



INTELLECTUAL OUTPUT 1

Digital Health Technology Trends & Implications for Health Professionals

Author: FHS

Date: 18 February 2020

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I. INTRODUCTION

This output is linked to the achievement of Specific Objective 1: "Increase the level of understanding of digital technology trends and their implications in the health practice". It is aimed at creating a knowledge base about current successful practices on new health technologies and training methods adopted to facilitate their understanding and adoption within public and private health organizations (hospitals & territorial services). Based on a sectorial classification that is introduced below, the Partners selected three successful cases and interviewed the people involved in them. They were interviewed following the interview guidelines provided by the Activity leader to assess the following aspects of the selected cases:

1. General knowledge about health related technologies and usage in the professional environment
2. Decision making process of implementing digital technology innovation in daily work
3. Implementation of digital technology in daily work
4. Daily work with new technology
5. Usage of digital technologies for patient empowerment Major lessons learned in using health-related digital technology Data collection and storage of data

The Interview Guide is included as Annex to this document.

II. CASE & INTERVIEWEES SELECTION

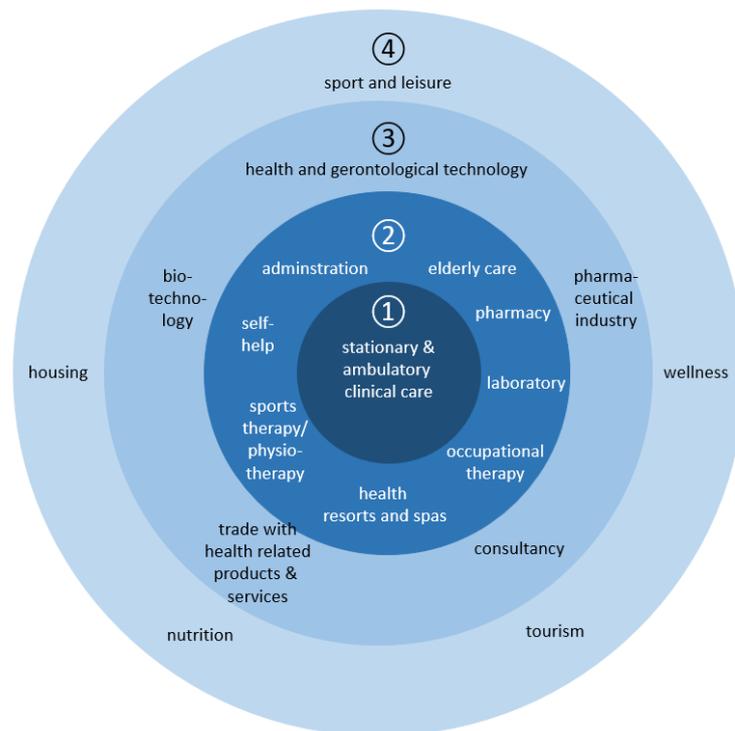
1. Criteria for identifying three cases of successful implementation of digital innovation in health systems

2. The organization (one or more needs to apply) ...

- has already been referenced in (required) training programs and workshops (eligible for points)¹
- has already been identified via trainers or instructors of educational organizations²
- has already been reported in newspapers or field-related journals
- has already been a partner in a former eHealth project
- The organization needs to use digital innovation solutions/devices frequently and has used it successfully already for a month min.

3. The interviewees. Key users frequently using health related digital technology

- Three cases needs to be identified. One case needs to be from an organization from inner circle 1 (see below), one case from inner circle 2 and the third case can be from any other circle.



Adapted from Hilbert, Fretschner & Dülberg (2002), p. 6; Hilbert & Fretschner (2004), p. 13c

¹ Physicians et al are required to do trainings in a certain period (that is the case in Germany/Austria) in order to keep their licenses. If this is not the case in other countries, we could revise the question: has already been referenced in training programs and workshops

² It means that an organization can be included that was also been referenced by educational organizations in the respective fields

4. Selected Cases

Technische Universität Dresden (TUD)

Case 1

The first interviewee (case 1) is senior physician and head of a research group in the field of **trauma and post-traumatic disorders** (30 years of professional experience). The interviewee has already been referenced in required training programs/workshops, reported in field-related journals, a partner in a former eHealth project. The research group belongs to the inner circle 1 (stationary and ambulatory clinical care). The inner circle 2 is covered by the areas of self-help and psychotherapy.

The described case refers to the app called **CoachPTBS**. **CoachPTBS** is a guide for psychological disorders. The app was developed by a team of doctors, psychologists and patients. In addition to an all-round information package on post-traumatic stress disorder (PTSD) and trauma-associated disorders, the coach is individually adaptable. Users can create their own support network. Information, self-assessment and a wide range of exercises as well as individual progress documentation can be offered. The app is a good way of activating one's own resources in the context of self-management in the event of stress, relieving oneself and, if necessary, paving the way to the extensively presented assistance options.

Case 2

The second interviewee (case 2) is physician and owner of the chair for **prevention and care of diabetes** (19 years of professional experience). The interviewee has already been referenced in required training programs/workshops, reported in field-related journals, a partner in a former eHealth project. The research group belongs to the inner circle 1 (stationary and ambulatory clinical care). The inner circle 2 is covered by the areas of self-help and prevention. The inner circle 3 is covered by health and gerontological technology.

The described case refers to **the project SALUS and the motion app VIDEA bewegt**. The project was exploring new ways of accessing and analysing data found in Electronic Health Records (EHR) to provide an infrastructure that enables the execution of safety studies for mining and analysing real-time patient data. In this way, patient safety could be ensured through early detection of rare adverse events. The app aims to integrate more movement into people's everyday lives. The app is a video-based coaching program.

Case 3

The third interviewee (case 3) is **sociologist, health scientist and head of research department for general medicine** (10 years of professional experience). The interviewee has already been referenced in required training programs/workshops, reported in field-related journals, a partner in a former eHealth project. The research group belongs to the inner circle 1 (stationary and ambulatory clinical care). The inner circle 2 is covered by the areas of administration and elderly care.

The described case refers to the project **ATMoSPHÄRE**. The joint project **ATMoSPHÄRE** develops, tests and evaluates in Saxony the integration of a medical IT platform with an integrated care management approach in order to enable chronically ill and multimorbid elderly patients in particular to lead an independent life.

