**Considering the current pandemic caused by Covid-19 what role does health informatics now play in improving health outcomes and what future role do you see for health informatics?**

The systematic application of information and communication technology tools in public health practice, research and learning is called Health Informatics. This is an emerging concept of disseminating health information through electronic mediums leading to efficient patient centered care. Health Informatics plays a crucial role in analyzing the spread of pandemics. This is evident from the current scenario of COVID-19.

The COVID-19 pandemic has had a significant impact on population health and wellbeing. Ever since the deadliness of the disease was known, researchers have been trying to gather as much information about the disease as possible from infected patients, regarding the symptoms, incubation period, mode of transmission etc., through informatics methodologies. Researchers have been consistently putting efforts to improve accuracy of testing kits for the disease, understand its transmission, prepare vaccines and identify prevention strategies. So far, the research seems to have borne fruit, with the medicine Remdesivir released into the market.

Health Informatics can be categorized into various branches:

1. Bioinformatics

2. Clinical Informatics

3. Consumer Health Informatics

4. Public Health Informatics

The role of each branch of health informatics is discussed below:

1. Bioinformatics

The genome sequences of coronavirus strain causing the COVID-19 pandemic are essential to track the spread of disease and help design drugs, medicines or vaccines. Many countries have shared an increasing number of coronavirus genome sequences and related clinical and epidemiological data via the Global Initiative on Sharing All Influenza Data (GISAID). Exploring the genome sequences of the coronavirus helps scientists to understand the rapid mutations in the virus and investigate whether new cases of the coronavirus in a given country are occurring due to international travel or local infections. In other words, they can identify the mode of transmission of the disease.

2. Clinical Informatics

Medical Imaging is a powerful tool for monitoring a patient’s health who is infected by COVID-19, given the impact on lung physiology and anatomy. For example, CT scans have shown promising sensitivity and early detection power to detect the impact of the coronavirus on lungs. Imaging plays a crucial role in monitoring patients with worsening respiratory status. Given the increasing rate of COVID-19 cases, there is an urgent call for researchers in informatics to work on developing Artificial Intelligence methods to automate the analysis of CT scans and other diagnosis tools. This reduces the burden on doctors to manually evaluate the condition of patients and helps them to focus on finding methods for treatment and cure.

Informatics solutions are being developed to assist healthcare institutions in managing the increasing number of COVID-19 patients, from symptoms to recovery. Tools have been developed to distinguish COVID-19 symptoms from common colds and flu. Chatbots are being deployed to answer patients’ queries about COVID-19. This limits the number of individuals contracting the disease. Based on the number of cases in a region, a healthcare center can estimate the amount of medical equipment like beds, ventilators, PPE, masks and other critical medical supplies required to accommodate patients.

3. Consumer health informatics

Using informatics solutions (smartphones and technology), public can be educated about the pandemic and ways to avoid infection.

Consumer health informatics has a substantial role to play in the context of a pandemic which can target specific areas such as consumer education, self-triage, monitoring, and social engagement. Consumer education is vital in conveying actionable timely information which can be customized to the independent needs. The existing systems are being used extensively for symptomatic patients while tracking the parameters of sleep quality, wellness, self-management of individual. Digital tools play significant role in providing social services to the vulnerable populations making the ‘social distancing’ feasible.

One such example is AarogyaSetu, a mobile app developed by the Government of India to connect essential health services with the people of India in the combined fight against COVID-19. The app is aimed at informing the users of the app regarding risks, best practices and relevant advisories pertaining to the containment of COVID-19. An impressive feature of the app is, it provides information about the number of COVID positive patients in your proximity, your distance from a nearby COVID hotspot etc. so that anyone who has to go out on an essential work can take the necessary precautions.

Further, with the help of sensors in smartphones and other devices, subset of COVID-19 symptoms (fever, fatigue, shortness of breath etc.) can be detected among widely populated groups. This helps in identifying those people who extensive evaluation or testing.

Public health informatics

The main strategy in addressing COVID-19 is monitoring the disease. Government institutions and general public should be aware of the levels of cases, deaths.

Public health informatics is essential to understand how the effects of healthcare disruption propagate across a community, affecting access to care and population health. Data on health care utilization and outcomes can be obtained from a variety of sources like hospitals, government websites, social media etc. Data on public health interventions are already being compiled by researchers, including national and international databases of policy changes.

Informaticists can develop mobile applications based on machine learning, data processing and visualization techniques which can be used in contact tracing and identification of disease hotspots. This information helps in containing the out-break. Though this approach is not as effective as appropriate lab tests, it is helpful in tracking the disease in real time because widespread testing may not be possible and making retrospective analyses in spread of cases prior to and after widespread testing.

Future Role for Health Informatics

COVID-19 has exposed flaws in healthcare systems of all countries while enabling innovation that clinicians have demanded for years.

When COVID-19 spread to Europe, clinicians watched in horror as many front-line healthcare workers in Italy, Spain, UK were struck down by this virus, and those who could work, scrambled to find ways to avoid a similar fate. So, the need for virtual ICU capability became a necessity for hospitals. In addition to protecting clinicians, a virtual ICU system enables increased remote patient surveillance. This optimizes resources for hospitals and allows for even better patient care.

During the SARS outbreak in 2002, it took scientists more than a year to decode the genome. It took them so long because they didn’t have enough data to analyze and health informatics as a field was not developed. But now, there is so much data and health informaticists along scientists have decoded the coronavirus genome within a month and have concluded that it is just another strain of the virus that caused the SARS outbreak.

COVID-19 is just one disease. As health informatics helps implement the technology that allows physicians, nurses, researchers and other experts to truly access and analyze the information from real patients, more information can be harnessed about all disease processes.

This technology is a tool, not a solution to one big problem. It can fill the gaps and augment your workforce. These tools are designed by health informaticists so that people can embrace it when they have an immediate need. If these tools reduce a problem that existed before, people will continue to use it and find value in it.

Sources:

1. Class Notes

2. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7216865/>

3. <https://michealthcare.com/how-will-covid-19-reshape-the-future-of-healthcare/>