

Corona Virus COVID-19 Investigated by World Amudha Ondiveerappan*

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Abstract

The number of COVID-19 cases in the world and the United States. Virus risk group. SARS-CoV-2 is the virus that causes the new coronavirus COVID-19. The confirmed cases range from mild to severe and COVID-19 of each severity is subdivided every day. COVID-19 affects our mental health. The method used to trace or track COVID-19. Test for coronavirus. Finally, the COVID-19 vaccine showed promise in early research.

Keywords: COVID-19; Immune function; Diseases; World health organization

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Introduction

Number of cases in the world and in USA

This study investigated Corona Virus (COVID-19) in the United States in January 2020 [1]. The total number of cases collected on May 6, 2020 are 1,193,813 new cases, 22,303 cases, a total of 70,802 deaths, and 2,523 new deaths [2].

Who are the risk groups for the virus?

High-risk groups, over 65 years old, especially severely ill patients with COVID-19, are more affected by men [3]. Young adults are also hospitalized in the United States between the ages of 20-44 [4]. The elderly and people of any age who suffer from serious underlying diseases are at higher risk of COVID-19 complications. Such groups include people over 65 years old, people living in nursing homes or long-term care facilities, and people of all ages who have basic diseases, including lung diseases with moderate asthma, patients with severe heart disease, and obesity or people with BMI ≥ 40 , diabetic patients, chronic kidney disease patients undergoing dialysis, liver disease patients, and people with low immune function, including people receiving cancer treatment, smokers, transplant patients, people with poor HIV/HIV control AIDS People with prolonged use of corticosteroids use other immune weakening drugs [5]. The Centres for Disease Control and Prevention (CDC) shows that young people between the ages of 20-44 are at great risk of serious illness and hospitalization caused

by the coronavirus [6]. The CDC says that 29% of hospitalized patients are between 20 and 44 years old [7].

Literature Review

Overall, according to COVID-19 data (data for all states and the District of Columbia where all available data are aggregated), the death rate in the United States has reached a new high for all races:

- 1 in 1,500 black Americans die (or 65.8 deaths per 100,000 people).
- 1 in 2300 Native Americans die (or 43.2 in 100,000 people).
- 1 in 3,100 Pacific Islander Americans die (or 32.7 per 100,000 people).
- 1 in 3,200 Hispanic Americans die (or 31.1 per 100,000 people).
- 1 death per 3,600 white Americans (or 28.5 deaths per 100,000 people).
- 1 in 3,700 Asian Americans died (or 27.7 deaths per 100,000 people).

The new case of childhood coronavirus syndrome is somewhat similar to a rare childhood disease, Kawasaki disease, but as doctors understand it, they emphasize that the two conditions are not the same (**Figure 1**) [8].

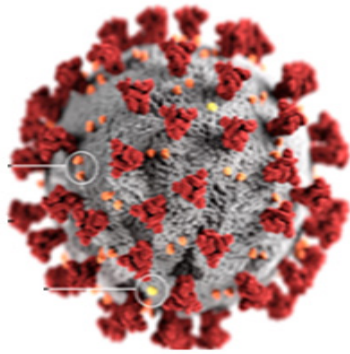


Figure 1: Image showing Coronavirus COVID-19 (SARS-CoV-2).

The SARS-CoV-2 the virus that causes the novel coronavirus COVID-19

Coronavirus COVID-19 (SARS-CoV-2) is a positive single-stranded enveloped RNA virus, belonging to the coronavirus family. What is seen under the microscope is a coronal shape due to small spherical protrusions formed by virus spike (S) peplomers (**Figure 2**).



Figure 2: Laboratory confirmed cases of COVID-19. Note: (orange) Mild/moderate, (red) Severe, (dark red) Critical.

What does this mean?

The diameter of a single unit of COVID-19 is 120 nanometres. Each cell of the virus is composed of several parts (E protein, M protein and S protein) on the outside, which are covered with nodules and have unique protein spikes. It is these spikes that make the Corona Virus family in Latin. The name of corona is the best. The name COVID-19 only means. The corona protrudes from the glycoprotein membrane and the envelope of the lipid molecules covering the body of the virus cell. This lighter fatty skin is very delicate and will disperse when exposed to soap. This is why soap is now our best weapon against viruses. Therefore, it is very important to take some time to wash your hands, because after 20 seconds, soap will penetrate into the oil and cold surface of our hands, enough to tear the virus membrane and kill it. Under oily skin, the real problem is that there is only a small part of RNA (ribonucleic acid) in each cell, which carries the genetic code of the virus and causes multiple infections (**Figure 3**).



Figure 3: Emerging skin manifestation of COVID-19.

How does the viral RNA get into our bodies?

