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Quality and cost-effectiveness in long-term care and dependency prevention

IN-DEPTH STUDY: POLAND

A study of innovation and initiatives in new technologies in Poland

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1 Role of innovative technology in the context of long-term care

The objective of the project 'European network on long-term care quality and cost-effectiveness and dependency prevention' is to support long-term care policy-making processes across the EU by highlighting strategies to increase the cost-effectiveness and quality of care systems. The use of new technologies in care is one of these strategies.

The concept of new models of care implies innovative solutions as part of projects or initiatives at local or national level, implemented by public or private entities. Those innovative solutions are expected to involve the use of new technologies whose goal is to enable the improvement of patients' quality of life as well as the cost-effectiveness and sustainability of long-term care systems.

The role of new technologies in the context of long-term care systems and devices is significant in enabling care personalization. Innovative solutions such as telecare, telehealth, telecoaching, and self-care applications, provided through mobile health applications, nanodevices, patients' tracking systems, or data management tools, are likely to be highly relevant in the improvement of cost-effectiveness of the long-term care system.

According to Deloitte, the market for medical services in Poland is among the fastest growing in the EU, and expenditure in this field is increasing by 6.1% per year. The focus is on the individualization in responding to patients' needs, as well as innovative solutions leading to the emergence of new fields of medicine as well as new possibilities for medical services (Małkowska, 2014).

The role of innovative technology is therefore crucial. It stimulates the development of IT technology in the provision of diagnosis, the monitoring and rehabilitation of patients, and the development of telehealth. Innovations in technology can provide significant support for the daily functioning of persons in need for long-term care, as well as for their carers, helping them to maintain a better work-life balance. It also has a positive impact on the healthcare system generally, taking pressure off health services (Ministry of Work and Social Policy, 2014).

Poland has no universal access to telehealth and telecare, but only local initiatives are undertaken. Among these are systems aimed at monitoring cardiovascular diseases, detecting cardiac changes and preventing cardiac emergencies[1] (Łuczak, 2013), technologic 'smart homes' operating through the installation of internet cameras, fall sensors, gas sensors, and other home monitoring systems and devices that may contribute to the cost-effectiveness of long-term care (World Bank, 2015). In the project 'KIGMED.eu – incubator of innovative technology', led by the Polish National Chamber of Commerce, 67 innovative solutions have been presented, of which 38 have been assessed positively for their innovation aspects (Bujok et al., 2014).

The possibilities offered by innovative technology in the field of healthcare and long-term care, primarily through automatization and robotization, have been assessed in the literature as positive (Mikołajewska, 2013). Nevertheless, technological innovation also raises ethical issues such as the questions of human dignity and data privacy. The literature suggests a balance needs to be found between the autonomy of patients and their safety, in order to ensure ethical solutions in the application of technologic innovation to long-term care (Niemeijer, 2016).

In Poland, and Europe-wide, innovative technology such as e-health or telemedicine is mainly implemented at local level inside the framework of bigger projects, such as Horizon 2020 in the field of successful ageing, and mainly in the form of pilot programmes. The programmes described in our in-depth interviews are such programmes.

[1] BIOTRONIK Home Monitoring®

2 Methodology

The present report is a qualitative analysis of several innovative initiatives involving new technologies in the context of long-term care in Poland. Four initiatives, in different locations, have been analysed after an in-depth interview with their managers[2], in order to establish cost-effectiveness, obstacles, solutions, and future steps. The selected initiatives fulfil two criteria: they have been operating for at least two years and they aim at supporting innovative solutions, including the introduction of computer-based technology targeted at older people and people with declining health, though they are not medical interventions as such. Projects were identified using a 'snowball' methodology, based on interviews with experts in the field of long-term care. Additionally, information on preconditions and barriers to telecare implementation from the project led by Institute of Labour and Social Studies was used, as this project included a research component, evaluating preconditions for implementation of telecare in selected six locations in the country (Głogosz et al., 2018).