Fondazione Bruno Kessler (FBK)

The successful cases analysed have all been developed in the framework of **TrentinoSalute4.0 (TS4.0)** is the recently created "**Competence Center on Digital Health**" after approval from the Trentino Provincial Council as a policy instrument to coordinate the work on digital health in the region. TS4.0 represents the meeting point between the health system, research and the territory, becoming the instrument of cohesion between the guidelines of health planning, the innovation needs expressed by the Provincial Health Service and the opportunities offered by research

and new digital technologies. The entities which are part of TS4.0, and that have worked in the successful cases analysed are:

Fondazione Bruno Kessler (FBK) and particularly its Centre for Information Technology is organized in Research Units that contribute their competencies to the project. Research and innovation in the field of Medical Informatics, in fact, is the core business of the FBK electronic-Health Research Unit (eHealth), an interdisciplinary research group that studies methods and models for the design, implementation and evaluation of prototypic applications and ICT-based innovative services supporting the management of data, information and knowledge in healthcare domain. The eHealth Unit is an interdisciplinary research group that studies methods and models for the design, implementation and evaluation of prototypic applications and ICT-based innovative services supporting the management of data, information and knowledge in the healthcare domain. The two main research themes are eHealth applications and services supporting a model of care centred on citizens and patients (Patient-centred eHealth), and models and applications aimed to healthcare professionals (Clinical e-Health) for supporting high-quality care process.

The local health Trust: APSS (Azienda Provinciale per i Servizi Sanitari di Trento): the local health department in charge of delivering healthcare services to citizens. In particular, APSS has the experience within Public PHR in Trentino Province (TreC).

The Department of Health and Social Policies of the Autonomous Province of Trento, leads the development of innovative solutions to support advanced models of service management in integrated social and health care service delivery. These solutions respond to principles like usability and transparency, addressing issues of assistance, care, promoting well-being and social inclusion. The Department aims at developing of an overarching scheme of assistance in which smart hospitals, integrated and inclusive care will be considered as the driving concepts of the innovation in healthcare sector. The Autonomous Province of Trento runs a Personal Health Record (PHR) platform named “Cartella Clinica del Cittadino” (TreC), and other online services that are used by the citizens to access their clinical data via the web.

According to the Proposal, FBK and PAT interviewed 2 representatives from each of the above entities in relation to the cases below.

Case 1

This case is about a geocaching App for active and healthy aging called “**Impronte**” (=footprints). It has been implemented jointly by the Province, FBK, and a Centre for elderly people. The aim was to encourage participants in undertaking physical activity in open air, developing at the same time their technological skills. The “Footprints in the park” project involved a group of people from the University of the Third Age and Available Time of Primiero who, from May to September 2018, accompanied by researchers from the FBK ehealth group and by experts from the Paneveggio – Pale di San Martino Park. It has the aim of promoting healthy lifestyles and active aging, through gamification and the use of digital technologies.

Case 2

In Trentino, GPs and diabetologists can now prescribe a medical app, **TreC Diabetes**. The Project is an App that the clinician can prescribe to the patients suffering from diabetes. Thanks to the App, patients include the data on their health status, the measurements and all relevant info on their own simply using their smartphones. The clinician has access to such data via an online platform and can, in this way, monitor the patient and give instructions in case intervention is needed. All the data gathered from the app is periodically sent to the TreC platform, where it becomes part of the patient’s personal health records, accessible to the GP. The next morning the app reminds the patients to take the diabetes medication and allowing the patient to start the day with a feeling of being in control of his/her condition chronic conditions, with the reduced subjective burden of disease.

Case 3

The third case regards in general the introduction of digital technologies in healthcare, with a focus on the **service of the Personal Health Record (TreC in Trentino)**. TreC is Personal Health Record System for Citizens, a digital

platform that allows all citizens living in the Trentino Region to access and manage their own health information. The TreC platform is composed of different modules. This particular structure allows the system to be flexible (i.e. only one component can be modified, thus leaving the rest of the platform intact) and adaptable (i.e. other modules can be integrated into the system, so to enrich the services provided). The system is able to integrate: on the one hand, the electronic health record, i.e. the EHR from private and public clinic institutions, and, on the other, the patient-generated data, i.e. the PHR (personal health record) which are the data provided by the citizens (e.g. those related to lifestyles, such as physical activity and diet, coming from IoT health& wellbeing devices). All these data are the input for the services developed by FBK, such as TreC diabetes: this is an app where AI technologies are integrated: these comprehend the predictive models and the virtual coach technology based on the Horus.AI module, which define tailored and contextualized goals and care plan to the patient.

Fachhochschule Kufstein (FHS)

Case 1

The first interviewee (case 1) is a **nurse and studied manager** (MBA) and works as a nursing director in a regional hospital (3 years of professional experience in this position).

The described case refers to the implementation of digital patient records and the digitalization of older paper based patient records in the hospital.

Case 2

The second interviewee (case 2) is **senior physician and head of the department of microinvasive therapy** at a University Hospital in Austria (16 years of professional experience). The interviewee has already published about his work in field-related journals and holds several patents.

The described case refers to the development and implementation of **stereotactic radiofrequency ablation** (SRFA). SRFA with intraprocedural digital image fusion represents an innovative efficient minimally invasive therapy for the treatment of diverse carcinoma.

Case 3

The third interviewee (case 3) is a **medical computer scientist and researcher at a University of Applied Sciences** (3 years of professional experience). The interviewee had worked as trainer in digital health related training programs/workshops and had supported the implementation of digital health innovations in hospitals.

The described case is about a **patient safety intelligence system and framework for the secondary use of multimodal clinical data** to assess and improve patient safety (PATIS). PATIS contributes to a better understanding on how to monitor patient safety by the use of available routine data.

University of University of Nottingham (UoN)

Case 1

C2Hear are Reusable Learning Objects (videos/ DVDs) providing advice and information to help people to cope with using hearing aids. A participatory approach led to the development of C2Hear, influenced by members of the public and hearing-aid users. Randomised Control Trial (RCT) evaluation of efficacy showed improved knowledge, practical skills, hearing-aid use and self-confidence. Health economic analysis showed C2Hear to be a cost-effective clinical intervention. This has led to license agreement between the partnership between Nottingham University Hospitals NHS Trust, the University of Nottingham, commercial sector partner, PC Werth Ltd, and the charity Action on Hearing Loss, with the C2Hear trade mark registered. The C2Hear DVD is available through the NHS Supply Framework. The online videos are freely available. A local NHS Clinical Commissioning Group is funding the DVD for new hearing-aid users and take-up is 90%. Five leading UK audiology departments are implementation models for C2Hear and increasing numbers of audiology departments are using C2Hear in clinic for patients and in waiting rooms. m2Hear is the continuation of c2Hear delivered on a different (mobile phone) platform.

