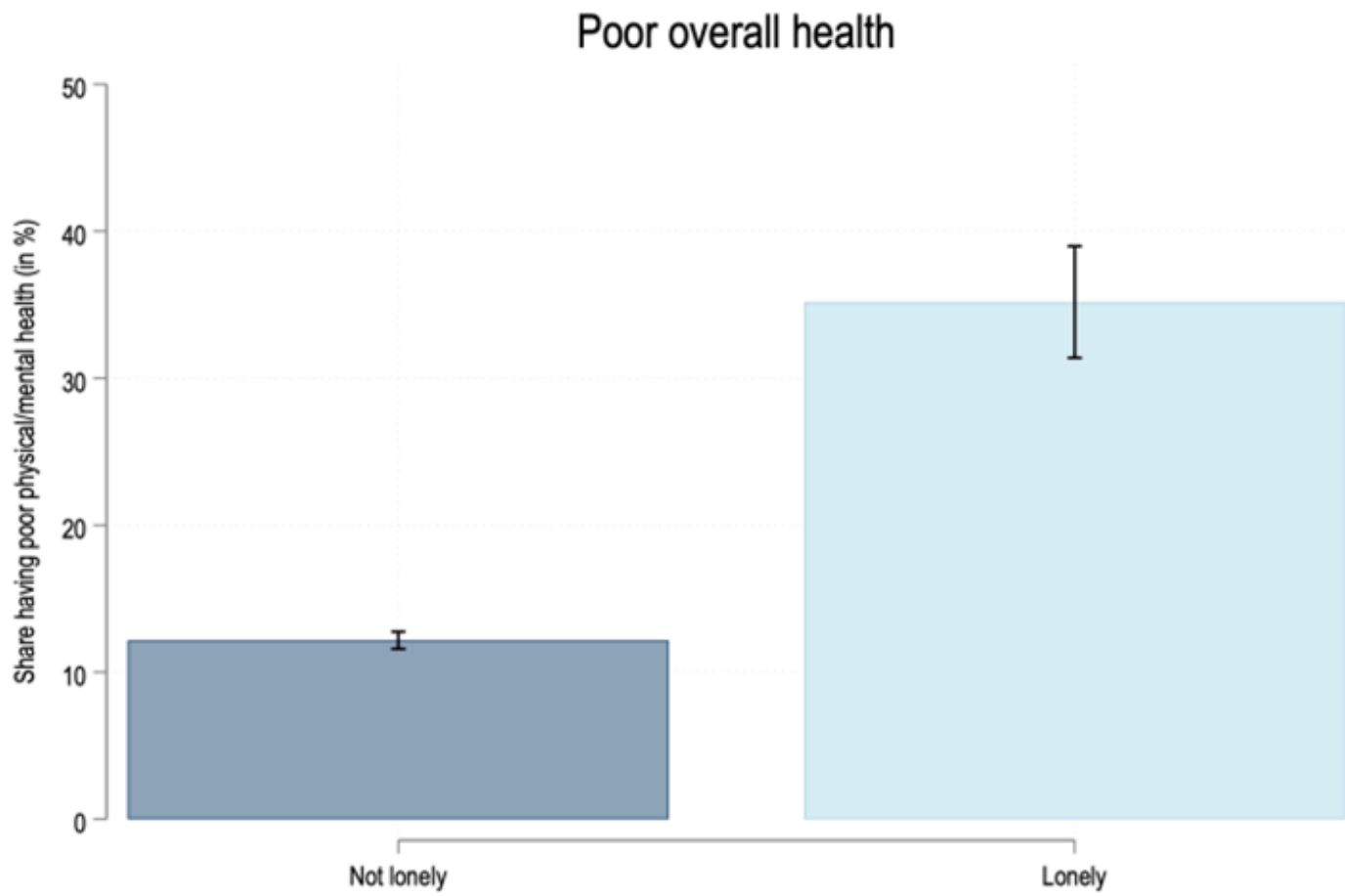


The significance of tackling loneliness among seniors constitutes a multifaceted challenge with profound implications for individual health and societal cohesion (EU-LS, 2022). Research consistently demonstrates its detrimental effects on physical and mental well-being, including increased risks of mortality (National Academic Press, 2020).

Silver Economy Network

Furthermore, social disconnection can erode civic engagement, contributing to broader issues of societal fragmentation. Co-housing, grounded in principles of communal living and active community participation, offers a promising antidote to the perils of loneliness and social isolation among older adults.

Correlation between self-perceived Loneliness and Health, UE27, 2022



Source: European Commission, EU-LS, 2022

Fig. 2: Roughly 35% of participants that felt lonely stated to have poor physical/mental health as opposed to the lower 12% share of participants that did not feel lonely.

Co-housing, which originated in Denmark in the 1970s and was later termed in the 1980s by American architects fascinated by shared living spaces, not only has potential in tackling housing, environmental, and cost-of-living crises but also offers a straightforward solution to loneliness and social isolation (Novy, 2022). Its core concepts focus on people living together, actively participating in community life, and sharing spaces and amenities.

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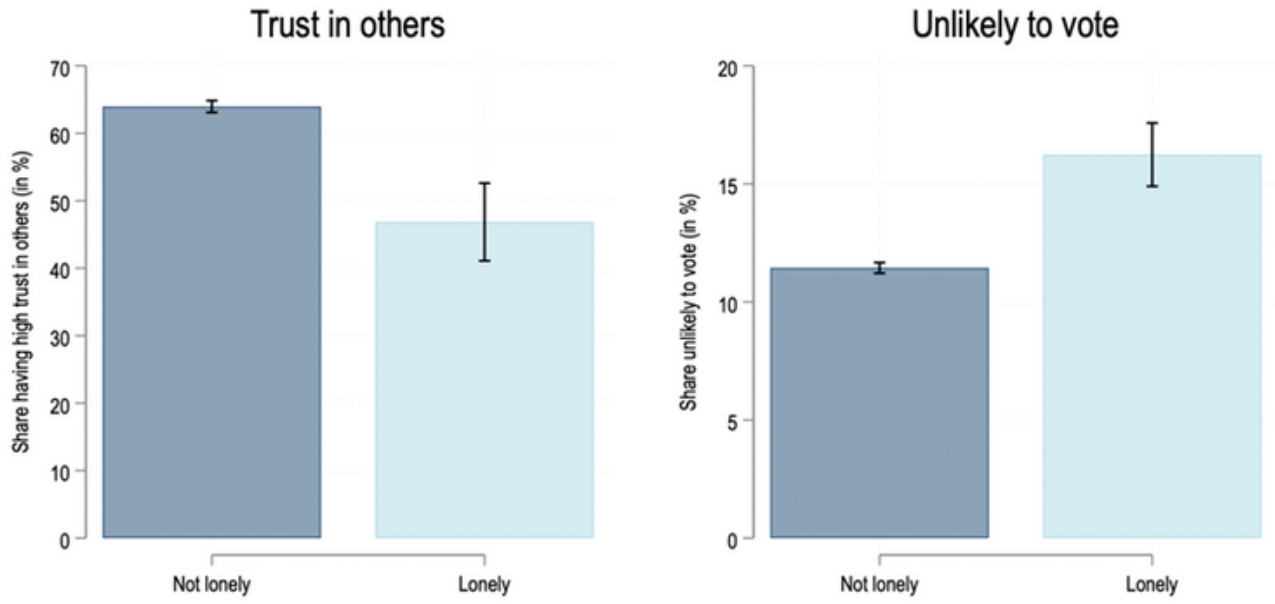
Co-housing doesn't have strict rules about the type of accommodation or number of residents as long as two central principles are met: residents live alongside each other and engage in communal living, designing, and managing their communities (Novy, 2022). This approach, known as senior co-housing or silver (co)housing, is gaining popularity due to shifting demographics and changing family structures in EU countries (Zannella, 2022). Seniors, facing loneliness and isolation due to these changes, find value in shaping their living arrangements alongside others as cohousing offers physical and psychological benefits by fostering community and connection in one's living space.

Co-housing offers a wide range of benefits, from financial to socio-political, with a significant impact on general health and well-being (Carrere et al., 2020). Social inclusion, support, and engagement are essential for mental health and cognitive function preservation over time (Ybarra et al. 2008). Co-housing fosters these factors by creating cohesive communities where individuals collaborate, interact, and provide security, especially for elderly residents who might otherwise live alone. As family structures change in the 21st century, cohousing helps mitigate the negative effects of lacking traditional family support. For seniors, this is particularly relevant as it counters health decline associated with loneliness and isolation (Debevoise, 2023). Co-housing initiatives often report improved self-perceived health over time due to increased social support and reduced reliance on healthcare services (Carrere et al. 2020).

Impact of Loneliness on Trust and Political Participation, UE27, 2022



Source: European Commission, EU-LS, 2022

Fig. 2: Roughly 17% of participants that felt lonely stated that "most likely [they] wouldn't vote" as opposed to non-lonely participants, of which only 11% said they would likely not vote.

