Transnational Trends and Demand Report on Social Service Providers and Care for People with Disabilities and Elderly People

Report

January 2024

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1. Introduction

People with disabilities and the elderly are one of the most vulnerable social groups. They do not have the same opportunities to participate in society, whether professionally, socially, touristically or culturally, and they are under marginalisation and social exclusion. This social problem should not be ignored since we live in a demographic period of population ageing, and and growing rate of people with disabilities[1]. This problem has not bypassed Germany and Croatia, which are the implementers of the *INnoClusion* project, as part of which this analysis and research is being conducted. This **report aims** to analyse global **trends** and **their impact** on people with disabilities, elderly people and social service organisations, and the **needs and demands** of care based on qualitative research conducted in the partner organisations on the transnational level.

According to the latest report on people with disabilities published by the Croatian Institute of Public Health (2022), 16 per cent of the total population in Croatia has some form of disability, i.e. the total number is 624,019, while the number of elderly people aged 65+ years according to the last population census from 2021 is 22.45 per cent. A similar situation occurs in Germany, where the trend of population ageing is recognised. According to statistical data of the Statistics Research Department from June 2022, in 2021, the share of the German population aged 65+ was 22 per cent. Additionally, according to DPA data, 7.8 million people have some form of disability in Germany, which represents 9.4 per cent of the population. Given this **growing demographic trend**, it is necessary to emphasise that people with disabilities[2] and elderly people struggle with a series of difficulties in their daily social and professional lives, which are impacted by several factors and which have multiplied due to the health and energy crisis, stigmatisation, social and spatial exclusion (rural-urban challenges), and intensive digitisation of society. Due to the inability to cope with everyday tasks normally, they are most often cared for by social service providers - at the formal and informal level. However, there is also a lack of substantial financial resources and a lack of skilled workers in the care sector. This is why social service providers face some challenges in ensuring the continuous provision of healthcare services to people with disabilities and elders.

Thus, the **INnoClusion project** aims to **develop, test and implement user-centred green and digital solutions through the Living Labs model to improve the lives of elderly citizens and citizens with disabilities and to professionalise further and decarbonise social service organisations according to identified needs and trends.**

[1] In the EU over 100 million people live with disabilities, according to European Disability Forum (2019) in their publication 'How many persons with disabilities live in the EU?'.

[2] Persons with disabilities still face considerable barriers in access to healthcare, education, employment, recreational activities, as well as in participation in political life. The impairment may be in physical or mental health, but also in age or housing situation. People with limited cognitive abilities cannot participate in digital life and the use of social media because the media are rarely tailored to such people. People with physical disabilities find it much harder to get a job because it is blocked by barriers.

2. Methodology and Objectives

This report presents the findings of a study on the **needs, trends, gaps and demands** of care for the elderly and people with disabilities as well as social service providers focusing on Germany and Croatia. The study is based on a **mixed method approach** - 1) analysis of global trends and their impact as well as mapping of best practices based on **literature review and discursive analysis** and 2) identification of the needs of social service providers organisations and their beneficiaries (elderly and people with disabilities) in Germany and Croatia based on **qualitative research** using the semi-structured interview method. This research aimed to **identify social needs** and detect social problems for generating **social innovations** that can respond to these social needs - the needs of social service providers and their beneficiaries.

First part, the discursive analysis is based on the analysis of the current situation of care for people with disabilities and the elderly and the situation of social service providers in two national contexts, Germany and Croatia, based on statistical data, legislative framework and declarations. In addition, an analysis of global trends (energy crisis, pandemic crisis of COVID-19, spatial segregation and digitalization) and their impact on the current situation is presented in this report as well as the mapping of digital social innovation as best practices in the field. Secondly, qualitative research was conducted from December 15, 2023, to January 15, 2024, in partner organisations in Germany and Croatia as part of the demand study. The target groups sampled in this research were: 1) social service providers in the organisations CPUK, Diakonie Kork and VAL Lastovo; vulnerable groups in need - elderly people and people with disabilities - who are beneficiaries of the social services in those organisations; and 3) family members as informal caregivers. Five semi-structured interviews were conducted in the Diakonie Kork – Epilepsy Center in Germany who provide outpatient and inpatient diagnostics and therapy, rehabilitation, research and teaching, and among people with disabilities, and seventeen semi-structured interviews in Croatian organisations of VAL Lastovo and Home help centre Međimurje County (CPUK) that are given home assistance and in-home care for elders. The interviews were conducted online via Zoom, face-to-face, and telephone. Based on qualitative research findings, personas of target groups of users for each organization/country were created. The method of creating a persona is an innovative method that helps in the process of better understanding the needs of users with the aim of meeting the needs through that product and/or service. The **goal** of this overall study was to identify needs, trends and demands for the future design of social services within Living Labs in Germany and Croatia through digital and innovative solutions that are tested.

3. Contextual Overview: Global and EU Trends on Social Service and Lives of People with Disabilities and Elderly People

Contemporary societies are characterised by population ageing and accelerated digitisation, which is why today's world lives increasingly dependent on ICTs. Therefore, this report

summarises the **analysis of the impact of global and regional trends** (e.g., energy crisis, pandemic crisis, rural-urban challenges, digitisation) on citizens with disabilities, elderly people and social service providers who nurture them. Besides that, an overview of the relevant current situation in the social welfare sector in Germany and Croatia is briefly presented. This analysis is the basis for **further developing new innovative solutions** through the **Living Labs model** for the transnational call of applications and scouting prototype solutions by enterprises (mainly start-ups, SMEs) on the market within the INnoClusion project[3].

3.1. The Context and Current Situation

3.1.1. National framework: Care and social service for people with disabilities and elderly people

Demographic and social changes over the past few decades have transformed healthcare needs, making **long-term care**[4] for the frail elderly and people with disabilities a major social and policy issue. Long-term care for elderly people and people with disabilities generally refers to home care and institutional care. Care can be organised informally[5] or formally. However, care policies for the elderly and persons with disabilities reflect the specificities of the social and political context of the country. In this research, the focus is put on social care services for the elderly and people with disabilities in **Croatia and Germany**. European countries, including Croatia and Germany, face increased needs for long-term care services and demands to control social costs. They strive for similar solutions, such as combining services and financial benefits that support the family in providing care. The process of deinstitutionalisation is closely related to long-term care, so non-institutional services are seen as a more financially sustainable alternative to residential care and a response to users' preferences to stay in their homes.

At the EU level, in terms of care for the elderly and people with disabilities, we have a dominant system of **personal social service (PSS)[6].** PSS is provided by governmental organisations;

[3] The overall project aim of the transnational innovation partnership is to further develop, test and implement user-centred green and digital solutions to improve life of citizens with disabilities, and elderly people and to further professionalise and decarbonise the social service organisations.

[4] Care is defined as providing what is necessary for the health, welfare, maintenance, and protection of someone or something (Cambridge University Press, 2019).

[5] Informal care is unpaid care provided by family, friends or volunteers and plays a crucial role in the caregiving process to a person with a chronic illness or disability (Roth, Fredman, & Haley, 2015). Today, informal care is a common way of caregiving and its demand is increasing in many countries.