Case 2

The Health Care System - LLM Care, is a result of the research project Long Lasting Memories - LLM that was funded by the European Union. It is a technology tool that combines the contemporary exercises promoting physical activity and cognitive training through an entertaining environment. In LLM Care in January 2014 passed from the pilot implementation to the market implementation, as a service provided by the infrastructures of the Research Committee of Aristotle University of Thessaloniki, at low prices in local stakeholders, public and private elderly care homes, health care professionals, individuals, as well as elderly citizens in need. LLM Care is based on non pharmaceutical intervention that combines the contemporary exercises promoting physical activity and cognitive training through an entertaining environment prolonging the independent living, with a direct and effective impact on improving the quality of elderly's life. Addressed to Local Authorities, Public and Private Seniors Care Centers, Recovery - Rehabilitation Centers, Health Care Professionals and individuals. The LLM Care Health Care System consists of specialized designed programs, including two main systems: the Physical Training Component Fit For All and the Cognitive Training Components, BrainHQ and Video GRade. LLM care complements by research publications, but also multiple announcements and reports in press.

Case 3

The **SurePulse VS** is an accurate and hands-free heart rate monitor specifically designed to be used on newborn babies. SurePulse combines highly accurate monitoring with functional design and opens up the possibility of adding reliable vital sign monitoring to a multitude of clinical scenarios where this would provide real value. SurePulse technology was developed at the University of Nottingham through a collaboration between the School of Electrical and Electronic Engineering and the Department of Child Health. It has received over £3M in research funding over 10 years, and has CE approval. The VS comprises two parts – a single-use Cap which integrates a sensor and a reusable Display with wireless Modules. The VS has been designed with the baby and the user firmly in mind. The monitor integrates seamlessly with the resuscitation workflow to provide accurate vital sign information right when it's needed. The Cap is designed to be rapidly applied to the baby and situate the sensor on the forehead where optimum signal quality can be obtained. The Display is easily mounted on the side of the resuscitation table. The Display houses two wireless Modules. When the monitoring is required, a Module simply lifts from the Display and is placed into a cradle at the side of the baby's head, which connects to the sensor. The SurePulse VS monitor has been successfully tested at the University of Nottingham NHS Trust Hospitals. SurePulse Medical Ltd are winners of the 2018 East Midlands Medilink 'Start-Up' Business Award and also winners of a place on the prestigious TMCx7 Texas Medical Centre Accelerator Programme.

Stitching Smart Homes (SSH)

Case 1

The first interviewee (case 1) is the **founder of MiBida**, a product that aims to improve **the communication and collaboration in healthcare**. He started MiBida in 2009 and founded the company in 2013. The interviewee has experience in healthcare technology before founding his company, and realised the way that healthcare professionals are communicating in the Netherlands is not efficient, especially the communication between different organisation in transmurial care. Therefore, he created three Apps, including three different packages for different kind of users that are named 'Essential for every healthcare provider (MiConnect)', 'Consultation, revalidation and aftercare (MiCure)', and 'Insight, coordination and patient activation (MiCare)'.

MiConnect offers, besides safe communication and video communication, solutions for the necessary statement of consent, the MDO, video consultation with the patient and potential reference. The interviewee values the law and legislation, and ensures that the App also is conform with the GDPR, NEN7510 and NEN7516 so it is safe to use and the privacy regulations are understood and applied.

Link:

<https://mibida.nl/>

Case 2

The second interview (case 2) was conducted with two interviewees from the same organisation. This organisation is **tanteLouise**, a large **nursing home** in West-Brabant. The first interviewee is a relationship manager and has to deal a lot with external parties in care. He has 34 years of experience as location manager at several locations of tanteLouise. The second interviewee used to be manager of the care support and was a member of the medical secretary. Currently, she's head of the education centre. She has been working at tanteLouise for eight years.

tanteLouise is known for being one of the most innovative nursing homes in the Netherlands. In 2019, they developed 'Hof van Nassau', perhaps the most innovative dementia care centre in the world, visited by many healthcare professionals globally. tanteLouise also participates in several project to stimulate innovation in their organisation, such as DoACTIVE, Anders Werken in de Zorg, AAL FreeWalker and AAL Tactile.

Link:

<https://tantelouise.nl/>

Case 3

The third interviewee (case 3) was educated as a dietitian, but now serves the role as **care change manager and policy advisor**. She started in 2003, and now directly works under the board of directors as an independent advisor. The interviewee works for **Thuiszorg West-Brabant (TWB)**, a **home care organisation** that strives to implement care innovations to decrease the gap between healthcare providers and those who demand care. TWB is awarded as best homecare organisation in West-Brabant and has been offering this services for over 100 years. TWB has over 1800 employees that aim to offer knowledge, expertise and the network the improve patient's self-sustainability.

Link:

<https://www.twb.nl/>

III. RESULTS

1. GENERAL KNOWLEDGE ABOUT HEALTH RELATED TECHNOLOGIES AND USAGE IN THE PROFESSIONAL ENVIRONMENT

Technische Universität Dresden (TUD)

All three interviewees are familiar with wearable devices (smartwatch, pedometer), mobile apps (smartphone) and digital technology innovations (platforms) that are useful for the clinical practice. All interviewees encourage to use such solutions, while two currently use different digital technologies (mobile apps, Bluetooth-enabled measuring devices such as blood pressure monitors and scales). Opportunities refer to using smartphones; one can be very close to the patient and detect/monitor various things. This happens partially automated – without the patient noticing. Another potential is the ability to collect a large amount of data (collected intuitively by the patient but also actively via questionnaires), which can improve clinical activities with the help of algorithms. Digital technologies are a good adjuvant in treatment (e. g. a migraine app). Patients' needs can be identified and linked to individual offers, therapies and patient pathways. Digital solutions can also serve as a decision template for physicians. On this basis, the physician can decide on further treatment or involve the patient in this decision-making. Furthermore, they can be a support for monitoring; home visits can be saved and data provided by patients are rated positively. However, it must be carefully considered which data are collected and why, when and how often (vital) parameters are measured.

Fondazione Bruno Kessler (FBK)

While the interviewees were familiar with health-related technologies and their usage, different groups of health care professionals seem to have different level of familiarity. Especially clinicians developed strong skills since approx. 10 years, despite having very little knowledge and interest initially. Others are more familiar with the use of Personal Health Records or with the use of wearable devices to collect data for research activities. Especially the application to chronic diseases have developed significantly, demanding training for health professionals at all levels. Others interviewees use more traditional technology like Google calendar. Health technologies for professionals are perceived to bring more efficiency and effectiveness of services and improve patients' management, especially to the youngsters and more applications usable for the elderly. The use of such devices will expand, and people will be more incline and will to take advantage of online and digital services.

Fachhochschule Kufstein (FHS)

All interviewees state that they are familiar with several clinical documentation software, some of them are familiar with field specific data analysis software and health apps. Most of them use only the standard software that is installed on their PCs and are not familiar with health apps or wearable devices and do not use them in their daily practice.