Therefore, when the virus enters the human body, it returns to those protein peaks. Once the viral RNA is released and begins to absorb, it uses these peaks to attach itself to healthy cells in the respiratory system. The cell reads the virus's RNA and makes proteins to keep the body's immune system suppressed, so that the virus reproduces and kills healthy cells, and may cause lifelong harm or death.

The confirmed cases range from mild to severe and COVID-19 of each severity is subdivided every day.

According to a joint survey conducted by WHO and China, as of February 20, 2020, in the COVID-19 joint mission, 80% of the confirmed cases in the laboratory were mild-moderate, 14% were severe, and 6 were severe. For the sake of clarity, a mild case of COVID-19 is not like a mild cold, and the symptoms will be very severe and far fewer than those that require oxygen. Severe cases do require supplemental oxygen, while critical cases are defined by respiratory failure or multiple organ failure. The symptoms, treatment and schedule of the disease vary according to the category (mild, moderate, severe, and severe) to which the patient belongs (**Figure 4**).

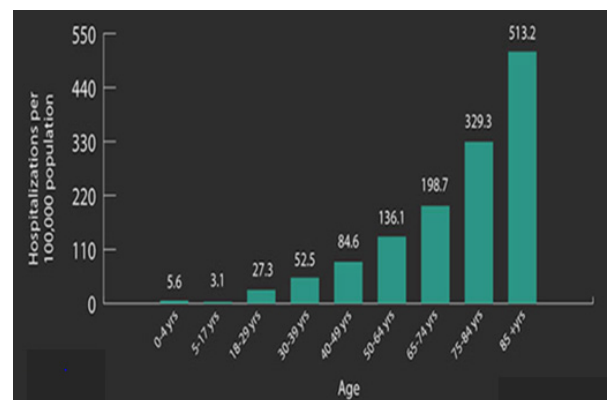


Figure 4: COVID-19 associated hospitalisation surveillance network.

Therefore, the breakdown of COVID-19 looks like a daily routine for each severity level. After being exposed to the new coronavirus, it may take as little as two to fourteen days before the first symptoms appear. In this case, you may feel like a cold or common flu, and many patients will have a fever in the early stages. The WHO-China joint mission found that about 88% of COVID-19 people had a fever, while another study from China showed that 44% of people had a fever after admission, and eventually 89% had a fever. In some cases, it may cause gastrointestinal symptoms such as diarrhoea, nausea, vomiting, and abdominal discomfort a few days before the onset of respiratory symptoms. This is not a normal cause, because COVID-19 is a respiratory disease, which means that for most patients, it starts and ends in the lungs. In the early stages of infection, the virus will invade lung cells, especially damage the cilia (hair moving around, clearing mucus and debris from the air). Once the cells are infected, they will die and fall off, which intensifies the growth of cilia. Debris also hinders the body's ability to keep things out of the lungs and trachea (Figure 5).

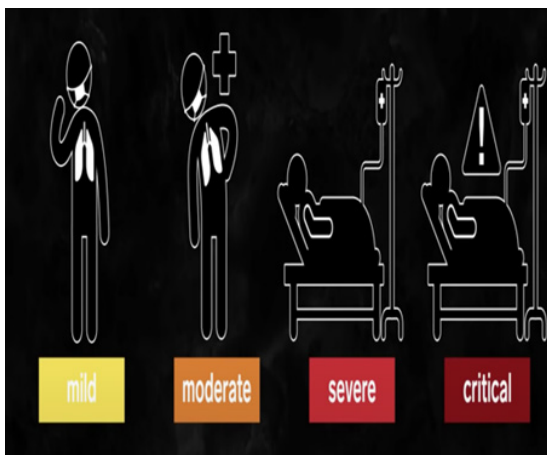


Figure 5: Different conditions of effected COVID-19 patients.

Therefore, inflammation can cause damage, and damage can cause more inflammation. This cycle can continue until no healthy tissue remains, and inflammation can explain why dry cough is the most common symptom (67.7% of laboratory confirmed cases), breathing The same is true for rush. (18.6%), sputum is produced (33.4%). Other symptoms at this time are fatigue, sore throat, headache, joint pain or muscle pain, chills and runny nose. By the 5th day, patients with symptoms may find it difficult to breathe, and it usually takes about 7 days for a person to go to the hospital for treatment. Although mild cases can usually be cleared now, moderate to severe cases can develop into pneumonia, the severity of which ranges from life-threatening to service, and the recovery time for these patients may range from a few days to a few weeks. In some severe and severe cases, the symptoms may escalate to Acute Respiratory Distress Syndrome (ARDS). When the pulmonary fluid builds up and causes inflammation, it will trigger a flood of immune cells designed to target the infection and usually be isolated to Infect the area, but ARDS will occur. Sometimes the human body falls

into the body, which is why immune cells start to kill everything in their path, including healthy cells (Figure 6).