3 Presentation of the selected initiatives using new technologies in long-term care

Until recently, technology played a marginal role in the provision of long-term care in Poland, due to a lack of finances and of technical opportunities. Today, with the impetus of EU policies related to active and successful ageing, the use of innovative technology solutions and IT is becoming increasingly common and widely appreciated. Local communities decide to invest in new technological solutions in care sector when a service is available and can complement the services already provided, when there is a leader (an institution or an influential person) encouraging the implementation of services, and when the relative cost of implementation is low (Głogosz et al., 2018; Richert-Kaźmierska, 2017). Technological innovations continue to develop, and their cost-effectiveness as far as long-term care is concerned is recognized particularly in prevention of accidents and enabling prompt intervention. Smartphone applications enabling the diagnosis of a patient, watches and armbands to monitor daily functions, communication systems with emergency or care services, databases gathering data about patients' health, and planning software managing healthcare staff are among the smart solutions which hold out the potential of increasing the cost-effectiveness of long-term care.

The initiatives analysed in this study aim at the provision of care services with the use of computer technologies, aimed at increasing the quality of care and the effectiveness of intervention by improving the monitoring of users. However, the implementation of ICT is not a goal in itself. ICT is a tool to facilitate improvements in the access to community care services. Four initiatives have been analysed (seeTable 1).

[2] The four interviewees are: Mr Tomasz Pactwa, Director of the Office for Social Assistance and Social Projects of the Municipality of Warsaw; Mr Łukasz Klimek from the department of project management at DGA S.A., a consulting-investment group based in Poznań; Mr Karol Pawlak, manager of the project led by IPiSS, from ECON, an association for dependent people based in Warsaw; Mr Dawid Konina, manager of the Tele-Anioł project in Małopolskie region.

Table 1: Initiatives analysed

'Elder-friendly Warsaw' programme, project e-care. ('Warszawa Przyjazna Seniorom – e-opieka')	
Institution	The project is implemented by the Office for Social Assistance and Social Projects in the municipality of Warsaw.
Description	The first goal of the project is to create a system enabling easier data gathering, through the running of standardized tests on a regular basis (once every three months). The data about patients' health, sent to the cloud, will be kept in one place, which will enable the creation of algorithms aiming at preventing diseases or identifying disease risks in an individualized way. The data gathered allows a profile to be created and offer individualized solutions for the patients' health and home, and also allows for a segmentation of patients. So as well as e-health, the project involved the personalized installation of 'smart home' devices, aiming to improve patients' quality of life and safety.
Realization	In practice, the project starts with a pilot, in which devices, such as the armbands measuring the patients' vital signs, are tested in terms of quality of life and safety. The pilot allows the project to be modified, in order to improve its results. The first pilot encompassed 40 volunteers and tested two types of technological devices: an armband which sends the patient's vital measurements directly to the cloud, and a speaking device working through a tablet, the aim of which was to observe how patients react to different mobile applications, how their memory is stimulated by the use of the devices, and how elderly people learn to use mobile devices. The second pilot recruited 120 volunteers assisted by medical doctors, not only carers and nurses. The monitoring and testing will be more extensive than in the first pilot, but less frequent.
Aim of the project	This system's aim is to offer an alternative to nursing homes, and to improve the quality of life of people in need of long-term care so that they do not need to relay on a caregiver on a full-time basis. The final aim of the project is to improve cost-effectiveness in long-term care and improve the provision of domestic care through innovative technology.
Target group	Patients in need for long-term care benefitting from domestic care.
Use of technology	Armbands, tablets and emergency assistance buttons are the main technical innovations the project is using. It also makes use of cloud data storage and access, wi-fi and internet, as well as gas and carbon monoxide sensors.
Number of people involved	There are three managing staff: one coordinator, one accountant, and one manager in charge of the pilot. Twelve staff supervise the care services provided to the volunteers. The city has a contract with hospitals which enables collaboration with health services in the pilot. Lastly, several volunteers collaborate with the project to provide companionship to the patients.
Geographic coverage	Warsaw. At a later stage, a collaboration with 10 communes around Warsaw will be set up around a project aiming at the centralization of social services in a social services centre.
Original project	The idea is original but there are similar projects abroad, notably working with 'smart homes'.
Evaluation	The project is not subject to any official evaluation; the assessment of the functioning of the project is made through monitoring the pilot's results. However, an internal mid-term evaluation was undertaken to analyse the results and provide an overview of the successes and failures.The results of the first pilot indicated that the tests run on the patients are too heterogeneous and that procedures should be standardized. The armbands were found to be inefficient in terms of prevention because they are unreliable when not used properly.
Financing	The project is financed from various sources, mainly EU funds.

