World wide Outbreak Prediction: COVID-19

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Abstract—*COVID-19 is currently the most dangerous variation of the coronavirus as threating the humankind, accepted as the pandemic by the World Health Organization (WHO). Nowadays, there is not a single country where issues regarding COVID-19 is not observed. With thousands of reported deaths and the cases more than that, the world is in an active war to eliminate that virus. The main objectives of the proposed paper is to provide the most recent research and innovative developments regarding the COVID-19. In this context, the paper aims to inform the target audience about the latest findings-results regarding a wide variety of different applications using computer techniques for fighting COVID-19.*

Key Words: Covid-19, symptoms, virus, WHO, disease, China, India, spread, government, outbreak.

I. Introduction

COVID-19 is an infectious disease caused by severe acute respiratory syndrome coronavirus. The disease was first identified in December 2019 in Wuhan, the capital of China's Hubei province, and has spread globally, resulting in the ongoing 2019–20 coronavirus pandemic [1].

The virus is primarily spread between people during close contact, often via small droplets produced by coughing, sneezing, or talking. While these droplets are produced when breathing out, they usually fall to the ground or onto surfaces rather than being infectious over long distances. People may also become infected by touching a contaminated surface and then their face. The virus can survive on surfaces for up to 72 hours. It is most contagious during the first three days after the onset of symptoms, although spread may be possible before symptoms appear and in later stages of the disease [2].

Coronavirus disease (COVID-19) is an infectious disease caused by a newly discovered coronavirus. Most people infected with the COVID-19 virus will experience mild to moderate respiratory illness and recover without requiring special treatment. Older people, and those with underlying medical problems like cardiovascular disease, diabetes, chronicillness. People can become sick with the virus for 1 to 14 days before developing symptoms.

Following fig. shows the structure of corona virus:-

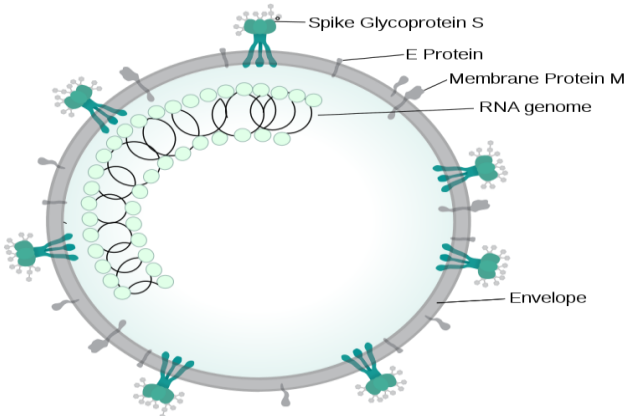

Fig -1:structure of CORONA virus

An expert in rural health advises governments to take a systematic approach to tackling the coronavirus crisis rather than focusing solely on urban areas. One of the most striking images of the coronavirus disease 2019 (COVID-19) pandemic came after India's government initiated a 3-week lockdown on March 24, 2020, forcing millions of migrant workers to flood out of its cities on foot and return to their homes in the countryside, amid promises of financial help for casual labourers. Days later, Indian Prime Minister Narendra Modi used his weekly radio address to beg for forgiveness from the poorest members of society, who were being left without jobs and food due to the shutdown [3].

The topic of Novel Corona virus is huge to cover it entirely in every aspect on a single page, and so is its impact across the world. But the basic things and protocols remain same everywhere. However subjected to change in due course of time as is the number of cases and mortality. The health care personnel are doing their job perfectly and so is the Government, but what is important for everyone being a citizen of India is to maintain social distancing and follow advisories strictly from time to time so that we can make way for our own lives and lives of our dear ones.

