

The challenge of providing adequate care during the pandemic has in many countries resulted in a spectacular increase of interest in the use of e-health and telemedicine. In the pre-COVID era, the implementation of e-health solutions in the Polish health care system was very slow. Only a limited number of patients/citizens were able to benefit from these technologies. Actually, in 2016, changes in laws governing the provision of health services by physicians and other health professionals were introduced, which enabled the use of teleinformatic systems to provide care to patients. Earlier, primarily interactions between health care providers had been authorized. The COVID-19 pandemic has coincided with intensified efforts to establish e-health services, e.g., e-prescription or electronic sickness confirmation, to society. In March 2021, widespread access to remote visits to physicians, both GPs and specialists, was enabled. For the majority of Polish citizens it was the first occasion to use remote health services. However, it is of note that remote physicians' visits have mainly taken place via telephone.

The use of innovative technologies in health care is being propelled by the 4th industrial revolution. E-health may be perceived as the preceding phase of Health 4.0, a concept characterized by the use of industry 4.0 technologies in the health care domain. Health 4.0 means much more than increased connectivity, interactions, and remote access to services, as is generally expected from e-health. The key areas of Health 4.0's progress, apart from the integration of cyber and physical systems, include the widespread use of the Internet of Things, Cloud Computing, and Big Data analysis based on artificial intelligence.

There is a certain discrepancy between the progress in developing innovative solutions for delivery of health services and the attitudes in a society toward them. Therefore, the main goals of the project are to assess Polish society's acceptance of and readiness for wide implementation of e-health systems and to analyze the determining factors. In addition, our research will focus on the perception of the adult population which faces the challenge of adopting and using even more sophisticated technological tools as the Health 4.0 revolution continues in the coming years.

The research activities will assess the intensity of e-health usage during the pandemic, the level of satisfaction with and acceptance of individual categories of e-health and telemedicine applications, socio-demographic variables related to the acceptance of e-health solutions, the interrelations between information, health, and e-health literacies, and the use of e-health solutions, the perception Health 4.0 as a concept, and finally the barriers to adopting advanced solutions brought to health care by the 4th industrial revolution, e.g., the omnipresence of smart devices or the common use of artificial intelligence for decision making.

The main planned research activities include developing a state-of-the-art view of the project field, exploratory interviews, cultural adaptation and validation of an instrument currently unavailable in a Polish version, and designing survey tools to target the general adult population in the first two studies (telephone- and web-based interviewing) and a population of young and middle-aged adult respondents in the third, web-based survey. Three surveys, each with a different focus, will be carried out. The first will assess perceptions and attitudes, technical predispositions, the level of use of e-health solutions, and the factors supporting and barriers to using e-health. Two further studies will be conducted online. The second will assess the acceptance and e-health readiness of the general population. The third study, also based on web-interviewing, will be conducted among a population aged 18-55 to assess how young and middle-aged adults respond to the use of advanced Health 4.0 solutions. In the final stage, a model of care based on Health 4.0 technologies will be proposed.