Predictive Model of Coronavirus Disease COVID-19 Cutting Edge Research

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

Original Research Article

ABSTRACT

COVID19 is a global pandemic spread to over 170 nations and regions. In virtually all nations impacted, the number of illnesses and fatalities has skyrocketed. Predictive approaches may be implemented to aid in developing improved plans and the making of sound judgments. These technologies analyze previous events to better anticipate what will occur in the future. These forecasts can aid in the planning of anticipated hazards and repercussions. In order to provide reliable projections, forecasting technology is critical. The prediction technology in this study is divided into two categories: random theoretical mathematical models and data science/machine learning technology. Forecasting relies heavily on data obtained from multiple platforms. Big data acquired from the World Health Organization/national database and social media communications were the two types of data sets examined in this study. The influence of environmental variables, the incubation time, the impact of isolation, age, gender, and other characteristics may all be used to forecast the pandemic. In this paper, the methodologies and factors utilized for prediction have been thoroughly examined. Forecasting technology, on the other hand, comes with its own set of difficulties (technical and general). This study examines these issues and offers a series of advice for those who are presently fighting the global COVID-19 epidemic.

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Aim: Predictive Model of Coronavirus Disease COVID-19 Cutting Edge Research.

Conclusion: To get more accurate global forecasts, the models suggested in the literature must be evaluated on a worldwide scale. Multiple peaks should be included in the model for similar reasons, not just for short-term forecasting but also for anticipating outbreaks later this year. The study also highlighted the limitations of various prediction models and provided practical advice for dealing with the outbreak.

1. INTRODUCTION

The new coronavirus disease 2019 (COVID-19) was identified in Wuhan, China, in December 2019. On January 20, 2020, in Washington State, the first verified case was identified, and the first fatality was revealed on February 29, 2020. By early March, most states had identified cases, and by mid-March, several had issued state-wide school cancellations and stay-at-home orders. The fast pandemic spread and accompanying mitigation efforts have upended millions of lives just weeks after the virus arrived in the United States. People from all areas of life were affected by COVID-19 outbreaks, and residents were urged to self-quarantine in their houses to prevent the virus from spreading. The lockout has a significant negative influence on mental health, causing dissatisfaction, worry, and despair. Time spent on online classes and self-study, learning medium, sleeping habits, daily exercise routine, and the resulting consequences on weight, social life, and mental health were all identified as COVID-19's effects on students of all ages. Furthermore, our research showed that people utilized various coping methods and sought help from their loved ones to manage stress and worry [1].

COVID-19 is a global pandemic spread to over 170 nations and regions. In virtually all nations impacted, the number of illnesses and fatalities has skyrocketed. Predictive approaches may be implemented to aid in developing improved plans and the making of sound judgments. These technologies analyze previous events to better anticipate what will occur in the future. These forecasts can aid in the planning of anticipated hazards and repercussions. To provide reliable projections, forecasting technology is critical. The prediction technology in this study is divided into two categories: random theoretical mathematical models and data science/machine learning technology. Forecasting relies heavily on data obtained from multiple platforms. Big data acquired from the World Health Organization/national database and social media

communications were the two types of data sets examined in this study. The influence of environmental variables, the incubation time, the impact of isolation, age, gender, and other characteristics may all be used to forecast the pandemic. In this paper, the methodologies and factors utilized for prediction have been thoroughly examined. On the other hand, forecasting technology comes with its own set of difficulties (technical and general). This study examines these issues and offers a series of advice for those who are presently fighting the global COVID-19 epidemic.

Pandemics have posed a threat to the globe on several occasions throughout history. The aftermath of these pandemics has always had a massive influence on the world, and it has also flipped the tables. COVID-19, the latest deadly epidemic, is also now sweeping the globe. Not only is economics collapsing, but so are the general strengths and values of the countries worst hit [2].

Understanding the normal course of illness is critical for making accurate forecasts. A disease usually advances as a result of infection exposure. As a result of this infection exposure, hosts are created. The term "hosts" refers to a group of persons who are more likely to be impacted. The disease spreads when an infected host comes into touch with other people. COVID-19, SARC, PLAGUE, and other acquired illnesses are examples. It indicates that illnesses are propagated by pathogenic agents (viruses, bacteria, or any other microbe), which is a conventional paradigm for the causation of infectious disease. An Epidemiologic Triad is what it's called [3].

Environmental variables, carrier agents, infected hosts, and pathogens are the four major components of the epidemiologic triad. In most cases, the agent is the one who spreads the virus. When an agent comes into touch with the host in a particular environment, the infection is transferred. A pathogen can also be referred to

as a vector. A vector is a creature that spreads infection from one host to another via a virus or bacterium [4].