Figure 6: Lungs effected due to COVID-19.

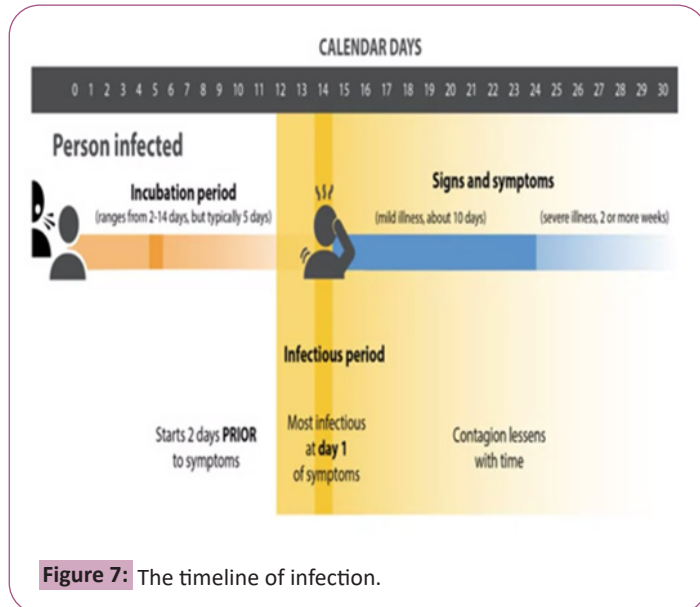
In critical cases, ARDS is usually fatal. It can lead to respiratory failure and requires advanced life support. This is most likely to occur when the patient goes to the ICU. ARDS treatment includes supplemental oxygen and mechanical ventilation. The goal is to get more oxygen into the blood, because if this treatment does not work, the lungs will not be able to absorb any oxygen because the lungs are congested. This is most COVID-19 death due to 19 causes, even if the patient survives this stage, he may suffer from lung permeability damage. SARS made a hole in the lungs of some infected people, causing them to have a honeycomb effect, and these lesions can be seen after being infected with the new coronavirus. Early research shows that most people who die from this disease will die within 14-19 days. On average, people who recover will leave the hospital after two and a half weeks, but in the most severe cases, once the patient is admitted to the hospital, Recovery may take several months. During the recovery period, they may be contagious, and these people should work with doctors and public health officials to determine when they are no longer in danger.

As of now, there is no vaccine against this virus, so the best way to avoid getting sick is to avoid exposure. COVID-19 is easily spread from person to person through coughing and sneezing, so you should wash your hands frequently and avoid contact with others. Use sick and clean disinfected surfaces every day. COVID-19 should be taken seriously, but most cases are survival, so please stay at home, stay safe and keep clean.

How is COVID-19 affecting our mental health?

Regarding what is happening to people of this pandemic today and in the future, mental health effects are indeed a problem in general, which will cause stressful behaviours for many people, and this pandemic disease will bring many problems. For example, if someone wants to know whether he or she is positive for COVID, it is like being stigmatized and threatening their lives and affecting their behaviour. Panic leads to bad behaviours and psychological and physical problems, so medical staff must be careful and cautious. Similarly, seeing the decline in coronavirus cases, frontline health care workers are facing their own sources of stress. Frontline workers must treat people with coronavirus calmly, look directly at standards and rules, and should not pass pressure on patients. Another pressure is the long-term economic instability. Unemployment during and after the great depression led to an increase in the incidence of heart disease.

The problem is that stress kills because it causes two things, first, vasospasm and immunosuppression of the vascular system, and finally suppression of the immune system (Figure 7).



Discussion

What are the methods that are used to trace or track COVID-19?

One of the methods that is used to trace COVID-19 is contact tracing.

What is contact tracing?

Contact tracking is the key to slowing down the spread of COVID-19 and helps ensure the safety of you, your family and your community. The health department uses contact tracing to prevent the spread of infectious diseases. Generally, contact tracing involves identifying people with infectious diseases (cases) and those in contact with them (contacts), and working with them to interrupt the spread of the disease. This includes requiring people with COVID-19 to be isolated and having their contacts voluntarily isolated at home.

- What is the contact tracing for COVID-19 that typically involves?
- Interview people with COVID-19 to identify everyone in close contact with them during the time they may be infected.
- Notify contacts of potential risks.
- Recommend contacts for testing.
- Monitor contacts for signs and symptoms of COVID-19.
- Associate contacts with services they may need during self-isolation.

How to prevent the further spread of the disease?

In order to prevent the further spread of the disease, people who have been in contact with a COVID-19 infected person are

encouraged to stay at home and maintain social distance (at least 6 feet) from others until 14 days after their last contact with a COVID-19 infected person. Contacts should monitor themselves by checking their temperature twice a day and observing the symptoms of COVID-19.