[6] Four PSS types are: 1) The informal sector - social care is provided freely – but not necessarily willingly - by families, friends, neighbours, and colleagues. This is difficult to quantify but remains the main source of social care in all countries; 2) The voluntary non-profit sector - the care provided by NGOs both large and small, using both paid and unpaid resources; volunteers working within and outside formal schemes. In recent years, new types of not-for-profit organisations have appeared eg. Trusts; 3) The state sector - this includes services provided by central, regional and local governments. PSS*ƒ* may be provided by separate PSS departments and/or as part of a larger department eg. health, social security, education; 4) The for-profit sector - this is growing in size and importance in some countries eg. the UK (Anheier, 2000).

non-governmental agencies – NGOs or not-for-profits; and by commercial for-profit organisations. However, most social care is still provided informally and unpaid by family members, friends, neighbours, colleagues and unpaid volunteers. PSS may be provided in service beneficiaries' own homes (domiciliary care), in day centres of various types, and in residential homes and institutions.

Croatian Context

The primary and relevant laws that determine the regulatory framework of social care for the elderly and persons with disabilities in Croatia are the *Law on Social Care,* the *Law on Labor, Social Security and Pension Law, the Law on Inclusive Allowance, the Law on Professional Rehabilitation and Employment of Persons with Disabilities, the Law on foster care, Family law* and several by-laws and strategies such as *Social care strategy for older people*[7]. The law regulates monetary benefits related to personal disability benefits, one-time and monthly payments or allowances for assistance and care. According to the law, social services for the elderly and people with disabilities in Croatia are limited to: i) accommodation services in state or county homes as long-term care facilities, ii) non-institutional accommodation services and iii) home assistance services as in-home care service[8] (VAL Lastovo and CPUK, project partners, provide this type). Social service care is provided by government agencies, non-governmental organisations (NGOs), and local municipalities.

According to data from 2015 from the latest Social Care Strategy for Older People, there were 170 home help providers in Croatia. According to statistical data from the Ministry of Demography, Family, Youth and Social Policy (2015), 3,328 people aged 65+ received the service help at home based on the Centre for Social Care solution. Additionally, the National Plan to Equal Opportunities for Persons with Disabilities for the period from 2021 to 2027 represents a strategic planning act by which the Republic of Croatia continues to create a policy towards persons with disabilities respecting the UN Convention on the Rights of Persons with Disabilities and other contemporary international standards. To conclude, like most post-communist countries, the care system remains of a residual character, organised according to the principles of the social welfare system, fragmented and with insufficiently developed infrastructure. Therefore, care for the elderly and people with disabilities falls primarily on the family, leading to difficulties balancing family obligations and paid work. The system in Croatia faces a series of non-transparencies that lead to an unequal position of beneficiaries and service providers (e.g. defining the price of services, absence of public tenders for new providers and criteria for admission to homes). The price policy, which is based on the administrative decision

[7] In addition to the above-mentioned regulations, social care is provided by the general acts of regional and/or local self-government units, which define social programs in the area of their jurisdiction, as well as their content, scope and methods of financing. Also, it should be pointed out that the care of the elderly also takes place through various policies, strategies and programs, regardless of whether they are national, regional or local programs.

[8] The right to a home help service includes: 1) organising meals (procurement and delivery of ready-made meals to the home; 2) doing housework; 3) maintenance of personal hygiene; 4) meeting other daily needs. The decision on the recognition of the right to the home help service is made by the center for social care.

of the leading ministry and does not reflect the content of the services, erodes their quality, especially in non-state homes. There is a trend of insufficient care and a deficit of social service providers. The third sector is central to practical and psychosocial support for people in need. Third-sector organisations are essential to maintaining services, such as help in the house. However, the precarity of the third sector needs and social services must be addressed to ensure it can continue supporting disabled and elderly people. Besides that, regional differences in the availability of social care services persist.

The German context

Germany's comprehensive social system plays an important role in the care and support of people with care needs. Germany has a well-established legal framework for elderly care and people with disabilities in the twelve Social Codes. The most relevant ones are *Book XI (Sozialgesetzbuch XI), Book IX, and Integration Assistance Act*, which supports social integration, education, employment and long-term care insurance. The social care system for people with disabilities in Germany is characterised by public and private support services focusing on various aspects of daily life, healthcare, and social integration. Thus, Germany has a compulsory long-term care insurance system that provides financial support for individuals who require assistance due to disabilities or age-related conditions. This insurance covers a range of services, including in-home care (personal hygiene, meal preparation, and household tasks), nursing home care as a residential setting, assistance with daily living activities and other support services. Besides that, the Caregiver Leave Act enables working family carers to combine their job with caring for a close relative.

According to the Federal Statistical Office, the proportion of people over 60 was 29.4 % in 2022. In 2021, 7.795.340 people in Germany were officially registered as severely disabled, but the number of unreported cases is higher. The life expectancy of men and women in Germany has been rising continuously over the last decades. At the end of 2021, there were 4,961,146 people in need of care in Germany, and that is why the care rate is also rising: from 2,5% (2001) up to 6%. However, The Federal Statistical Office reports that in 2020, 96% of older people live alone in their own homes, and only 4% in residential care homes. To be more precise, only 24% of people in need are cared for by outpatient nursing and care services, 56% of them are cared for by relatives, and only 20% of people in need are cared for in fully inpatient care homes (Federal Statistical Office, 2022).

The Federal Statistical Office reported for 2021 the existence of 16 115 nursing homes and 15 376 outpatient care service organisations. With the growing number of people needing care, the need for personnel in the care sector is increasing. Outpatient services are increasingly important in relieving the burden on family carers as more and more people in need of care are being cared for at home. With this in mind, there is an increasing shortage of skilled nursing staff. According to an analysis by the Cologne Institute for Economic Research, there will be a shortage of around

307,000 nursing staff in inpatient care homes in Germany by 2035[9]. The number of people needing care is increasing while the number of professional carers is decreasing. Accordingly, it will increasingly be the task of relatives to care for those needing care at home in the future. Another reason for this assumption is that inpatient care is usually associated with high costs, so relatives are likely to decide against this option. Given this, the nationwide strategy should focus on outpatient care rather than increasing the number of inpatient care homes. More should be invested in information and counselling for family carers. It will be necessary to strengthen this group of people in caring tasks to close the gap in professional care.

To conclude, many countries adopted the United Nations Convention on the Rights of Persons with Disabilities in 2006, and along with it, the convention's definition of disability. According to this definition, "persons with disabilities include those who have long-term physical, mental, intellectual or sensory impairments which in interaction with various barriers may hinder their full and effective participation in society on an equal basis with others" (UN Enables, 2014). Additionally, the United Nations Convention on the Rights of Persons with Disabilities (CRPD) has reaffirmed "that the universality, indivisibility, interdependence and interrelatedness of all human rights and fundamental freedoms and the need for persons with disabilities [have] to be guaranteed their full enjoyment without discrimination" (CRPD, Preamble). The European Union and all its member states are party to this convention. The CRPD guided the EU to the first strategy to tackle these problems, which has been replaced by the EU's Strategy for the Rights of Persons with Disabilities 2021- 2030. The objective of this Strategy is to ensure that people with disabilities in Europe, regardless of their sex, racial or ethnic origin, religion or belief, age or sexual orientation, enjoy their human rights, have equal opportunities, equal access to participate in society and economy, are able to decide where, how and with whom they live, move freely in the EU regardless of their support needs, and no longer experience discrimination. Several initiatives are planned as part of the EU action plan, and one of them for 2024 is a framework for social services of excellence for persons with disabilities.

3.2. Impact of global and regional trends on people with disabilities and elderly people

Below is presented a brief **analysis of trends** that challenge the way we could care for citizens with disabilities and elderly citizens - one of the most vulnerable social groups. Following standards and demands are crucial for unlocking the full potential of digital health and improving the care of ageing populations and people with disabilities: E-health applications, telemedicine, VR solutions, wearable devices, and other digital and innovative systems. By analysing the trends and real needs of beneficiaries and social service providers, this **report aims to provide information for testing digital social innovations** - in which innovators, users, policymakers

[9] Statistisches Bundesamt. *Personal in Pflegeheimen und ambulanten Pflegediensten*.

and communities collaborate using digital technologies to co-create knowledge and solutions for a wide range of social needs in social service sector[10].