Table 1 (continued): Initiatives analysed

'Professionalization of assistive and care services for dependent people – new educational and care standards' ('Profesjonalizacja usług asystenckich i opiekuńczych dla osób niesamodzielnych – nowe standardy kształcenia i opieki')	
Institution	The overall leadership of the project is provided by the Institute of Labour and Social Studies based in Warsaw.
Description	The project should contribute to more effective intervention, greater efficiency, coherence and coordination through several activities: • developing standards in assistive and care services provided to older dependent people, • developing educational paths for assistants, care and telecare; • developing a uniform dependency assessment system, by creating a standardized definition of a dependent person and dependency levels, • analysis of up-to-date use of care and assistance activities communities with and without the use of ICT in care activities, • implementation of a pilot telecare project together with developed standards in assistive and care services.
Aim of the project	The main goal of the project is to develop methods for professionalizing community care for older and dependent people by means of carers' education, introduction of care standards and introduction of ICT services in care.
Target group	Older dependent people in need for long-term care fulfilling disability/dependency criteria defined and established in the project (three levels of dependency – mild, moderate and severe – have been distinguished).
Use of technology	A waterproof armband with voice telecommunication and a SIM card allowing for emergency calls at any time.
Number of people involved	The project is a collaboration of three insitutions: the Institute of Labour and Social Studies, the Cardinal Stefan Wyszyński University in Warsaw and EKON Association for the Disabled and the Environment. Overall, there are more than 20 people involved in different project stages in the managing institutions. The implementation phase is organized locally in cooperation with social assistance offices.
Geographic coverage	ICT tools are implemented as a pilot project in 32 local governments (gminy) in five regions: Mazowieckie, Warmińsko-Mazurskie, Podkarpackie, Wielkopolskie and Ślaskie. Overall, 300 recipients selected according to the disability criteria developed in the project have been provided with an armband and full-time monitoring.
Original project	This is the first project which proposes new criteria for assessment of disability and standarisation of care, including telecare services.
Evaluation	There is an ongoing evaluation of the project, similar to those of other European Social Fund projects. The project completed in May 2018 and a final evaluation of the efficiency and effectiveness of the project is scheduled after the project's completion.
Financing	European Social Fund (PO WER project)

Table 1 (continued): Initiatives analysed

'Tele-Angel' in Małopolskie region	
Institution	The leadership of the project is provided by the regional self-government of Małopolska.
Description	The project, established in 2018, includes a telecare centre enabling emergency calls at any time. Additionally, about one-third of persons covered with telecare receive community care services. Calls enable emergency interventions, but other services are also offered such as those of a psychologist, assistance with home services or help in contacts with healthcare institutions.
Aim of the project	The aim of the project is to improve the safety of older, disabled and dependent people in the Małopolskie region and enable them to stay living at home and within local community for longer, by providing a system of care which makes use of modern information and communication technology.
Target group	The project will eventually reach 10,000 dependent people (by December 2018 about 3000 had been enrolled). Of these, about 3200 people will receive community care services and assistance from neighbours. Participation in the programme may be subject to partial co-payment.
Use of technology	An armband is provided with an SOS button and a SIM card allows for communication in case of emergency with an emergency care specialist, assistant, psychologist or carer.
Number of people involved	The project a partnership of the Department of Health and Social Policy of the regional self-government of Małopolskie (the lead organization, where four staff are working on the project), Caritas of Kieleckie Parish and the European Institute of Regional Development.
Geographic coverage	Małopolskie region
Original project	The project is innovative through its scale in terms of the number of people that it plans to reach and its geographical coverage. Similar projects, offering an armband and telecare services typically operate in other municipalities. However, this is the first project in Poland with a regional scope implemented in cooperation between a number of institutions: project partners, social assistance centres in the region, local communities, representatives of physicians, etc.
Evaluation	The project was foreseen as comprising two parts (two subsequent pilot sub-projects), each evaluated separately. In late 2018, an attempt to redefine its structure was undertaken with the aim of combining the two pilot activities, but extending them over a longer period and covering a larger number of recipients simultaneously.
Financing	Regional development programmes, European Union fund