University of University of Nottingham (UoN)

The interviewees had broad knowledge about non-interventional health related technologies, such as smartwatches that measure pulse rate, mobile applications for cognitive enhancement, sensors that can be used to track patients movements, hearable wireless headphones, heart rate measurement through smartphone applications, kind of ear level wore Health Products which provide you with monitoring and healthier heart rate, smartphone apps for fall detection, smartphone hearing aids that allow you to control intensive sound settings, motion sensors, pulse oximeters and ECG. One interviewee identified many opportunities on introducing digital technologies in the daily work to enhance the monitoring of cognitive and physical training measuring. Furthermore, monitoring the progress of a patient, check the improvement of the condition of a patient based on data existing on databases/electronic health records and distance management of a patient were among the opportunities foreseen on introducing digital technologies for patient management. Personalised digital innovations tailored to each person condition was also highlighted as part of patients management providing multiple details for the specific Healthcare service, including aggregation of data from multiple devices. In addition use of AI and deep learning was mentioned as a big opportunity to identify patterns for patients. One interviewee noted concerns of clinicians with devices that people can control themselves that they might be dangerous, and the need of safety range that these devices can be tuned. Empowerment identified for clinicians using digital technologies enable them to be more patient-centred. Examples of such technologies include remote fitting and fine tuning of hearing aids and smartphone hearing aids that enable clinicians to make function adjustments and reduce waiting times and cost, a type of patient remote management.

Provincia Autonoma di Trento (PAT)

All the interviewees are familiar with health related technologies. One interviewee has a high level knowledge since he is a Senior Analyst of an Healthcare Trust, another one has a broad experience about health related technologies while the third's knowledge is mostly as a user rather than a promoter.

Stitching Smart Homes (SSH)

All interviewees are well familiar with health related technologies and usage for professionals. All institutions work with an Electrical Health Record or Patient File, and work with wearables to measure their patient's health. They see big opportunities using health related technologies, recognize their effectiveness and stretch the importance of individualizing health care technologies. The personalization of care (robots not replacing the humans) is very important, especially for those who are older. Further, for the healthcare professionals it is very important to understand the urgency or the need of an innovation, otherwise they will not accept it, as innovation is not always as successful as originally planned.

2. DECISION MAKING PROCESS OF IMPLEMENTING DIGITAL TECHNOLOGY INNOVATION IN DAILY WORK

TUD

The implementation of digital technology innovations is trichotomous. It is initiated by technological innovations (e.g. by AGFA Healthcare GmbH) from practical experience while the implementation of digital technology innovations is usually initiated by the individual project staff who write the project proposals. In some cases, it is initiated by doctors. At a higher level, a clinic is also the driving force in the implementation. The implementation is promoted by the Free State of Saxony (SAB), the federal government (BMBF) and by the EU (ESIF). The interviewees have used various sources to obtain general information about digital tools for their daily work. First, the interviewees conducted literature reviews in major databases in conjunction with snowball searches and performed economic/market analyses of health insurance companies/technology manufacturers. Second, since the interviewees work in interdisciplinary teams with expertise in different fields, they exchange information among themselves and with colleagues (e.g. conferences). Third, one interviewee was able to draw on the know-how of an industrial partner (Philips) with a large research and development department. The other interviewee collaborated with the Federal Centre for Health Education. The most relevant information were found on the internet (databases, market analyses) and through exchanges with colleagues. The decision to invest in digital technology innovations is based on the objective that investment in digital technology innovations in health care in rural areas can be guaranteed that way even though the age structure and the working overload for doctors in rural areas is very high. Consequently, telemedicine will be used soon. Barriers include privacy and security concerns regarding the app and data transfer problems. The development of solutions that do not meet the customers' requirements leads to barriers in terms of acceptance and perceived usefulness.

FBK

In terms of decision-making, overall, more support and awareness could help. While one team showed commitment in pursuing such initiatives, a barrier related to decision-making refers to partners in such projects who are concerned about the supply of devices and technologies: they ask to be provided with the relevant technologies and they prefer not to buy them directly. The implementation of digital technology innovation was initiated, for all interviews, as a joint initiative, combining interest from different actors towards actions to improve health care in diversified domains (chronic diseases, patients empowerment, healthy and active aging). It came from a growing interests between different areas of research. In general, the use of telemedicine and the prescription of medical apps were successful and gave the input to proceed to involves in technologies.

FHK

The initiative for the implementation of digital solutions comes mainly from physicians in their field, sometimes from persons who had experiences with digital technologies of their former employers. The patient's expectations seem to play a minor role in the decision making process. The decision is made mainly in management boards and seems to be a decision that has to be done mostly under cost pressure.

UoN

Usually the idea is initiated by a researcher, but informed by patients and users. In some cases it is usually a combination of a team of the organisation with some end users/patients/elderly that initiate the need of such a digital innovation. The idea in the case of LLM service derived from a European research project and was in the individual researchers to further promote it to be adopted in healthcare practice. When it comes to healthcare homes it is the management board usually that takes the decision to invest in a digital technology innovation with some input from healthcare workforce. On the contrary, in the NHS the clinicians themselves can initiate the process, writing a business case (showing benefit for the service) for consultation among fellow clinicians and then the management board/ Head of Service has to approve it. A new device/technology should undergo a few "strict" steps before used in practice. There is some resistance in the clinicians, but always it depends from the technology and case. Due to time limits within the NHS service the addition of new process or learning skills might cause some resistance. Usually the "older" clinicians are more resistant to new technologies. The usually source of information is a face to face training event that accompanies the service. Additional material are available in both printable

resources and online material. In the NHS a competency checklist is used before a clinician is allowed to use the new device/technology and in some trusts 70% of clinicians have to be trained, before anything go into practice. All cases reported that they look for strong research evidence before they decide to implement a new digital technology in practice. For private institution, provision of state-of-the-art healthcare interventions add on to their promotion, while public organization modernize their approaches for the benefit of the elderlies.

PAT

All the three interviews referred to the peculiar framework of Healthcare in Trentino. The Healthcare Trust of the Autonomous Province of Trento (APSS) started working twenty years ago on a centralized archive of patients' data. At that time, it was just an archive because the concept of a Personal Health Record (PHR) would come later. After that, the PHR laid the foundations for the electronic platform TreC, which allows a patient to access all of his health data in a simple and smart way. It was developed based on the collaboration between the Autonomous Province of Trento in the role of decision maker, the Bruno Kessler Foundation research institute and APSS in the role of provider of the service of Trentino Salute 4.0 (TS4.0), a competence center for the development of digital health created by the provincial government. TS4.0 also involves citizens, health professionals and sector companies according to a quadruple helix approach.