3.2.1. Impact of the pandemic (COVID-19) crisis on vulnerable groups

The COVID-19 pandemic caused drastic changes in the lives of the general population, especially among vulnerable groups such as elderly people and people with disabilities. Relevant studies show that many disabled people and elderly people have felt abandoned and forgotten during the pandemic (Simmons, 2020). They as commonly encounter daily challenges such as barriers to community mobility, reduced access to healthcare services and a higher risk of suffering from depression, have faced additional challenges in the context of the pandemic. They have a higher risk of contracting the virus as they face barriers to accessing preventive measures, and they are more likely to develop a severe illness due to their pre-existing health conditions and limited access to healthcare. Moreover, mobility restrictions and social distancing measures have increased the pre-existing barriers for people with disabilities and created new disruptions and risks to their autonomy, health and lives[11]. Based on the literature review and conducted qualitative research, the impact of the pandemic crisis in the context of social relationships and exclusion was identified. In other words, elderly people and people with disabilities during the pandemic, but also in the post-pandemic period, feel lonely and socially isolated in their homes, which affects their mental and physical well-being. Besides that, social care was not working as it should have been before the pandemic—and has been exposed even more during it. This is why the pandemic has highlighted how the transition to digital and innovative solutions in social services is an important social task. Studies show that older persons who were connected to the Internet and were technologically literate were far better positioned to deal with the reality of sudden lockdowns, not only for their health and welfare but also to keep in touch with family members and stay abreast of the latest information and health-based guidance notices. Such individuals could also overcome the feeling of being isolated during self-quarantine or lockdown[12]. For this reason, the pandemic crisis has shed even more light on digital exclusion and the problem of digital literacy among the elderly[13].

3.2.2. Impact of the energy crisis on vulnerable groups

Relevant studies show that people with disabilities and elderly people are among those **hardest hit by the energy crisis** because they face additional costs with potentially severe consequences

[10] Bria, F. (2015). Growing a digital social innovation ecosystem for Europe: DSI final report.Luxembourg: Publications Office.
[11] United Nations Human Rights Office of the High Commissioner (2020). "COVID-19 and the Rights of Persons with Disabilities: Guidance".
[12] International Telecommunication Union. Geneva: ITU; 2021 Feb 8 [cited 26 October 2022]. Technology and older persons: Ageing in the digital era. Available from: www.itu.int/hub/2021/02/technology-and-older-persons-ageing-in-the-digital-era/.
[13] Xie B, Charness et al (2020). "When going digital becomes a necessity: ensuring older adults' needs for information, services, and social inclusion during COVID-19", *Journal Aging Soc Policy.* 32 (4–5):460–70.

for their health. The Health, Disability and the Energy Crisis Report[14] shows that they cannot pay for the charging of medical equipment, such as stairlifts, hospice beds, electric wheelchairs, ventilators, and hoists. They may also find it more difficult to maintain their heating needs or undertake basic essential tasks such as washing, laundry or cooking. People with pre-existing health conditions, especially long-term illnesses, disabilities, and long age, are especially vulnerable to living in a cold home due to the energy crisis. The mental and physical health impacts of the energy crisis are negative on elderly people and other vulnerable groups, such as people with disabilities, those on low incomes etc. The energy crisis especially affects vulnerable social groups with poor economic conditions and those who live in deprived areas (rural areas and islands for which transportation to the nearest city with associated facilities is required). However, this relatively new literature highlights the need to recognise, involve and address the energy needs of vulnerable groups. In addition, when discussing the energy crisis and climate change, the importance of measuring the carbon footprint of social services is recognised in many countries, which is why the trend of decarbonising social service organisations is being recognised[15].

Thus, there is a need to develop **innovative solutions to enhance safe and green physical environments**, which optimise health, well-being and community participation among elderly people and people with disabilities. Over a decade since the World Health Organization's recommendation for "age-friendly cities", the built environment continues to pose major hazards to older adults, which contributes to reduced community participation. According to the literature review, new urban design initiatives are emerging globally to transform public spaces, increase physical activity, participation, and social interaction, and reduce the growing burden of chronic diseases in older adults. Notable developments include **exercise parks designed** for vulnerable people's needs, **smart home technology**[16], **dementia villages**[17], and scoping of **"walkable" neighbourhood** design features. Therefore, environments encouraging interaction with others may effectively support the healthy and active lives of elders and people with disabilities.

[14] Consumer Scotland (2023). *Health, Disability and the Energy Crisis.*

[15] Changes are required to make hard to treat social homes easier to decarbonise. There is no silver bullet solution, but funding will likely be the biggest single barrier for social housing providers. Financial assistance can reduce the number of hard-to-decarbonise homes based on the investment required. See The Welsh Government Energy Service (2022) "Decarbonising Social Care in Wales", URL: https://www.gov.wales/sites/default/files/publications/2022-07/decarbonising-social-care-in-wales.pdf.

[16] Morris ME, Adair B, Ozanne E, Kurowski W, Miller KJ, Pearce AJ, et al. Smart technologies to enhance social connectedness in older people who live at home. Australas J Ageing. 2014;33:142–52.

[17] Peoples H, Pedersen LF, Moestrup L. Creating a meaningful everyday life: perceptions of relatives of people with dementia and healthcare. Dementia. 2018; https://doi.org/10.1177/1471301218820480.

3.2.3. Spatial exclusion: rural-urban challenges in lives of vulnerable groups

Onwards, households in rural, remote and island areas face **negative impacts due to the energy crisis**. These living areas, which we can find mostly in Croatia[18], interact to create fuel poverty risk[19]: relatively low household incomes; limited connectivity (digital, transport, and social); limited access to essential services; old and hard-to-treat housing stock quality; socio-demographics, especially ageing populations; and the greater prevalence of more extreme weather conditions. However, the rural-urban challenges of deprived areas[20] and regions are not recognised only in the context of the energy crisis. These challenges are identified in the context of the citizens' social and professional everyday lives and mostly in the case of the most vulnerable - elders and people with disabilities. This kind of **spatial exclusion**, which is studied through the urban agglomeration and centralisation of large cities in Germany and Croatia, is manifested in sparsely populated and remote areas (islands, rural areas) where the elderly population living mostly and struggle with **transport connections, adequate health and social care.** Analysing social service in rural and island areas, differences with urban work practices are observed. So, **the effect of geography on both services and the type of problems is evidenced**. According to academic articles and studies, it is argued that greater distances between people pose special problems for service delivery. In other words, **rural areas and people** have been characterised as possessing **more social problems** proportionally and having fewer social services than urban dwellers. Previous research indicates that rural residents and health care providers face several barriers associated with the provision of effective health care service related to rural resource limitations, challenges to confidentiality, overlapping roles for patients and providers, travel and geographic complications, service access restrictions, and limitations in training and education. Some barriers are related to the special circumstances of rural life, some are unique to the nature of rural residents, and some are closely tied to the experiences and backgrounds of rural healthcare providers[21].

