



“COVID-19 tracking dashboard using Reactjs with sentiment analysis using ML”

Priyanka Shende
Computer Science
Engineering
RCERT ,Chandrapur

Radhika Bhaskarwar
Computer Science
Engineering
RCERT ,Chandrapur

Sakshi Gaddamwar
Computer Science
Engineering
RCERT ,Chandrapur

Prof.Vanita Buradkar
Computer Science
Engineering
RCERT ,Chandrapur

ABSTRACT

The coronavirus family has significant human and animal pathogens. At the end of December 2019, a novel coronavirus was recognized as the reason for a group of pneumonia cases of unidentified etiology in Wuhan, a city in the Hubei Province of China. The novel coronavirus has rapidly become widespread, resulting in an epidemic throughout China, followed by a pandemic, an increasing number of cases in various countries throughout the world. Coronavirus disease 2019 (COVID-19) is spread through large droplets produced during coughing and sneezing by symptomatic patients, as well as asymptomatic individuals before starting of their symptoms. The incubation period of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection is assumed to be 14 days succeeding exposure, mostly around four to five days. Individuals of all ages may acquire SARS-CoV-2 infection, although middle age and older individuals are the majority. The usual clinical characteristics involve fever, dry cough, fatigue, sore throat, rhinorrhea, conjunctivitis, headache, myalgia, dyspnea, nausea, vomiting and diarrhea. Therefore, this paper provides in-depth information on covid-19 as it discuss the disease epidemiology, transmission, clinical features, diagnosis, treatment and prevention.

Keywords: Coronavirus, COVID-19 disease, SARS-CoV-2 infection.

INTRODUCTION

COVID-19 epidemic is the major global health disaster today and the supreme challenge to the universe. Ideally, COVID-19 is an enclosed RNA virus that is distinctly present in people and animals. The virus belongs to the Nidovirales order that consists of families, namely, Roniviridae, Arteriviridae, and Coronaviridae [1,2].

At the same time, the Coronaviridae family is divided into two, which include Torovirinae and Coronaviridae. Further, the Coronaviridae subfamily is classified into alpha-, beta-, gamma-, and delta- COVs [1]. These viruses have a virus-related RNA genome that measures from 26 to 32 kilobases in dimension, and this makes it possible to isolate them from different animal species. Moreover, the coronaviruses can be seen under the electron microscope as it possesses a crown-like appearance. Ideally, the extensive spreading and associated health risks of the disease make it an essential pathogen. Primarily, human types of coronavirus are linked to minor clinical symptoms. Simultaneously, the World Health Organization (WHO) has conducted studies and lab research to identify the new strain of COV, designated as COVID-19 [3-22]. On the other hand, the International Committee on Taxonomy of Viruses referred to the disease-causing virus as the SARS-CoV-2 virus.

As a result, the way the illness spread from person-to-person has made it a public threat [17]. In this case, COVID-19 is extremely transmissible, and this calls for the need to understand its epidemiology, transmission, clinical features, diagnosis, treatment, and prevention so as to gain insight about the disease.

EPIDEMIOLOGY

All ages are at risk of getting the illness. This is because the ailment is transmitted through large droplets that result from coughing and sneezing by symptomatic individuals. In some instances, the infection can happen from asymptomatic individuals and before the beginning of symptoms. As of March 2020, the WHO announced that there are about 87,317 cases of COVID-19 globally as well as confirmed cases of deaths of 2,977 [1,23-29]. This implies that the disease symptoms are mild as only 3.42 per cent of patients with it have died because of the virus. At the same time, the high number of incidences and deaths have been identified in China. It is that 92 per cent of the total number of occurrences have been reported in Asia, mainly China [30]. Importantly, the confirmed incidences are clinically identified and laboratory-confirmed. Further, outside Asia, the number of cases and deaths differs due to the ongoing nature of the disease, population density, degree of testing and reporting, and timing of reducing strategies [6]. The features of COVID-19 are categorized into the host of the virus, transmission mode and incubation period [5]. In the first place, the Chinese horseshoe bats are the natural hosts and the terminal hosts are humans [10]. Also, the transmission is from individual to individual through aerosol droplets. Lastly, the incubation period varies from two to fourteen days. Therefore, COVID-19 cumulative incidence differs depending on the country and incidences have been confirmed in almost all continents.

TRANSMISSION

SARS-CoV-2 can spread through both direct means (droplet and human-to-human transmission) and by indirect contact (contaminated objects and airborne contagion). Meanwhile personal protective equipment (PPE) could also be the source of airborne infections [30]. As mentioned before, person-to-person spread of SARS-CoV-2 is supposed to occur mainly via respiratory droplets, when a patient coughs, sneezes, or even talks or sings. Droplets typically cannot traverse more than six feet (almost two meters) and remain in the air for a limited time. However, SARS-CoV-2 remains intact and contagious in droplets (less than five microns in diameter) and can be suspended in the air for up to three hours [31]. Therefore, airborne isolation, room ventilation, and appropriate application of disinfectant (especially in toilets) might restrict aerosol spread of the virus [32].

Many randomized clinical trials are ongoing to assess the supportive use of remdesivir efficacy in modest or severe COVID-19 infection and any clinical effects of remdesivir on COVID-19 stay currently unidentified. There is anecdotal practice with the utilization of remdesivir, a wide spectrum anti-RNA medication previously used for Ebola in COVID-19 treatment (43).

