



ICT-based Solutions in Austrian Care Homes

Policy Review and Recommendations

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Executive Summary

The nursing and care sector has not been given much attention in policy debates and proposals on e-health in Austria. While general legal frameworks in the domain of data protection and regulation of medical devices have been formulated, questions of liability, responsibility, adequate training and data ownership remain. Austrian patients and doctors are skeptical of telemedicine, despite the successful rollout of pilot projects by local governments. Advances in telemedicine and telecare need to be accompanied by legal clarifications, information campaigns and trainings for patients and healthcare professionals. Any advances in telenursing also need to take into consideration that long-term care in Austria is predominantly provided in informal settings.

Introduction

Austria, like many countries in Europe, is faced with the socio-economic challenges of an ageing population. Currently, 19 percent of the Austrian population are aged 65 years and older (Statistik Austria, 2021). The percentage is projected to increase to 27.6 in 2050 (Statistik Austria, 2020a). This demographic trend sparks policy debates on rising costs in healthcare and care of older people.

Telemedicine and telecare are debated as technological solutions to this societal issue. The Austrian federal government responded by creating working groups on telemedicine and telemonitoring. Local governments fund pilot projects in specific areas of e-health.

Compared to other countries in Europe, Austria is in the midfield regarding the digitalization of health care services. In a comparative study on digital health care systems in 17 OECD countries¹, Austria was ranked 10th (Thiel et al., 2018), mainly due to the rollout of an electronic health record (Elektronische Gesundheitsakte, ELGA) system. However, telemedicine services have mainly been adopted in the form of medical consultations via phone or email; this development has been pushed further due to the COVID-19 pandemic. Telenursing and telecare in Austrian care homes have not been implemented yet. This puts Austria in an interesting situation, where the groundwork for e-health has already been completed, but implementation of telemedicine and telemonitoring is long in the coming.

Difficulties in implementing telemedicine and telecare services for older people arise from the characteristics of the national (health-)care system in Austria. Care of older people is mainly carried out in informal settings. The Austrian care system is based on a mixed-system, which includes residential care in nursing homes, and care at private homes by care professionals² and family members as informal caregivers. The majority of older adults (80 percent) are cared for by family members at home.³

¹ The study included comparative country cases of Germany, Australia, Belgium, Denmark, Estonia, France, Israel, Italy, Canada, United Kingdom, Netherlands, Austria, Poland, Portugal, Sweden, Switzerland and Spain. While Estonia (1st) Canada (2nd), Denmark (3rd), Israel (4th) and Spain (5th) ranked high in the comparative study, France (15th) Germany (16th) and Poland (17th) ranked low.

² In 2019, 153.152 Austrians were cared for at home and assisted by mobile care services, 96.456 people were cared for in care homes (Statistik Austria, 2020b). Intensive care, or so-called "24-hour care" is also provided by privately hired temporary migrant carers (from Slovakia or Romania, for example) who live and work at the patient's home (Fink, 2018, p. 7).

³ The Austrian government argues that it cannot finance professional care for all who need it. However, it supports the care of older people by family members by providing financial remuneration to (family) caregivers (oesterreich.gv.at, 2021).

Another obstacle to national wide rollout of telemedicine and telecare is a fragmentation of competencies among ministries, and among the federal government and local/state governments. Long-term care often falls into the competency of local governments (and their respective departments for health and social affairs), while health care (financing) is regulated by the federal government (Ilinca et al., 2015, p. 6).

Furthermore, the majority of Austrian doctors and patients are skeptical of or opposed to e-health. The main concern among patients and medical professionals regard privacy issues (Haluza et al., 2016). Especially medical professionals remain critical of e-health (Haluza and Jungwirth, 2015). Among particular patient groups and physicians, the opinions are mixed. In the domain of care for diabetes patients, 58 percent of physicians and 65 percent of patients perceived that Austria is ready for telemonitoring. Prevalent concerns included data protection issues, decrease of personal communication, lack of funding and the organizational structure of the Austrian health care system (Muigg et al., 2018).