Many researchers advocate for **technological solutions** that will respond to rural-urban challenges in care and improve service delivery and social well-being in rural areas. Despite substantial research suggesting that digital solutions and the Internet can improve the lives of vulnerable groups and social services, there are still concerns that elders and people with disabilities have limited abilities to access and use the Internet. Such inequalities in Internet and digital usage are commonly described as a **digital divide**, suggesting that people with certain

[18] This category includes the island of Lastovo and Međimurje County - as deprived areas in Croatia according to the National Strategy in the fight against poverty and social exclusion - areas where social service organizations that provide care for the elderly as partners in the INnoClusion project are located.
[19] UK FUEL POVERTY MONITOR 2021-2022. *The hardest hit: Impact of the energy crisis.*
[20] Deprived i.e. lagging parts of Croatia, are determined based on GDP, income, unemployment rate, and the demographic and educational structure of the population: Croatian islands (including the Island of Lastovo), Međimurska county and others (National Plan for Combating Poverty and Social Exclusion for the period from 2021 to 2027).
[21] Chipp et al. (2008). "Adaptations to Health Care Barriers as Reported by Rural and Urban Providers", J Health Care Poor Underserved. 19(2): 532–549. doi: 10.1353/hpu.0.0002.

demographic and socio-economic characteristics may be more disadvantaged in accessing and using the Internet than others[22]. Reasons for a digital divide affecting elderly people in rural areas are diverse and include limited access to the Internet and digital technology in rural areas, limited Internet proficiency among elders and people with disabilities resulting from lower education and socio-economic backgrounds, as well as differing experiences and preferences in terms of how to use the Internet.

3.2.4. Impact of digitisation on care and lives of vulnerable groups

Digital technologies and social innovation are fundamental in unlocking a better quality of life for elderly people and people with disabilities. Digitalisation is based on technological innovation. In particular, "age technology," namely **all technological products** and services designed **with and for older persons**, can potentially **perpetuate development and inclusion**:

- Improve and maintain the quality of life and safety of elderly people
- They contribute to their independence
- They enable older people to remain active and can reduce loneliness
- They prevent falls and reduce the potential consequences of falls
- Improve care at home and in the community
- Increase sense of control over life
- Reduce social isolation; increase social inclusion - help to stay connected
- They help to promote and maintain activity - both physical and cognitive
- They offer continuous monitoring of vital signs in chronic diseases; they allow timely detection and rapid response to any deterioration in health status

The majority of the "**gerontechnology**"[23] and "age-tech" markets focus on care and healthcare-related technologies, a focus that is often policy-driven. **ICT-based solutions** have become a **necessity in health and social care and related professions**[24]. Although there there is a dearth of research on the adoption of gerontechnology from the perspectives of social caregivers, given that caregivers bear a substantial burden in the form of chronic stress, relevant research[25] in social sciences shows a major problem in adapting to digitisation processes for people with disabilities, especially the elderly, is the **low level of digital literacy and their**

[22] Cresci K. and Jarosz P. (2010). "Bridging the Digital Divide for Urban Seniors: Community Partnership Geriatr Nurse, 31(6):455-63. doi: 10.1016/j.gerinurse.2010.10.006.

[23] Huang,Genghua and Ampadu Oteng,Samuel (2023). " Gerontechnology for better elderly care and life quality: a systematic literature review", *European Journal of Ageing*, 20 (1): 27, doi: 10.1007/s10433-023-00776-9.

[24] Mishna, F., Milne, E., Bogo, M., & Pereira, L. F. (2021). Responding to COVID-19: New Trends in Social Workers' Use of Information and Communication Technology. Clinical Social Work Journal, 49(4), 484-494. https://doi.org/10.1007/s10615-020-00780-x

[25] López Peláez A and Marcuello-Servós C (2018). "E-Social work and digital society: reconceptualizing approaches, practices and technologies". *European Journal of Social Work,* 21 (6):801–803.

attitude towards technology[26],[27]. Currently, people with disabilities frequently experience digital exclusion as they encounter many difficulties when it comes to being able to afford or access Information and Communications Technologies (ICTs) and the Internet due to a myriad of factors. Despite that, **digital transformation is fundamentally reshaping the care of older persons and persons with disabilities in all aspects**[28]. Artificial intelligence (AI) improves home monitoring for older persons by continuously monitoring irregular activities or patterns related to health issues, such as **fall prevention** and **SOS calls**.

When talking about innovative digital solutions for elderly people and people with disabilities and how they can help them, a more important **gap which can be overcome through digitalisation** is **social connectedness**. Many reviewed studies on the effect of smart technologies on dimensions of social connectedness reported **positive impacts** in aspects such as social support, isolation and loneliness. There is emerging evidence that some technologies augmented the beneficial effects of more traditional aged-care services.

- **Smart technologies,** such as **tailored internet programs**, may help older people better manage and understand various health conditions, resulting in subsequent improvements in aspects of social connectedness.
- Onwards, virtual reality (**VR)** is also being used to improve the mental health of elders and people with disabilities and tackle isolation. Loneliness and isolation profoundly impact the mental health of elderly citizens. VR can create a new virtual space[29] or even recreate a memory of the past, where family members and friends can join older adults to socialise and engage in activities. Additionally, VR can provide a unique brain-stimulating experience that encourages older adults to stay mentally active. Through VR, older persons can play games that require them to move around or perform simple exercises that would keep them mentally active, positively impacting their quality of life[30].
- Additionally, digital solutions such as assistive technology like **personal emergency response systems (PERS)** and special telephones are helping in taking care of elderly people and people with disabilities. PERS devices can attend to emergencies, such as

[26] Huang,Genghua and Ampadu Oteng,Samuel (2023). " Gerontechnology for better elderly care and life quality: a systematic literature review", European Journal of Ageing, 20 (1): 27, doi: 10.1007/s10433-023-00776-9.
[27] European health parliament (2016). *Digital skills for health professionals. Committee on digital skills for health professionals,* URL: https://www.healthparliament.eu/wp-content/uploads/2017/09/Digital-skills-for-health-professionals.pdf . Assessed 21 Dec 2023.
[28] Pita-Barros P, Bourek A, Brouwer W, Lehtonen L. Assessing the impact of digital transformation of health services. Report of the EXPH (Expert Panel on effective ways of investing in Health). 2019. https://health.ec.europa.eu/system/files/2019-11/022_digitaltransformation_en_0.pdf. Assessed 22 Dec 2023.
[29] VR enables older persons to visit their favourite locations and travels to places where they used to live simply by putting on a VR headset.
[30] Rogers S (2020). Forbes. How virtual reality is benefiting seniors. Jersey City, NJ: Forbes Media LLC; 2020 Feb 6, Available from: https://www.forbes.com/sites/solrogers/2020/02/26/how-virtual-reality-is-benefiting-seniors

falls, that might occur at their home and the telephones are equipped with amplifiers and speakers for elderly people with hearing and vision problems.

Onwards, **digitisation can positively impact the professional and work life of people with disabilities**. Studies show that:

- Digital tools can support people with disabilities to perform tasks that they might otherwise be unable to do as effectively as others due to their disabilities.
- The use of online recruitment platforms, if accessible, offers people with disabilities direct access to employment and employers. Digitalisation expands people with disabilities' possibilities to access the traditional labour market.
- Remote work can also provide flexibility, promoting a better work-life balance for people with disabilities.
- Remote working makes persons with disabilities suitable candidates for jobs, irrespective of the accessibility shortcomings of the workplace or transport[31].