SSH

The management/innovation managers decide how and if to implement digital technology in daily work. They all reckon that not only managers do this, but the implementation is a process that should involve all stakeholders from the beginning to the end of the implementation. It is very important to also involve the professionals in the decision process, not only the managers. When trying to obtain information on digital technologies, the care organisations use internet, but also rely on their European contacts or related publications. Also, it is important to have user-friendly, low-threshold technology . The patients should never be at risk, and the innovation should be safe to work with. Everyone, including the patients, caregivers and managers, should be fully committed to the innovation, otherwise, it will not be implemented successfully. People are usually reluctant to change, unless they see the urgency of an innovation and how it can help them directly.

3. IMPLEMENTATION OF DIGITAL TECHNOLOGY IN DAILY WORK

TUD

Resistances were encountered in the assessment of the tool (app) as a medical device or when working with general practitioners. General practitioners seem to have a certain scepticism towards the use of digital technologies, in particular, referring to the idea that technology is not intended to replace anyone. It was also difficult to show that telemedicine solutions can save time and money. The learning process of orienting oneself more towards the patient's needs can be seen as a challenge. The implementation process was different for each interviewee. Two interviewees knew that training courses had taken place in connection with the implementation. One of them did not participate. The other one explained that the trainings were delivered by the German Red Cross. Case and care managers as well as technicians supported the test persons. The technicians set up the tablets and showed the test persons how it works and the case and care managers acted as contact persons.

FBK

The implementation has now acquired a validated approach. In some cases, it involves a training, with both tech and medical support. Especially when dealing with elderly people, one may suggest to approach a limited number of person to enroll, so that the group is easier to manage. Then, it is important to assess to what extent the elderly are familiar with technologies. On the other hand, especially with services related to chronic diseases, people are more familiar with the devices and the training is mostly a learning-by-doing approach.

As regards challenges in implementation, the need to improve digital literacy in the health environment, the actual purchase of technology and the will to invest on as it was mentioned. Some people seem to be reluctant and are still used to a more traditional approach to healthcare; this depends also on the age of people. Those who experience an aversion against it, expect more efficient and improved services at the same time. The general belief is that a training is necessary to take full advantage of the potential offered by technology. In this regards, I think that it would be ideal to include specific courses on technology also in the Medical School as part of the education offered at University.

FHK

The strength of the implementation of digital technologies are mainly transparency and better documentation, additionally easier patient management and benefits for the patient. Some of the interviewees see the digital technologies as more efficient than others. The resistance was in some cases high, in others low. The main reason for resistance was doing it "the traditional way". In the implementation phase there were several trainings, in some cases mentoring systems. All interviewees talked about the high financial costs of implementing digital technologies.

UoN

Resistance can be summed up to the use of something new, new skills required to use the digital technology and workload of healthcare workforce. Clinicians' "resistance to change" can be another reason, as sometimes it's hard to be convinced that it's a better healthcare intervention from the one that they currently use. This resistance usually fade out quickly once the staff and the elderlies are familiarized with the LLM service, leading to waiting lists to access the service. A day training is taking place when install the training having both a theoretical and hands on part, delivered by experts offering the service. Due to time constrains clinicians was difficult to understand why there is a need for something that they already providing counselling and rehabilitation support to the user. When clinicians understood that was supplementary to their work and given advised on when, where and how the patient should be signposted was easier to be adopted.

PAT

The implementation of PHR went on mainly thanks to self-directed learning. There exist hundreds of IT systems and each one is different to another, so each assignment is carried on through a training on the job together with the company who usually works on the specific system. The possibility to carry out the development of the platform

with the internal staff of APSS allowed to overcome any financial barrier to its implementation and furthermore highly motivated people assigned to the project, who had the opportunity of professional growth, also thanks to a dedicated training plan.

The implementation of TS4.0 occurred thanks to a reorganization of the services: for example, in order to be able to prescribe a new service. Furthermore, a user-driven and co-creation approach was adopted, with a deep involvement of end user, through a training on the job path. The implementation of “Impronte” within the framework of TS4.0 went on thanks to the social cooperative Kaleidoscopio, which has a specific expertise in active and healthy ageing initiatives.

SSH

All companies have provided trainings to their employees, both e-learning and on-the-job. By making mistakes in the implementation process of a digital innovation, you create a lot of resistance in the company. Employees often feel stimulated by trainings since it involves them early in the implementation process, increasing the willingness to accept new technology. They also learned to reason from the clients’ perspective and needs. All trainings should be easy-to-understand and the technology user-friendly. It is also important to find a device that does not send data to America, such as Garmen, Fitbit and Apple. The security of choosing the right technologies is therefore very important.

4. DAILY WORK WITH NEW TECHNOLOGY

TUD

Digital technologies affect the daily work of the interviewees by providing a lot of data. In the clinical context, some employees feel that they have less time for patients due to the use of digital technologies. Even if the results of monitoring are exciting and informative, one should maintain a healthy skepticism and question the meaningfulness of the collected data. A clear benefit of introducing digital solutions is that improved patient monitoring can be ensured. Digital technologies therefore serve as distant early warning systems (for e. g. stroke, adverse events). Furthermore, they enable the collection of numerous patient data in a standardized format, automatic detection, examination for patterns and can be used to streamline processes. As a result, patients can be treated better.

In the clinical sector, not all the benefits of the digital solutions are being exploited. In addition, a constrain refers to the more technology is used, the more responsibility is relieved from the patient. Thus, a constant monitoring can have a bad impact on one’s own health competence. Furthermore, digital technologies can lead to an increased occurrence of false alarms if the reference values for certain parameters have not been defined person-specific. Additional trainings regarding the full functionality and the handling of digital technologies in general would be helpful.

FBK

The usage of technology differs according to the profile of the interviewees. Some use to collect data for quantitative research. Others, especially the medical professionals, believe that technologies provide immediate connection and exchange with the patients, but needs to be regulated. Technology has impacted the daily work especially for patients who live far from the hospital. E.g. fewer doctor visits are needed. Face-to-face communication can be substituted with other digital communication channels. Being closer to the patients needs, such as frequent control of the patients, regardless where they live. They have the same opportunities and are more motivated to follow a therapy now. Challenges refer to the attention that should be given to issues related to data (storage, availability). Awareness on it should be increased.

The impact on the organizations was significant, not only on the structure but also on the attitude of the medical team. The caregiver, both the medical doctor and the whole team need to adopt a different attitude towards patient management the technology itself. Awareness and sensitivity to issues related to personal data management could be improved and should involve also physicians. Also, such tools expand the level of information available to the

physician to evaluate the status of health, that means also that the he is potentially responsible for taking into consideration a wider range of data.

FHK

All interviewees see benefits through digital technologies in their daily work. The needs they articulate refer to better information about new functionalities, skill gaps between physicians and nursery staff, better usability of systems, better data literacy of users. Trainings should alternate between medical training and technical training and should involve personality development of the trainees.