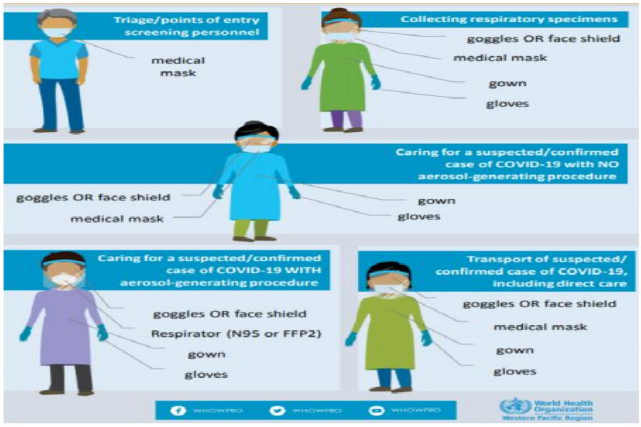

Fig -2: solution of COVID-19

The virus is thought to be natural and have an animal origin, through spillover infection. The actual origin is unknown, but by December 2019 the spread of infection was almost entirely driven by human-to-human transmission. A study of the first 41 cases of confirmed COVID-19, published in January 2020 in The Lancet, revealed the earliest date of onset of symptoms as 1 December 2019. Official publications from the WHO reported the earliest onset of symptoms as 8 December 2019. The World Health Organizaion announced in February 2020 that COVID-19 is the official name of the disease. World Health Organisation chief Tedros Adhanom Ghebreyesus explained that CO stands for corona, VI for virus and D for disease, while 19 is for when the outbreak was first identified. For a WHO of the minimum needed PPE (personal protective equipment) by health care activities being conducted, above [4, 5].

There is no available vaccine, but various agencies are actively developing vaccine candidates. Previous work on SARS-CoV is being utilised because SARS-CoV and SARS-CoV-2 both use the ACE2 receptor to enter human cells. There are three vaccination strategies being investigated. First, researchers aim to build a whole virus vaccine. The use of such a virus, be it inactive or dead, aims to elicit a prompt immune response of the human body to a new infection with COVID-19. A second strategy, subunit vaccines, aims to create a vaccine that sensitises the immune system to certain subunits of the virus. In the case of SARS-CoV-2, such research focuses on the S-spike protein that helps the virus intrude the ACE2 enzyme receptor. A third strategy is that of the nucleic acid vaccines (DNA or RNA Vaccines a novel technique for creating a vaccination). Experimental vaccines from any of these strategies would have to be tested for safety [6].

2. SYMPTOMS

Those infected with the virus may be asymptomatic or develop flu-like symptoms such as fever, cough, fatigue, and shortness of breath. Emergency symptoms include difficulty breathing, persistent chest pain or pressure, confusion, difficulty waking, and bluish face or lips; immediate medical attention is advised if these symptoms are present. Less commonly, upper respiratory symptoms—such as sneezing, runny nose, or soar throat—may be seen. Gastrointestinal symptoms such as nausea, vomiting and diarrheoa have been observed in varying percentages. Some cases in China initially presented only with chest tightness and palpitations in some, the disease may progress to pneumonia, multi-organ failure, and death. In those who develop severe symptoms, time from symptom onset to needing mechanical ventilation is typically eight days.

Coronaviruses can also pass into the brain, causing neurological symptoms, but little research has been done on this. Neurological symptoms of the disease may include headaches, dizziness, anosmia (loss of smell and taste), muscle pain and fatigue. Anosmia was identified as a common early symptom of COVID-19 in March 2020, although not as common as initially reported [7]. As is common with infections, there is a delay between the moment when a person is infected with the virus and the time when they develop symptoms. This is called the incubation period the incubation period for COVID-19 is typically five to six days but may range from two to 14 days. 97.5% of people who develop symptoms will do so within 11.5 days of infection. Reports indicate that not all who are infected develop symptoms. The role of these asymptomatic carriers in transmission is not yet fully known. however, preliminary evidence suggests that they may contribute to the spread of the disease. The proportion of infected people who do not display symptoms is currently unknown and being studied, with the Korea Centers for Disease Control and Prevention (KCDC) reporting that 20% of all confirmed cases remained asymptomatic during their hospital stay. China's National Health Commission began including asymptomatic cases in its daily cases on 1 April; of the 166 infections on that day, 130 (78%) were asymptomatic [8].