Finally, **digital solutions have a positive impact on social service providers** and **(in)formal care:**

- They save their time and money
- They can positively impact their quality of life and quality of care
- Improved quality of work (easier and faster exchange of information, time
- savings) and improved collaboration between staff
- Decrease their burden of care, help them to reconcile care and work
- Increase their peace of mind, reassurance, their well-being and self-efficacy
- They give the feeling that the elderly and persons with disabilities are safe
- They enable better control over one's own life
- They give them a sense of self-efficacy[32],[33], [34], [35], [36]

According to Kaihlanen *et al* research (2023), digitalisation was perceived to have changed social service providers' 1) workload and pace, 2) the field and nature of work, 3) work community communication and interaction, and 4) information flow and security. In addition to

[31] OECD (2016). *New markets and new jobs. 2016 ministerial meeting on the digital economy.*
[32] Kaihlanen, Anu-Marja *et al*. (2023). "The effects of digitalisation on health and social care work: a qualitative descriptive study of the perceptions of professionals and managers", *BMC Health Services Research Journal* 23: 714, URL: https://bmchealthservres.biomedcentral.com/articles/10.1186/s12913-023-09730-y .
[33] Cijan A, Jenič L, Lamovšek A, Stemberger J (2019). "How digitalization changes the workplace". *Dynamic Relation Manag Journal*, 8(1):3–12.
[34] Nadav J, *et al* (2021). "How to implement digital services in a way that they integrate into routine work: qualitative interview study among health and social care professionals", *Journal Med Internet Research*, 23 (12).
[35] Staggers N, Elias BL, Makar E, Alexander Gl (2018). "The imperative of solving nurses' usability problems with health information technology". *JONA* 48(4):191–6.
[36] Lapão L (2018). "Digitalization of healthcare: where is the evidence of the impact on healthcare workforce'performance? Building continents of knowledge in oceans of data: the future of co-created ehealth". *IOS Press.* 247:646–50.

these digital examples, *Chapter 5* describes innovative digital solutions as examples of best practices in caring for the elderly and people with disabilities.

4. Demand Study: Main Findings of Qualitative Research

The following presents the needs and challenges for people with disabilities, the elderly and organisations that care for them as social service providers in Croatia and Germany based on qualitative research. Although it is about different contexts, social-state systems, legislative frameworks, living conditions and benefits, similar/equal needs and demands were identified among social service providers and their beneficiaries in Croatia and Germany. For a deeper understanding of the conditions and socioeconomic position, below are presented the **personas** of real users, as target groups, for whom solutions (product a/o service) are found within this research and project in response to their needs and demands. Based on the research, personas of target groups[37] were made - fictional profiles representing a certain type, a sub-group of people from the real population reflecting basic characteristics, identitarian determinants, problems, obstacles and needs. Understanding user needs is key to developing a successful product and/or service. It is necessary to emphasise that the types of users differ between the countries of Germany and Croatia since social service organisations provide care for **2 types of users:** 1) elderly people in Croatia and 2) people with disabilities in Germany. What distinguishes the **type of service** is: 1) in-home care (home assistance from CPUK and VAL Lastovo organisations) in Croatia and 2) stationary medical care, ambulatory care, nursing care, family support service, assisted living, and outpatient living in Germany as part of Diakonie Krok organisation[38].

4.2. Challenges and needs of elderly people

We have identified **3 types of personas** that represent elderly people - beneficiaries of care services - in **Croatia**. The main differences differentiating the types of target groups/personas of older adults are: **a) the type of household** and **b) the type** and **distribution of care** for them. This means that there are those elderly people who: **1)** live alone in a **single household** and receive help from an **in-home care** organisation (CPUK and VAL Lastovo), **2)** live alone in a **single household** and their **family members** who live nearby or in the same county are caregivers (sometimes family members are caregivers as well as in-home care organisations); **3)** live with family members (children, spouse) but receive some kind of help and care from in-home care organisations. In addition, the differences between users/people of the elderly depend on: **a)** level of digital literacy **b)** possession of digital devices (mobile phones, smartphones, computers, tablets) c) possession of the Internet and d) having basic living

[37] With the aim of solving a specific problem through the creation of a product and/or service, creating personas helps in the process of better understanding the needs of users with the aim of meeting the needs through that product and/or service. Therefore, based on the conducted research among social service providers and their beneficiaries, personas of elderly people, people with disabilities and caregivers were created with the aim of better understanding their needs and obstacles.

[38] This Center offers residential options, ambulatory assisted living, workshops, schools and training.

conditions (electricity, water). This means that some users do not own smart devices or the Internet and do not know how to use them due to poor digital literacy. However, some own simple push-button cell phones or even more advanced ones who own smartphones, tablets and PCs. Of course, beneficiaries/elderly persons differ based on **a) educational level, b) socioeconomic position**, **c) level of pension and other financial assistance** from the state concerning their status (if they are entitled to this type of assistance), **d) social capital** and **e) family network** (depending on whether they have family members and where they live - far from them or close to them). It is important to note that these users - elderly people - live in rural areas (on an island or the mainland) with a greater distance from large cities where they have to go for health check-ups, purchases, etc. For this reason, they struggle with the problem of transportation and social interaction, considering that they live in lagging regions and, due to their condition, they are often not mobile enough to go somewhere alone.

The research found that the **challenges** that elderly people face in everyday life and their **needs** concerns: loneliness, housing, social interaction, sense of purposefulness, and income/financial assistance. and a safe environment (decent healthcare, basic living conditions, transportation). Elderly people define the need for care as everything that is an obstacle to independent living. Care for elderly people should, therefore, entail **more than health care** alone. To be more precise, based on qualitative research, **elderly people need**:

- **Social interactions and a sense of belonging** (social relationships, day activities and social participation) to raise their sense of purposefulness and reduce loneliness. They usually live alone, feel lonely, socially excluded, and distant from cities and their neighbours/family/friends. Due to the rural and lagging area, their poor mobility, and spatial and social exclusion, they feel very lonely. Social connection and interaction are the most important needs identified among beneficiaries.
- **Satisfied living conditions** and **hot meals** since some live on the edge of poverty (electricity, water, food).
- **Accessible health care.** That is, both islands and rural areas should have adequate health staff (such as visiting nurses for in-home care, doctors, psychologists, and physiotherapists). They have to go to the mainland or bigger cities for doctors and medical examinations, which requires a 30+ km trip oneway. and other health professionals). For this reason, they do not take good care of their health, they do not perform regular tests and health examinations.
- A **transparent care supply** and high-quality care ensuring the following aspects: expertise, decent treatment, on-call 24- hours-per-day care, digital aids for safety and emergency, and reliability, specific attention to a family caregiver(s)
- **Transport.** That means poor transport connections, infrequent sea and public transportation lines, expensive ticket prices and small vehicle seats in social service organisations that drive them as part of operative care.

4.2. Challenges and needs of people with disabilities

People with disabilities are in a disadvantaged position compared to those without disabilities. When analysing the **current social situation** of **people with disabilities,** they are facing the following[39]:

- The real employment situation of people with disabilities is not often reflected as many persons with disabilities might not be registered as unemployed, so the unemployment rate is higher. If they are employed, their workloads, work tempo, and work tasks are often unsuitable given their health conditions.
- In most countries, people with disabilities who are employed are more likely to be in vulnerable employment, characterised by inadequate earnings, low productivity and difficult working conditions that undermine workers' fundamental rights.
- People with disabilities face a pay gap and run a significantly higher risk of poverty or social exclusion, leading to a lower quality of life.
- People with disabilities are facing problems in the physical environment and transportation.
- People with disabilities generally experience significantly lower educational levels than people without disabilities. Generally, they experience unstable health conditions that limit their abilities to participate in employment and social activities.
- Women with disabilities are often more disadvantaged than their male counterparts. In addition, multiple vulnerabilities - belonging to a minority, age, gender, and ethnicity affect the unfavourable social position of people with disabilities.
- They face social stigma, i.e. negative or limiting stereotypes, which bring them to social exclusion and marginalisation.

