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# Digitalisation and informatisation of healthcare system in Croatia: learning from others' experience

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## Abstract

**Introduction:** The information system currently used in the everyday practice of Croatian hospitals, ambulatories of general practitioners, community health care facilities, pharmacies, and other health care institutions, is far from being on a satisfactory level: it is generally highly bureaucratized, the system units do not communicate between each other adequately, and the process of health care service quality suffers. In the UK, for instance, the aim has been set to fully avoid using paper in hospitals by 2020. Overall computerization is supposed to alleviate the position of both patients and health care system employees, enable better communication, offer improved health care service, and above all, increase the general level of satisfaction.

**Methods:** We conducted a review of the relevant literature published within the last ten years (2010-2019) in the Medline database. We searched for accounts of positive and negative effects of health care system digitalisation and computerization on treatment errors, waiting lists, communication between health care providers and patients, patient safety, personal data protection, and other relevant parameters.

**Results:** In March 2019, Croatian Health Insurance Fund reported that it had secured the means to speed up the process of computerization of the health care system by introducing e-patient-dossiers and e-orders by 2021, thus shortening waiting lists for medical examinations. In Slovenia, it is said that the health care business model largely failed to integrate ICT into its operational context. In Germany, it also seems that the degree of digitalisation in health care is low when compared internationally and with other German industries. A more general study concluded that successful implementation of new technology requires organisational and collegial support.

**Discussion and conclusion:** Although digitalisation and computerization have proved to result in an overall increase in economic efficiency of a health care system, the process of digitalisation brings certain risks related to the collision of inherited technologies with a new complex organisation and performing structures, as well as to limited resources and other social and political phenomena. Our analysis of pros and cons of digitalisation and computerization experiences in various European health care systems has revealed the expected benefits but also certain specific ethical dilemmas. From the findings we have concluded that for a system to achieve success in the digitalisation process, it should pay attention to health care system users and providers, to the protection of privacy and the improvement of safety, and to the increase in interoperability and transparency. It should also foster the inclusion of health care providers in the design and performance of the digitalisation process.

**Keywords:** digitalisation, hospital, health care system, health care, health care providers

# Analyses of the eHealth solutions' usage in Slovenia

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## Abstract

**Introduction:** The project of digitalization of the Slovenian health care system (eHealth) was managed by the Ministry of Health of the Republic of Slovenia from 2008 to November 2015. It was one of the largest national information and communication technology projects in the Slovenian history and was co-financed by the EU under the European Social Fund. National Institute of Public Health (NIJZ) took over the governance of the eHealth project solutions on 1 December 2015. eHealth should integrate all fragmented information systems and provide relevant medical, economic and administrative data, which could assist increasingly important evidence-based decision-making and management in the health care system. This paper explores the current state of the most significant eHealth solutions in Slovenia and specifically focuses on different aspects of their usage.

**Methods:** We analysed Slovenian eHealth solutions from the usage aspect. In-depth analysis of the year 2018 included a review of the eHealth-related sources and structured discussions with the experts responsible for the development and implementation of the eHealth solutions and real statistical data from of the usage.

**Results:** The research has revealed that significant progress has been made in the last three years and that the short-term objectives of the eHealth solutions have been met almost without exception. ePrescription is the national eHealth solution established for the electronic prescription and dispensing of medications. The share of ePrescriptions in total of all prescriptions was between 92% and 94%. eAppointment is the national eHealth solution, established for the eReferrals, on-line booking of appointments and waiting lists. The share of eReferrals in the total of all referrals was between 93% and 97%. The number of on-line appointment bookings has been rising quickly during the last years. The Central Registry of Patient (CRPD) is a database of the eHealth documents for residents of Slovenia, which focuses on the collection of data exchanged between health care providers and storage of documents, which should be available to patients. A significant rise in the use of patient health documentation and Patient Summary (PPoP) in CRPD was recorded in 2017 and 2018. The national patient portal zVEM provides patients with safety access to their data in eHealth solutions in a one-stop shop manner.

**Discussion and conclusions:** As part of eHealth, NIJZ has taken over the governance of 20 eHealth solutions, the majority of which having already been implemented on the national level. NIJZ has been facing different challenges while trying to introduce the solutions into the health care environment. However, the general success in the implementation of innovative eHealth solutions in Slovenia was recognized also by the European Commission. Namely, Digital Economy and Society Index Report placed Slovenia at the sixth place in eHealth Services for 2017. However, in order to further exploit the potentials of eHealth in the future all efforts behind this project will have to be supported by systematic measures on all levels and by a firm commitment of stakeholders.

**Keywords:** eHealth, ePrescription, eAppointment, Central Registry of Patient, Patient Summary Record, patient portal zVEM