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Across Europe, co-housing initiatives are gaining momentum as attractive potential solutions to address the needs of aging populations. While countries like Germany have established robust Institutional backing since the 90s to support co-housing endeavors - as seen with the Miethäuser Syndikat to support co-housing endeavors, with detailed stances and strategies on co-ownership, financing schemes and support networks all to legal norm (Dąbrowiecki, 2022) - others, including Italy, are in the process of navigating legal and regulatory frameworks to facilitate the growth of co-housing communities. Yet, even the latter example demonstrates an institutional appreciation and recognition of co-housing as the government has actively discussed the matter in legal articles passed earlier this winter. Although legal regulation is lagging behind, a considerable amount of private sector actors and NGOs have formed across Europe and are actively engaged in advancing co-housing initiatives and advocating for supportive policies. A couple of examples from Italy are Cohousing Venture, CoHabitando and CoAbitare. Current co-housing initiatives in Italy represent a structure more similar that of nursing homes or long-stay hotels but the notion is nonetheless present, conscious and popularized across the territory, with some examples being Domytis in Bergamo and the VivereOver residences nationwide.

In conclusion, co-housing represents a transformative paradigm in addressing the complex challenges of loneliness and social isolation among older adults in Europe. Beyond offering shelter, co-housing embodies a holistic approach to community living that promotes dignity, resilience, and social inclusion for seniors. As societies grapple with the demographic realities of an aging population, co-housing stands as a beacon of hope, offering a vision of vibrant and interdependent communities where older adults can age with purpose and vitality.

Emerging Innovations Addressing Elderly Loneliness

Intesa Sanpaolo Innovation Center

4

Emerging Innovations Addressing Elderly Loneliness

Aurora Di Campli, Marco Scherian - Intesa Sanpaolo Innovation Center

Human beings are social beings, they experience the condition of loneliness when they feel emotional separation from others, sadness, melancholy, a feeling of abandonment and a desire for more connection.

Loneliness of the elderly is a growing social phenomenon, influenced by changes in family dynamics and increasing population mobility. In the past, the elderly lived within the family, but today, due to smaller families and the relocation of young people for work, the elderly may find themselves distant from their loved ones.

Ageing is a natural process, a phase of life that leads to a progressive modification and reduction of certain functions and capacities, with cognitive, emotional, sensory and motor repercussions. Add to these, changes in the habits of daily life can bring loneliness feeling, particularly when self-sufficiency begins to be lacking and vulnerability increases.

To fully understand the phenomenon of loneliness in older people, it is essential to break it down into several interconnected key elements that offer opportunities for intervention. The person must always be considered in his or her interaction with the environment and therefore the areas identified are health, physical and social environment.

Compensating the feeling of loneliness is a growing need in the Silver Economy and innovative solutions not only represent a business opportunity but can also help to ensure the sustainability of the national care system with technology that is changing and revolutionising the way people relate to each other.

The increasing digitisation of everyday life creates the need to design computer applications avoiding digital ageism, offering a user experience free of all age-based stereotypes, prejudices and discrimination.

Health

As mentioned, health and the absence of security increase the sense of loneliness, especially when there is no physical family support to cope with such conditions.
Factors such as cognitive decline, sensory deficits and age-related pathologies can impact the communication ability of older people. These challenges need to be addressed by caregivers in an empathetic and respectful manner, avoiding that older people perceive themselves as incapable. Even at a distance, an approach centred on enhancing residual skills, adapting communication modes and including assistive technologies is needed to foster effective communication without making them feel marginalised or belittled.
The current development of telemedicine aims to monitor the health of patients by means of biomarkers, objective and assessable biological indicators that can be used to indicate the physiological state of an organism, the progress of a disease or the response to a treatment such as, for example, heart rate and blood glucose. Telemedicine exploits ICT (Information and Communication Technology) technology to enable remote interaction between patients and medical personnel by facilitating access to medical services. In Italy, the **"Piattaforma Nazionale di Telemedicina"**, developed through PNRR funds, is being activated with the aim of reaching 300,000 people in 2025.

With today's available technologies such as broadband connectivity, the use of voice assistants, wearables, robots and IoT devices, it is possible to provide a sense of protection and a fast and reliable communication method at a distance to enable the necessary effective communication with caregivers to cope with emergencies and to reduce the sense of detachment.

The impacts of these technologies have been analysed and are shown in the table below. The levels of benefits found about usability, adherence and patient safety tend to be high but there are challenges to be considered regarding the privacy of collected data, device maintenance and associated costs. Although challenging, it is important to ensure the security of personal data and transparency in its use to take advantage of artificial intelligence and the data analysis on order to have more information on the health status of patients with which to build digital diagnostic or predictive platforms.

	Usability, Ease of Use	Adherence	Patient Safety	Privacy Issue	Maitenance	Cost
Wearables	Medium	Medium	High	Medium	Medium	Medium
Contactless Health-monitoring Devices	High	High	High	Medium	Low	High
Virtual Assistants	High	High	High	High	Medium	Medium
Robotic Assistance	Low	High	High	Medium	High	High
Intelligent Pill Dispensers	Medium	Medium	High	Medium	Medium	Medium

Source: Frost & Sullivan

Looking at practical examples, wearables such as smartwatches or wristbands can provide continuous monitoring of vital parameters, transmitting real-time data to caregivers or assistance systems.

Of relevance is the issue of falls. The WHO (World Health Organization) estimates that 684,000 deaths a year are caused by accidental falls. One service available is SmartCare's Essence Care@Home™, which uses wearable sensors to monitor falls.

The health of the elderly requires not only preventive and analytical interventions, but to ensure their autonomy, support must be provided in activities that become problematic due to age-related frailty. The increase in life expectancy brings the issue of the quality of life of these individuals to the forefront. **Active ageing** is defined as the process of optimising the opportunities inherent in the health, participation and security of older people to improve their quality of life.

Within the market for rehabilitation devices, as shown in the chart below, several categories are identified. **Vision rehabilitation** devices help with restoring maximum possible eye function after a complete or partial vision loss.

In October 2014, the US Food & Drug Authority approved a first vision-improving implantable device which was called the Implantable Miniature Telescope and was supplied by VisionCare for patients with end stage age-related macular degeneration. About **cognitive rehabilitation** in neurodevelopmental disorders, Neuron UP (Spain) runs websites dedicated to brain stimulation. In the context of **language difficulties**, such as aphasia, dysarthria, autism Lingraphica (USA) offers several tablets containing alternative ways of communication to classic speech such as the possibility to write and make the device speak, the possibility to draw and choose pictures; it helps to improve the individual's ability to speak and understand through exercises and targeted content. **Audiologic rehabilitation** devices provide hearing solutions for hearing impaired patients. These devices work by either amplifying the sound or by direct electrical stimulation to the auditory nerve in the inner ear.

Source: Frost & Sullivan

Analysing the future of **physical & occupational rehabilitation** sector in the short-term, manual solutions are still expected to dominate the overall market. In addition to devices, this could include home care interventions by healthcare professionals. In the long-term, virtual rehabilitation is expected to be used more. This perspective suggests that advanced technologies such as virtual simulations and rehabilitation programmes based on digital platforms will lead the way in rehabilitation of the elderly. This transition could offer many advantages, including the possibility to access rehabilitation programmes remotely, thus improving accessibility for the elderly, especially those who may experience loneliness due to limited mobility

Another issue to focus on is **nutrition**, which plays a role in preserving the physical health of the elderly. An adequate diet can positively influence mood and contributes to the prevention of age-related phenomena such as **inflammageing**, a term for chronic low-grade inflammation characterised by a prolonged or excessive immune response to inflammatory stimuli, leading to a persistent inflammatory state.

Loneliness can have a significant impact on the eating behaviour of individuals by making them prone to less balanced food choices or skipped meals.

The market offers diverse types of functional foods and medical foods. Functional foods are readily available from large-scale food retailers and do not require medical supervision. Nutrisure, for instance, has created a company spinoff dedicated exclusively to the production of functional foods, SuperAge. The foods in this line are designed to meet the nutritional needs of the over-50s, who are more prone to protein deficiencies and lower absorption of certain macronutrients. In this case, the food is enriched with protein, vitamins and minerals.

Beyond these scientific aspects, it is important to emphasise that mealtimes not only impact on the physical health of the elderly person, but also play a role from a social point of view, showing the interconnectedness of the spheres. Nutrition is not only a question of nutrient intake, but mealtime can be a convivial opportunity that helps to counteract the sense of loneliness in the elderly, promoting both physical and emotional well-being through sharing experiences and socialising.

Physical environment

The housing paradigm is constantly evolving, with the home increasingly becoming a hybrid environment capable of performing complementary functions.