Because of their distribution style, pandemics are frequently referred to as outbreaks. The disease's fatality rate is determined by the type of outbreak. Infectious illnesses have rapidly escalated into pandemics due to lifestyle changes, increasing worldwide travel, and urbanization [5].

Strong policies must be implemented to avoid these outbreaks. Otherwise, the situation might quickly deteriorate. Epidemics and pandemics have plagued humanity since the dawn of time. In the early 1300s, humanity was struck by the first pandemic, known as the Black Death. It was one of the most devastating pandemics in human history. Millions of people died as a result of this outbreak. It was discovered that this condition primarily affected the elderly and those subjected to psychological stresses [6,7]. The next epidemic that humanity faced was smallpox in the early 1500s, which resulted in a 50% death rate [8].

Research is as follows:

- Research the existing prediction models.
- Classifies predictive models based on the type of data set.
- Research on symptomatic and asymptomatic parameters.
- Derive the challenges associated with predictive models.
- Formulate recommendations for controlling epidemics.

1.1 Aim

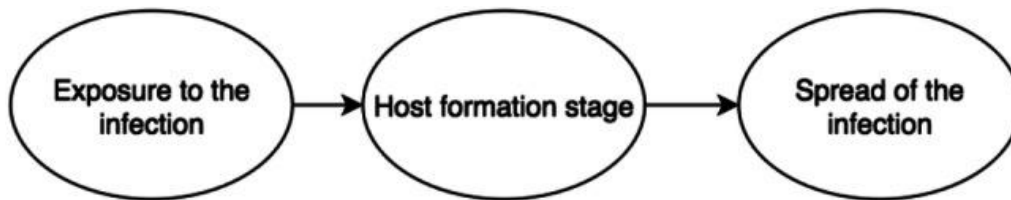Predictive Model of Coronavirus Disease COVID-19 Cutting Edge Research.

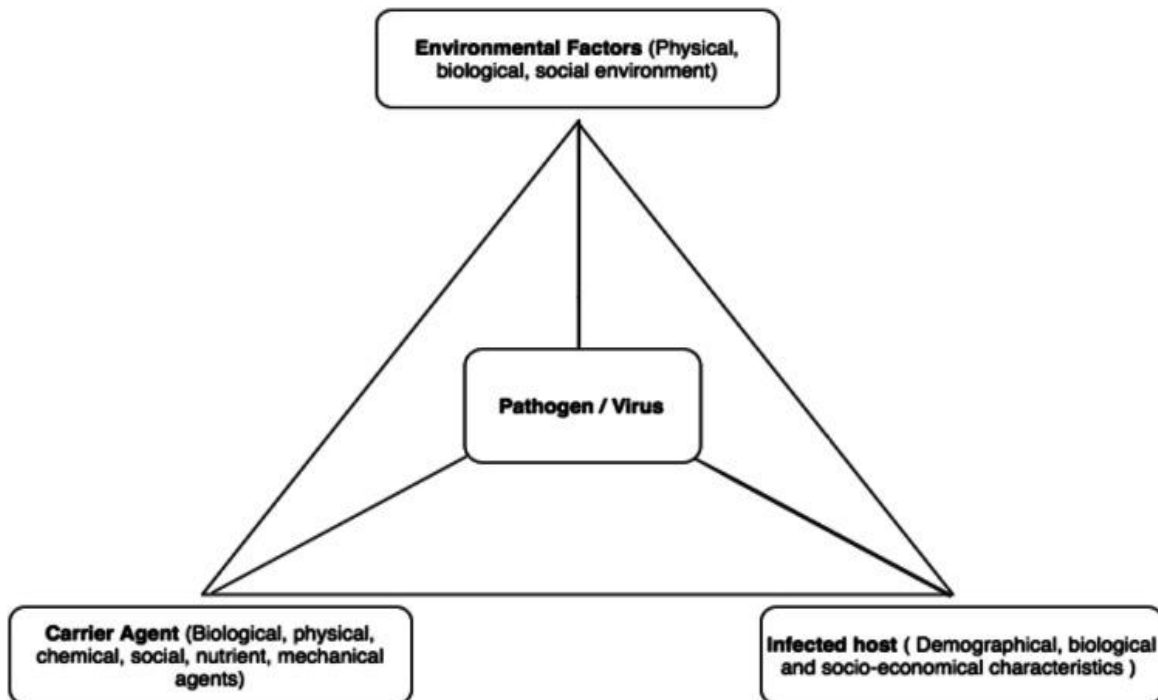
Fig. 1. Prediction models

Fig. 2. Environmental factors

2. MATERIALS AND METHODS

This study conducted on Datta Meghe Medical College and Shalinitai Meghe Hospital and Research Center, Nagpur in collaboration with ABVRH and JNMC (Datta Meghe Institute of Medical Sciences Deemed to be University), Sawangi, Wardha, Maharashtra.