UoN

The role of the clinicians affected differently by the case. In terms of m2Hear it didn't affected a lot, as the discussed digital technology was supplementary to their role, while in the surePulse the clinicians didn't have to be continuously over the infant in order to continuously monitor their heart rate, providing additional time for other tasks. When it comes to a non A&E setting in healthcare homes using exergames for example, daily work with technology lead to entertained personnel, better involvement of the patients and the technology can enable the personnel to choose easily between different protocols for their service users and follow that protocols. There is a need of training to the clinicians in order to use the digital technology, but not something complicated. It has been suggested a simple power point presentation, hand –on training or trained by the “champions” that use this technology. In some cases, e.g. m2Hear there is a need of reminders to clinicians in order to keep it to their daily practice, while in the other cases the technology itself becomes the teaser of continuous use. Basic digital skills sometime is not evident in healthcare assistants or carers for the elderly leading to not being able to use the service, while in NHS setting there is a continuous upgrade of digital skills, the health service itself can be upgraded. In some cases, especially for the service in the community, the training for the use of the digital intervention basic digital understanding still missing.

PAT

New technologies are already part of our everyday life but they need to be tailored to better fit the needs and expectations of different people. Furthermore, each implementation must meet all the requirements needed to ensure data protection according to the GDPR.

SSH

Most identified technologies (platform for communication, wearables, patient monitoring) truly affects the quality of care. When they fail, and as a consequence, they cause reluctance from those who work with it. Other challenges are the shift of professionals or involving the right personnel and keeping them involved the right way. As for the patient, when he sees the relevance and the advantage of the innovation, he experiences no resistance. Additional trainings could improve the general knowledge in the field of the technique – employees could know what kind of technology is available and how they could use it. Preferably this would be with real life cases, that fits with what they already know. One organisation experiences a great sense of autonomy in suggesting new ideas and innovation. To conclude, if employees see the effectiveness of digital innovation, they will be far more willing to try out new ones.

5. USAGE OF DIGITAL TECHNOLOGIES FOR PATIENT EMPOWERMENT

TUD

The patients currently being treated by the organisations use digital technologies (smartwatches, smartphones, tablets) for patient empowerment. The Electronic Patient Record (EPR) simplifies documentation processes in the clinic. In the direct psychotherapeutic treatment of patients the use of digital technologies has not yet been established. One interviewee believes that new digital technologies in patient treatment are particularly helpful when these technologies are linked to algorithms/artificial intelligence.

FBK

Patients currently treated with the use of digital technologies feel reassured and supported. Also, projects which are not properly medical, people feel the benefits of using such technologies. They always receive training, especially the elderly. Specifically, apps addressed to the elderly are very helpful and they enhance relations through, for example, gamification elements. As regards communication, exchange of information now takes place through instant messaging that are stored in the devices.

From the medical perspective, in the use of new digital technologies in patient treatment (wearable devices, mobile apps, etc. is positive), clinicians pay great attention to the relationship with the patient and to the risk of causing distancing through apps. Dealing with chronic diseases can assure a more frequent control of the patients, regardless where they live: Patients who live far from the hospital can have the same opportunities. This does not only mean avoid visits but also being closer to their needs.

FHK

The potential of digital technologies for patient empowerment seems to be underdeveloped. Reasons may be a lack of awareness of medical staff, a lack of knowledge and skills of medical staff, a lack of integrated systems that can bring together clinical and patient's personal devices data. For the future, it seems to be an appropriate way to develop integrated systems that can bring patient's private collected data and clinical data better together.

UoN

There is an agreement between the three interviewees that patients did not use other technologies. For example in the case of LLM, the majority of service users (elderly people) do not have a smartphone to use apps, while in the setting (Emergency Department) where the SurePulse used, there is no space for patient related technologies. A small minority of elderly use a smartwatch to check their heart rate, but this is not something that the healthcare workforce takes into consideration. Patients in the case of m2Hear were empowered by the specific technology as they reported that it empowers them to manage their health and gives them greater independence. The digital technology also acted as a reminder that they needed to implement the health related tasks and gave them a greater reassurance. New technologies appeared to support treatment with the mention of the following as an example: In two occasions following the LLM service there was a change in service users cognitive conditions. They change from mild cognitive impairment to healthy condition. Neurofeedback and cognitive training can be implemented through digital technology, applied in one care centre as the interview mentioned. In some cases were patients have to act themselves in order to get the service, additional training is needed.

PAT

Technologies are helpful for patients' treatment. Patients become more and more confident with technologies. Anyway, the frequent request for user authentication through a password protected account in order to access data can represent an obstacle for the user, since he starts to worry about the value of the data he accesses. On the other hand, new technologies make the patient a passive but demanding user, so the greater the involvement of patients, the more effective the initiative is.

SSH

Patients are usually very happy to be able to do things again, increase their autonomy and self-reliance. However, the circumstances will have to be considered: one who is very dement and not used to technology, shouldn't be pushed to use it. However, the children of the patient might be more open to use this technology, so it is important to determine your target group and respect the perspective of the client when implementing new technologies. Patients can use the digital technologies for their empowerment, e.g. adjusting their medication.

6. MAJOR LESSONS LEARNED IN USING HEALTH-RELATED DIGITAL TECHNOLOGY

TUD

The lessons learned were different for each interviewee. The introduction of the health-related digital technology was experienced as partially annoying, but generally very helpful. Especially with regard to capturing aspects of user acceptance. An interviewee sees only one advantage in this: in emergency situations one has immediate access to the data of patients who have previously been to the clinic. In fact, colleagues from the clinic reject digital technologies because the usage results in having less time for patients. Two of the interviewees stated that their organizations were positively influenced. A digital solution that forces users to fill in questions one by one leads to fewer gaps in patient survey questionnaires. This means that digital technologies can support data collection. Larger tablets will be used in future projects and more attention will be paid to software interfaces during the design process. The different patient target groups and the projects have to be defined even more specifically. So far, there have been no investigations to determine whether digitization has led to an improvement in the quality of medicine.

FBK

The general opinion is that it takes time to appreciate the benefit coming from the use of digital technologies in health. From the medical perspective, there's an increasing number of patients on the one hand, while medical personnel is decreasing. Consequently, there is the need to find a means to treat all patients and the use of digital technologies can help this. The patient is empowered and motivated of his health-related data management and also in cure and treatment. For physicians, such instruments increase interconnections and eliminate duplication of efforts, e.g. they avoid certain tests or visits by keeping track of a number of data and allowing the patient to collect data autonomously. While there is a tendency to have a unique approach that is the same for different contexts, it is important to consider that each context requires its own approach according to users, caregivers and to the organization itself.

