PREDICTIVE MODEL OF CORONA VIRUS DISEASE COVID-19 CUTTING EDGE RESEARCH

ABSTRACT

INTRODUCTION: COVID19 is a global pandemic that has spread to over 170 nations and regions. In virtually all of the nations impacted, the number of illnesses and fatalities has skyrocketed. Predictive approaches may be implemented to aid in the development of improved plans and the making of sound judgments. These technologies analyse previous events in order 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 data from 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 utilised 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 COVID19 epidemic.

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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.

KEY WORDS: COVID-19, SARS COV-2, Wuhan, PLAGUE and WHO

INTRODUCTION

The new corona virus 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 major 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 consequent 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 utilised a range of coping methods and sought help from their loved ones to manage with stress and worry.[1]

COVID19 is a global pandemic that has spread to over 170 nations and regions. In virtually all of the nations impacted, the number of illnesses and fatalities has skyrocketed. Predictive approaches may be implemented to aid in the development of improved plans and the making of sound judgments. These technologies analyse previous events in order 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 data from 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 utilised 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 COVID19 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. COVID19, the latest deadly epidemic, is also now sweeping the globe. Not only are 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. Disease spreads when an infected host comes into touch with other people. COVID19, 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 certain environment, the infection is transferred to the host. A pathogen can also be referred to as a vector. A vector is a creature that spreads infection from one host to another via virus or bacterium.[4]

Because of their distribution style, pandemics are frequently referred to as outbreaks. The disease's fatality rate is determined on the type of outbreak. Infectious illnesses have rapidly escalated into pandemics in recent years as a result of changes in lifestyle, increasing worldwide travel, and urbanisation.[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, mankind 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 who were 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 are 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.

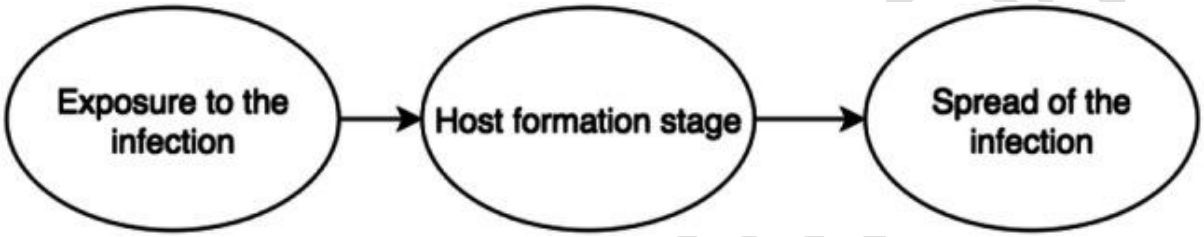

Fig. 1. prediction models

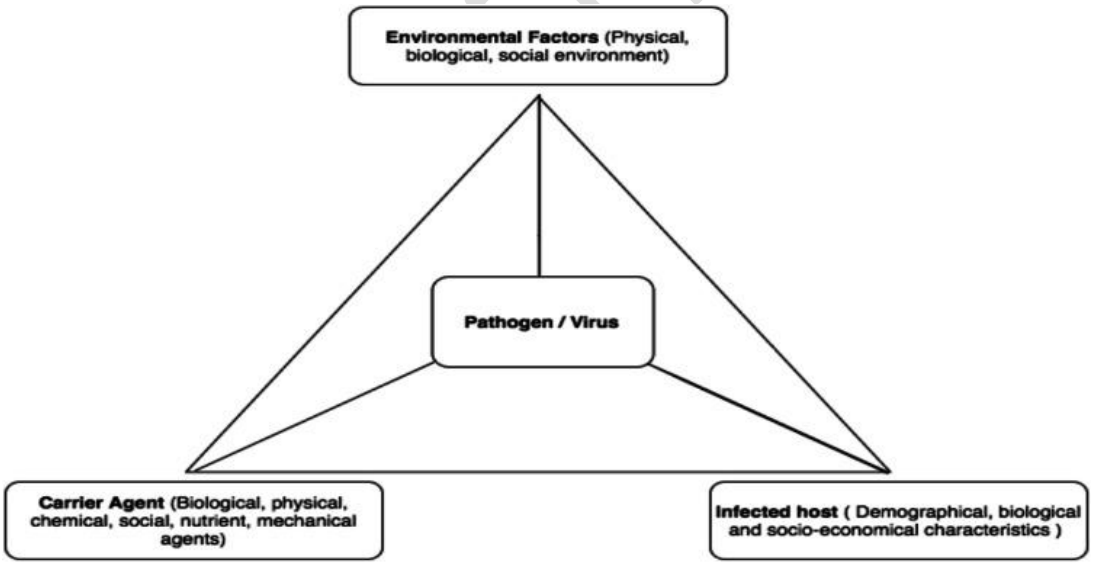

Fig. 2. Environmental factors

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MATERIAL AND METHOD:

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

RESULT AND DISCUSSION

As previously said, the above-mentioned literature study is organised 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. All of these research have one goal in common: to determine the eventual magnitude of the COVID 19 pandemic. However, it's worth noting that all of the research are 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 a variety of purposes, including tracking COVID19's global spread, tracking COVID19's spread in specific countries, determining its impact, constructing a COVID19 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 COVID19 spread, and analysing COVID19. COVID19 pandemic trend, as well as local and worldwide COVID19 surveillance The COVID19 pandemic has only been around for a short period, therefore it's critical to track its spread and infection instances.[10]

With the aid of modelling 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 certain perspective. The major purpose of these research and forecasts is to assist the health community in initiating important activities, choices, control measures, and public limitations in a timely way. Another accomplishment is to support the establishment of mechanisms to provide internationally recognised 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 whether 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 COVID19 epidemic is spreading at an alarming rate throughout the world, resulting in thousands of deaths in all countries. Unfortunately, this number will undoubtedly rise in the near future, putting medical facilities at risk of resource constraints. In this instalment, we'll look at several COVID19 prediction models in order to offer partner organisations with the most up-to-date information. COVID19, its prognosis, effect, and control methods were all investigated in depth in this study. The research's major contribution is to classify and assess the numerous prediction models available in the literature, as well as 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, common but essential criteria such as the number of fatalities, measuring parameters, isolation duration, medical resources, liquidity, and so on are taken into account.

We categorised diverse forecasting approaches into four categories in this study, including big data sets. Data from WHO national data sources, data from 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 more simply and concisely integrating the prediction techniques provided in this work.[15,16] A number of interesting studies were reported on Covid-19 [17-20]. Some of the studies highlighting impact on education and healthcare system were reviewed[21-24].

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. 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. We anticipate that by analysing multiple COVID19 prediction models, we will be able to better modify and enhance intervention programmes, therefore reducing the devastating effects of this pandemic. Many of the publications mentioned in this study for analysis are preprints, which mean they have not been subjected to official peer review. However, given the increasing rise of COVID19 on a worldwide scale, such a thorough study is urgently needed to contribute to society.

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