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Coronavirus: A Global Pandemic

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Abstract

There is a new world health crisis threatening the public with spread of COVID-19 (Coronavirus Disease-2019). Since December 2019, when Covid-19 emerged in Hunan seafood market at Wuhan, South China and rapidly spread throughout the world, the virus outbreak has been declared a public health emergency of International concern by World Health Organization (WHO). We here summarize the current clinical characteristics data to guide potential COVID-19 about Prevention, Diagnosis, Treatments and Prevention of COVID-19.

In this review, we extracted data from various Research Report, WHO guidelines and other articles. It is important to caution the readers that new data updating nearly every hour regarding clinical characteristics, diagnosis, treatment strategies, and outcomes COVID-19. Throughout the world the disease has caused varying degrees of illness. Patient shows various symptoms

usually fever, cough, sore throat, breathlessness, fatigue, and malaise among others.

The disease is being cured through general treatment, symptomatic treatment, by using antiviral drugs, oxygen therapy and by the immune system. It is necessary to identify the potential cases as soon as possible and isolate the suspected people from the confirmed cases of COVID-19, to prevent the potential transmission of infection to other patients and health care staff.

Keywords: Coronavirus disease-2019; COVID-19; respiratory syndrome; symptoms; SARAS; Vaccine; treatment.

Introduction

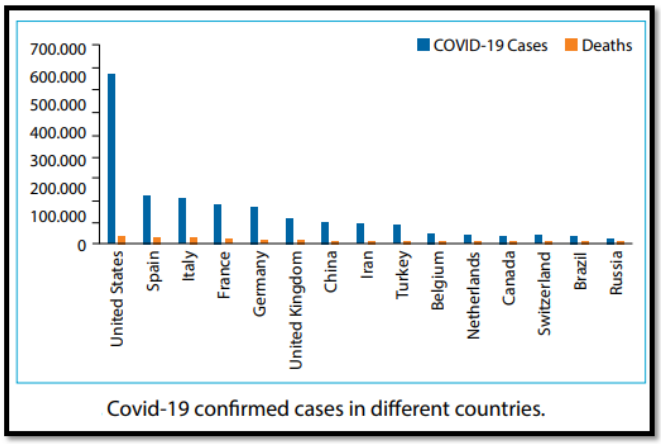
Coronaviruses are a large family of viruses which may cause disease in animals or humans. Seven coronaviruses can produce infection in people around the world but commonly people get infected with these four human coronaviruses: 229E, NL63, OC43, and HKU1.[1]

On January 8, 2020, a novel coronavirus was officially announced as the causative pathogen of COVID-19 by the Chinese Center for Disease Control and Prevention.[2]

The outbreak of coronavirus disease 2019 (COVID-19) in the area of Wuhan, China, has evolved rapidly into a public health crisis and has spread exponentially to other parts of the world.[3]

On January 30, 2020, the World Health Organization (WHO) announced that this outbreak had constituted a public health emergency of international concern *(Mahase 2020)*. The novel coronavirus was initially named 2019-nCoV and officially as severe acute respiratory syndrome coronavirus 2 (SARSCoV-2).[4]

As of February 26, COVID-19 has been recognized in 34 countries, with a total of 80,239 laboratory-confirmed cases and 2,700 deaths.[5]



Covid-19 confirmed cases in different countries.

Source: https://ejmo.org/10.14744/ejmo.2020.90853/pdf

The virus has a natural and zoonotic origin: two scenarios that can plausibly explain the origin of SARS-CoV2 are:[6]

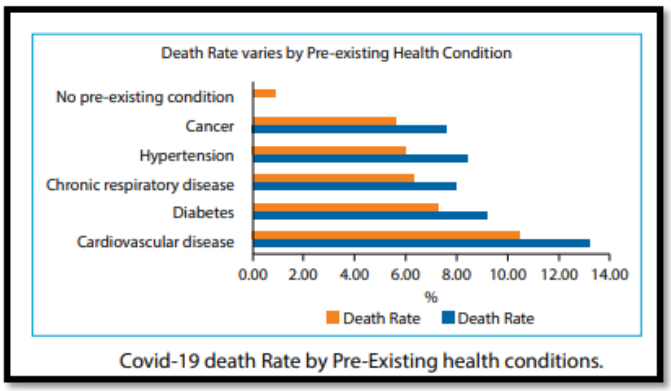
(i) natural selection in an animal host before zoonotic transfer; and

(ii) natural selection in humans following zoonotic transfer. Clinical features and risk factors are highly variable, making the clinical severity range from asymptomatic to fatal.

History

Coronaviruses are enveloped positive sense RNA viruses ranging from 60 nm to 140 nm in diameter with spike like projections on its surface giving it a crown like appearance under the electron microscope; hence the name coronavirus. [7]

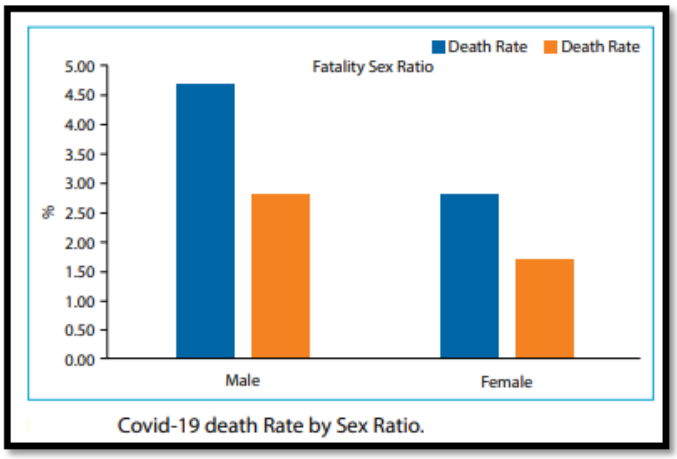
Four corona viruses namely HKU1, NL63, 229E and OC43 have been in circulation in humans, and generally cause mild respiratory disease. There have been two events in the past two decades where in crossover of animal betacorona viruses to humans has resulted in severe disease.[8]