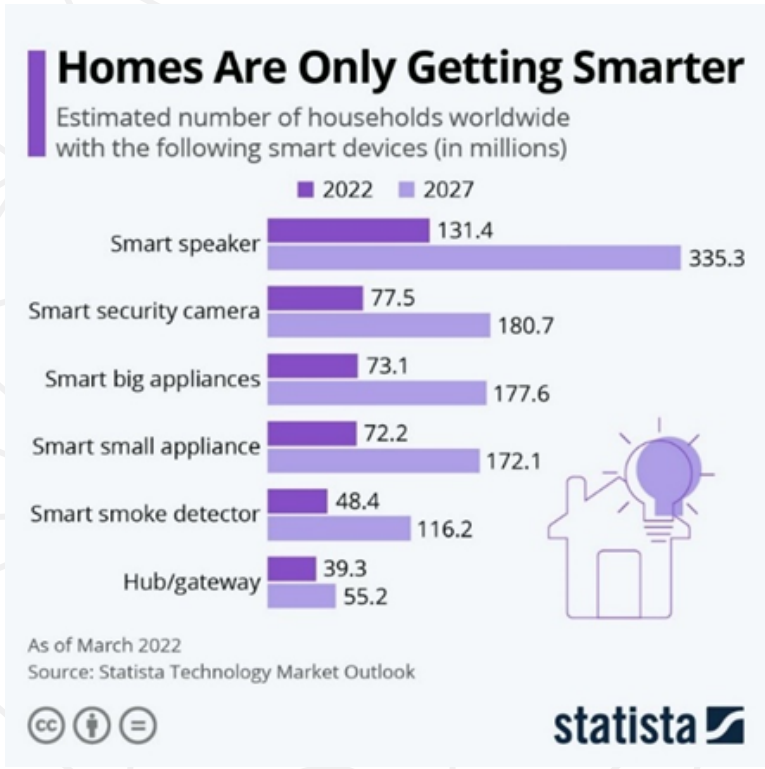
Even though 80% of individuals over the age of 50 own at least one home, these homes are not adequately equipped to meet the needs related to non-self-sufficiency.
This is where **Ambient Assisted Living** (AAL) comes in, which aims to make rooms architecturally accessible and equip them with sensors to collect environmental data in real time. Within the home, empty spaces must be preserved to be functional for movement. The design must consider the manoeuvring space of people moving in each environment. Spaces must also be functional in case of unforeseen events that restrict the movement of inhabitants. The home must be able to adapt to the future needs of its inhabitants and architectural barriers must be reduced or eliminated. The furniture industry is adapting to the needs of the elderly, meeting their specific requirements with solutions oriented towards ergonomics, comfort and safety. The Royal College of Art in London founded the Design Age Institute in 2020; the Institute is working to create a true platform that includes designers, citizens, associations, consumer goods manufacturers, startups and entrepreneurs with the aim of developing solutions oriented towards ergonomics, comfort and safety, adapting furniture design to effectively meet the specific requirements and challenges of the elderly population.

The combination of home automation technologies, artificial intelligence and integrated IoT sensors give rise to the **Smart Home** concept. This system of devices fits into the context of the home, making it possible to improve efficiency, safety, comfort and automatic management of the home's resources through customised and flexible control, even remotely, enabling everyone to live autonomously even in the absence of complete self-sufficiency, as well as facilitating contact with loved ones.

To understand the applications in concrete terms, the ELISAcare system is available on the market, which defines itself as a digital family assistant. The product consists of a device, two motion sensors and an application to send audible and visual alarms, as well as personalised reminders. This system facilitates indirect and unobtrusive monitoring, without the use of microphones or active cameras. A further system is careALERT, an IoT device that can detect data on temperature, humidity and movements in the room. It sends audible alerts to remind people to take medication and has artificial intelligence that notifies caregivers of any changes in habits or abnormal behaviour.

From the 2022 figures to the forecasts for 2027 shown in the graph below, the trends point towards a clear increase in the use of technology devices in the home, with a particular emphasis on the growing presence of voice assistants.

These not only allow communication within the home, but also represent an open door for the automation of indispensable everyday actions.



In short, in everyday life, it is possible to automate simple but indispensable actions such as:

- Entering medicine reminders in the calendar, reminding at the exact time which medicine to take and answering any questions
- Remembering appointments and doctor's visits
- Composing a shopping list and sending it to relatives or the shopkeeper
- Interact with webcams and video intercoms
- Control the switching on and off lights or household appliances
- Manage the heating system
- Manage more complex devices such as alarm systems and cameras

In the wake of Smart Homes also, Senior Housing, residential contexts combining mini-apartments and single rooms with services dedicated to care and social activities, exploit the technologies analysed above.

The importance of being able to continue living in one's own home is explained by the concept, as defined by the US Centers for Disease Control and Prevention, of **“ageing in place”**. This denotes the ability to live in one's home and surrounding community safely, independently and comfortably, regardless of age, income or level of physical ability. The aim is to experience ageing not as a deprivation of one's habits but by embracing the important aspect of a sense of belonging to a community or neighbourhood, where values, histories and informal social support networks are shared.

The growing ageing population in cities is leading to the emergence of **“Age-friendly Cities”**, which reflect the need to adapt urban environments to support the elderly population. For example, new buildings should eliminate architectural barriers and public transport should be accessible. Improved transport services and the future adoption of autonomous vehicles offer innovative solutions to enable older people to actively participate in city life. Improving transport services for the elderly enables them to participate in activities and get out of the house. Furthermore, the creation of community centres, volunteer programmes and digital training initiatives can help to ensure an inclusive urban environment adapted to the unique needs of the elderly population.

The World Health Organisation (WHO) has promoted the establishment of a network of Age-friendly cities and developed a framework composed of eight key areas of intervention.

Currently the network includes 830 global cities that have committed themselves to creating more welcoming environments for the elderly; among them there are only two Italian cities: Udine and Imperia. To implement the interventions included in the 8 areas of action identified by the WHO, represented and described in the table below, technologies can play a key role with a view to achieving increasingly 'Silver oriented' Smart Cities.
The framework for implementing Age-friendly Cities

The framework for implementing Age-friendly Cities		
Scope		Key directions for a city responsive to the needs of the elderly
1	Outdoor Spaces and Buildings	The cleanliness of the city with rules against noise and nuisance odours, well-maintained and accessible green spaces, regularly placed outdoor seating, safe and accessible paving, streets with safe and adequate pedestrian crossings, strict enforcement of traffic regulations and separate bicycle lanes. Public safety, with measures to reduce risks, street lighting, police patrols and concentrated services near the homes of the elderly. Accessible buildings with lifts, ramps, adequate signage and clean and easily accessible public toilets.
2	Transportation	The economic viability of public transport, its reliability and frequency, availability to reach key destinations, accessible and well-maintained vehicles, specialised services for people with disabilities, reserved seating, courteous and traffic-code-compliant drivers, safety and comfort, well-equipped and accessible bus stops and stations, clear and accessible information, community transport services, affordable and senior-friendly taxis, well-maintained and safe roads, refresher courses for drivers, accessible parking and monitoring of the use of reserved spaces.
3	Housing	The availability of affordable housing, essential services accessible to all, adequate design with well-structured spaces, adaptations for the needs of the elderly, sustainable and affordable maintenance, facilitation of ageing at home, integration into the community, adequate housing alternatives, a comfortable and safe living environment, not overcrowded, away from natural hazards and access to financial assistance for home improvements and security.

4	Social Participation	Accessibility of events and activities, with convenient venues and suitable timetables, no hidden costs, affordability and diversity of events. Equipment and facilities must be accessible, well-publicised promotions and clear information to facilitate participation. To address isolation, personal invitations are made, participation is facilitated without the need for specific skills and contact is maintained with members who do not actively participate. Finally, to foster social integration, local facilities promote shared use and interactions between different ages and interests, creating an environment conducive to familiarity and exchange between neighbourhood residents.
5	Respect and social inclusion	Public, voluntary and commercial services are designed with the needs of older people in mind, actively involving older people in advising on services and ensuring trained staff to meet their needs. The public image of ageing is positive and free of stereotypes due to representation in the media. Intergenerational and family interactions are encouraged through inclusive community facilities and activities, while public education includes courses on ageing and actively involves older people in school activities. In community inclusion, older persons participate in community decisions and are recognised for their contribution. Finally, economic inclusion ensures that even economically disadvantaged older persons have access to public services and events.
6	Civic Participation and Employment	Offering a wide range of volunteer and work opportunities for older people, with well-developed organisations and training programmes. Accessibility is ensured through publicity of opportunities, workplace transport and adaptations for the disabled. Civic participation is encouraged, with older people serving on committees, advisory assemblies and contributing to policies and programmes. The contribution of older people is valued, ensuring a respectful and appreciative working environment. In addition, entrepreneurship is supported with opportunities for self-employment, and income from the work of older people is treated fairly, without affecting pensions or other economic support.

7	Communications and Information	A universal communication offer, consisting of print media, television broadcasts, telephone and information centres ensures that every resident receives regular and reliable information. The elderly prefer oral communication accessible through public meetings, broadcast media and personal interactions with trusted individuals, such as volunteers or home care workers. Printed information is presented in large, clear fonts, making it easy to read. The language used is simple and understandable, both in written and oral communication. Telephone answering services provide clear instructions and electronic devices are designed with large buttons for ease of use by older people. Access to computers and the Internet is made easy through numerous public points in places such as government offices, community centres and libraries, with instructions and assistance available to users.
8	Community and health services	Health and social services are efficiently distributed throughout the city, ensuring accessibility by various means of transport. Residential care facilities are located close to services and residential areas to maintain integration into the community. Information on services is clear and accessible, with efficient coordination of individual services and respectful administrative staff. Economic barriers are minimised to facilitate access to services. The provision of health and support services includes home care, covering the specific needs of the elderly, with competent and well-trained providers. Voluntary support is encouraged, involving volunteers of all ages to assist the elderly in various situations.

Source: World Health Organization

Social environment

Entertainment and activities play a crucial role in mitigating loneliness. Moreover, providing opportunities for entertainment and social involvement also helps to improve the mental and physical health of the elderly.