The qualitative research found that **challenges and needs** that people with disabilities in Germany - Diakonie Korks beneficiaries that live in rural areas and receive assisted in-home care as part of ambulatory assisted living - face in everyday life **concerns**: social interaction/participation in terms of loneliness and boredom, sense of belonging, monitored support and assistance but also autonomy, home care digital aids and devices for safety, transportation and financial assistance.

Since the target group sampled within this qualitative research refers to people with disabilities who use **ambulatory assisted** living services, meaning they get care 1-3 times a week for a few hours, it is necessary to describe their **characteristics** in the form of personas. These are people without earning capacity, who live in villages but do have a good level of digital literacy and possess digital devices such as smartphones and PCs. They differ in the type of household, the social network and the type of aids they use.

[39] Disability and Development Report (2018) *Realizing the Sustainable Goals by, for and with persons with disabilities*. United Nations Department of Economic and Social Affairs.

To be more precise, based on qualitative research, people with disabilities (beneficiaries of Diakonie Kork) need:

- **Social interaction and a sense of belonging**. Among people with disabilities, the basic need that has been identified as a priority relates to loneliness and boredom. They feel lonely and bored and want their everyday life filled with communication, participation and contentment. This problem is also the main one for those who live in rural areas and do not have any social contact or can not go to the local bar or social event because of their disability or mobility problem.
- **Assistance and autonomy**. Beneficiaries need help and assistance for going to the doctor, ordering medical examinations, ordering medicines, going for groceries, assistance for walks and daily activities and social interaction, and someone for help after an epileptic seizure. On the other hand, they need independence - to be independent, at least in certain daily activities that they have to do, based on a digital solution or some additional aid.
- **Home care digital aids for safety.** Assistance and help by aid or some other solution are essential because of their sense of safety and autonomy.
- **Transportation/ Mobility**. There is a need for better transport connections and assistance (they need someone to escort them - that is social companionship and escort services for elderly) to be mobile and self-sufficient.
- **Finances.** They require better financial support from the state and some other benefits.

4.3. Challenges and needs of social service providers

The target group of social service providers needs to be analysed as a **heterogeneous group**, especially when comparing the Croatian and Croatian contexts. This means that the caregivers in this research differ by **1) type of organisation**, **2) type of care - informal and formal caregivers** (we have educated experts in terms of health care, geronto-housekeepers and family members as caregivers), **3) level of education** and **digital literacy**. This type of typology and personas characteristics are essential for further project development.

Geronto-housekeepers as in-home caregivers

In the context of in-home care and home care assistance, social service providers in Croatia refer to geronto-housekeepers as a gender-specific job for women, usually of an older age women who belong to a certain vulnerable group. This type of in-home care consists of cleaning, purchasing food and supplies, accompanying doctors, performing medical examinations and psychosocial support. Geronto-housekeepers in Croatia, when creating personas, differ mainly in terms of the level of 1) digital literacy 2) education/knowledge about social care and 2) social status. Regarding digitisations, geronto-housekeepers use smartphones, WhatsApp/Viber and email. Thus, their needs mainly concern:

- **Work communication and coordination.** They feel a lot of work overload and emotional/mental overload, so they need some digital solution or re-structuration process of their daily work coordination and organisation. There is a need to relieve the care and responsibility of geronto-housekeepers. Staff planning and work coordination are done manually and physically without using smart technology (They only use WhatsApp/Viber group for communication, which is tiring considering the incomprehensibility of changes and a million notifications).
- **Human resources and finances at the organisational level.** Social service organisations in RoC struggle with a lack of employees, professional staff and geronto-housekeepers. In addition, financial resources, low salaries, and insufficient equipment for work are big problems for them. There is a lack of cooperation with medical and care professionals, especially in rural areas. In Croatia, social services and providers of these services belong to low-paid jobs. Geronto-housekeepers themselves belong to the categories of vulnerable social groups.
- **Education** on raising **digital literacy.** Most of them only have basic or lower levels of digital skills.
- **Education** on communication techniques and providing support to beneficiaries. Most of the social service providers did not attend training on caring for the elderly and people with disabilities. The need for education on first aid, techniques for easier communication with users in stressful and unpleasant situations, and other education and content to raise the necessary skills and knowledge were identified.
- The need for **sectoral and intersectoral networks** (connection with other organisations, stakeholders, policymakers, and NGOs). Poor peer-to-peer expert connection and no "social service providers" network among organisations, low advocacy and intersectoral cooperation were identified. Considering the dissatisfaction with state influence, the need for structural changes and improvement was also identified.

Institutional caregivers in Diakonie Kork

In the German case, we have institutionalised care and the types of care within the Diakonie Kork Center. The centre provides outpatient and inpatient diagnostics and therapy, rehabilitation, research and teaching, and among their beneficiaries - people with disabilities - but also supports those people who do not suffer from epilepsy. This Center offers residential options, ambulatory assisted living, workshops, schools and training. Diakonike Krok has a differential staff - from medical professionals, caregivers, volunteers, students, etc. As for the interviewed employees of the Diakonie Kork Center, people with different job positions participated - those who use digital technology, those who work directly with people with disabilities in the education and rehabilitation process, and those who deal with digital marketing and public relations at the organisational level. All interviewed employees underwent training and education for care, i.e. they have the necessary expertise in their job description. All interviewed social service providers use PCs, iPads (UK-iPads for people with disabilities with supported communication

and using the system), smartphones, digital tools and software (for music, image and video editing), motion composers, and gamified solutions like educational games and game systems for people with disabilities, videos, etc. Although, in this case, a greater digitisation in terms of work and care was analysed compared to Croatia, as well as better conditions, the following needs of social service providers were observed:

- **Digitised aids for working with people with disabilities for their autonomy.** Considering the difficulties and disabilities range, social service providers would benefit from user-friendly and simple aids that beneficiaries can use independently without their assistance, which will help them in workshops and education (schools) and in everyday activities and content they offer.
- **Improve organisational communication and work coordination (care administration/ operative care).** Since they feel a lot of work overload and emotional/mental overload, the need to improve communication and coordination of work tasks (documenting care and care administration) is recognised, which means improving staff planning and facilitating everyday tasks through fast and simple digital solutions (such as ordering medicines or writing reports).
- **Lack of human resources and finances** (insufficient workforce and financial resources/funds). Although employees are trained for work, the need to increase the workforce and the need for skilled social service providers is recognised. Also, the need for greater financial resources and system restructuring was recognised among interviewees.
- **Structural change of social service system.** Although Germany is a developed country, the research interviewees need systematic changes at the national and policy level in the social service sector and care for the people in need.

Family members as caregivers

Lastly, family members (spouses, children, friends, and relatives) are important in caring for people with disabilities and the elderly. In some cases, people in need live in the same household with their informal caregivers (family members), but most often, family members live far away. Regardless of the proximity of the residence, a large burden of care falls on the family member, due to which they feel a great **emotional and physical overload. 24/7 care** and **concern about safety** are mentally demanding to them. For this reason, **releasing this burden** has been identified as a main need for family members as informal caregivers. They do everything for their people in need - finances, medicines, doctors, ordering, shopping, all the administration and the operational part - so they need to relieve that work in a faster way that can be obtained through a digital solution or aid.