Source: https://ejmo.org/10.14744/ejmo.2020.90853/pdf

The first such instance was in 2002–2003 when a new coronavirus of the β genera and with origin in bats crossed over to humans via the intermediary host of palm civet cats in the Guangdong province of China. This virus, designated as severe acute respiratory syndrome coronavirus affected 8422 people mostly in China and Hong Kong and caused 916 deaths (mortality rate 11%) before being contained. Almost a decade later in 2012, the Middle East respiratory syndrome coronavirus (MERS-CoV), also of bat origin, emerged in Saudi Arabia with dromedary camels as the intermediate host and affected 2494 people and caused

858 deaths (fatality rate 34%).[9]



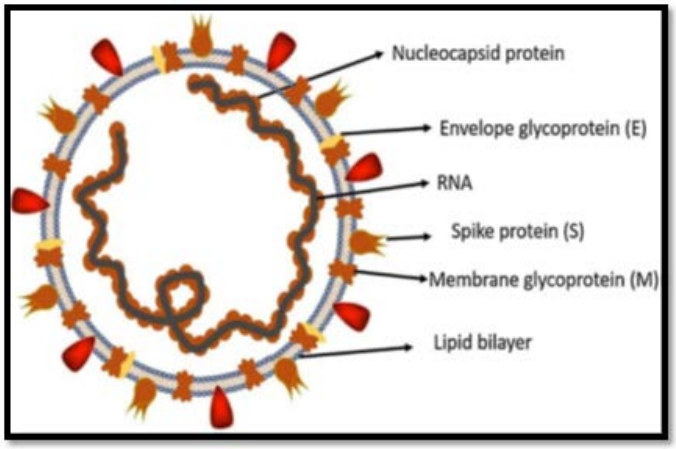
Source: https://ejmo.org/10.14744/ejmo.2020.90853/pdf

Viral Etiology

Corona Virus Disease 2019 (COVID-19) is an RNA virus, with a typical crown-like appearance under an electron microscope due to the presence of glycoprotein spikes on its envelope.[12]

According to recent research, similar to SARS-CoV and Middle East respiratory syndrome coronavirus (MERS-CoV), SARSCoV- 2 is zoonotic, with Chinese horseshoe bats (*Rhinolophus*

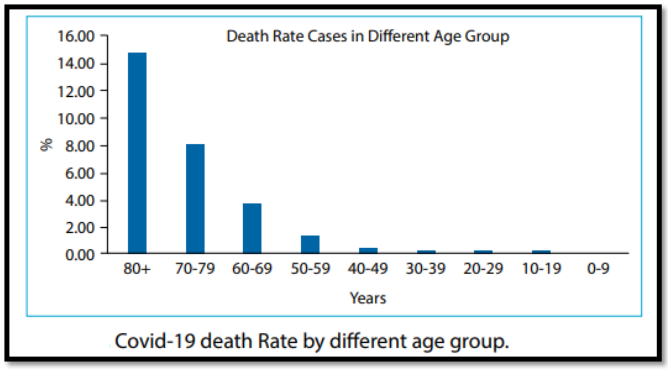
sinicus) being the most probable origin (Chan et al. 2020; Lu et al. 2020) and pangolins as the most likely intermediate host *(The Chinese Preventive Medicine Association 2020).*[12]



Source: https://ejmo.org/10.14744/ejmo.2020.90853/pdf

Epidemiology

All ages are susceptible. Infection is transmitted through large droplets generated during coughing and sneezing by symptomatic patients but can also occur from asymptomatic people and before onset of symptoms Studies have shown higher viral loads in the nasal cavity as compared to the throat with no difference in viral burden between symptomatic and asymptomatic people. Patients can be infectious for as long as the symptoms last and even on clinical recovery started with a single animal-to-human transmission, followed by sustained human-to-human spread *(Chan et al. 2020; Del Rio and Malani 2020).* It is now believed that its interpersonal transmission occurs mainly via respiratory droplets and contact transmission.[10,11]



Covid-19 death Rate by different age group.

Source: https://ejmo.org/10.14744/ejmo.2020.90853/pdf

The COVID-19 epidemic expanded in early December from Wuhan, China's 7th most populous city, throughout China and was then exported to a growing number of countries. The first confirmed case of COVID-19 outside China was diagnosed on 13th January 2020 in Bangkok (Thailand). On the 2nd of March 2020, 67 territories outside mainland China had reported 8565 confirmed cases of COVID-19 with 132 deaths, as well as significant community transmission occurring in several countries worldwide, including Iran and Italy and it was declared a global pandemic by the WHO on the 11th of March 2020. The number of confirmed cases is constantly increasing worldwide and after Asian and European regions, a steep increase in cases is currently (31 March 2020) being observed in low-income countries.[13]