This policy review introduces the main policies and governmental initiatives in Austria that have been adopted in the domains of telemedicine, telecare and telenursing. Based on the evaluation of policies, the paper issues recommendations for a responsible, sustainable and ethical policy development in ICT-based care. It also builds on the outcomes of a study conducted by SYNYO (Bertel et al. 2018), defining a roadmap for assistive technologies for care until 2025.

Austrian policies in telemedicine and telecare

The Austrian federal government recognizes the benefits of e-health and telemedicine. The Ministry for Social Affairs (Sozialministerium, 2019) underlined the potential of telemedicine to treat chronic diseases among older people, as well as cardio-vascular issues, in a cost-effective way, in addition to the potential of creating better access to care to the population that lives in remote areas. While the federal government is dealing with telemedicine and telehealth on a theoretical and policy level, local governments are involved in the implementation of telemedicine and telecare through the realization of pilot projects. However, the domain of telenursing and ICT-enabled care in nursing homes has been neglected in this context.

The Austrian government formed an inter-disciplinary commission on telemedicine in March 2013 (TGDK - Telegesundheitsdienste-Kommission), which issued recommendations. These recommendations were further developed by a working group in 2015, which developed a guideline for IT infrastructure for telemonitoring and data collection (Sauermaun, 2018). As

noted in the guideline, Austria does not have an existing IT infrastructure in place that would currently enable telemonitoring. Standardization and interoperability are core issues addressed in the guideline. As noted by Sauermann, health care providers in Austria use a variety of software to store and process data of patients. Another issue is the standardization of language to ensure semantic interoperability (op.cit. p.13). Furthermore, medical data (of implanted heart rate monitors) is sent to the product companies, rather than to health care providers (op.cit. p.18), raising questions about data ownership and data accessibility. The guideline does not specifically address the use of telemonitoring in the setting of care homes. The main discussion centers around the monitoring of patients after they release from the hospital, or the monitoring of patients with chronic diseases by health care providers.

While there is no general roll out of telemedicine services, some pilot projects have been successfully implemented, such as "Herzmobil Tirol", "Herzmobil Steiermark" which monitor patients with heart disease (funded by the regional public health care system), or the project "Gesundheitsdialog Diabetes" which provides telemedicine service to patients with diabetes.

Telenursing is a topic that has been neglected in the discourse on e-health in Austria. This issue was raised during an event at the Austrian Ministry of Social Affairs, Health, Care and Consumer Protection, during which Dr. Hanna Mayer, Director of the Institute of Nursing Science at the University of Vienna, stressed that the policy discourse on e-health is focused on telemedicine, and not on telenursing, despite the fact that there are already research projects implemented on this topic. One of the issues, according to Mayer, is the low standard of education requirements for care professions, which goes hand in hand with the low desirability of taking up the profession (Springer Vienna, 2020) and does not reflect the required knowledge and new responsibilities of ICT-based care.

Telemonitoring is state of the art in intensive care but not in long-term care at home. The use of telenursing and robotics in other care settings is not well established (Rappold and Juraszovich, 2019, p. 73). While robotics and care robots are a field of research in which Austrian research institutes and companies are involved, robotics have not been sufficiently included in policy development or implementation (Čas et al., 2017).

Assistive Technologies in Austria

In addition to telecare and telemedicine, assistive technologies in the context of Ambient Assisted Living (AAL) aim to maintain or improve the quality of life of older people and support their independence, especially within their own homes. Intelligent assistive technologies can be used in a number of areas, in which they can provide support for senior

citizens and their caring relatives; they include telehealth solutions as mentioned above, as well as home emergency call systems, navigation systems for pedestrians and wheelchairs with voice control (Bertel et al. 2018). With the *benefit* research programme⁴, funded by the Federal Ministry of Digital and Economic Affairs and the Federal Ministry of Climate Action, Environment, Energy, Mobility, Innovation and Technology, the Austrian government supports the development of AAL solutions. Several test regions have been rolled out in Austria, testing the implementation of AAL solutions for longer periods of time. For example, the Viennese AAL test region WAALTeR⁵, which ran between December 2016 to November 2019, addressed demographic and health policy challenges and combines the ubiquitous digitalisation of everyday life with the requirements of current Viennese concepts.