3. How does COVID-19 spread?

Some details about how the disease is spread are still being determined. The WHO and the U.S. Centers for Disease Control and Prevention say it is primarily spread during close contact and by small droplets produced when people cough, sneeze or talk with close contact being within 1–3 m. Loud talking releases more droplets than normal talking. A study in Singapore found that an uncovered cough can lead to droplets travelling up to 4.5 meters. An article published in March 2020 argued that advice on droplet distance might be based on 1930s research which ignored the effects of warm moist outbreath surrounding the droplets and that an uncovered cough or sneeze can travel up to 8.2 metres (27 feet) [9].

4. 2020 CORONA VIRUS LOCKDOWN IN INDIA

On 24 March, the Government of India under Prime Minister Narendra Modi ordered a nationwide lockdown for 21 days, limiting movement of the entire 1.3 billion population of India as a preventive measure against the 2020 coronavirus pandemic in India It was ordered after a 14-hour voluntary public curfew on 22 March, followed by enforcement of a series of regulations in the country's COVID-19 affected regions. The lockdown was placed when the number of confirmed positive coronavirus cases in India was approximately 500.Observers state that the lockdown has slowed the growth rate of the pandemic by 6 April to a rate of doubling every six days, from a rate of doubling every three days earlier. As the end of the lockdown period approached, state governments and other advisory committees recommended extending the lockdown. The governments of Odisha and Punjab extended the state lockdowns to 1 May. Maharashtra, Karnataka, West Bengal and Telangana followed suit. On 14 April, Prime minister Narendra Modi extended the nationwide lockdown till 3 May, with a conditional relaxation after 20 April for the regions where the spread has been contained [10].

The coronavirus is often compared to flu but it is actually It is must more dangerous Wild exact death rate is heart to pin down during and ongoing pandemic We know for sure that it's much more contagious and spread faster than flu.

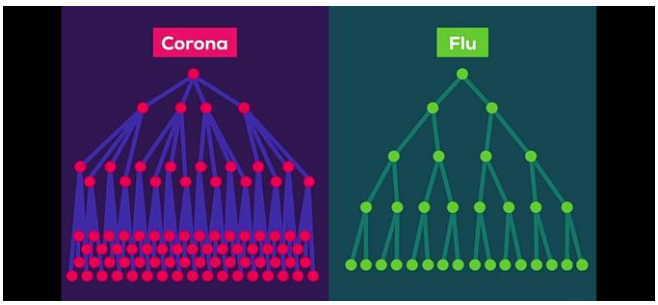

Fig -5: Symptoms

There are two features for pandemic like Corona fast and slow Which future we will see depend on how we all react to in the early days of outbreak A fast pandemic will be horrible and cost many Lifes [11].

Fig -3: Healthcare system

In the fast pandemic many people get infected at the same time if the number goes to the large Healthcare system become unable to handle it there are enough resources like medical staff or equipments like ventilators left to help everybody people will die untreated and more Healthcare workers get sick themselves capacity of Healthcare system Falls event further.

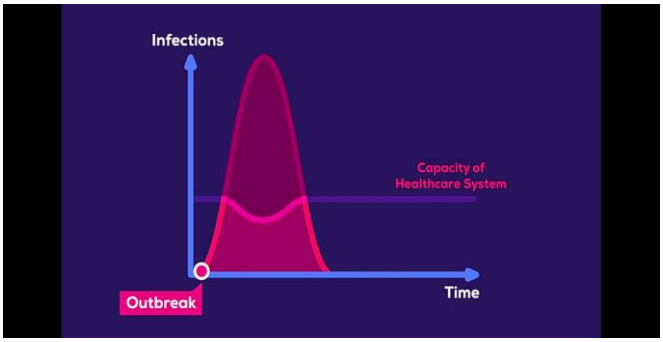

Fig -4: Healthcare system

If this becomes the case then horrible decisions will have to be made about who get to leave and who doesn't the number of death rises significantly in such a scenario to avoid this the world needs to do what it can turn into slow pandemic.