4.4. Transnational Comparison: Germany and Croatia

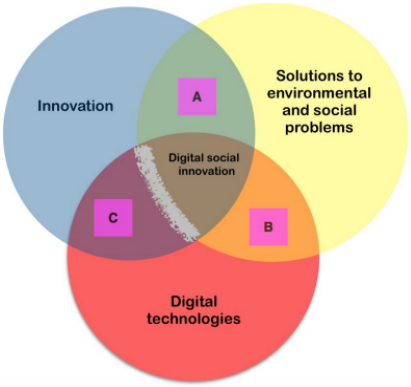
The main difference recognised between beneficiaries (elderly people and people with disabilities) in Croatia and Germany refers to basic living conditions, i.e. socioeconomic position. Beneficiaries in Croatia are living on the edge of poverty and receive significantly less financial aid from the state, which does not cover all basic living expenses and medical care problems (especially on the islands and/or rural areas), unlike in Germany. Therefore, elderly people in Croatia often do not have an Internet connection or even electricity in their homes and adequate healthcare in their residance. Also, the biggest difference can be seen in the possession of smart technology - smartphones, laptops, and tablets. While beneficiaries in Germany have smartphones, PCs and internet connections, some beneficiaries in Croatia do not have the above. But Croatia also has an identified difference due to the two different regions. More specifically, on the island of Lastovo, most elderly people own smartphones and the Internet in their homes (or even PCs and tablets), while in Međimurje County, hardly anyone has a smartphone or Internet. Still, if they have a phone, then the elders have a simple cell phone with buttons. However, the need for social interaction and participation - content and connection that will reduce their feeling of loneliness and give them meaning and purpose - is the most important need of all beneficiaries - people with disabilities and the elderly - both in Germany and Croatia.

Furthermore, the difference between Germany and Croatia refers to beneficiaries' and social service providers' digital literacy levels. In contrast, beneficiaries and social service providers in Germany have a much higher level of digital literacy and digital aids already. For the social service provider, the improvement of work coordination and communication was identified as the most important need with the aim of more up-to-date care administration. While for family members it is the need to relieve the emotional and physical workload.

To conclude, although these are different locations and contexts, especially regarding budget and conditions - some similarities have been identified. Mapped examples of best practice can help us detect certain digital solutions for social interaction, telecare and work coordination such as staff planning (see below).

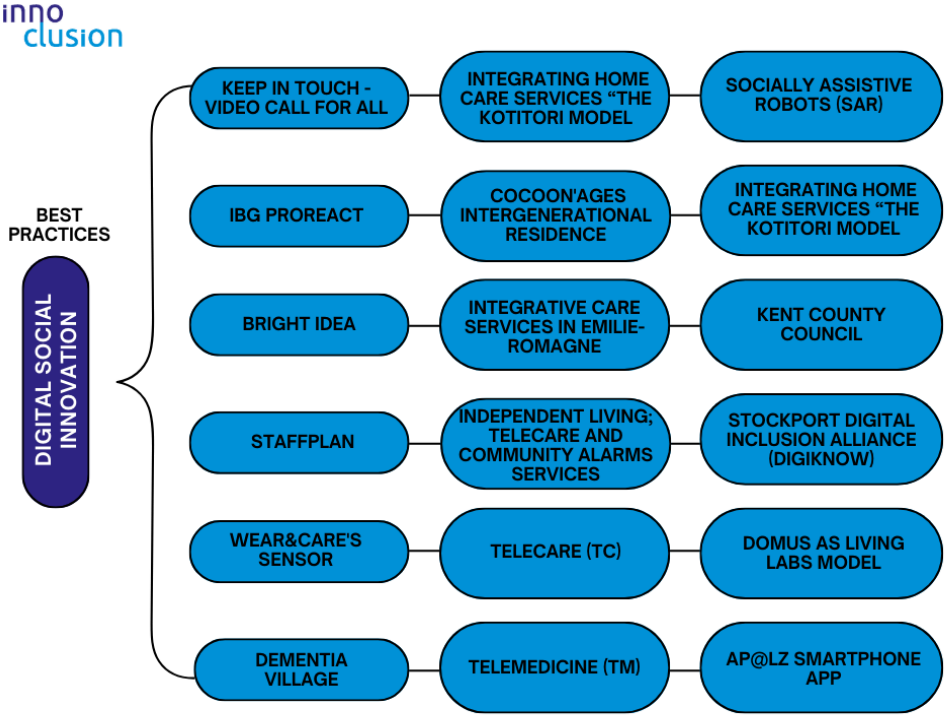
5. Green and Digital Social Innovation

According to the OECD, *social innovation* refers to designing and implementing new solutions that imply conceptual, process, product, or organisational change, aiming to improve individuals' and communities' welfare and well-being. Social innovation aims to tackle the social need and re-design social relations. At the same time, digital social innovation focuses on using digital technologies to co-create knowledge and solutions for social needs, in our case, elderly people, people with disabilities and social service providers.



Infographic 1. Digital Social Innovation

Based on the **identified needs** of social service providers and their beneficiaries, mostly in the segment of the need for social interaction, work coordination, community engagement and integrative care services, below are presented **examples of best practices on a global level.** A more detailed description of each mapped social innovation can be found in ***Appendix I.***



Infographic 2. Mapping Innovative Solutions - an Example of Best Practices

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Appendix I. Mapping Innovative Solutions - an Example of Best Practices

- **Denmark–Advancing Elderly Care**
  - Description: Denmark focuses on supporting the elderly to stay in their homes as long as possible. This includes services such as home care, home physiotherapy and technology interventions a citizen-centred approach. The goal is for the elderly citizens to maintain their independence, stay in control of their own life, improve their quality of life, and stay healthy in their own homes for as long as possible.
  - ***Innovative Example 1*** "**Keep in touch - video call for all**" is a b-near touch screen, a user-friendly device bridging the tech gap. It's ideal for individuals who find smart devices challenging due to age, cognitive impairment or developmental disabilities. This device is more than a communication tool; it's a conduit for emotional connection. With a unique feature allowing users to control their visibility, it promotes a sense of presence and closeness, even from afar.
  - ***Innovative Example 2*** **"IBG ProReact"** stands for Interactive CitizenGuide and is a digital solution for life management for people with reduced function. The solution consists of a large number of modules and functions for communication and planning in everyday life.
  - Innovative Example 3 "**StaffPlan**" for caregivers and nurses.
  - Innovative Example 4 **"Wear&Care's sensor"** aims to free up resources for caregivers, reduce stress and increase dignity and well-being for the elderly and disabled people.
  - Website: https://healthcaredenmark.dk/national-strongholds/elderly-care/
- **Netherlands – De Hogeweyk, "Dementia Village":**
  - Description: People with dementia live in a controlled but realistic environment that mimics everyday life. Besides the medical staff care, the village has shops, cafes and other facilities.
  - Sources: https://hogeweyk.dementiavillage.com/
- **France – Cocoon'Ages intergenerational residence:**
  - Description: The solution for the issues of weakening social relationships, an ageing population and lower purchasing power. Residence with a low carbon content, intergenerational contacts and relationships, social content and adequate care.
  - Website: https://www.habitat-intergenerationnel-cocoonages.fr/
- **Finland – Integrating public and private home care services "the Kotitori model"**
  - Description: Kotitori is a social innovation assisted by technological solutions. The main idea is to provide a "one-stop shop" of public and private home help services with easy access for older people and their relatives. In the model, the City contracts with a private provider, which, in turn, works with public, private, and third-sector providers in order to meet the customer needs in a personalised way. Kotitori focuses on home care and home care support services. A person is entitled to these services if he or she experiences difficulties coping with routine tasks at home due to illness or reduced functional capacity and if the informal care provided by a spouse or relatives is inadequate. Municipalities

are responsible for organising (i.e. funding, providing and commissioning) services for their eligible residents[40].

