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Health Informatics: A Vital Strategy to Tackle Pandemic Diseases

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ABSTRACT

Abbreviations: HER: Electronic Health Records; HI: Health Informatics; AI: Artificial Intelligence

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Medical records for a patient's medical information were written on paper with the details of their medical history and care, but they were not in widespread use until 1900-1920 [1]. Physicians have to go through all paper charts to search for relevant information for the patients. They may end up not finding any information linked to the disease because these records on paper have restrictions on retrieving information and being limited with information. The writings of medical records have evolved to be maintained in a computer system to make it convenient for physicians [2]. Data is a valuable asset in the calibration, validation, and evaluation of any condition, and it plays a critical role in comprehending the disease. As of now, we are aware of the critical significance of health informatics, particularly in the maintenance of medical records. Medical records and health-related data play an important part in many disease outbreaks, the secondary disease approaching after these diseases, one of them the whole world faced recently is COVID-19.

According to statistics, the rising number of people diagnosed with COVID-19 as a tragedy can provide a wealth of information for measuring and studying these types of ailments in the future, allowing for early detection and treatment. The term "health informatics" refers to the use of information technology and modern computer software to maintain medical records that contain not only episodic medical interactions but also health and lifestyle data with information on the effectiveness of drugs and therapeutic strategies in the form of Electronic Health Records (EHR), has become popular in recent years [1]. When we talk about Health Informatics (HI), the discussion is about the multidisciplinary field encompassing a wide range of disciplines that one conceptualizes, constructs, develops, implements, and evaluates. The assessment is based on related methods, tools, and concepts for clinical care and research support [3]. Due to the virulence and transmissibility of the causative virus, SARS-CoV-2, the pandemic coronavirus outbreak of 2019 has piqued the interest of many researchers and

medics throughout the world [2]. This pandemic has had an impact on the global economy and healthcare system. Even in an era when information technology reigns supreme, exact information about the number of cases, the severity of disease, mortality rate, and clinical predictions lags [4]. Applying digital technologies such as big data analytics, next-generation communications networks, and artificial intelligence could solve this fundamental difficulty connected to pandemic management and containment. Collaborative data infrastructures, databases, and digital technologies are some of the existing health informatics solutions that have the potential to speed up COVID-19 epidemiology, pathophysiology, and healthcare system dynamics discoveries. There are issues with data sharing and governance and the near-term directions for improving and supporting clinical research in the COVID-19 pandemic [5].

Public health authorities must be able to access the data shared globally to monitor the COVID-19 outbreak. The 'Worldometer,' which offers a real-time update of the actual number of individuals suffering from the covid-19 disease worldwide, daily new cases of the disease [6], disease distribution by nations, and disease severity, are just a few of the initiatives taken by the organizations [7]. Artificial Intelligence (AI) and Deep Learning techniques can help to improve COVID-19 detection and diagnosis. These algorithms can be used as a primary screening tool for suspected infections, and those who are at a higher risk of disease can be tested for confirmation or quarantined. Although most patients with coronavirus infection exhibit minor symptoms, clinicians are using the same amount of isolation, treatment, and monitoring techniques on all of them [7]. By automating various processes such as determining the role of treatment and care by analyzing clinical data with the use of pattern recognition approaches, and digitalization of patient's reports in terms of medical records for future reference, AI and machine learning-based systems can be used to reduce the burden of work for health care professionals and medical staff [8]. Furthermore, this massive data can be utilized to train multiple machine learning algorithms to classify patients as patients with mild, moderate, or severe disease, particularly those at high risk of mortality, based on the severity of the infection, to treat the patient most effectively accordingly [7]. The patient data can be utilized as a training dataset for predicting other patients' mortality risks using a prognostic prediction algorithm based on machine learning approaches [8].

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