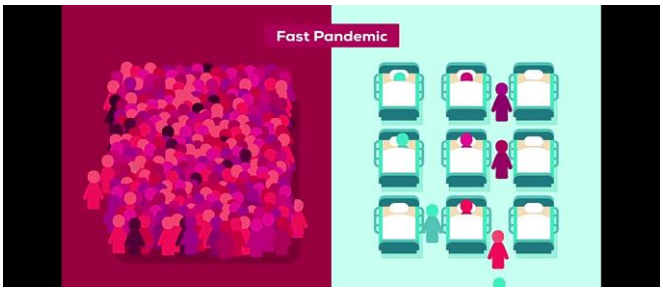

Fig -6: Smptoms

a pandemic is slowed down by right responses specially in the early phase so that everyone who get sick can get treatment and there's no crunch point with overwhelmed Hospital.

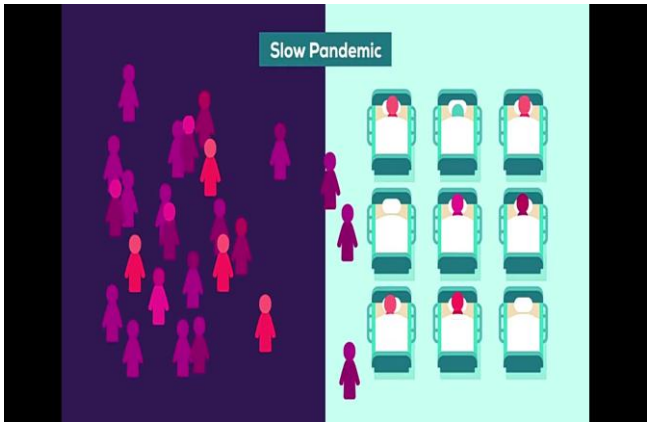

Fig -7: Symptoms

Location Tracking:-

Possibly the most commonly used technology by governments, tracking people's whereabouts through the location information provided by their phones has been crucial to identifying where an infected person went before being quarantined and how many people were in close proximity to the patient. Israel has allowed its internal security agency the use of its citizens' location data for 30 days. South Korea, China and Taiwan have also used location-tracking wide[12].

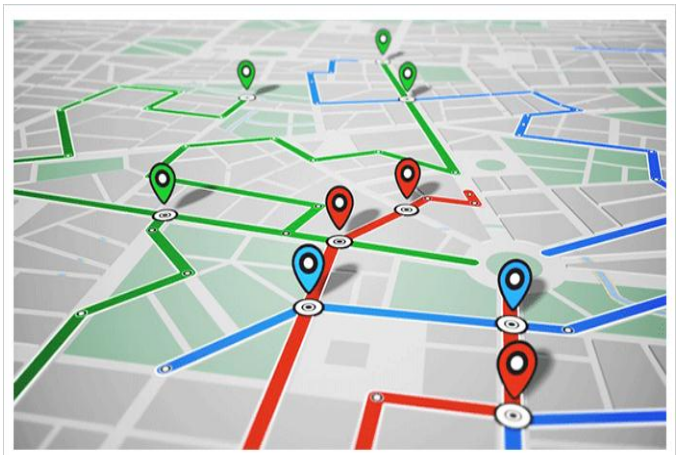

Fig -7: Location Tracking

CCTVs:-

When a family of three in Kerala's Pathanamthitta district tested positive for Covid-19 after returning from Italy, local authorities realised the family had visited several places and met many people for a week before they were quarantined. Reviewing CCTV footage from the areas they had been to was one of the methods the local administration used to track down 900 people the family could have potentially infected. South Korea and Singapore, too, have used CCTVs exten

Fig -8: CCTV's

Robots & Drones:-

In early March, a new isolation ward was opened in Wuhan, the Chinese city where the coronavirus outbreak started. What's interesting about this ward is that it is entirely manned by robots that take patients' temperature, give them food and drugs, and disinfect the ward. China has also used robots in quarantine facilities, and so has Singapore to clean hospitals. The use of robots spares healthcare workers the risk of contracting the virus. In some parts

Fig -7: Technological developments

There is also a great focus on technological developments for improving the mechanism – momentum of science for effective and efficient solutions. At this point, Data Science is the most powerful tools for researchers to fight against COVID-19. Thanks to instant data-analyze and predictive techniques by the Data Science, it is possible to get positive results and introduce revolutionary solutions against the related medical diseases. By running capabilities – resources for rising the Data Science, technological fields like Artificial Intelligence (with Machine / Deep Learning), Data Mining, Applied Mathematics are essential components for processing data, recognizing patterns, modeling new techniques and improving the advantages of the Data Science more. Nowadays, there is a great interest in application potentials of the Data Science so that it will be an effective approach for taking the humankind more step away, after COVID-19 and also before pandemics similar to the COVID-19 many appear.