- Website: https://stm.fi/en/social-and-health-services and https://www.emerald.com/jica/article-abstract/20/5/284/225378/Integrating-public-and-private-home-care-services?redirectedFrom=fulltext

- **Italy – Integrative care services in Emilie-Romagne:**
  - Description: A holistic model that combines different services to provide the elderly with integrated care.
  - Website: https://salute.regione.emilia-romagna.it/
- **Orkney – Independent Living; Telecare and Community Alarms Services**
  - Description: Orkney has become a pioneer in using technology to provide care for the elderly. Technologies such as video consultation, telemedicine and digital technology are used to monitor health parameters.
  - Wesite: https://www.orkney.gov.uk
- **Welfare technology (WT)** is designed for people with diverse abilities and disabilities and refers to:
  - **Telecare (TC)** - continuous (24/7), automatic and remote monitoring to manage the risks associated with independent living, particularly among older people or those with physical disabilities (e.g., pendant alarms, red buttons, motion sensors or fall detectors)
  - **Telemedicine (TM)** - the remote exchange of physiological data between a patient at home and medical/nursing staff to assist in diagnosis and monitoring (e.g. monitoring vital signs)
  - **Socially assistive robots (SAR)** - assistive technologies developed to assist care staff in long-term care (LTC) facilities. These robots take on the role of social companions and have been shown to reduce loneliness and agitation, improve mood and encourage social interactions with other people.
- **Kent County Council: supporting adults with autism through use of technology**[41]
  - Dsecription: Blended physical and virtual approaches are being adopted by the occupational therapy team in Kent that offers enablement support to adults with autism. In Kent, a lot of people are experimenting with using apps and electronic whiteboards to improve their planning and organisational abilities so they can handle daily chores on their own. It is possible to configure whiteboards and applications to give detailed instructions on how to perform tasks. Prompts can be added remotely by carers or support personnel, they can be written or spoken, and they sync with the person's phone calendar.
- **Video Carephone**
  - Description: Early in the pandemic, the county authorities of Essex, Kent, and Suffolk committed to using more care technology to support individuals getting care in their homes. They discovered a safe tablet called a Video Carephone that allows users to make virtual check-in with their family, carers, and other authorised providers.

[40] See: Hakari *et al* (2012) "Emerald Article: Integrating public and private home care services: the Kotitori model in Tampere, Finland", doi: http://dx.doi.org/10.1108/14769011211270738 .
[41] See: https://www.local.gov.uk/sites/default/files/documents/25.172%20Digital%20innovation%20in%20adult%20social%20care_3.pdf

- **Digital Social Care**
  - Description: To help with all things digital, Digital Social Care is a free online resource managed by and for carers. Digital Social Care, supported by NHS Digital, helps adult social care providers navigate the digital landscape. To assist social care organisations in assessing their level of digital readiness and capabilities, a digital self- assessment tool has been created.
  - Website: https://beta.digitisingsocialcare.co.uk
- **Collaborative digital adult social care recruitment**
  - Description: A cooperative digital recruitment campaign including 14 councils, the local ADASS branch, and West Midlands Employers has contributed to the region's ability to retain a diverse and adaptable social care staff. Three specific campaigns were developed as part of the recruitment strategy for the sector during the first pandemic response: one aimed at luring in former social workers, another at luring in final-year social work students, and the third, which sought to draw in social workers for the West Midlands independent care sector. This was accomplished through targeted digital communications, including social media, partnerships with nearby universities, and digital campaign materials, such as videos and unique campaign websites.
  - Sources: https://www.wm-adass.org.uk/international-recruitment/international-recruitment-programme-2024-25-phase-2/
- **Stockport Digital Inclusion Alliance (DigiKnow)**
  - Description: Initially established to facilitate the adoption of digital technology throughout the borough through several initiatives. In locations like community centres or shared living spaces in assisted housing, volunteers would conduct training courses and impart digital skills. Today's support is virtual and geared towards helping those who require assistance with using technology to stay connected and healthy. Through the creation of a digital device lending library, the council has also been assisting those who wish to increase their digital proficiency and confidence but are constrained by the expense of purchasing a device or connecting to the internet.
  - Source: https://www.digitalstockport.info/digital-inclusion-in-stockport/
- **Telehealth in Lincolnshire**
  - Description: The county council has been collaborating with a technology supplier, the local care association, and care facilities throughout Lincolnshire to quickly grow a telehealth pilot project. Basic observations such as blood pressure, temperature, pulse, and oxygen levels can be reviewed and shared with health and care specialists remotely with a basic telehealth kit given to care facilities. The primary care network employees, as well as care professionals from all of the homes, have received training.
- **The Innovate Dementia Project** comprises ten partners in four regions of Northwestern Europe (Belgium, Germany, the Netherlands, and the United Kingdom), and they collaborate via more than 25 LLs (living labs) to explore, develop, test, and evaluate innovative, sustainable solutions that consider the socioeconomic challenges linked to ageing and dementia.
- **DOMUS** (Laboratoire de Domotique et informatique Mobile à l'Université de Sherbrooke) in Canada

  - Description: DOMUS operates three variants of the LL concept: a smart apartment on its campus that is controlled by a home automation system enabling short-term studies in technology-rich simulated housing; an LL in an alternative housing unit for people with traumatic brain injury, enabling long-term ecological studies in a technology-rich real house; and the LL at home that can be installed in older adults' places of residence (apartments and houses), enabling long-term ecological studies in a mobile, agile-technology environment.
  - Sources: https://www.usherbrooke.ca/informatique/recherche/les-laboratoires-et-equipes-de-recherche/domus
- **AP@LZ smartphone app**
  - Description: The goals were to optimise their independence in ADLs by compensating for their memory problems, further supporting family caregivers and alleviating their burdens. The AP@LZ works like a personal assistant or organiser and has five main functions, namely appointment reminders, a personal database, a medical database, a list of contacts, and a notepad for jotting down shopping lists. to support the day-to-day activities of persons with Alzheimer's disease.
  - Sources: https://www.researchgate.net/publication/301737819_Impact_of_APLZ_in_the_daily_life_of_three_persons_with_Alzheimer's_disease_long-term_use_and_further_exploration_of_its_effectiveness#:~:text=Abstract,their%20activities%20of%20daily%20living.

Since the INnoClusion project intends to test the ***Living Lab Model*** in the context of caring for people with disabilities and the elderly, it should be emphasised that numerous living labs have established a new approach to studying the health, independent living, and well-being of older adults. Depending on the definition, LLs are considered as a methodology for user-driven innovation; "a pragmatic research environment, which openly engages all relevant partners with an emphasis on improving the real-life care of people living with disabilities through the use of economically viable and sustainable innovation"[42]. To our knowledge, there are no best practices for design-driven LLs. The lack of consensus on the practices, methods, tools, and boundaries of LLs raises several obstacles to adopting this approach. Therefore, more LL experiments must integrate both older adults and people with disabilities, their formal and informal caregivers, and all other pertinent stakeholders - what we are planning to do throughout the INnoClusion project.

[42] Bergvall-Kåreborn B, Eriksson C, Ståhlbröst A, Svensson J. A Milieu for Innovation: Defining Living Labs. The 2nd Ispim Innovation Symposium: Simulating Recovery - the Role of Innovation Management; ISPIM'09; December 6-9, 2009; New York. In: Huizingh KRE, Conn S, Torkkeli M, Bitran I. editors. ISPIM Innovation Symposium /12/2009 - 09/12/2009; 2009.