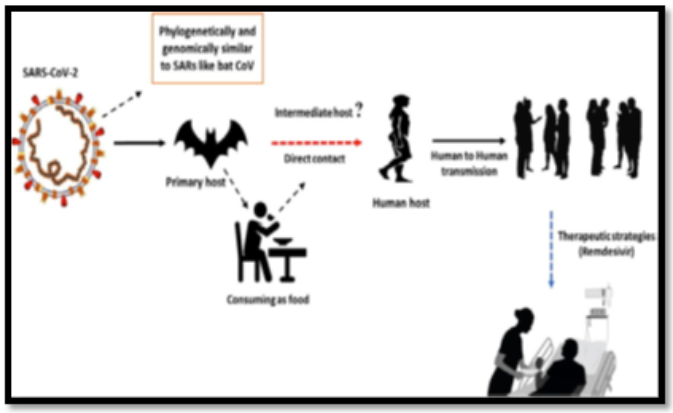
Origin and Transmission

The novel coronavirus originated from the Hunan seafood market at Wuhan, South China where raccoon dogs, bats, snakes, palm civets, and other animals are sold, and rapidly spread up to 109 countries.[14,16]

The virus that causes coronavirus disease 19 (COVID-19) is a highly transmittable and pathogenic viral infection and mainly transmitted through contact with respiratory droplets rather than through the air.[14]

Transmission can occur more easily in the "Three C's" (the risk of COVID-19 spreading is higher in places where these "3Cs" overlap):[15,17]

1. Crowded places with many people nearby;
2. Close-contact settings, especially where people have conversations very near each other;
3. Confined and enclosed spaces with poor ventilation



Source: https://ejmo.org/10.14744/ejmo.2020.90853/pdf

The incubation period of COVID-19 has been estimated at 5 to 6 d on average, but there is evidence that it could be as long as 14 d, which is now the commonly adopted duration for medical observation and quarantine of (potentially) exposed persons *(Backer et al. 2020; Li et al. 2020)*.

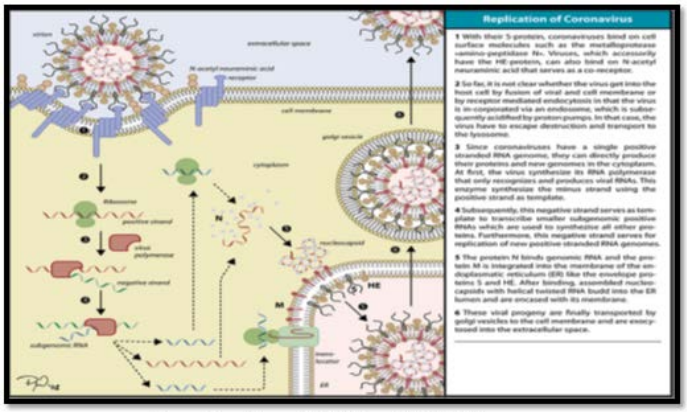
Pathophysiology

Infection begins when the virus enters the host cell, the virus particle is uncoated and the spike protein attaches to its complementary host cell receptor. After attachment, a proteolytic enzyme of the host cell cleaves and activates the receptor-attached spike macromolecule. Depending on the host cell proteolytic enzyme available, cleavage and activation enable cell entry through endocytosis or direct fusion of the viral envelope with the host membrane.[19]

(SA16) The chemical structure of Coronavirus RNA consists of 5' methylated head and a 3' polyadenylated tail, through which the RNA attaches to the free ribosomes of the host cell. This lead to the process of translation and formation of a long polypeptide chain. This protein has its enzyme (Proteases) which break the polyprotein into multiple nonstructure proteins.[19]

Coronaviruses (CoVs), are the family of viruses that have pricky spikes that project from their surface. They have enveloped RNA viruses, are characterized by club-like spikes that project from their surface, they have a unique replicating process.[20]

These viruses are the cause of many types of diseases in mammals and birds leading to enteritis in cows and pigs and upper respiratory infection in humans which may be fatal. In the given review we have discussed a brief introduction to coronaviruses detailing its replication and pathogenic activity, preventive measures and treatment strategies. We will elaborate the discussion on the outbreaks of the highly pathogenic Severe Acute Respiratory Syndrome Coronavirus (SARS-CoV) and the recently discovered Middle Eastern Respiratory Syndrome Coronavirus (MERS-CoV).[20]



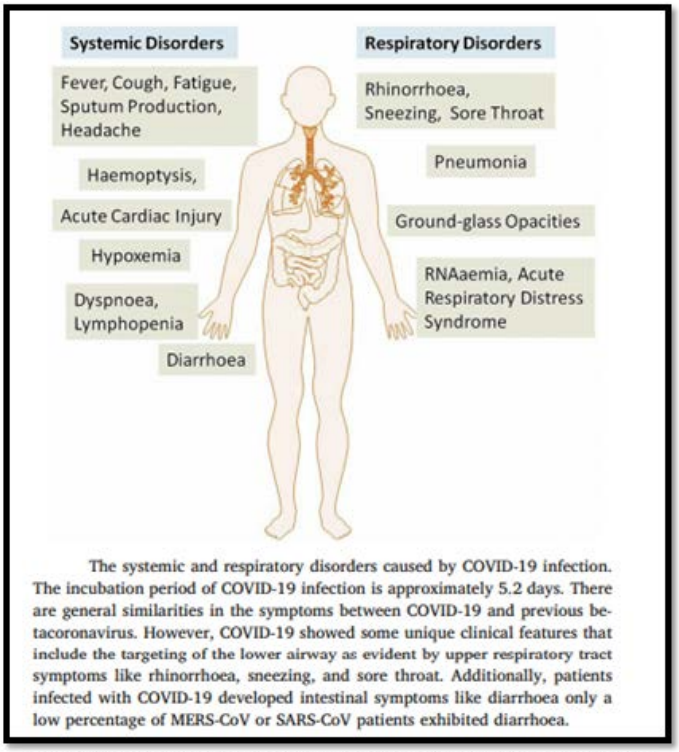
Source: https://ejmo.org/10.14744/ejmo.2020.90853pdf