Arbidol, oseltamivir and other antiviral drugs: Arbidol, an antiviral drug available in Russia and China, is used for

COVID-19 can occur if a person touches a surface contaminated with SARS-CoV-2, and then the hands come into direct contact with mucous membranes such as the eyes, nose, or mouth [33]. Thus, sufficient washing of hands with soap and water or hand sanitizers is recommended. The reported contagion rates from a patient with symptomatic infection vary by location and efficiency of infection control measures. Based on a joint WHO-China report, the rate of secondary COVID-19 infection ranged from one to five percent among tens of thousands of confirmed patients in China [33]. The spread of SARS-CoV-2 from asymptomatic individuals (or individuals within the incubation period), without any radiological findings, has also been reported [34], [35], [36]. Therefore, there is a need for improvements in rapid and sensitive diagnostic methods for detecting infected individuals. In a study on four hospital staff who became infected, although each patient had at least two negative tests, the RT-PCR was still positive from 5 to 13 days after being discharged [37]. Also, viral shedding in the stool likely occurs for up to five weeks (the longest time of shedding was 37 days [38] and in deceased patients until the moment of death) with a mean of 11.2 days after the respiratory tract test was negative [39]. So, because SARS-CoV-2 can be transmitted from recovered patients.

TREATMENT

Supportive Therapy

Treatment is basically supportive and symptomatic. The first step is to guarantee sufficient isolation to stop spread for other contacted individuals, cases and healthcare workers. Depend on their medical being required in certain cases (40,42).

Antiviral Therapy

There has not been, currently, yet a widely accepted therapeutic option for COVID-19 disease. Antiviral drugs, such as ribavirin, lopinavir-ritonavir, have been tried depending on the anecdotal knowledge of HIV, SARS and MERS infection therapies (40,41).

Remdesivir: Remdesivir is a new nucleotide analogue that has effects against SARS-CoV-2 in vitro and linked coronaviruses (including SARS and MERS-CoV) both in vitro and in animal studies (41).

adult SARS-CoV-2 infection; yet, its efficacy and safety remain uncertain(41,44). A combination with oseltamivir and other anti-influenza medications may be required for co-infections with Influenza A/B. The other antiviral medications are evolving daily but now comprise nitazoxanide, favipiravir, nafamostat, and so on(45).

Chloroquine/hydroxychloroquine: Both chloroquine and hydroxychloroquine hamper SARSCoV-2 replication in vitro, even though hydroxychloroquine seems to have a more powerful antiviral effect (46,47).

PREVENTION AND VACCINATION

According to the infection prevention and control strategies from the WHO, standard precautions for all patients, which are also appropriate for public prevention, include hand and respiratory hygiene, the use of appropriate personal protective equipment, safe injection practices, safe waste management, cleanliness, environmental cleaning, and sterilization of patient-care equipment [48]. A vaccine to prevent COVID-19 is perhaps the best hope for ending the pandemic, and vaccines are especially needed by health care workers on the front lines and other vulnerable members of the population who have a higher risk of contracting the infection.

While injection is the most widely used way for vaccine delivery, there are also some novel approaches to deliver vaccines. For example, a fingertip-sized microneedle array vaccine, PittCoVacc, a vaccine from University of Pittsburgh School of Medicine, delivers the spike protein pieces into the skin to stimulate the body to produce antibodies against SARS-CoV-2 [49]; INO-4800 delivers DNA into the host's cells by a hand-held smart device, CELLECTRA[50]; and Symvivo COVID-19 products are presented as oral lyophilized gel-capsules [51].

PURPOSED WORK

"COVID19 TRACKER " is a useful application with a bunch of exciting features that it offers to the users from no page reloads to all coronavirus related data under a single web page. It covers all scenarios to achieve the requirements of any user searching for worldwide or country wise details regarding coronavirus. This application is developed for serving its users to the fullest of its potential by providing them a platform where they can get the data and information about coronavirus not only worldwide but also country wise and in graphical as well as geographical display. Though the application is based more on the frontend development, dynamic data is also given equal preference. The data is collected by asynchronous API calls to disease.sh that provides dynamic data depending on the endpoint used during the call. In simple words disease.sh acts as a server to which we make a GET request to provide an endpoint and according to the endpoint it gives JSON data in response.

In "Sentiment Analysis" the authors implemented and evaluated different classifiers in classifying the sentiment of the tweets. Classifiers were applied on both balanced and unbalanced datasets. Classifiers used are Decision Tree, Naïve Bayes, Random Forest.

Dataset Description

We obtained a dataset from Kaggle, one of the largest online data science communities in this work. It consists of more than 14000 tweets, labeled either (positive, negative, or neutral). The dataset was also split into six datasets; each dataset includes tweets about one of six American airline companies (United, Delta, Southwest, Virgin America, US Airways, and American). Firstly, we summarized the details about the obtained datasets, as illustrated in Table 1 below.

Table 1: Summary of obtained Dataset

	American Airline Companies					
	Virgin America	United	Delta	Southwest	US Airways	American
Number of Tweets	504	3822	2222	2420	2913	2759
Positive Tweets	152	492	544	570	269	336
Negative Tweets	181	2633	955	1186	2263	1960
Neutral Tweets	171	697	723	664	381	463

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CONCLUSION

COVID-19 outbreak has challenged almost all sectors due to the spread of the disease at an alarming rate across the globe. Notably, COVID-19 is an RNA virus that poses a threat to public health. Currently, the disease has caused thousands of infections and deaths. Ideally, the rapid spread of the ailment calls for strong investigation and isolation protocols to avert additional spread. Fundamentally, no confirmed medicine or vaccine has been created to improve the health of patients with the condition. Therefore, individuals need to take measures such as isolation, proper ventilation, hand hygiene and use of personal protective equipment, mainly surgical masks, eye protection, gloves, and gowns to safeguard themselves from the disease.

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