Legal framework

The Austrian legal system provides regulations for key aspects of e-health which are relevant to ICT-based care, such as data protection laws, regulations of medical devices and laws stipulating the responsibilities of health care practitioners. With the general legal framework in place, the devil is within the detail, especially when it comes to regulating the responsibilities and liabilities of medical and care personnel.

Data protection is regulated by the European General Data Protection Regulation (GDPR)⁶ and the Austrian data protection act (DSG). Data stored in electronic health records (ELGA) are in line with law of GDPR. The legal aspects of ELGA were specified in the ELGA law (Elektronische Gesundheitsakte-Gesetz - GTelG 2012). Since then, the GTelG has been amended to include changes regarding the Covid19 pandemic and to further the use of the ELGA infrastructure in other aspects of health and medicine. The latest version of the health telematic act (Republik Österreich, 2020) will also serve as a foundation for the e-vaccination certification, which is currently piloted and will be implemented nationwide. In this context it has to be noted, that Austrian citizens can opt out of the ELGA system.⁷ Therefore, the participation of the whole population in the centralized system of health care data cannot be readily assumed.

⁴ <https://www.ffg.at/programm/benefit>

⁵ <http://www.waalteer.wien/>

⁶ Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation).

⁷ In the period between 2009 (when ELGA was introduced) and 2018, 269.000 patients made use of the opt-out clause. (Egyed, 2018).

Medical devices are regulated in the Austrian Medical Devices Act (Medizinproduktegesetz, MPG), which includes general requirements for quality standards of medical products, and specific legislation for in-vitro diagnostics and implanted medical devices. The Austrian legislation is based on the EU Regulation on Medical Devices (European Parliament, 2017)⁸, which includes strict regulation for wearable technology.⁹ Medical devices need to be registered and approved by the Austrian Federal Office for Safety in Health Care.

Regulations of health care professionals' responsibilities and liabilities are not clear regarding the administering of telehealth services. The Doctors Act (ÄrzteG 1998) (Republik Österreich, 1998) does not provide legal details on telemedicine services. In paragraph §49 of the Doctors Act it is stated that doctors need to practice medicine in a direct/unmediated manner ("unmittelbar"), a term that provoked uncertainty among practitioners and legal advisors (Raabe-Stuppnig and Söllner, 2020). While the law does not forbid telemedicine services, it states that doctors need to pay respect to due diligence. This means that doctors need to assess on a case-by-case basis whether telemedicine is appropriate to treat a patient. During Covid-19 pandemic, a preliminary regulation specified the fees that doctors in the public health care system can charge for the provision of telemedicine services, which mainly included consultations per phone or email (Tremel and Schwabl, 2020).

Further uncertainties regarded the responsibilities of nurses, carers and other medical personnel. The amendment to The Health and Nursing Act (Gesundheits- und Krankenpflegegesetz, GuKG 2016), which regulates confidentiality, mandatory documentation and access to medical information, expanded on the competencies of care professionals. In Paragraph § 15(4)18 it is stated that care professionals are allowed to administer the monitoring of patients using technical medical devices, if they received relevant training (Republik Österreich, 2016), without further specifying which type of training would be deemed adequate.

Key issues in the national rollout of telemedicine and telecare

The existing policies and legal frameworks need to be further developed to address key issues and open questions regarding the implementation of telemedicine and telecare in Austria. The identified issues resonate with the findings of Nittari et al. (2020) on legal and ethical issues in telemedicine. The following section discusses key issues which need to be

⁸ The new regulation entered into force in 2017 and is replacing existing regulation in a transition period until 2022.

⁹ Software used in wearable devices is classified in the IIa, IIb or III risk category, instead of risk category I, thereby requiring official certification (Koch, 2020).

considered in a national rollout of telemedicine and telecare services in Austria: data security, data ownership, ethics, liability, user friendliness & user acceptance, standardization, informed consent, financing and ICT training.

Data security and trust

Austrian patients and health care professionals have concerns regarding data protection. While there is a robust legal basis in place to deal with privacy and data protection issues (based on the EU data protection laws), the wide-spread use of telehealth services would provide vulnerabilities in terms of data security. Hospitals and other health care providers have been (successfully) targeted by hackers (Seh et al., 2020) and remain vulnerable to data breaches. Given the sensitivity of medical data, the issue of data protection and security is crucial to ensure trustworthiness of new technologies.