Clinical Manifestations

The clinical spectrum of COVID-19 varies from asymptomatic or paucisymptomatic forms to

clinical conditions characterized by severe respiratory failure that necessitates mechanical ventilation and support in an intensive care unit (ICU), to multiorgan and systemic manifestations in terms of sepsis, septic shock, and multiple organ dysfunction syndromes (MODS).[21,22]

Research from the Chinese CDC observes that around 80% of coronavirus cases are mild, around 15% of patients have infected severe cases, and 5% have become critically ill. A day by day breakdown of coronavirus symptoms shows how symptoms progress among typical patients, how the disease, COVID-19, goes from bad to worse.[23]



The systemic and respiratory disorders caused by COVID-19 infection. The incubation period of COVID-19 infection is approximately 5.2 days. There are general similarities in the symptoms between COVID-19 and previous be-tacoronavirus. However, COVID-19 showed some unique clinical features that include the targeting of the lower airway as evident by upper respiratory tract symptoms like rhinorrhoea, sneezing, and sore throat. Additionally, patients infected with COVID-19 developed intestinal symptoms like diarrhoea only a low percentage of MERS-CoV or SARS-CoV patients exhibited diarrhoea.

Source: https://www.sciencedirect.com/science/article/abs/pii/S0896841120300469?via%3Dihub

Day 1: In the starting day of the symptom, the patient suffers from fever along with fatigue, muscle pain, and a dry cough. Few of them may experience nausea and diarrhea a few days before the arousal of symptoms.

Day 5: Patients may suffer from breathing problem especially if they are elderly or have some pre-existing health condition.

Day 7: According to the Wuhan University study, these are the symptoms of the patient that lead the patient to be admitted in the hospital.

Day 8: On the 8th day, patients (15%, according to the Chinese CDC) develop acute respiratory distress syndrome (ARDS), a condition where the fluid fills up in the lungs and this is mostly fatal. This usually happens in severe cases.

Day 10: The progression of the disease leads to worsening of the symptom and at this point the patient is shifted to ICU. Patients with milder symptoms probably have more abdominal pain and loss of appetite. Only a small fraction dies. The current mortality rate is around 2%.

Day 17: On average, after two-and-a-half week's patients who recover are discharged from the hospital.

However, it's difficult to find out the symptoms in the earlier days of the infection. This is usually seen after 5-6 days.

Reported symptoms have ranged from mild to severe illness and death for confirmed coronavirus disease 2019 cases.

Diagnosis[19,27]

The Coronavirus disease outbreak is additionally typical to prevent virus community transmission, including how testing might be rationalized when lack of reagents/ testing kit or testing capacity necessitates prioritization of certain populations group or individuals for testing." (MA3).

To test for COVID-19, doctor or health practitioner may take samples, including a sample of saliva (sputum), a nasal swab and a throat swab, to send to a lab for testing or follow the directions of your local health authority.

For patients with suspected infection, the following diagnosis techniques are utilized: performing real-time fluorescence (RT-PCR) to detect the positive nucleic acid of SARS-CoV-2 in sputum, throat swabs, and secretions of the lower respiratory tract samples.[29]

SARS-CoV-2 RNA is detected by reverse-transcription polymerase chain reaction (RT-PCR).

A positive test for SARS-CoV-2 generally confirms the diagnosis of COVID-19, although false-positive tests are possible. If initial testing is negative but the suspicion for COVID-19 remains, the WHO recommends resampling and testing from multiple respiratory tract sites. The accuracy and predictive values of SARS-CoV-2 testing have not been systematically evaluated.[24]

Negative RT-PCR tests on oropharyngeal swabs despite CT findings suggestive of viral pneumonia have been reported in some patients who ultimately tested positive for SARS-CoV-2.

Other laboratory investigations are usually non-specific.

The white cell count is usually normal or low. There may be lymphopenia; a lymphocyte count <1000 has been associated with severe disease. The platelet count is usually normal or mildly low. The CRP and ESR are generally elevated but procalcitonin levels are usually normal. A high procalcitonin level may indicate a bacterial co-infection. The ALT/AST, prothrombin time, creatinine, D-dimer, CPK and LDH may be elevated and high levels are associated with severe disease.[25]

The chest X-ray (CXR) usually shows bilateral infiltrates but may be normal in early disease. The CT is more sensitive and specific. CT imaging generally shows infiltrates, ground glass opacities and sub segmental consolidation.[30]

It is also abnormal in asymptomatic patients/ patients with no clinical evidence of lower respiratory tract involvement. In fact, abnormal CT scans have been used to diagnose COVID-19 in suspect cases with negative molecular diagnosis; many of these patients had positive molecular tests on repeat testing.[25]

Differential Diagnosis

Differential diagnosis should include the possibility of a wide range of common respiratory disorders such as:

- Other Coronaviruses (SARS, MERS)
- Adenovirus
- Influenza
- Human metapneumovirus (HmPV)
- Parainfluenza
- Respiratory syncytial virus (RSV)

- Rhinovirus (common cold)
- Bacterial pneumonia, mycoplasma pneumonia (MPP) and chlamydia pneumonia.