All these projects are pilots. Where activities are financed by local communities (e.g. Warsaw), they are not bound by an evaluation and a tight budget: their aim is to experiment, test, and assess what is working and what is not, although a quantitative monitoring of the changes resulting from implementation of activities takes place. Those projects funded by the European Commission are undergoing monitoring and evaluation of the results achieved within the project after completion of each task and at the end of the project.

The rationale for above listed projects is similar. The population is ageing and the need for care services will increase. Care in the community is the form of

provision that will inevitably be the most popular and will grow in importance. Therefore, the initiatives aim to improve the safety of older people living in home settings, particularly dependent and solitary people, and improve the cost-effectiveness of long-term care in institutionalized care settings.

Additionally, the project undertaken in Warsaw has been created to overcome the backwardness of data management in health and social assistance data systems, which operate independently. In Poland, patient health records and blood or radiography test results are in paper form and consequently inefficient to manage and difficult to access. Clearly there is a need for digitalization of patients' data. The 'e-care' project is introducing a new system of gathering data of patients in long-term care institutions, which is seen as essential for the cost-effectiveness of long-term care provision.

4 Obstacles encountered and solutions found

In the literature, the obstacles found in technological innovation in the area of long-term care are institutional, legal and financial. A 2012 study by the Polish Academy of Sciences analyzing innovation in the healthcare sector stated that there are three significant barriers in the development of technological innovation in this field: the lack of finance for the realization of innovative ideas; the high costs of labour in R&D, and issues in finding partners for collaboration in projects involved in innovative technology (Małkowska, 2014).

Another report finds the main obstacles hampering technological innovation to be the lack of long-term governmental strategy, the competition between scientific institutions, the lack of financial resources in the health and R&D sectors, the lack of a holistic ecosystem supporting the development of innovation, and the lack of effectiveness in the allocation of finances (Sznyk & Karasek, 2016).

In the project implemented by the City of Warsaw, the obstacles are both technical and human. From a technical perspective, the management of non-digitalized data is a significant problem. Segmentation of patients is impossible and the management of data very difficult. Another technological problem encountered by the Institute of Labour and Social Studies is unreliability of existing telecommunication technology, including poor access to telecommunication in distant rural areas.

From a human point of view, the obstacle encountered is a psychological barrier experienced by the professionals (social helpers or carers). They have difficulties in adapting to the changes, the new ways of gathering data, the fact that the data are in real time, that the data needs to be sent to the cloud, and that data must all be precisely and rigorously taken and recorded. The professionals need time to change their habits and adapt to the new system.

As far as the human barrier is concerned, in the e-health project in Warsaw, the team working in social welfare homes has put in place a detailed task schedule for each carer, with precise and clear information, and progressively implemented a systematic management structure. Management is based on the daily monitoring of the tasks of each carer, which is a significant motivational factor and enables increasing efficiency of work. Understanding the need to monitor the daily activities of each carer was an obstacle in the first few weeks following the system's introduction but compliance was eventually achieved.