Data ownership, data access and sustainability

Ownership of medical data remains a complex issue. While some argue that patients should be the owners of their personal medical data, health care providers (such as hospitals and medical practitioners) often remain the de-facto owners of medical data (Choi and Walker, 2019). Discussion regarding the use of medical data for research purposes and for the benefit of the general public are also ongoing. In Austria, this discussion is held regarding data stored in the ELGA system (Die Presse, 2018). Data ownership in the context of wearable technology is even more contested (Kerr et al., 2019), as manufacturers claim ownership of the data and exploitation for commercial purposes. This leads to further uncertainties regarding the reliability of data access, and again, the security of stored data. Responsibilities in the continued maintenance of devices and IT infrastructure are also unclear. From a policy perspective, these issues also have to be taken into account regarding procurement strategies.

Ethical issues and liability

An open topic remains the question of who is responsible for the accurate and ethical gathering, use and interpretation of remotely collected data. To what extent are patients responsible for the adequate use of devices? Who takes responsibility if telemedicine leads to false diagnoses or late treatment (due to malfunction of the devices, wrong interpretation of the data, among other issues)? Uncertainties regarding legal issues (such as liability in

cases of malpractice) were named as one of the issues Austrian medical practitioners named in a survey (Hainzl and Juen, 2020). Therefore, a comprehensive e-health strategy needs to be based on robust ethical and legal frameworks.

User-friendliness and user acceptance

The use of emerging ICTs requires a certain level of tech-savviness and the ability to learn new skills. Older patients have different levels of IT competency. This can create issues among older people, who have less experience and sometimes feel that they are not equipped to learn the use of new technologies. Some patients feel that the effort of learning the use of new technologies is higher than the potential benefits. Other issues can be sensory difficulties, dementia, or lack of internet access (Kratky, 2020). Institutional setting of care homes can provide advantages in this respect, by providing the necessary infrastructure and assistance by care personnel. A study conducted in 2018 defined the development of assistive technologies for and with the users to increase acceptance and usefulness as one of the key goals for the future of the field (Bertel et al. 2018).

Standardization and interoperability

Clear guidelines regarding the necessary quality of wearable sensors (such as accuracy etc.), robotics and other ICT tools need to be formulated. This also regards potential European standards in telemedicine. As patients move between member states of the European Union, a standardized language would enable the smooth transfer of patient data across borders. Cooperation with other European countries would also enable states like Austria to draw on existing efforts of data standardization. As of now, there is no European wide standard regarding telemedicine, which could be implemented in Austria.

The national electronic health record (ELGA) has an standardized terminology, which has been evaluated as a success (Seerainer and Sabutsch, 2016). A comparative study on e-medication approaches in Austria, Germany and Switzerland demonstrated the divergence among national approaches. While the goals are similar, the implementation through e-health infrastructure varies significantly in terms of standards used, chosen architectures and available functionalities (Gall et al., 2016).

Informed consent and drop out

Patients need to give their consent to participating in e-health. In addition, there needs to be an option to drop out of telemonitoring, or to choose between personal consultations and telemonitoring. Older patients that do not master the use of new technologies need alternative treatment and monitoring options. Especially in the Austrian context, where patients and doctors are skeptical of adopting emerging ICTS, a drop out option is necessary. The personal choice in treatment options also needs to take into consideration the different costs of offline and online treatments, and whether patients can be asked to pay more if they choose the more expensive treatment.

Financing

Apart from the funding of research and pilot projects in telemedicine and ICT for care, a national strategy for the financing of telehealth is missing. At this moment, it is not yet clear to what extent the public healthcare system will cover the costs of telecare and telemonitoring. A nationwide rollout of telemedicine and telecare services needs to be supported by a national funding strategy, incentives for investment in telemedicine for health care providers and clear guidelines on who covers which costs.