3. RESULTS AND DISCUSSION

The literature mentioned above is organized into four categories: data set size, data set source, and application of prediction approaches such as mathematics/analysis or machine learning/data science. This survey looked at a variety of medical and non-medical factors. This research has one goal in common: to determine the eventual magnitude of the COVID 19 pandemic. However, it's worth noting that all of the research is focused on the Chinese pandemic, and all of the forecasts are based on the first statistical data from the outbreak in China [9].

The findings of these studies can be used for various purposes, including tracking COVID-19's global spread, tracking COVID-19's spread in specific countries, determining its impact, constructing a COVID-19 vulnerability index, establishing correlations between conditions and environmental conditions (measurement conditions). And determining the rate of transmission the number of reproductions, establishing the link between isolation and isolation and COVID-19 spread, and analyzing COVID-19. COVID-19 pandemic trend, as well as local and worldwide COVID-19 surveillance The COVID-19 pandemic has only been around for a short period therefore it's critical to track its spread and infection instances [10].

With modeling tools, all impacted nations are looking for mitigation strategies to prevent the disease's spread. The effects of these forecasts have been varied in the aftermath. Regardless of the category, each forecast is produced from a particular perspective. The primary purpose of these research and forecasts is to quickly assist the health community in initiating important activities, choices, control measures, and public limitations. Another accomplishment is to support the establishment of mechanisms to provide internationally recognized control measures, such as quarantine, isolation, contact tracing, and measurement conditions (primarily air, temperature, relative humidity, wind speed, and visibility for the global control of this epidemic [11,12].

And how it affects communication Despite these positive outcomes, there are still several issues and difficulties to be addressed. The first and most significant concern is weather modelling and prediction based on Chinese data is adequate to tackle all nations' challenges. It is important to review to guarantee that China's epidemic control methods are enough to control this worldwide pandemic, and you must pay close attention to fine-tune the model [13].

The COVID-19 epidemic is spreading at an alarming rate worldwide, resulting in thousands of deaths in all countries. Unfortunately, this number will undoubtedly rise shortly, putting medical facilities at risk of resource constraints. In this installment, we'll look at several COVID-19 prediction models to offer partner organisations the most up-to-date information. COVID-19, its prognosis, effect, and control methods were all investigated in depth in this study. The research's significant contribution is to classify and assess the numerous prediction models available in the literature, the problems these models face, and recommendations for managing the pandemic. We investigate different statistical, analytical, mathematical, and medical factors using existing prognostic techniques (symptomatic and asymptomatic) [14].

In addition, standard but essential criteria such as the number of fatalities, measuring parameters, isolation duration, medical resources, liquidity, and so on are taken into account. We categorized diverse forecasting approaches into four categories in this study, including big data sets. Data from WHO national data sources, social media and other forms of media, random theory/mathematical models, and data science/machine learning approaches are all available. This categorization will undoubtedly aid researchers in integrating the prediction techniques provided in this work more simply and concisely [15,16]. Several interesting studies were reported on COVID-19 [17-20]. Some of the studies highlighting the impact on education and the healthcare system were reviewed [21-24].

4. CONCLUSION

Our analysis suggests that China's and other nations' control methods should be reconsidered. Different data sets must be evaluated to forecast breeding and propagation numbers. The models suggested in the literature must be evaluated on a worldwide scale to get more accurate global forecasts. Multiple peaks should be included in

the model for similar reasons, not just for short-term forecasting but also for anticipating outbreaks later this year. The study also highlighted the limitations of various prediction models and provided practical advice for dealing with the outbreak. We anticipate that by analyzing multiple COVID-19 prediction models, we will be able to modify better and enhance intervention programs, therefore reducing the devastating effects of this pandemic. Many of the publications mentioned in this study for analysis are preprints, which means they have not been subjected to official peer review. However, given the increasing rise of COVID-19 worldwide, such a thorough study is urgently needed to contribute to society.

CONSENT

As per international standard or university standard, patients' written consent has been collected and preserved by the author(s).

ETHICAL APPROVAL

As per international standard or university standard written ethical approval has been collected and preserved by the author(s).

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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