FHK

The (further) implementation of digital technologies seems to be very helpful for the daily work and leads to more transparency and patient security. What the working staff really needs has to be kept in mind. For the younger generation it would be easier, because they are more familiar with digital devices in their private life.

UoN

The technology itself needs the healthcare workforce in order to enhance and contribute service users' health. The organisations that adopt a new digital technology needs to lead to some kind of benefit, which could be financial, evidence of improved care, less waiting time, and fewer visits leading to less cost per patient for the national health system. Contribution to increase the research or high quality care profile is also included. Regarding the implementation and successful adaptation to healthcare practice of digital technology the major lesson can also be considered to involve key stakeholders, throughout the process. In some cases the patients can be involved at all stages, and especially on the design and on the testing of the technology, leading to an accessible and acceptable digital technology. While in others the regulatory requirements should be considered in depth which are much more challenging. While developing and implement the technology barriers on the funding might delay the actual use of it in practice.

PAT

Technologies have certainly brought great benefits in Health and Care. Anyway, in order to achieve real innovation with a real input in service, it is necessary first a strong endorsement of political decision-makers and of managers in public administration entities. Then, it should involve a systemic approach in which the program of the different bodies and actors of the process are aligned. Furthermore, it is important to involve professionals and end users in all phases of the project as well as companies in order to promote the IT sector.

SSH

All organisations mentioned the importance of keeping it simple, making a digital technology easy to use and user-friendly. Not one organisation, not one innovation and not one individual is the same.

Furthermore, trust in the innovation, but also trust in the people working with each other (so patient – care professionals and care professional – manager) is essential when using these kind of technologies.

Next, always try to involve the entire organization, not only those who are directly involved. All the employees should be able to tell the same stories to the clients. Employees need to see the importance of using technology, and to not see it as a hurdle, but as a tool. Positive experience with implementing innovation right will spread through the organisation, but also the other way around.

7. DATA COLLECTION AND STORAGE OF DATA

TUD

All interviewees know what happens with the patient data and where they are stored. One interviewee has a data protection officer who takes care of it. One interviewee depicts that the Ethics Committee calls for a high-quality data management concept to be submitted. When developing apps, the interviewee orientates himself towards the General Data Protection Regulation (EU). Two of three interviewees are concerned about privacy issues. In healthcare one works with sensitive data that should not be accessed by unauthorized people. For this reason, healthcare professionals use systems that transfer data in encrypted form. Two of three interviewees are concerned about security issues, such as leakage and hacking. The homepage of a friends' association and health insurance funds have already been hacked. Furthermore, the interviewees receive almost daily emails that could contain a virus. Therefore, it is important to establish optimal safeguard measures, especially for the Electronic Patient Record (EPR). The main aspect is a better data encryption. The one who is not concerned about security issues states "that the development of technologies that influence behaviour would be dangerous." All three interviewees had encountered problems with data transfer. Within the individual departments of the clinic there are no problems with data transfer, but with the transfer of data to other healthcare workers. One interviewee had problems from time to time due to a weak internet connection. While one interviewee would like to learn more about data issues and one would not, the other one has a neutral opinion.

FBK

Data collection and storage are an issue when using health technologies. However, the interests vary according to professions. None of the interviewees is currently involved in the exchange of data between different services and types of technologies. It appears that clinicians do not perceive privacy issues as something that concerns them directly or that is of their responsibility, but they would like to receive more information about that. Others, taking the point of view of patients, appear to be concerned about privacy, even if they are not dealing with sensitive data currently. This is also a sign that there is a need for better services which give guarantees to the use of the data.

FHK

Issues of data protection and security are relevant, but all interviewees state a higher level of data protection than in the "paper age". Data protection and security are relevant, but time demanding processes and are of risk to hinder medical relevant workflows. All stated problems in the communication between different digital technologies and pointed out that, therefore, IT specialist are necessary. Hacking and data leaks do not seem to be a large problem due to high security standards in the organizations. More problematic can be personal mistakes that have their reason in a lack of skills or uncritical behaviour.

UoN

None of the 3 cases store sensitive data within the digital technology itself. Either they are stored in central server without patient information, on the device or not stored at all. No major concerns were mentioned on privacy issues, leakage or hacking as the digital technology. NHS Digital service or relevant IT services are providing all the necessary mechanism to ensure security. Patient or their first of kin do not seem to be concerned either as the sharing of data is part of their everyday life, becoming increasingly desensitised to it. Regarding data transfer, no major concerns mentioned, neither in-depth knowledge was mentioned, apart from some protocols that should be used in such technologies, bureaucracy and GDPR. Additional knowledge on digital literacy was needed but only on the spot. NHS provides short courses for security issues.

PAT

From the operational point of view, data is saved in a system belonging to the healthcare trust. A cloud migration strategy is developed. The most stringent data protection measures have been implemented to ensure data protection. One of the main objectives of the action carried on by TS4.0 is to make interoperable the systems of health workers belonging to the Provincial Health Service and to the National Health Service.

Data is a crucial issue in healthcare services. In addition, the fact that each person involved has a different point of view about it, can represent an obstacle in data management: data analysts are concerned about rules for implementing data accessibility, clinicians often regard privacy issues as an obstacle and citizens consider privacy as a right to claim, but often without having the necessary knowledge.

SSH

None of the interviewees are too worried about data collection and storage of data – they all have an Electronic Health Record of the clients according to the GDPR and know what happens with the patient data. It is possible to organise trainings for these regulations, but this will be more interesting to the managers than the healthcare professionals as they have to deal with it daily. The professionals have to know about things as GDPR, but most organisations have this already. All organisations have systems and/or departments that work specifically on these regulations.

8. PROFESSIONS OF THE INTERVIEWEES

TUD: senior physician; physician; sociologist and health scientist

FBK: one physician; two researchers

FHK: a nurse and head of business administration; a physician; a medical computer scientist

UoN: carer/Facilitator of the service / research assistant; psychologist / lecturer; clinician/ neonatologist

PAT: one senior analyst, one public administration manager and a public administration officer

SSH: a care change manager and policy advisor; a relationship manager and a head of education centre and healthcare innovator

9. POSITION OF INTERVIEWEES AND WORKING TIME

TUD: head of a research group in the field of trauma and post-traumatic disorders (30 years); owner of the chair for prevention and care of diabetes (19 years); head of research department for general medicine (10 years)

FBK: Clinician responsible for the diabetes center of a hospital, also coordinating other centers from a Province (since 8 years); researcher supporting the design phase of e-health technologies (since 5 years); researcher in e-Health and social sciences (since 5 years)

FHK: Nursing director (since 3 years); senior physician (since 16 years); researcher (since 3 years)

UoN: lecturer (when initiating the m2hear digital technology a research associate, (since xx), member of the management team of the LLM service (since 2013); clinical academic (since 15 years)

PAT: Head of the information systems service of the Provincial Healthcare Trust (since 30 years); director of the innovation and research office at the department of health and social policies at the Autonomous Province of Trento (since 2 years); employee (?) in the Innovation and Research Office of the Department of Health and Social Policies of the Autonomous Province of Trento (since 2 years)

SSH: independent advisor working directly under the board of directors as an (since 16 years); managerial care support (since 8 years) and medical secretary (since 34 years); CEO (since 9 years)

10. MAIN FINDINGS AND CONCLUSIONS

As shown in the summaries above, the use of digital technologies in health and care is becoming more and more common in the countries analysed.

