

Is the Future of Public Health after Covid-19 Becoming Digital? Electronic Health Records (EHRs) in the Italian National Health System: A Special Case Study

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ABSTRACT

The recent SARS-CoV-2 pandemic represented a turning point in many health sectors worldwide, particularly in Italy, one of the nations most affected by COVID-19. There is no doubt that the pandemic has accelerated the spread of digital technologies in health care. This article proposes, as a special case study, the introduction and dissemination of EHRs in the Italian national health system, highlighting their limits and areas for improvement through the introduction of health regulations that are more appropriate for a unified vision of national health.

Keywords: Public Health; Digital Health; Electronic Health Records; Next Generation EU; National Plan of Recovery and Resilience

Abbreviations: U.S. FDA: U.S. Food and Drug Administration; DHTs: Digital Health Technologies; EHRs: Electronic Health Records; NHS: National Health System; HER: Electronic Health Record; NRR: National Plan of Recovery and Resilience

Introduction

There is no doubt that COVID-19 has accelerated a digital transformation in the health sector [1-4]. After the recent declaration of the director of the World Health Organization of the end of the pandemic as a global threat to public health [5], a key question arises: what is the status of such a digitization process? The evolution of the application of digital technologies to health care has changed radically during the years of the pandemic compared to the prepandemic era, not only in the United States but also in Europe and, in particular, in Italy. Furthermore, those changes have sowed the seeds for a real metamorphosis, albeit with delays and difficulties, of the health care sector in the postpandemic era. The U.S. Food and Drug Administration (U.S. FDA) defines digital health technologies (DHTs) [6] as follows: “systems that use computing platforms, connectivity, software, and/or sensors for healthcare and related uses DHTs are helping to move

healthcare from the clinic to patients by improving understanding of patient behavior and physiology outside traditional clinical settings and potentially enabling early therapeutic interventions”. To have an overall idea of the dynamics, progress and challenges of the digitization of the health care sector, this summary considers, as a special case study, the evolution of the usage of electronic health records (EHRs) [7] in the Italian health sector before, during and after the COVID-19 pandemic.

The Adoption of Electronic Health Records (EHRs) in the Italian National Health System

Digital health has both the prerequisites and the potential to increase the accessibility, quality, effectiveness and efficiency of health care. Prior to the COVID-19 pandemic, progress was made in the implementation of digital health care technologies, although

there was still a great deal of unrealized potential in most European countries, particularly in Italy, due mainly to individual, organizational and systemic issues. This was a relevant case study on the adoption of new digital technologies in the Italian national health system (NHS) represented by the transition from handwritten to digital medical records. An electronic health record (EHR) is a set of health and public health data and digital documents. These data are generated from clinical events concerning the patient, referring to services provided by the NHS. EHRs in Italy were established on the basis of article 12 of the decree of 18 October 2012 n. 179 [8] and represent an important tool for improving the quality of care that health care facilities offer to their patients. The purposes of EHRs, as detailed in Box 1, range from prevention to health planning. Similarly, to date,

EHRs collect and make available to the patient and, with his consent, to health care personnel a set of information on the patient's personal health history (Box 2). In summary, the EHR has a twofold important purpose [9]:

1. First, the EHR represents the IT tool through which the public administration guarantees electronic access to health and public health digital data and documents to citizens made available by family doctors, pediatricians or hospitals.
2. Second, the EHR contains the so-called patient summary, i.e., a summary of the clinical history of the reference patient that is useful for doctors so that they have information on the patient's health status and can electronically navigate his clinical documents.

Box 1 - The main purposes of the EHRs are:

- a) prevention;
- b) diagnosis, treatment, and rehabilitation;
- c) international prophylaxis;
- d) scientific study and research in the medical, biomedical and epidemiological fields;
- e) health planning (verification of the quality of care and evaluation of health care)

Box 1.

Box 2: Information made available in EHRs include

- a) the identification and administrative data of the assisted person;
- b) the information of the general practitioner chosen by the patient;
- c) specialist and pharmaceutical prescriptions;
- d) laboratory reports;
- e) the synthetic health care profile drawn up and updated by the general practitioner or pediatrician of choice that summarizes the patient's clinical history and his or her current recognized situation; and
- f) vaccination data.

Box 2.

The Virtuous Circle of Electronic Health Records (EHRs) and Their Limits

The introduction of EHRs into the Italian national health system has made it possible to build a virtuous circle of information (Figure 1) (such as laboratory data and data generated by hospitals), which patients on the one hand and clinicians and physicians on the other can access electronically, allowing for a qualitative improvement in health services and a substantial reduction in costs. However, although the COVID-19 pandemic has extended the use of EHRs, their diffusion is uneven within the Italian territory, which is divided into twenty regions and two autonomous provinces. The operation of EHRs is limited by a structure based on a regional and nonunitary approach. In fact, each region and autonomous province has built a separate database with different logics, architectures and information syntaxes. In other words, the various records cannot communicate

with each other outside regional borders. This means that patients seen in a region can see the data relating to their health history, but only those generated within their own region of residence. The problems of fragmentation in the formatting of EHRs emerged in all their gravity during the COVID-19 pandemic; the health histories of patients hospitalized on an emergency basis in regions other than those where they lived were not often available. Hence, there is a need to create a national database, i.e., a national infrastructure is necessary to guarantee the interoperability of EHRs across regions, as well as the need for better legislative regulation. The need for more adequate legislation gave rise to article 21 of decree no. 4 on 27 June 2022 (converted into law no. 25 on 28 March 2022) [10], where it is stated that “every health care service provided by public, accredited private and authorized private operators must be included, within five days, in the EHR”; in other words, the use of EHRs was also extended to accredited private health care at the national level.



Figure 1.

The problem of the lack of a national database requires the investment of a tremendous amount of resources, which are provided for by the so-called European Recovery Plan, namely, the Next Generation EU (a fund made available by the European Union to help European countries recover from the economic and social damages caused by the COVID-19 pandemic) [11]. In Italy, such an aid plan is named the National Plan of Recovery and Resilience (NPRR) [12], and a nationwide revision of EHRs is related to one of the objectives of

the NPRR (Mission 6, component 2, investment 1.3). The resources of the NPRR dedicated to strengthening the EHR system will concern in particular its

1. Accessibility
2. Interoperability
3. Customization (increasing the quality and quantity of clinical data to improve their ability to diagnose and treat patients),

with a specific focus on policy issues to create a set of information on the state of health of the population to better define the government's health prevention and planning policies and the health research activities of the bodies responsible for carrying out these activities.

Concluding Remarks

The spread of SARS-CoV-2 represents an unprecedented opportunity to accelerate the digitization process of the Italian national health system, and now that this health emergency is over, greater efforts must be made toward the digital transition of the health sector, since, as with EHRs, this change reduces costs and increases the efficiency of health service delivery. To this end, it is necessary to overcome the regional and fragmented vision of Italian health care that creates inhomogeneity and incommunicability for the construction of a national database capable of providing information throughout the national territory for the benefit of patients, scientific research and prevention as well as for possible future, although not desirable, pandemics.

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