The integration of technologies in this area such as devices and apps can promote a healthy lifestyle. **Sport**, in fact, helps to strengthen the immune system, reduce the risk of obesity and support muscle mass and can prevent the onset of dementia. Through 'exergaming', gamification and physical activity are combined to facilitate active ageing.

These activities can be carried out at home, e.g. OrdoSport is designed to connect people with chronic illnesses with coaches specialised in the management of those illnesses.

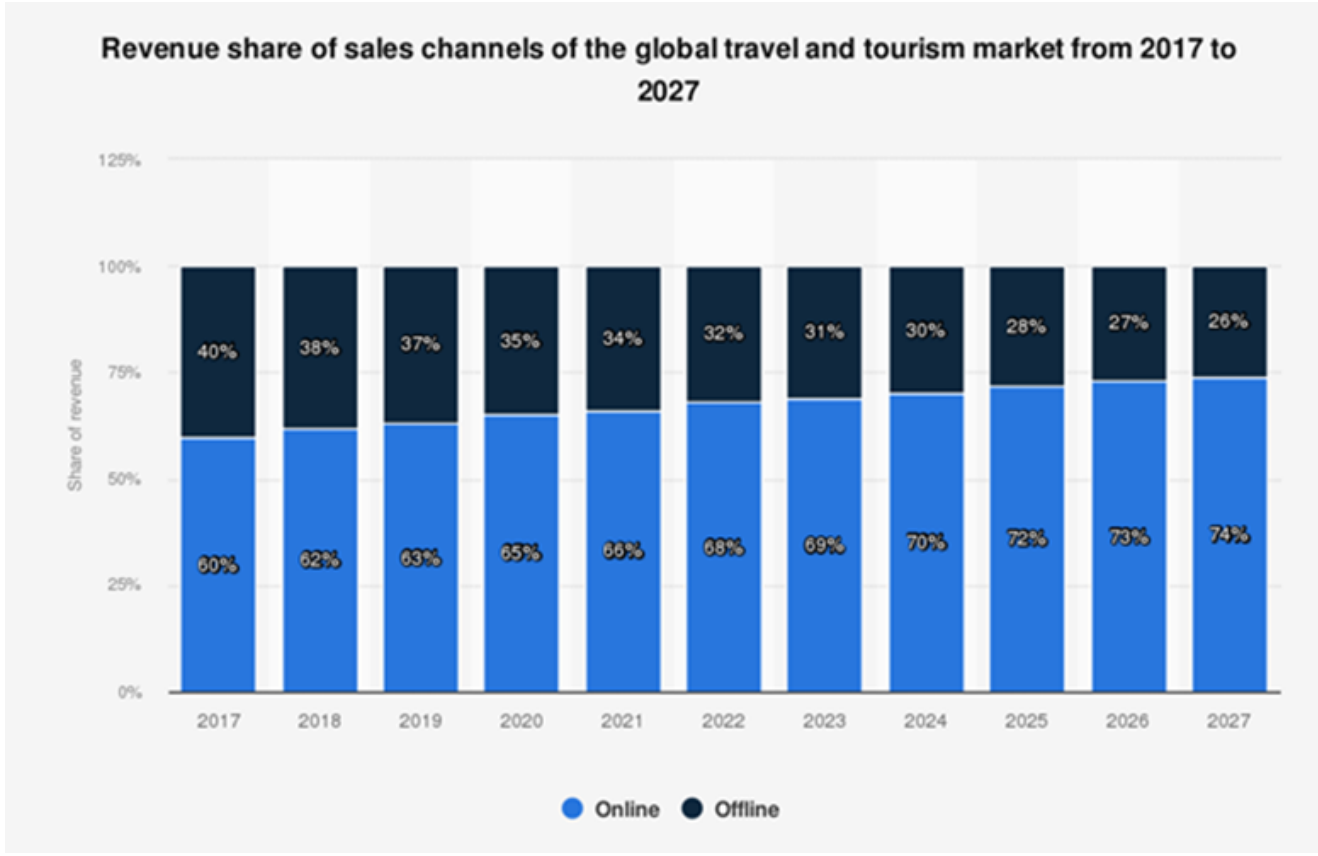
Other activities such as **travel** and **cultural** experiences play a key role in improving the quality of life of older people by promoting sociability.

Online platforms, virtual reality and artificial intelligence make it possible to enjoy new experiences, such as virtual visits to museums while remaining at home, thus helping to combat loneliness for the less self-sufficient and to maintain a link with the outside world.

Silver tourists are looking for personalised services and consider the opinions and recommendations of other travellers. The use of social networks and the internet to search for information on points of interest and cultural experiences is also relevant for silver people and affects their perception of tourism and tourism services. Comments from other travellers of the same age can be perceived as validating the quality and innovativeness of a service.

Some specialised platforms are created with the aim of connecting silver travellers and promoting deep interaction within a community. Cooconers is a digital platform dedicated to silver travellers offering tailor-made services such as trips, courses, travel and events realised in collaboration with dedicated partners. The Italian start-up has developed a community that in its intentions will evolve into a social network to connect and foster interactions between travellers over 55. Community users are called Cocooners and can post photos, information on events, write blogs and propose initiatives to the community. The service was launched in the second half of 2022 and in less than 6 months the platform reached the milestone of more than 100,000 active users.

The use of the online channel to access destination choice and accommodation and service booking services has now become the prevalent mode, so much so that according to the Statista Mobility Market Outlook report of January 2023, the global tourism market is expected to reach a 74% share of revenues through the online channel by 2027.



Source: Statista

Another area of technology to look out for in the future are **humanoid robots and pet robots**. These innovative devices are emerging as one of the future trends in assisting the elderly and combating loneliness.

The European experimental project ACCRA, which developed robots such as ASTRO for mobility assistance and BUDDY for companionship and sociability, was concluded in 2020. The current trend is still towards more interest in robotics for assistance than for companionship. Robots undergoing testing and commercialisation use Artificial Intelligence and Machine Learning to create natural interactions. Intuition Robotics' ElliQ is an example of a non-humanoid robot designed to stimulate daily life and keep users' cognitive abilities through proactive interactions and simulating empathy. ElliQ differs from smart speakers in its ability to mimic human expressions and offers stress-reduction capabilities.

The Pet Robot phenomenon represents another category of robots designed to reproduce the experience of having a pet without the commitments associated with a real animal. These robots are particularly useful in situations where a real animal might suffer or cause stress.

They replicate the positive effects of pet therapy, offering companionship, empathy and comfort.

The PARO robot, marketed between 2003 and 2011, was an example of a seal pup designed to interact with patients suffering from dementia or autism. Scientific studies have shown its effectiveness in reducing the use of drugs and stress levels. However, its high cost, around $6,000 per specimen, has limited its spread. Other pet robots, such as those of Ageless and Tombot, offer inexpensive but realistic robotic cats and dogs in terms of interaction. Ageless focuses on the silver population with neurodegenerative diseases, offering affordable products, while Tombot has created Jennie, a high-quality animatronic puppy dog designed with the involvement of Hollywood professionals.

Despite the ongoing challenges, technological developments, price reductions and the introduction of new models could open new market opportunities and increased adoption.

Understanding behavioural patterns of the 60+ population towards sensor-based technologies tracking health and wellness

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AmplifonX, Publicis Sapient - Research Centre of Excellence

1. In Brief

The research investigates the behaviour of the 60+ population towards sensor-based devices, exploring the emerging patterns in tracking health and wellness and how attitudes and behaviours are currently evolving.

The emerging multifaceted approaches towards care and technology were used to define clusters of behaviours that took shape into six behaviour profiles. These profiles are characterized by different needs, enablers and blockers in their relationship towards self-care and its tracking.

The research findings indicate that 60+ people are redefining their perception of physical and mental health, their role in society and their relationship with the healthcare system.
Moreover, they have increasingly incorporated technology and digital solutions in their daily lives: they are expanding their awareness towards well-being practices, and they have new expectations for the quality of life they want to keep, ultimately redefining the meaning of ageing.

The research establishes the concept of agency as key for the design of product-service systems for the 60+ population. Considering agency as a perspective and as a perception of the ability to perform and control the impact of their actions, leads to new visions of empowerment. Ageing for 60+ is defined by the ability to determine and protect their lifestyle.

2. Introduction

The invention of sensor-based technologies has been a turning point in the amount of data available about people's bodies. The rapid increase in the availability of sensor-based devices and their growing adoption by the older population is set to redefine the meaning of ageing.

Medical devices, digital therapeutics and consumer products now extensively leverage sensor-based technologies that transform physiologies into visualised information. Service offerings are already adapting to the growing demand for tailored solutions, while the healthcare system is moving towards virtual and virtually enabled care.

Approaches to self-care are disparate, and while the use of sensor-based devices among the 60+ population is on the rise, their behaviours and the meanings and drivers for health and well-being monitoring practices are as multifaceted and complex.

This research outlines the current context and emerging trends regarding healthcare technologies, service and market landscapes and develops an in-depth analysis based on a qualitative survey to map the behaviours, needs and attitudes towards monitoring practices for health and well-being.