ICT training of physicians and care takers

Medical doctors and care takers are not experts in the use of ICTs and in the interpretation of data generated by wearable sensors. The curriculum of medicine in Austria does not include mandatory education in e-health. Currently, elective subjects in telemedicine are taught at Austrian universities, which are often theoretical and do not provide students with the necessary practical skills. Curricula of medicine students need to be reformed to reflect trends in e-health (Rieder, 2020). The Medical University of Vienna suggested to include a module on health care informatics and ethics in the curriculum (*Task Force Lehre*, 2019, p. 26). Similar gaps concern the education of care professionals (Ammenwerth and Kreyer, 2018). While the general curriculum in medicine and care does not include courses on telemedicine, some specialized Masters degrees in this field exist.¹⁰

¹⁰ Examples are the Master's degree in Telemedicine at the Donau-University Krems, the Master in Digital Health at the St Pölten University of Applied Science and the Master's degree in Medical Informatics at the Medical University of Vienna.

Perspectives and Policy Recommendations

The existing policy initiatives and legal frameworks provide a good starting point for the development of telemedicine and telemonitoring in Austria. Opportunities lie in the further roll out of successful pilot projects, in intensifying efforts to include the nursing and care sector into e-health initiatives, in specifying legal guidelines further and in educating all stakeholders in the responsible use of ICT in health and care. Based on the review of current policies on telemedicine, telecare and e-health in Austria, eight policy recommendations can be issued:

- Foster acceptance and desirability of e-health through information and communication

The advantages of introducing telemedicine and telemonitoring need to be communicated to health care professionals, patients and the general public, to increase desirability and acceptance of the use of ICT in health care. This means to address and take seriously the fears and concerns of the involved groups.

- Create evidence through research and pilot studies

Finance and promote research projects that can demonstrate in which contexts the use of ICT in health and care can save costs, increase quality and accessibility of care, and involve the users – older people, informal and professional caregivers – in the design and development of technologies. Studies need to demonstrate the pros- and cons of different telemedicine and telecare technologies in hospital, care and private settings. In particular, the use of ICT in care homes needs to be advanced, which is currently understudied. Further, research is needed to understand benefits and long-term effects of assistive technologies and telemedicine.

- Fund investment in ICT and cover telemedicine and telecare services within the public health care system.

Widespread roll-out of telemedicine and telemonitoring needs to be financially supported by the government, through incentives for investments in ICT for institutions and through covering the costs for patients by the public health insurance. ICT for care needs to be affordable, addressing socio-economic gaps. The creation of new market opportunities and funding for near-market solution will further ensure the successful development of novel technologies in this sector

- Create a solid legal framework regarding the liability for medical decisions based on data generated by wearable devices

Eradicate uncertainty among health care professionals regarding their liability and responsibilities in the quality of treatment and accuracy of diagnostics mediated via ICTs.

- Plan telehealth and telecare services for formal and informal care

Any extensive rollout of telemedicine services in care home needs to take into consideration the informal care sector. Advances in the use of telemedicine and telecare in nursing homes should not create divides between those receiving care in professional and in family settings.

- Address gaps in ICT education for health care professionals and family carers

Provide adequate training and education opportunities for health care professionals and include ICT in the curriculum of higher education and professional education. Provide specialized training for family carers.

- Promote a human-centered approach to the implementation of ICT in health care

Telemedicine and telecare need to be tailored to the needs and rights of the patient, doctors, nurses, care professionals and family carers. This includes a strategy to develop telemedicine and telenursing for particular conditions, treatments and patients. Furthermore, telemedicine needs to be based on the informed consent of patients, who need to have the right to opt out of telemedicine or telecare.

- Streamline National and European Policies

Combine efforts on the national level and ensure efforts are not duplicated on the European level. Exchange information and policy advice with other European governments, to facilitate cross-border care and standardization of e-health practices.

Efforts in advancing telemonitoring and telehealth in medical settings can and should be translated to the care sector. The proposition is therefore to adopt an inclusive, multi-stakeholder approach to developing ICT use in Austrian (health) care.

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Acknowledgement: The project INNOVATION THROUGH ICT IN CARE has been funded by the European Union's Erasmus+ Program under Grant Agreement No 2019-1-TR01-KA204-074733.

Disclaimer: The content of this publication is the sole responsibility of the authors, and in no way represents the view of the European Commission or its services.