What are the steps of contact tracing?

Generally, contact tracing includes the following steps:

Case investigation: Public health personnel work with patients to help them remember everyone they might have been in close contact with during the infection.

Contact tracing: Public health personnel start contact tracing by promptly and sensitively informing the exposed people (contacts) of their potential contact opportunities without revealing the identity of the infected patient.

Contact support: Provide education, information, and support to contacts to help them understand the risks, how to separate themselves from others who are not at risk of contact, and how to monitor their condition. In addition, they were told that even if they did not feel unwell, they could spread the infection to other people.

Self-isolation: Encourage contacts to stay at home, monitor their health, and maintain social distancing (at least 6 feet) from others until 14 days after their last contact with an infected patient to prevent them from getting sick.

What if a person is diagnosed with COVID-19 what can they expect to happen during contact tracing?

If you are diagnosed with COVID-19, public health workers can call you to check your health, discuss who you have been in contact with, and ask you how much time you spend on infectious diseases and transmission capacity. If you have not done so, you will also be asked to stay at home and isolate yourself.

Even if they ask, they will not reveal your name to anyone you might expose.

Self-isolation means staying in a specific room away from other people and pets at home and using a separate bathroom whenever possible.

Self-isolation can help slow the spread of COVID-19 and help maintain the health of family, friends, neighbors, and other people who may be in contact with you.

If you need support or help in self-isolation, your health department or community organization may provide assistance.

Symptoms of COVID-19 may include fever or chills, cough, shortness of breath or difficulty breathing, fatigue, muscle or body pain, headache, loss of new taste or smell, sore throat, congestion or runny nose, nausea or vomiting, and diarrhea. If your symptoms worsen or become severe, you should seek medical attention. Severe symptoms include difficulty breathing, persistent pain or pressure in the chest, confusion, inability to wake up or stay awake or blue lips or face.

Testing for the coronavirus

Testing for the coronavirus is the first and most urgent priority. It is to increase access to tests that diagnose people who are currently infected. But now there are other tests. Antibody tests that can identify patients with signs of past infections are now available. The third test is in progress. The World Health Organization is closely monitoring the field of COVID-19 vaccine candidates, listing more than 100 projects, although many of them are designed in academic laboratories without commercial production capacity. In addition, the two companies estimate that they will be able to produce millions of doses in factories in the United States and Europe this year. By 2022, production may reach hundreds of millions of doses.

Finally a COVID-19 vaccine that shows a promise in early study

In March, the biotechnology company Moderna became one of the first companies to test an experimental COVID-19 vaccine in healthy human volunteers.

Now, the company has reported the positive results of a small phase I study: Moderna said on May 18 that encouraging early signs indicate that the vaccine has been tested by researchers in three different doses to produce Antibodies against SARS-CoV-2 virus. Causes levels of COVID-19 that are similar or higher than those seen in the plasma of people who actually recovered from the infection.

Immune response: The phase I study is actually to measure the safety of the vaccine rather than its effectiveness, but the antibody levels seen in the participants indicate that the vaccine can wake up the body's immune response to defend against SARS-CoV-2. In addition, the company reported that in preliminary analysis, antibodies from eight participants appeared to neutralize the virus in the laboratory.

Forefront: These findings are an early verification of Moderna's technology, which is different from traditional vaccine design. Although most vaccines rely on viral fragments or inactivated viral fragments to activate the immune system, Moderna vaccines are made from viral genetic material.

Next step: The Phase II study will start in June, with about 600 healthy volunteers. If it goes well, the final phase III study may start as early as July. Due to an emergency situation, on May 12, the U.S. Food and Drug Administration (FDA) granted Fast Track qualification for Moderna vaccine to speed up the agency's review process. However, even a fast track can only be so fast: Although a few people are testing candidate vaccines in the population, no one is ready for a mass immunization campaign until at least next year.

Conclusion

Till the vaccine is out in the market what we can do till then is continuing with the same practices that we have been following through the CDC such as: Reduce the chance of contact. The most common way to catch the virus that causes COVID-19 is to have close contact with others. Avoiding gatherings and keeping distance from society can help reduce exposure to the virus. Make sure to follow any orders issued by your state regarding placement in place or at home. Promote the use of daily preventive measures. Some common practices can reduce the risk of infection. Clean hands, cover coughs and sneezes, and wear cloth face masks as recommended or local or national orders to reduce the spread of infection. Protect high-risk groups. Certain groups of people have a higher risk of suffering from the serious illness of COVID-19. In order to keep our families and communities safe and healthy, it is important to take measures to protect the elderly, people with basic health conditions; homeless people, people imprisoned or detained, and engaged in medical care or other important infrastructure workers.

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