3. Context and Background

An elderly person can have physical and mental capacities similar to many 30-year-olds. This also means that one can experience significant declines in capacities at a much younger age. There is a large spectrum to ageing, no one is the same. This diversity is not incidental, physical and social environments impact on people opportunities and behaviours towards health. Thus socio-economic, service, market, and technological landscapes must be taken into consideration when understanding behavioural patterns of the 60+ population towards sensor-based technologies tracking health and wellness.

Socio-economic landscape

The world's population is ageing: today, there are 1 billion people over the age of 60 globally. Since the 60+ population is growing faster than any other age group, by 2050, 20% of the world population (2 billion people) will be over the age of 60. ("Ageing and health"). About 70% of people over 65 will need long-term care at some point in their lives.
Moreover, people with no spouse, children or close family at or near home make up 12% of the population ages 50+ in the United States. On the other hand, in 2010, there were 7.1 potential family caregivers for every person aged 80 years old or more. By 2030, there may be only 4.1 potential caregivers for every 80+ person.

Service landscape

Post-pandemic studies have indicated a 38X times usage of telehealth from the pre-COVID-19 baseline, with a penetration of 50% in psychiatry, 30% in substance use disorder treatments, 16% in Rheumatology and many more. Based on this trend, it's been estimated that $250 billion of US healthcare spending could shift to virtual and virtually enabled care.
63% of US Baby boomers said telehealth visit's quality was the same as an in-person visit.
Half (52%) of clinical trial operators or managers said one of the biggest benefits of remote patient monitoring is its ability to provide a more comprehensive supply of real-time data and insights.

Market landscape

The global wearable market hit a record number of shipments up nearly 11% from the prior year. Consumer demand was driven primarily by interests in health and fitness tracking products, Last year, 72.6 million people in the US were monthly users of smart wearables, such as smartwatches and fitness trackers, up 15.5% from 2019, according to eMarketer estimates.
When it comes to Baby Boomers, 13% of 56+ US Adults declare using a smartwatch to monitor their health, scaling up to 19% when it comes to other smart devices (such as blood pressure cuffs). Digital therapeutics market is projected to skyrocket from $5.8 billion to $56 billion global market by 2025.

Technology landscape

Advanced medical technologies are changing the healthcare landscape.
Technology is at the forefront of sensor-based technologies, bringing to life what before was impossible. Collecting data directly from one's body and transforming it into available and actionable content. Technology companies operating beyond the realm of healthcare have been tapping the industry as a growth opportunity.
The number of smartphone owners who used one or more health/fitness Apps on their phone, at least once a month, increased by about 20 million from 2019 to 2020.
At the same time an increase of +20% in the number of mHealth apps that integrate with certified EHRs (Electronic Health Record) was measured between December 2019 and December 2020.

Trends

In this fast-evolving landscape, several major trends concern health-related sensor services for the 60+ population.

A growing care-gap

The population over the age of 60 is growing faster than any other age group. This increase is occurring at an unprecedented pace and will accelerate in the coming decades. By 2050, 20% of the world population (2 billion people) will be over the age of 60 ("Ageing and health").
Many countries are experiencing a shortage of caregivers, as it is becoming more common for a family caregiver to be caring for more than one older relative at the same time. This rising demand and shrinking families will increasingly strain family caregivers and those they care for.

The Arrival of the Quantified-self

The widespread use of smart-sensors in our smartphones, wearables and IoT devices has increased drastically the amount of data available to users on their health and habits.
The increased data availability will enable people to better manage (Quantified-self) their wellbeing and health conditions and to take growing ownership of their care practices.

Elderly Adopters Growth

The growth in adoption of the lower ageing share is shaping a scenario that sets the ageing-based digital divide to become very thin by 2030.
The gap with the younger generations is getting closer and closer as the latter plateau.

Healthcare Consumerism

Medical consumerism is the near-future: individuals will essentially be in control of their day-to-day health, with the support from a dedicated care team.
Patients are expecting more direct interactions with providers and specialists, and to be proactively reached in case of need by their caregivers.

Post Covid Proactiveness Acceleration

During the tragedy of the pandemic, telehealth offered a bridge to care, and now a chance to reinvent virtual and hybrid care models, with a goal of improved healthcare access, outcomes, and affordability.
Insurance services are increasingly shaping their offers, tailoring them around client needs, lowering the risk of health-related accidents and prices accordingly.

Data Trust and Security

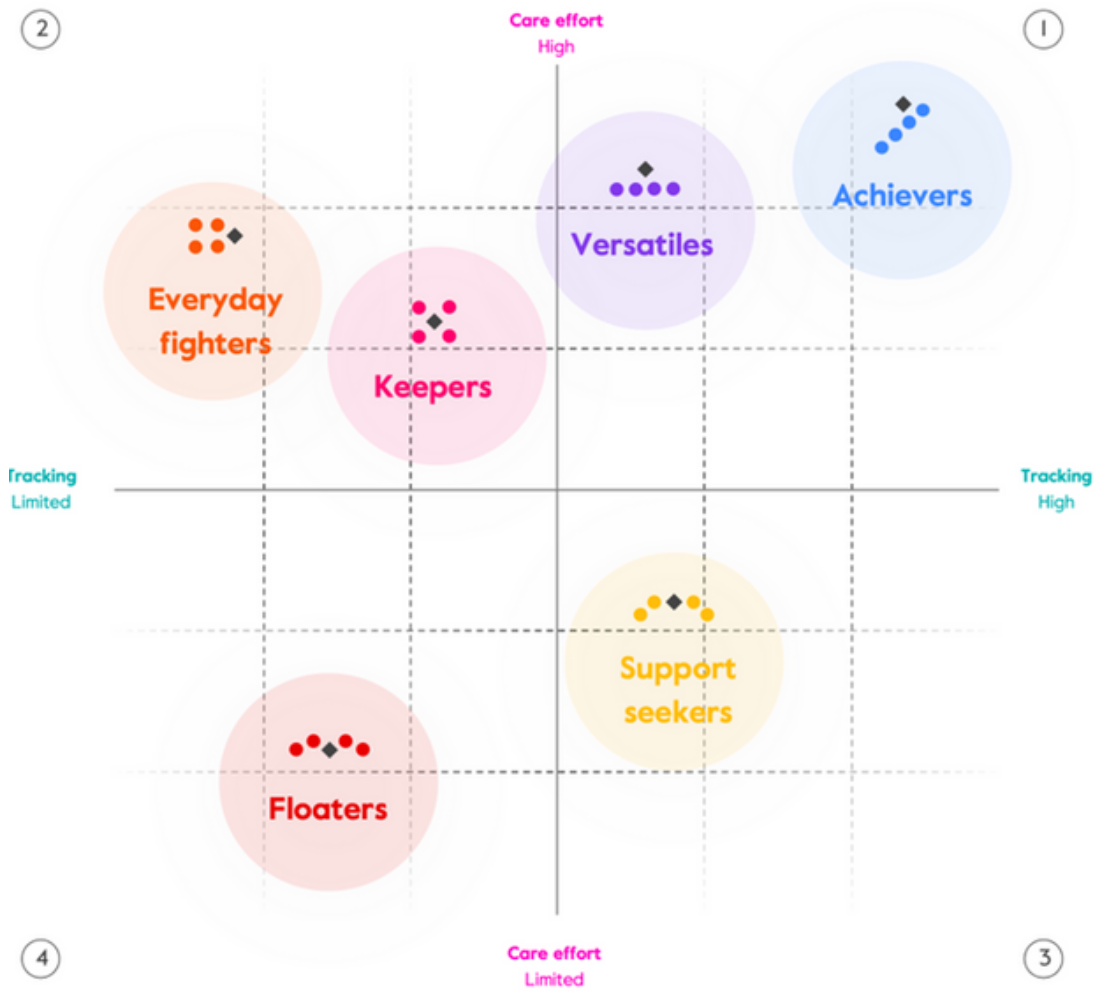
Consumers trust their doctor more than any other healthcare entity or organization. The reason is obvious: doctors are often the face of healthcare, the first resource people turn to when a medical situation arises.
They're also entrusting their personal data to someone else, and they know their records will be shared with other entities such as hospitals and health insurers.

Mental Health Awareness

An increase towards mental health sensitivity is reflected from the media and the market, shifting the perspective to an integrated and comprehensive perspective of wellbeing.
After the pandemic, people started looking for mental health care and support in less conventional ways than before.

4. Behavioural patterns and profiles definition

The research has identified six different behavioural profiles, thanks to the matrix adopted for profiles building and clustering, starting from the main topics and keywords that have been set for this research: **Care / Social ecosystem / Attitude towards tracking / Tech confidence.**



Looking specifically at the vertical axis of the matrix – coinciding to the Care effort – it has been arranged that a low level of care effort corresponded to practices exclusively connected to health status and to the control of particular medical conditions; on the other hand, higher care efforts corresponded with the coordination of different attempts to stay well, not only connected to medical health, but also referred to a more holistic perspective of well-being and peacefulness.

The horizontal axis, pertinent with the Amount of tracking, developed in the same way: a low level represented a series of limited tracking behaviours in terms of quantity, but they were also strictly related to medical-health parameters. High levels of tracking instead indicated an increase of these attitudes, for which other wellbeing monitoring practices could be also involved – e.g. from fitness to food or sleeping hours tracking.