Another human resources issue affecting care activities, not unique to innovative projects, is recruitment of staff. With a shrinking labour market and low pay in the care sector, recruiting professional employees – particularly social workers, but also care professionals, psychologists and other qualified staff – becomes a problem.

Mixed opinions are reported about the digital literacy of older, dependent people and their willingness to accept new technological solutions. The manager of the 'elder-friendly Warsaw ' project points out that 'digital literacy of the elderly, or absence thereof, is not a barrier as such, it is the lack of motivation which is. If an older person wants to learn, she will. We succeeded in teaching 80-year-olds how to use a tablet. 80% of the seniors who use the internet also use Skype or another communication application, which is actually similar to teenagers'. The technological devices aimed at the elderly have been modified to adapt to the patients: for example a handle has been added for better grip, and a large font is used.

Expressing a different view, the manager of the 'incubator for social innovation' sees elderly people's lack of digital literacy, or the lack of responsiveness of the patients when filling a form or using a mobile device, as a challenge. The solution he suggests to this challenge is understanding and patience. Similar problems have been encountered in the 'Tele-Angel' project, but they have been overcome by educational and information activities. The manager of the project led by Institute of Labour and Social Studies points out that as well as poor literacy of older people in the field of technology, the fear of being monitored is a drawback encountered during the project's implementation.

Poor information, fear of intervention and lack of digital literacy result in issues with reaching potential clients (Szwałkiewicz & Sajkiewicz, 2017). In the 'Tele-Angel' project, this has been overcome by a broad information campaign, involving the distribution of information on the project's activities to local policy makers, social workers and physicians. The system for client recruitment has been simplified and divided into two stages: first, the collection of applications and only a few documents (e.g. disability certificate or medical opinion) and second, a social worker visit to assess the needs of each client.

Finally, the lack of integration with other services targeted at older people as well as cross-sectoral cooperation with respect to emergency care and data involving information systems between social care and healthcare are pointed out as issues in the implementation of telecare and telemedicine projects. This obstacle has been tackled either by the collection of data on each patient using existing information or by establishing local cooperation between institutions from the health and social sectors within the project.

5 Characteristics and conditions for effectiveness of innovation in long-term care and future steps

The OECD identifies the four assets of technological innovation in the health sector as being an increase in the quality and effectiveness of healthcare, lower operating costs for clinical services, lower internal administrative costs, and the creation of new opportunities in the field of healthcare.

In the academic literature in Poland, expenses in the field of healthcare and investment in innovative technology are not viewed as a cost, but as an investment in human capital, since the level of health of the population is directly linked to the level of economic development and both are interdependent. A healthy society is therefore likely to lead to increased economic development (Sznyk & Karasek, 2016).

In the field of long-term care, innovative technology is important for the improvement of cost-effectiveness, since it contributes to improving the lives, health and security of patients in domestic care or in nursing homes, and to improving the working conditions of carers. The analysis undertaken by the Institute of Labour and Social Studies shows that telecare is particularly effective for solitary older people who are still independent,

becoming a tool against loneliness and depression and increasing overall well-being. It also has the effect of lowering the workload of carers supporting older people. However, when assistance in everyday activities and personal care is needed, ICT was not found to be of benefit (Szwałkiewicz & Sajkiewicz, 2017).

The literature also adds that innovation should be considered in a comprehensive manner, with the support and collaboration of the Ministry of Development, the Patent Office, the Ministry of Health, the Ministry of Finances, economists, lawyers and engineers, as well as business institutions. (Sznyk & Karasek, 2016)

In our in-depth interviews, the conditions for effectiveness of innovation in long-term care are mentioned to be original projects, pilot projects without a fixed budget or planning allowing for testing and learning through experience, and collaboration between all actors: carers, patients and health professionals, since the motivation and investment of people are essential for effectiveness.