Differentiation should also be made from lung disease caused by other diseases. A CT scan has great value in early screening and differential diagnosis for COVID-19.[25]

Treatment[19]

Optimized supportive care remains the backbone of therapy and the clinical efficacy for the treatment of COVID-19 disease.

General Treatment

A confirmed patient of COVID 19 needs complete bed rest and supportive treatment, ensuring adequate calorie and water intake to reduce the risk of dehydration.

Water electrolyte balance and homeostasis need to maintain along with the of monitoring vital signs and oxygen saturation; keeping respiratory tract unobstructed and inhaling oxygen in more severe cases; measuring blood count, Creactive protein, urine test, and other blood biochemical indexes including liver and kidney function, myocardial enzyme spectrum, and coagulation function according to patient's conditions. Chest imaging should be continuously re-examined and blood gas analysis should be performed when required.

Symptomatic Treatment

Control measures are needed for patients with a high fever. Antipyretic drug treatment should be performed in case the temperature exceeds 38.5 °C. Warm water bath and antipyretic patches are preferred as a preventive measure to lower the temperature. Common drugs include ibuprofen orally, 5–10 mg/kg every time; acetaminophen orally, 10– 15 mg/kg every time.

Need to administer sedative arises in case the child suffers from convulsions or seizure.

Oxygen Therapy

- The chances of hypoxia are increased as the virus targets the lungs. Nasal catheter, mask oxygen should be immediately provided to the patient.
- In emergency conditions, Non-invasive or invasive mechanical ventilation should be provided to the patient.

Antiviral Drugs

- Group of antiviral drugs including interferon α (IFN-α), lopinavir/ ritonavir, chloroquine phosphate, ribavirin, and arbidol are therapeutically useful for the Prevention, Diagnosis, and Treatment of Novel Coronavirus-induced Pneumonia by the National Health Commission (NHC) of the People's Republic of China for tentative treatment of COVID-19.

Drug with their dosage and duration of treatment

Drug	Dosage	Method of administration	Duration of treatment
IFN-α	5 million U or equivalent dose each time, 2 times/day	Vapor inhalation	No more than 10 days
Lopinavir/ritonavir	200 mg/50 mg/capsule, 2 capsules each time, 2 times/day	Oral	No more than 10 days
Ribavirin	500 mg each time, 2 to 3 times/day in combination with IFN-α or lopinavir/ritonavir	Intravenous infusion	No more than 10 days
Chloroquine phosphate	500 mg (300 mg for chloroquine) each time, 2 times/day	Oral	No more than 10 days
Arbidol	200 mg each time, 3 times/day	Oral	No more than 10 days

Source: https://ejmo.org/10.14744/ejmo.2020.90853.pdf

A team of researchers from Shanghai Institute of Materia Medica and Shanghai Tech University performed drug screening in silicon and an enzyme activity test, and they reported 30 agents with potential antiviral activity against SARS-CoV-2 on January 25, 2020.

These agents are indinavir, saquinavir, lopinavir, carfilzomib, ritonavir, remdesivir, atazanavir, darunavir, tipranavir, fosamprenavir, enzaplatovir, presatovir, abacavir, bortezomib, elvitegravir, maribavir, raltegravir, montelukast, deoxyrhapontin, polydatin, chalcone, disulfiram, carmofur, shikonin, ebselen, tideglusib, PX-12, TDZD-8, cyclosporin A, and cinanserin.

Certain Chinese herbal medicines such as RhizomaPolygoniCuspidati and Radix SophoraeTonkinensis were also found to contain certain

active constituents that were effective against SARS-COV-2

Recently, Wang and colleagues *(Wang et al., 2020)* evaluated in vitrofive FDA-approved drugs and two broad-spectrum antivirals against a clinical isolate of SARS-CoV-2. One of their conclusions was that"chloroquine is highly effective in the control of 2019-nCoV infection in vitro" and that its "safety track record suggests that it should be assessed in human patients suffering from the novel coronavirus disease.

Coronavirus (Covid-19) Vaccine: What To Know[28]

Millions of people have contracted the virus, and it has contributed to nearly 2 million deaths.

Researchers have been working around the clock to develop effective vaccines, which people started receiving in December 2020.

This article looks at the types of COVID-19 vaccine, how they work, their safety, and how to get one.

Source: https://www.medicalnewstoday.com/articles/coronavirus-vaccine

Which vaccines have approval?

Different vaccines are now available in various countries. In the United States, vaccines need approval from the Food and Drug Administration (FDA).

First, they need to pass through three phases of tests to prove that they are safe and effective. The last stage, phase 3, involves tens of thousands of participants.

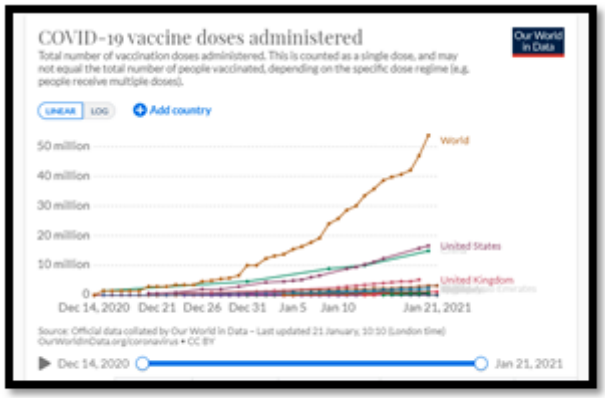
At the time of writing, two vaccines have FDA approval for use in the U.S.:

- the Pfizer-BioNTech COVID-19 vaccine
- the Moderna COVID-19 vaccine

The *Pfizer-BioNTech vaccine*, developed in Germany, received FDA approval in the form of an emergency use authorization on December 11, 2020.