Eventually, four specific quadrants with distinct features have been identified:

1. High care effort and high amount of tracking – "Care routine as part of their lifestyle": well-being practices strongly characterize them and are deeply part of their lifestyle and values.
2. High care effort and lower tracking practices compared to the first quadrant – "Care routine as a way to pace themselves": self-care activities have an important part in their daily routine and constitute an opportunity to slow down and practice personal passions and hobbies.
3. Low care effort and higher tracking behaviours – "Tracking as the only way to be in control of themselves": tracking is the only means to keep control of their health and medical conditions.

4. Limited care effort and low amount of tracking – "Tracking and care become an obligation during their ordinary days": self-care routines and tracking behaviours are extremely hard to maintain and keep on track.

Behavioural Profiles

The description of the behavioural profile tool and the introduction about how the matrix has been developed allows to elaborate the position and characteristics of each profile; from the first to the fourth quadrant: Achievers & Versatiles (1st quadrant), Keepers & Everyday fighters (2nd quadrant), Support seekers (3rd quadrant) and Floaters (4th quadrant).

First quadrant – Achievers & Versatiles

The two clusters of the first quadrant (Achievers & Versatiles) are **the most active profiles of the matrix.** They stand out above all for having a high level of care routine, leveraging and finding the right motivation in surrounding themselves with electronic and physical tools allowing them to track their data and support their daily self-care practices (from fitness, to diet, up to meditation).

Achievers live an active and sporty life, using data to increase their performance and be in control of their health.

Versatiles can't do many activities because of their health conditions: wellbeing is more holistic, linked to dieting, shared activities with friends or mindfulness.

Second quadrant – Keepers & Everyday fighters

This second quadrant includes the behavioural profiles Keepers and Everyday fighters: where care efforts continue to be high (as will emerge, with results not more oriented to performance) but with less sustained tracking behaviours compared to the clusters of the first quadrant. Their perception of well-being is more related to a **general feeling of calm and relaxation** rather than enjoying active and full routines; healthy practices correspond to slowing down and not being overstretched, since ageing is perceived as the time of dedication to personal passions and spending time with loved ones.

Keepers counter their health problems by trying to slow down and not overstretch themselves; technology is considered overwhelming.

Amplifon

Everyday fighters, severely limited in their body and fitness activity, their self-care practices coincide with a sense of responsibility and a need to be engaged and useful in all their activities.

Third quadrant — Support seekers

In this quadrant, one behavioural profile has been clustered (Support seekers). This and the following section introduced in the next paragraph, are the areas of the matrix with reduced care effort. Fewer respondents were placed here (most people lie in the upper ones) and these quadrants include only the presence of people from the US.

Support seekers are hindered by their medical conditions and struggling with mental health. They do the bare minimum to take care of themselves.

Fourth quadrant — Floaters

The final quadrant hosts the last behavioural profile of this research: the **Floaters**. This is the section with the least care effort and tracking behaviours of the matrix. People included here have difficulty in practising the majority of their daily activities and also monitoring their behaviours, since they lost any sense in maintaining this practice.

Floaters are strongly hindered by medical condition, they fight with depression and they are discouraged with their active care.

5. From ageing to agency: a perspective

By exploring wellbeing and monitoring related behaviours of respondents in the 60+ age group, it was possible to have a deep dive in their physical and mental health self-perception, in their expectations towards their role in society, and in their relationship with the care ecosystem. The previous sections explored motivations and needs behind taking care of themselves, mapping the key enablers and blockers towards it. This synthesis process explored the meanings of ageing, and how its perception is evolving, due to social, economic, cultural, and technological changes.

There are some main important observations regarding respondents' behaviours in this regard. They have incorporated tech and digital solutions that up to recent years were associated with younger people, with the strong determination of keeping pace with the context they live in. **They increased and expanded their level of awareness towards what well-being means**, bringing it to a new standard of expectation towards the quality of life they want to keep. Furthermore, **they are in the process of redefining what ageing means to them**, starting from their capacity to act and **control** their physical and mental conditions, and their lifestyle.

All these lead to the need of considering an important concept to design for this group of people — agency. The concept of agency is deemed not only as the way people act independently, but also as their perspective and perception of the ability to perform and control the impact of their actions. [For a socio-anthropological perspective on the concept of **agency** (Giddens #) (Bourdieu #)]
Those working on products, services, and experiences for the ageing population, should be aware of the risk of assuming the perspective of designing entirely for the deterioration of the body and mind. This narrow perspective leads to developing aid-based visions and paradigms for the elderly in need, without taking into consideration the agency, and a dimension related to their empowerment.
Instead, **the perspective** this paper wants to introduce is exactly about framing the 60+ population **on a journey of redefining what participating in their life could mean, and what role taking care of their wellbeing could play.**

There is a bold approach shift, moving from a vision where ageing is considered an inevitable, all-embracing condition to compromise with, towards a new one, where 60+ people are willing to determine and protect their lifestyle, and ultimately be in charge of what happens to it, here **agency**, plays a central role.

To make this shift (from ageing to agency) happen, it would be necessary **to set the foundation for a new health tracking paradigm. Moving from the current one, based on rigid, standardised and same for all parameters, with a focus on self-monitoring, to a new relational, ecosystem-based model**, that will be able to change and evolve according to users' conditions, contexts, and needs, not forcing or stressing them to compare themselves, and fit to younger-healthy-adults standards.

Ultimately, the proposed new approach consists of designing tracking paradigms, devices, and algorithms that are conceived to strengthen, guide and support 60+ sense of agency, considering the diversity of senior bodies, minds and lifestyles, and work to support the elderly in cultivating them, not (just) in progressively renouncing to do it.

Startups, cases and innovative experiences to tackle loneliness and foster socialization

AC75 Startup Accelerator

6

Startups, cases and innovative experiences to tackle loneliness and foster socialization

Enrico Polenta, Floriano Bonfigli, Mario Salerno - AC75 Startup Accelerator

In this chapter some cases and startup examples are reported in order to illustrate how innovation in the field of socialization and the contrast of loneliness is pursued and implemented.
Exploring the field, three areas of activities have mainly emerged:

- digital platforms to help seniors in socializing especially choosing common interests and activities or finding mates or companions to spend their time with:
  - The Colette Club
  - Gubbe
  - Stitch
- companion robotics as tools to reduce the sense of loneliness specially in a wellness and healthcare perspective:
  - ElliQ
  - Paro
  - QTROBOT (by LuxAI)
- initiatives related to new ways to organize villages or cultural activities as opportunities to have a better life
  - Cannock Mill Cohousing
  - COPE
  - The Village Movement
  - On the Brick

The recognition performed when mixed with the content provided in other chapters of the present report allow to make some comments and remarks that could be useful for future developments.

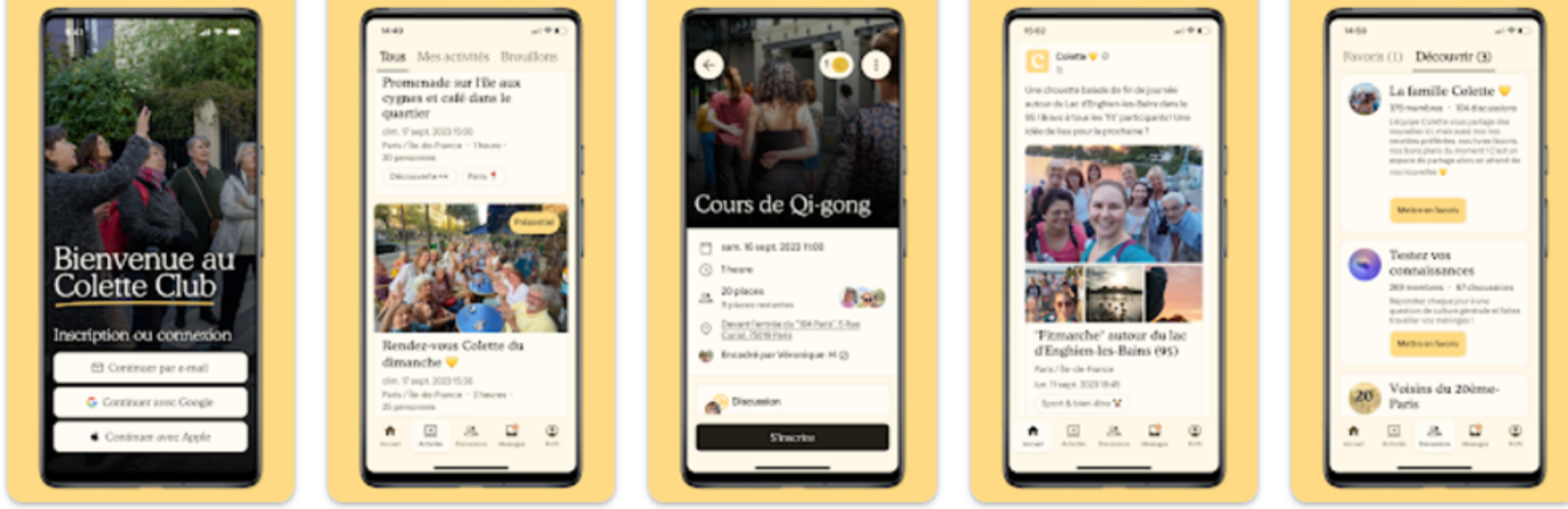
When it comes to digital, it is often a matter of digital platforms, matchmaking or social networks. It is obviously connected to global trends in the digital economy, but the success of this platform is linked to their accessibility and usability, and to the ability to really satisfy the need of relationship, moving from digital to physical space.