As regards familiarity with the use of technologies, it differs according to the type of technologies and to the users. The most common service, well-known by the interviewees, is the clinical documentation software like Personal Health Record. Certain users state to be familiar with health-related technologies wearable devices (smartwatch, pedometer), mobile apps (smartphone) and digital technology innovations (platforms), other have a limited knowledge. This applies also to health care professionals which seem to have different level of familiarity.

The interviewees identified many opportunities on introducing digital technologies in the daily work, recognize their effectiveness, how technology improves accurateness and stress the importance of individualizing health care technologies. However, also some reluctance emerged. In some cases, health professionals agree on the fact that digital technologies are a good adjuvant in patient management especially to the youngsters and more applications usable for the elderly. For some physicians, such instruments increase interconnections and eliminate duplication of efforts. Nevertheless, some obstacles were found in the implementation of the use of digital technologies in daily work by clinicians, but it generally depends on technology and case. General practitioners seem to have a certain scepticism towards the use of digital technologies, in particular, referring to the idea that technology is not intended to replace anyone.

From the patient's point of view, some people seem to be reluctant and are still used to a more traditional approach to healthcare; this depends also on the age of people. The resistance was in some cases high, in others low. Resistance can be summed up to the use of something new, new skills required to use the digital technology. However, once the patient sees the relevance and the advantage of the innovation, he rather experiences no resistance. Clinicians' "resistance to change" can be another reason, as sometimes it's hard to be convinced that it's a better healthcare intervention from the one that they currently use. When it comes to initiation and implementation of the use of the digital technologies, interviewees agree on the fact that the process should involve all levels of actors. Initiation is, in most cases, at the manager level (with the exception of projects where the input comes from researchers). Sometimes it comes as a joint initiative, combing interest from different actors. Some also pointed out that, in order to achieve real innovation with a real input in service, it is necessary first a strong

endorsement of political decision-makers and of managers in public administration entities. Furthermore, it is important to involve professionals and end users in all phases of the project . It is especially important to involve them early in the implementation process, since it increases the willingness to accept new technology.

In most cases, patients are able increase their autonomy and self-reliance through the usage of digital technologies. However, it is important to consider that each context requires its own approach according to users, caregivers and to the organization itself. Not one organisation, not one innovation and not one individual is the same. At the same time, it should be easy to use and user-friendly. In general, health-related technology was considered to be generally helpful, but it takes time to appreciate the benefit coming from the usage of digital technologies in health care. Digital technologies affect the daily work of the interviewees by providing a lot of data. This also brings about the issue of data collection and processing. In most cases, interviewees show awareness of questions related to sensitive data and privacy; others are not concerned since they work for companies or organization where there a strong data protection policy (or they use systems that transfer data in encrypted form). Few interviewees had encountered problems with data transfer to other healthcare workers. Different opinions emerged from patients on this issue: some seem comfortable with sharing data, fewer expressed concerns about it and would like to be more informed about their use.

IV. ANNEX: INTERVIEW GUIDE

I. General knowledge about health related technologies: Usage of digital technology innovation, wearable devices, and mobile apps for the clinical practice

6. Are you familiar with wearable devices, mobile apps, etc. potentially useful for the clinical practice? Which ones?
7. Are you currently using any digital technologies for empowering professionals' work? Which ones?
8. What are the opportunities you foresee on introducing digital technologies for your daily work?
9. What are the opportunities you foresee on introducing digital technologies for patients management?

II. Decision making process

10. Idea: Who initiated and promoted the implementation of digital technology innovation, wearable devices, etc. in your daily work?
Sources for information seeking on the usage for digital technology innovation, wearable devices, etc:
11. Which sources did you use when trying to access general information on digital tools for your daily work?
12. Where did you find the most relevant information?
13. Decision: Who made the decision to invest in digital technology innovation, e.g. wearable devices?
14. What were the main reasons?
15. Which resistances did you/your organization encounter? Which challenges did you foresee on introducing digital technologies to your daily work? What are the barriers you encountered during this process?

III. Implementation

16. Which resistances did you/your organization encounter? Which challenges did you foresee on introducing digital technologies to your daily work? What are the barriers you encountered during this process?
17. How did the implementation process look like? Which challenges on introducing the new digital technology did occur? For whom (staff, patients,...)? Which resistances did occur?
18. Did a training/workshop take place? How was it delivered and by whom (in person; online; brochure, etc.)? How helpful was it for your and your colleagues' daily work with the new technology?

VI. Daily work with new technology

19. How do the identified technologies affect your daily work?
20. Which have been the major constraints, challenges and benefits behind the adoption of these solutions in your daily work? What are the barriers you encountered (prejudice, lack of knowledge, fears)?
21. Which additional trainings would be helpful to fully use the specific digital innovation potential/features?

VII. Patients empowerment

22. Are patients treated by your organization currently using any digital technologies for patient empowerment? Which ones?
23. Does it support your treatment of the patient? Are you and your staff familiar with these digital technologies/devices? Do any of you need additional training in using it adequately? If yes, regarding which devices?
24. In general, what do you think, how helpful are new digital technologies in patient treatment (wearable devices, mobile apps, etc.)?

VIII. Major lessons learnt

25. What were major lessons learned in using your health-related digital technology?
26. What is your overall assessment of the introduction of the health-related digital technology in your organization?
27. How did it impact your organization?

IX. Data collection and storage

28. Do you have any idea what happens with the patient data, where they are stored?
29. Are you concerned about privacy issues of these data?
30. Are you concerned about security issues, such as leakage, hacking, etc.?
31. Have you encountered problems in transferring data to other healthcare workers, because of incompatible systems?
32. Would you like to learn much more about data issues, such as mentioned here?

X. What is your profession?

- Physician
- Nurse
- Chiropractor
- Dietitians
- Pharmacist
- Physical therapist
- Mental health professional
- Sport scientist
- Health manager
- Medical assistant
- Ambulance officer
- Other:

XI. What is your position and how long have you worked in it?