In a phase 3 trial involving more than 43,000 people, around half received a placebo and half received two doses of the vaccine, 21 days apart. The results showed that the vaccine was 95% effective at protecting against COVID-19.

The *Moderna vaccine*, developed in Cambridge, MA, received approval for emergency use in the U.S. on December 18. In a phase 3 trial, 30,000 volunteers received either a placebo or two doses of the vaccine, 28 days apart. The results indicated that the vaccine was 94% effective.



Source: https://ourworldindata.org/grapher/cumulative-covid-vaccinations?tab=chart&stackMode=absolute&time=earliest..latest&region=World

Other Vaccines

Other vaccines that have approval for use in various countries include:

- The Oxford AstraZeneca vaccine, in the United Kingdom
- Coronavac, developed by Sinovac, in China
- The Sputnik V vaccine, in Russia
- Covaxin, developed by Bharat Biotech, in India

Meanwhile, the Novavax vaccine is currently undergoing phase 3 trials, as is Janssen's COVID-19 vaccine. Both were developed by companies based in the U.S.

A person can keep up to date with the latest vaccine developments in the country using the Regulatory Affairs Professionals Society's COVID-19 vaccine tracker.

Types of covid-19 vaccine

Researchers have used various approaches to developing vaccines that protect against COVID-19. As a result, they have developed different types of vaccine, including:

- whole virus vaccines
- recombinant protein subunit vaccines
- replication-incompetent vector vaccines
- nucleic acid vaccines

We explore these types in more detail below:

Whole virus vaccine

Also known as an "inactivated" or "weakened" virus vaccine, this type contains dead or inactivated forms of the virus.

These vaccines cannot cause an infection because they do not contain the live virus.

The COVID-19 vaccines made by Sinovac, Bharat Biotec, and the Wuhan Institute of Biological Products are of this type.

Recombinant protein subunit vaccine

This type of vaccine triggers a strong immune response to a key part of the virus. It cannot cause an infection because it does not contain a live pathogen, such as a virus.

Researchers are investigating whether they can make a recombinant protein subunit vaccine that targets a protein, called the spike protein that the new coronavirus uses to latch onto and infect cells.

Novavax is one company taking this approach, using nanoparticle technology.

Replication-incompetent vector vaccine

This type acts as a platform for carrying genes that the body can express to provide immunity.

The AstraZeneca vaccine, which has approval in some countries, is a replication-incompetent vector vaccine. It uses a harmless, weakened adenovirus that causes the common cold in chimpanzees to provoke an immune response.

The scientists then changed the virus to make it suitable for use in humans. In other vaccines, this type of virus has safely produced a strong immune response.

In July 2020, an Ebola vaccine of this type received approval, and it may provide the basis for further COVID-19 vaccines.

Nucleic Acid Vaccine

This type is also called an mRNA-based vaccine. Vaccination involves injecting genetic material called mRNA into live host cells.

Each of these vaccines is designed to target a particular pathogen. In a COVID-19 vaccine, the mRNA contains instructions for producing coronavirus spike protein. The vaccine presents this information to the immune system, and as a result, the body produces antibodies to combat the virus.

Pfizer, BioNTech, and Moderna have developed this type of vaccine. The Pfizer-BioNTech and Moderna vaccines are already available in the U.S.

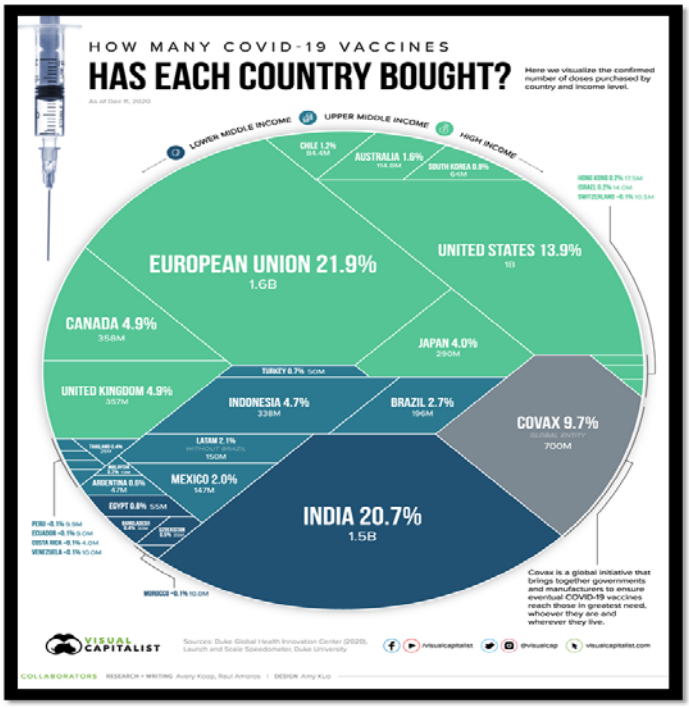
How do vaccines work?