Companion robotics could be an effective solution to alleviate peculiar conditions of loneliness connected to the absence of a family or relatives or to specific health conditions. The shortage in care workers could also foster the adoption of these solutions both in the homecare and in the nursing home contexts. Nonetheless, social habits and cultures can influence the degree of acceptance of such technologies as substitutes of human relationships.

Some seminal experience, not reported among the cases, point out to areas that should be explored in the future. An example is the initiative “Camminando per l’EUR” (“Walking around EUR”, EUR is a district in Rome where the initiative is based). It started during the Covid period, and it is organized as a Facebook group with 10.000 participants and 35 walking proposed every week with different levels of duration and difficulty. It is managed by volunteers, it’s free, allows people to have a physical activity and to socialize.

Overall, the presence of a relatively scarce number of examples -for example concerning lifelong learning, cultural experiences, pets and entertainment- can be considered as a signal of the room available for innovation and startups willing to leverage socialization and connectedness as a means of wellbeing and healthy ageing.

THE COLETTE CLUB



The Colette Club is a French startup headquartered in Paris. They are addressing older adults' sense of loneliness by pursuing intergenerational sharing. Colette's most widespread service is intergenerational cohabitation: through an all-in-one platform, senior hosts can rent their spare rooms or flats to young students and professionals, offering an affordable price and establishing relationships of trust and friendship with their tenants to break the solitude.[21] Colette assists users in all administrative matters, it collects rental payments online and passes them to the hosts, deducting a service fee in the process. The platform users are then only left with the search for the perfect housing mate. The nobility of the social impact that Colette has, especially in the older segment of the population, is reflected in market results: more than 900 housing matches have been formed since 2020, and more than 85 thousand nights of accommodation have been booked on the platform, not only in Paris but also in Bordeaux and Lyon regions. Values of mutual aid, sharing, and solidarity are driving the startup to constant growth of their community. The startup revenues have doubled from 2022 to 2023 and investor attractiveness is also consolidating, demonstrated by the 2023 seed round of 3 million euros.[22]

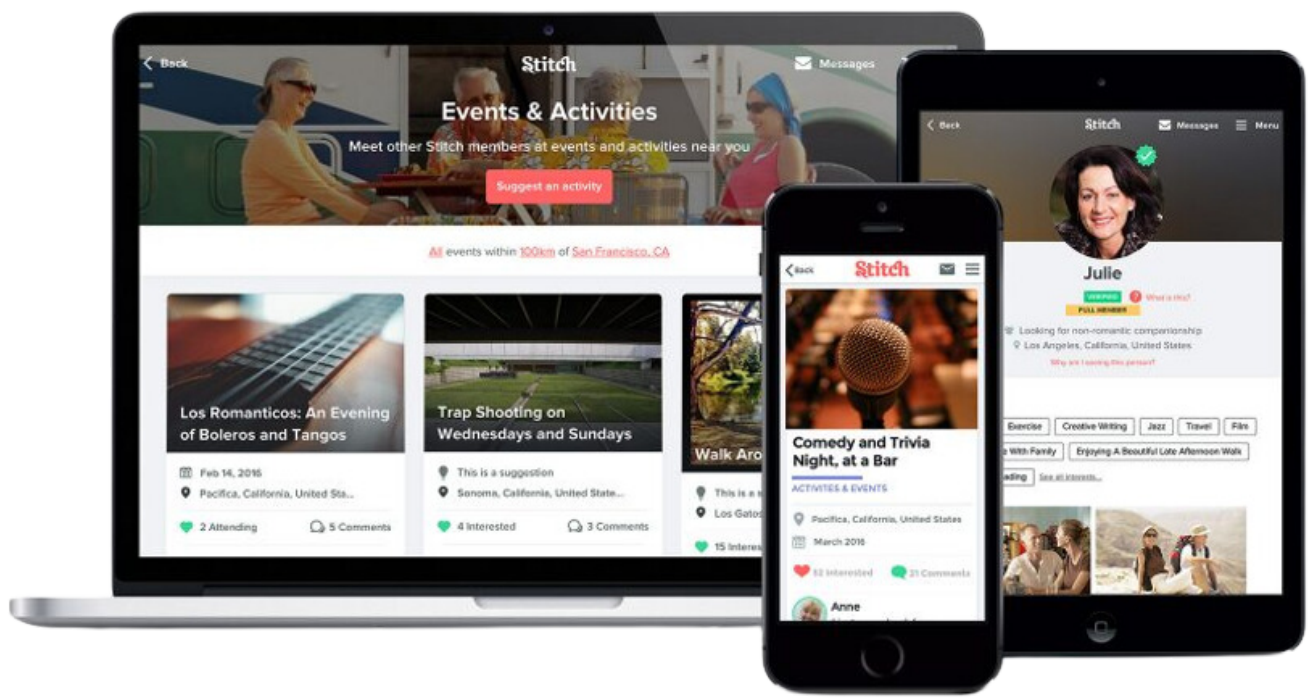
[21] https://start.lesechos.fr/innovations-startups/tech-futur/colette-la-start-up-qui-democratise-la-cohabitation-intergenerationnelle-leve-1-million-deuros-1250200?xtor=CS2-12
[22] https://app.dealroom.co/companies/colette_club

GUBBE

Launched in 2018, Gubbe provides a new kind of non-medical care for the elderly, helping them to stay active and perform everyday tasks. Since its establishment, Gubbe has been delivering caregiving services, extending assistance in both daily activities and mental well-being to elderly individuals residing independently. The company has broadened its operations to encompass three countries: Finland, Sweden, and the United Kingdom. The youth support personnel, known as "Gubbe Helpers," visit the elderly, helping by accompanying them on walks or during shopping trips, and providing mental care by engaging in meaningful conversations. This approach contributes to heightened physical activity, enhanced mental health stability, and an overall improved quality of life for the elderly. Gubbe provides an application designed to facilitate the collective management of various processes, from the recruitment of young professionals to user matching. The platform is designed to enhance usability for both service users. The startup race for 10 million euros in funding is a natural consequence of the two founders' ambition to expand a model that amazingly worked in Finland and is replicable across Europe, having the opportunity to make thousands of older adults feel less lonely and aging actively.[23]

[23] https://www.talouselama.fi/uutiset/sandra-lounamaa-ja-meri-tuuli-laaksonen-hakivat-10-miljoonan-rahoitusta-yritykselleen-mutta-potti-jai-puoleen-ei-kukaan-sano-syyn-olevan-se-etta-olemme-blondeja-naisia/e5587f93-6e64-41f0-a1a6-1a6d8507f876

STITCH



Headquartered in Sydney, Australia, the startup Stitch is building a community dedicated to assisting individuals over 50 and above discover the companionship they seek. Stitch's mission is to enhance the lives of older adults worldwide, offering a solution to the pervasive issues of social isolation and loneliness that inevitably arise at later stages of life. Whether one is looking for friendship, romance, or anything in between. The startup aims to be the answer to those fundamental needs. Stitch community enriches older adults' lives with activities, interest groups, social connections, and companionship. Over 150 thousand members share Stitch's vision and connect every day, borderless. Although the platform is accessible for free on laptops and mobile phones, it also offers a premium tier, providing members with additional features improving user interactions, and even introducing member-to-member phone calls. The company reports that more than 10% of registered users choose to upgrade their profile, confirming that older individuals seek interactions with each other and continuous stimuli from life. Part of 500 Startup's 9th batch, Stitch is one of the many successful startups alumni, and received financial support from the accelerator in 2014, closing a 5 million seed round, and in 2021 in a venture round.[24]

[24] https://app.dealroom.co/companies/stitch

ELLI-Q

ElliQ is an AI-driven companion created by Intuition Robotics to assist and accompany older adults in their pursuit of independent aging, aiming to alleviate feelings of loneliness and isolation. It is a social robot making real-time decisions, combining AI conversations, and delivering content in a fully integrated screen. Since 2017, the robot has consistently shown its capacity to sustain user engagement through daily health check-ins, cognitive and physical activities, and connection to family and friends. The usage of the device, as reported by the New York State, has resulted in a 95% reduction in loneliness among users.[25] ElliQ is offered as a fully subsidized service to hundreds of thousands of silvers through government agencies, non-profit organizations, and healthcare payers. Different actors showed interest in the solution and its values: in addition to numerous strategic partnerships, the startup secured a funding round of 20 million in equity in 2023 to further develop software and hardware, and to extend its reach to a broader elderly demographic, helping to improve healthcare ecosystem while offering valuable insights and context about the users.[26]