Using AI To Identify, Track And Forecast Outbreaks:
AI can learn to detect an outbreak, also the better one can track the virus, the better chances of fighting it. AI can detect an outbreak by analysing news reports, social media platforms, and government platforms. Canadian startup BlueDot's is working relentlessly to warn people of the threat days before the WHO issued its public warnings.

Using AI To Help Diagnose The Virus:

Infervision, an AI company had launched a coronavirus AI solution that helps front line healthcare workers detect and monitor the disease efficiently. This remedy also improves CT diagnosis speed. Alibaba, Chinese e-commerce giant has built an AI-powered diagnosis

system, which is 96 percent accurate in diagnosing the virus in seconds.

AI tools can help in many different ways. They are being used to predict the spread of the coronavirus, map its genetic evolution as it transmits from human to human, speed up diagnosis, and in the development of potential treatments, while also helping policymakers cope with related issues, such as the impact on transport, food supplies and travel. But in all these cases, AI is only effective if it has sufficient examples to learn from. As COVID-19 has taken the world into unchartered territory, the "deep learning" systems, which computers use to acquire new capabilities, don't necessarily have the data they need to produce useful outputs. "Deep learning is good at predicting generic behaviour, but is not very good at extrapolating that to a crisis situation when almost everything that happens is new," [13]

Using Drones To Deliver Medical Supplies:

Drone delivery is being considered as one of the safest and fastest ways to get medical supplies whenever they need to go during a disease outbreak. There are examples like Terra Drones that are using their unmanned aerial vehicles, in order to transport medical samples and quarantine material with minimal risk. Also, drones are being used to patrol public spaces, track non-compliance to quarantine mandates.

Using Chatbots To Share Information:

Using chatbots effectively is a very prudent way to deal with the pandemic. For instance, Tencent operates WeChat, where people can access free online health consultation services via it. Also, the travel and tourism sector has immensely benefited from the use of chatbots.

Using AI To Identify Infected Individuals:

At a time when many people have tested positive, China's sophisticated surveillance system had used facial recognition technology and temperature detection software from SenseTime, in order to identify that have developed a fever, and are more likely to have the virus.

Similarly, technological advances like 'Smart Helmets' that are being used by officials in Sichuan province to identify people with fevers. Also, the Chinese Government has developed a monitoring system called Health Code, that uses big data to identify and assess the risk of each individual based on their travel history.

Summing Up:

Dealing with a global pandemic as terrifying as COVID-19, the latest forms of technology like Artificial Intelligence and data science have become essential to help societies in dealing with this outbreak [14].

The search is on for volunteers to donate computing power to fight coronavirus. A virtual supercomputer could speed up the search for a vaccine for COVID-19. Distributed computing projects draw on the unused processing power of computers all over the world.

5. CONCLUSION

Person-to-person transmission may occur through droplet or contact transmission and if there is a lack of stringent infection control or if no proper personal protective equipment available, it may jeopardize the first-line healthcare workers. Currently, there is no definite treatment for COVID-19 although some drugs are under investigation. To promptly identify patients and prevent further spreading, physicians should be aware of the travel or contact history of the patient with compatible symptoms. The main focus of this research paper is that to inform the target audience about the latest updates regarding a wide variety of different applications using computer techniques for fighting COVID-19. Considering the enormity of the evolving Covid-19 pandemic, the scientists have recommended that it is pertinent that frontline healthcare workers are identified and trained before the outbreak sets in.

Stay Safe …….Stay Healthy!!

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