Vaccines prompt the immune system to make antibodies to defend against specific diseases. In other words — they make the immune system behave as if the body already had this illness.

Vaccines achieve this without making the person sick.

After vaccination, the person develops immunity to the disease. Their body can fight off the infection if exposure to the pathogen, such as the novel coronavirus, occurs.

An effective vaccine stimulates the immune system without kicking it into overdrive. Developing a vaccine that works without causing unwanted side effects is the goal for researchers. Vaccines also need to be safe for everyone, including people with allergies, young children, people who are pregnant or breastfeeding, older adults, and people with underlying health conditions.



Source: https://www.visualcapitalist.com/tracking-covid-19-vaccines-around-the-world/

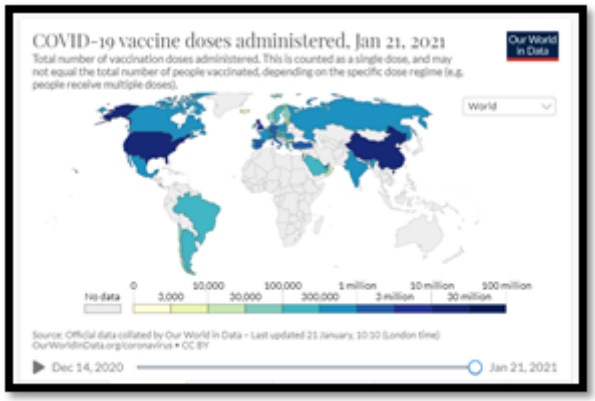
Are The Vaccines Safe?

A vaccine needs to pass through several stages of trials before the manufacturer can apply for approval from a country's health authority. In the U.S., the FDA gives this approval, and the Centers for Disease Control and Prevention (CDC) also work to ensure public safety.

Vaccine trials involve ever-larger numbers of people. The last stage, phase 3, includes tens of thousands of participants. At first, the specific long-term effects of any new medical treatment, including a vaccine, are unknown. The key is to balance the potential risks of getting a vaccine that has undergone extensive testing with the known dangers of developing COVID-19. In the short term, a person who has had a COVID-19 vaccine may experience flu-like symptoms and other side effects, including:

- pain at the injection site
- swelling at the injection site
- fatigue
- headache and muscle pain
- a fever

The side effects may be worse after the second dose of the vaccine because the body's immune response will be intensified. The CDC encourage people to use a smartphone-based health checker called V-safe to inform the authorities about any side effects. This helps them monitor the impact of the vaccine and do ongoing work to ensure public safety. It is essential to receive the vaccine from a licensed healthcare professional and follow every instruction, including getting a second dose. A person may get the vaccine at a local health department, hospital, clinic, or pharmacy. Anyone with a history of allergies to vaccines or other injectable medications should tell the healthcare worker before they administer the vaccine.

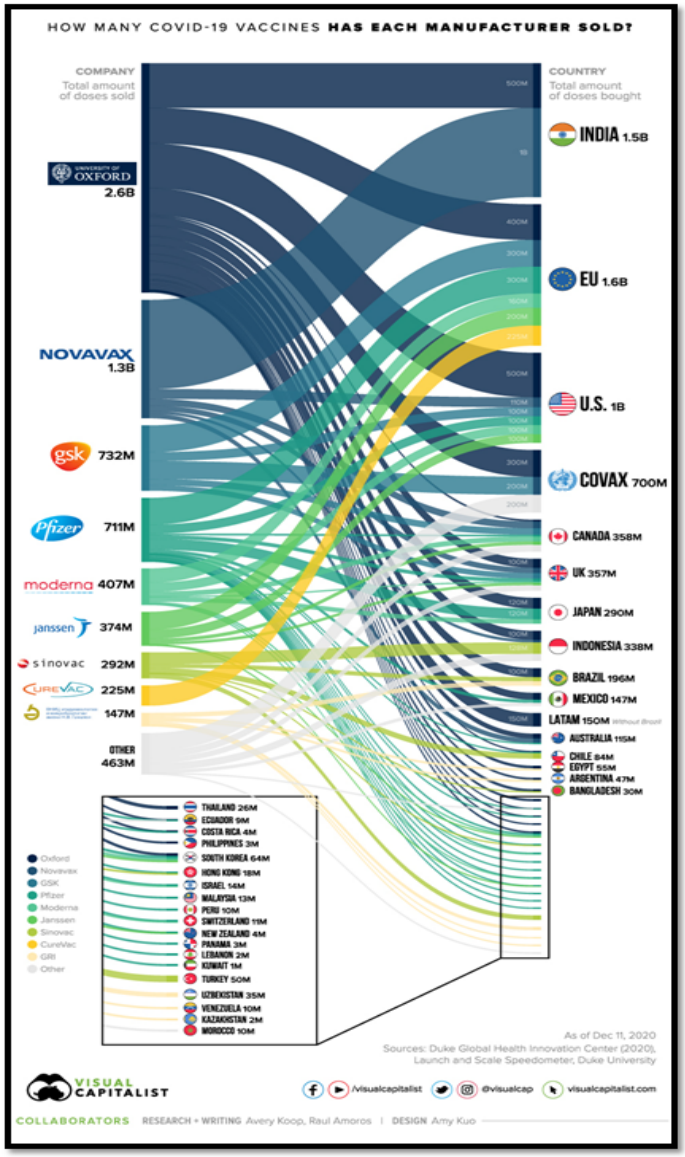


Source: https://ourworldindata.org/grapher/cumulative-covid-vaccinations?stackMode=absolute&time=2021-01-21&region=World

Getting The Vaccine

Vaccine doses are currently limited. For this reason, the first to receive the vaccine will be healthcare workers, residents of long-term care facilities, first responders, and people aged 75 years and older. As more doses become available, everyone will be able to receive it.