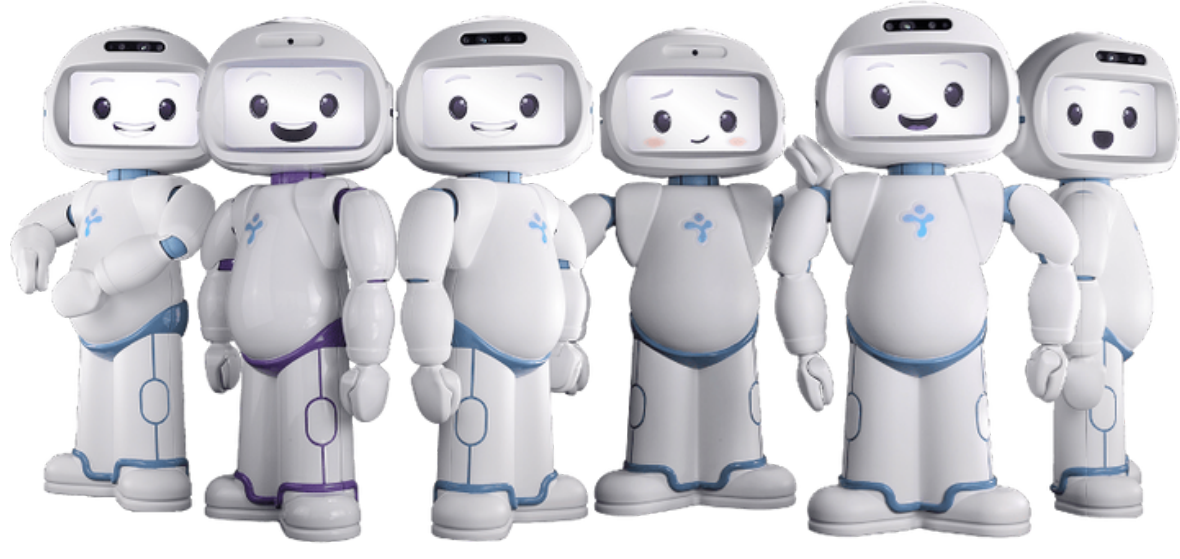
[25] https://www.therobotreport.com/intuition-robotics-brings-generative-ai-capabilities-to-elliq-3/
[26] https://www.prnewswire.com/news-releases/following-a-successful-commercial-launch-intuition-robotics-raises-25m-in-additional-funding-301911349.html

PARO

In 2004, Paro was one of the first social robots to be marketed, initially to bring psychological enrichment and companionship to senior citizens. The certified medical device has been verified to improve the well-being of patients dealing with dementia, Alzheimer's, and other intricate cognitive disorders. This is particularly beneficial in environments like hospitals and care homes where the inclusion of live animals would pose challenges in terms of treatment or logistics. Paro is equipped with five types of sensors, including tactile, light, auditory, temperature, and posture sensors, enabling it to perceive both individuals and their surroundings. The light sensor enables it to distinguish between light and darkness. Its tactile sensor allows it to perceive sensations of being gently stroked or tapped, while the posture sensor detects when it is being held. Additionally, the robot can discern the direction of sound and recognize specific words, such as its name, greetings, and expressions of praise. Ever since its introduction, the lifelike seal has been elevating patient engagement in care facilities in different countries, primarily in Japan and the US, then across the UK and Ireland through local distributor Sense Medical.[27] The design of the robot evokes feelings of calmness and affection, and according to scientists, the response of care home patients to Paro's stimuli led to a reduction in negative emotions, improved social engagement and quality-of-care experience.[28]

[27] https://www.paroseal.co.uk/public/site/pdf/press/Paro-Sense-Medical-Press-Release.pdf
[28] https://bmcgeriatr.biomedcentral.com/articles/10.1186/s12877-019-1244-6

QTROBOT (by LuxAI)



Created in 2017 in Luxembourg, QTrobot by LuxAI is a small humanoid serving as a valuable tool for therapists and educators, employing facial expressions, gestures, and interactive games to impart lessons on communication, emotions, and social skills. Initially tested on children, it has recently found space in the lives of seniors who show cognitive impairment tendencies. According to TechCrunch, the robot represents a link between therapists and patients, being a noticeably better option than using a tablet or an app. Researchers also found that the robot doesn't become the focus of the therapy but instead helps caregivers connect with the patient.[29] As reported by LuxAI, the humanoid's behavior is very simple to understand, other than engaging and non-judgmental. Some interesting use cases include Toyota's research center which analyzed the use of the robot as a social companion for senior patients, in Indiana University as conversational support, and in Middlesex University in London which made QTrobot play musical instruments as a therapy in elderly care homes. The price of the humanoid varies from €9.500 to €15.000, depending on the functionalities, these concern the robot's ability to see, hear, and speak, other than its programmability and connectivity. Supported by grants from the Luxembourg Ministry of Economy, the European Innovation Council, and EIT Health amounting to €300 thousand,[30] LuxAI performed long-term trials at various centers in Luxembourg, France, and Germany studying the robot's impact on social competence, emotional well-being, and interaction with people.

[29] https://techcrunch.com/2018/08/13/this-happy-robot-helps-kids-with-autism/
[30] https://app.dealroom.co/companies/luxai_1

CANNOCK MILL COHOUSING

Cannock Mill represents a groundbreaking initiative in sustainable living, encapsulating the essence of senior cohousing. Originated 15 years ago within a walking group, the concept emerges from concerns about the loneliness of older individuals. The group envisioned a community providing a balance between solitude and companionship. The community navigated challenges such as securing an appropriate site, funding the project, and establishing a collaborative company structure, investing over £10 million.[31] Residents at Cannock Mill actively participate in shared activities, ranging from communal cooking sessions to collective gardening, fostering a sense of utility and shared responsibility. The cohousing model is still evolving in the UK, with Cannock Mill standing out as one of the pioneering completed projects among the 50 currently underway.[32] The winning initiative serves as a testament to the viability of sustainable cohousing models in addressing social challenges. The success of this project underscores the need for embracing alternative living arrangements beyond the conventional paradigm of independent homes. As the silver residents navigate the journey of aging together, Cannock Mill stands as a beacon of innovative, community-centered living.

[31] https://www.thetimes.co.uk/article/1709c76e-3c41-11ee-87d9 ff29f95b54f7?shareToken=b314c9fc811dde2dfff58014aef220df
[32] https://cohousing.org.uk/

COPE

CULTURE ON PRESCRIPTION

The Erasmus+ project, Culture on Prescription, is a social intervention inspired by successful social prescribing practices previously implemented in the UK and Ireland. The primary objective is to engage senior participants with experiences linked to art, culture, and social activities to mitigate isolation and loneliness. Cultural prescribing involves healthcare or other professionals recommending local art and non-clinical initiatives to senior citizens to provide them opportunities to interact with each other in different activities, while improving their social skills and sense of belonging, other than finding new friends and contacts. The cultural activities are a recipe entitling people to a free educational opportunity that emphasizes their talents and aspirations. The COPE project includes several partner organizations in 6 European countries. Institutes, associations, and non-profit organizations from Germany, Ireland, Belgium, Portugal, Romania, and The Netherlands are collaborating to facilitate the dissemination of this initiative helping to identify it as a best practice for further expansion in the European Union. Visit https://culture-on-prescription.eu/ for more.

THE VILLAGE MOVEMENT

The Village Movement is a grassroots initiative that originated in 1999, driven by a group of older adults who aimed to age independently in their homes while remaining socially engaged in their neighborhoods. The Movement emerged as an alternative to traditional solutions such as nursing or retirement homes, emphasizing active community involvement and support among participants. It became a proven model with over 300 villages established all over the US.[33] The impact of this initiative is translated into a reduction of social isolation, expanded access to services, and increased overall well-being. Villages are nonprofit, community-based organizations seeking to transform the aging paradigm. While each Village is unique, they share common features such as fostering an inclusive community, offering membership-driven and self-governing structures, coordinating access to affordable services, and positively impacting various aspects of seniors' lives. 90%[34] of seniors in the US wish to age at home: Villages help fulfill this desire, offering practical support, social connections, and tools for successful aging. With a proven track record and ongoing nationwide growth, this movement presents a promising model for the future of aging, emphasizing community, support, and the preservation of seniors' autonomy.

[33] https://www.helpfulvillage.com/the-village-movement
[34] https://choicemutual.com/blog/aging-in-place-statistics/#:~:text=Over%2090%25%20of%20older%20adults,can%20cost%20up%20to%20%24100%2C000

ON THE BRINK

In the Sheffield Area, UK, On the Brink is a model of multi-generational cohousing, where residents live independently and share communal spaces and a collective ethos of companionship, ecological awareness, and mutual respect. This blending of privacy and social interaction offers a powerful antidote to the isolation commonly experienced by the elderly. Distributed in more than 11 flats, residents enjoy private homes alongside communal areas for cooking, dining, gardening, and leisure activities. This design fosters organic social interaction, encouraging residents to come together, share experiences, and forge meaningful connections across generations. On The Brink demonstrates a commitment to inclusivity and social responsibility by ensuring accessibility for all members regardless of financial means. The initiative had not been carried out without challenges: from navigating complex legal structures to securing funding for development phases, the community has displayed a high degree of resilience.[35] This initiative represents a valuable example of how to address older adults' loneliness through innovative cohousing initiatives. By prioritizing community-building and creative financing models, similar projects can emerge as beacons of hope, fostering vibrant communities where individuals thrive, supported by a network of caring neighbors.

[35] https://www.wrigleys.co.uk/charities-and-social-economy/community-led-housing/cohousing/cohousing-case-study/

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