According to the manager of the city of Warsaw project, the monitoring of life parameters and health status of patients in real time without laboratory tests, and the centralized gathering of patients' data is the future in the field of technological innovation in long-term care. It enables better cost-effectiveness in the provision of care and promotes prevention of health risks. Gathering data on the activities of staff in institutional care resulted (in the first three months after the implementation of the new system) in an increase of the efficiency of the performed activities by 20%, thanks to the reallocation of time for provision of services during the day ('elder-friendly Warsaw' project). In the case of the introduction of telecare in community services, efficiency arises from the ability for quick and early intervention leading to the quick response and intervention of emergency units providing lifesaving procedures ('Tele-Angel' project). However, there are barriers affecting the efficient development of innovative technology in the field of long-term care in Poland: those mentioned include lack of financing and fear of failure. A DGA manager interviewed underlined that although technological innovations are very useful in the field of health and long-term care, they are also expensive, and achieving their effective deployment requires the intervention of many entities and actors.

6 Conclusion

The in-depth interviews have shown that technological innovations in the field of long-term care in Poland are a very recent phenomenon, and that the projects involved in its development are in a phase of development and experimentation.

However, the cost-effectiveness of technological innovation in the field of long-term care, although nascent, is perceived positively by the interviewees: they consider technological innovation as an asset for long-term care and highlight its potential effects on cost-effectiveness and its positive impact on the quality of life of older people. The preliminary conclusions of the first phases of the projects described indicate that there have been improvements in patients' safety and quality of life, as well as carers' and professionals' working conditions. This implies that the initiatives in the sector should provide promising results for the provision of long-term care in Poland.

The study has shown areas for potential improvement in the implementation of innovative telecommunication projects: the training of healthcare staff and carers in the use of e-health devices and systems, and promoting digital fluency and awareness of the cost-effectiveness of innovative technology among users of long-term care.

References

Bujok J et al. (2014). 'Uwarunkowania Rozwoju Telemedycyny w Polsce', report.

Głogosz D, Sajkiewicz B, Sowa A (2018). Standardy usług asystenckich I opiekuńczych z wykorzystaniem teleopieki. Raport z badań, Institute of Labour and Social Studies, Warsaw.

Łuczak M (2013). 'System Home Monitoring® firmy Biotronik - korzyści z telemonitoringu implantowanych elektronicznych kardio urządzeń', Acta Universitatis Lodziensis. Folia Oeconomica. 287 Wyzwania współczesności : informacja – wiedza – zarządzanie, 67—77.

Małkowska MA (2014). 'Innowacje technologiczne na rynku usług medycznych w Polsce', Akademia Finansów i Biznesu Vistula – Warszawa, 1(39): 26–37.

Mikołajewska E (2013). 'Możliwości automatyzacji i robotyzacji otoczenia osoby niepełnosprawnej', Niepełnosprawność – zagadnienia, problemy, rozwiązania. Nr II/2013(7).

Ministry of Work and Social Policy (2014). 'Długofalowa Polityka Senioralna w Polsce na lata 2014–2020 w zarysie'.

Niemeijer A (2016). 'Bezpieczna autonomia, czy dobra opieka? Etyczne rozważania otaczające wykorzystania technologii w opiece długoterminowej', in Forum Opieki Długoterminowej MEDI, Kwartalnik nr. 3 (69), wrzesień 2016.

Richert-Kaźmierska A (2017). Teleopieka domowa w systemie opieki nad osobami – doświadczenia gmin województwa pomorskiego, Studia BAS, No 2/2017, pp. 169–189.

Sznyk A, Karasek J (2016). 'Innowacyjność w sektorze ochrony zdrowia w Polsce wyzwania, bariery, problemy i rekomendacje', Instytut Innowacyjna Gospodarka.

Szwałkiewicz E, Sajkiewicz B (2017). Raport z wyjazdów studyjnych, Institute of Labour and Social Studies, Warsaw.

World Bank (2015). 'Stan obecny i przyszłość opieki długoterminowej w starzejącej się Polsce – Uwagi na potrzeby opracowania polityki dotyczącej opieki długoterminowej'.