A person may need to pay an administrative fee for the vaccine. Insurance companies will reimburse this, and people without insurance can seek reimbursement from the Department of Health and Human Services' Provider Relief Fund. Otherwise, the vaccine is free.



Source: https://www.visualcapitalist.com/tracking-covid-19-vaccines-around-the-world/

Prevention and precautions[18]

People should stay aware of the latest information on the COVID-19 outbreak provided by WHO and Follow the directions of your local health authority and prevent secondary infections, interrupt human-to-human transmission to your close contacts, health care workers and prevent further international spread. most of the people who infected, experience mild illness and recover it, but its infection can be more severe for other individuals. To take care of your health and protect others take the subsequent steps:

Take steps to protect yourself

• Wash your hands regularly and thoroughly with soap and water for at least 20 seconds or with an alcohol-based hand rub (hand sanitizer that contains at least 60% alcohol) completely cover your hands and rub them together until they do not dry especially after you have been visited a public place, or after blowing your nose, sneezing or coughing.

• Hands touch many surfaces and pick-up viruses and these contaminated hands, can transfer the virus to your nose, eyes or mouth So, avoid touching these organs with unwashed hands. Because from there, the virus can enter the body and may cause persons to sick.

• Maintain social distancing (maintain at least 1 meter or 3 feet distance between yourself and anyone) and avoid close contact with people who are sick (who is coughing or sneezing). When infected individuals cough or sneezes, they spray small droplets from their nose or mouth which may contain COVID-19 virus. The person can breathe in these droplets.

• Avoid large events and mass gatherings.

Source: A screenshot of an interactive map of the global cases of COVID-19 by the Center for Systems Science and Engineering at Johns Hopkins University. This dashboard is continually updated and can be accessed at https://coronavirus.jhu.edu/map.html.

Take steps to protect others

• Stay home if you are feeling unwell, unless you're going to get medical care.

• If you have a cough, fever and difficulty breathing, seek medical attention consult online to your doctor.

• If you're sick avoid taking public transportation.

• Whenever you cough or sneeze cover your mouth and nose with a tissue paper.

• Throw used tissues in the trash and wash your hands immediately with antiseptic soap and water.

• If possible, stay isolated in a separate room from family and pets and wear a facemask when you are around other people (e.g., sharing a room or vehicle). If you are unable to wear a facemask (due to its causes trouble breathing or other reason) then you should cover your coughs and sneezes, and but when the people who are caring for you enter your room, they should wear a facemask (Facemasks may be in short supply and they should be saved for caregivers).

• Stay home for a duration of time and follow your doctor's instructions.

• If you're sick, avoid sharing bedding, dishes, glasses and other household items.

• If possible, use a separate bathroom and toilets from the family.

• If surfaces are dirty, clean them, and use detergent or antiseptic soap & water before disinfection.

• Apply disinfectant daily on frequently touched surfaces.

This includes desks, phones, keyboards, toilets, faucets, tables, doorknobs, light switches, countertops, handles, and sinks.

• Identify and Isolate Suspected Cases

• Before clinical care is started, Identify the potential cases as soon as possible and isolate the suspected people separately from those who confirmed cases of the virus COVID-19, to Prevent the potential transmission of infection to other patients and health care staff.

• Avoid direct physical contact (including physical examination and exposure) to respiratory and other body secretions.

For instance, move potentially infectious people to isolation rooms and close the doors. In a working place, make the distance in workers, customers, and other visitors, especially from potentially infectious individuals' location.

• In case of need to isolate a patient or patient group, pharmacies should designate and prepare a suitable space.

• Most patients presenting in community pharmacies are unlikely to have COVID-19. If they have coughs, colds or flu-like symptoms but not relevant to COVID-19, travel or contact history, pharmacies should proceed in line with their best practice and routine management of the cross-infection risks to staff and other patients.

• Restrict the number of individuals entering isolation areas, including the room of a patient with suspected and confirmed COVID-19.

• For safe work practice, protect workers to close contact with the infected person by using additional engineering and administrative control.

Coronavirus testing: how does it work?[28]

Most tests for the new strain of coronavirus involve taking a swab sample for analysis.

The virus known as severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) causes coronavirus disease 19 (COVID-19).

Developing reliable tests for the virus is essential to slow its spread.

Currently, these tests are for people at risk of developing severe COVID-19. For example, healthcare professionals will likely prioritize testing for older adults who may have the infection.

How does the test work?

There are several ways to test for the new strain of coronavirus. Most are either molecular or serological tests.

Source: https://www.medicalnewstoday.com/articles/coronavirus-vaccine

Molecular tests

Molecular tests look for signs of an active infection.

They usually involve taking a sample from the back of the throat with a cotton swab. The doctor then sends the sample off for testing.

The sample will undergo a polymerase chain reaction (PCR) test. This type of test detects signs of the virus's genetic material.

A PCR test can confirm a diagnosis of COVID-19 if it identifies two specific SARS-CoV-2 genes. If it identifies only one of these genes, it will produce an inconclusive result.

Molecular tests can only help diagnose current cases of COVID-19. They cannot tell whether someone has had the infection and since recovered.

Serological tests

These tests detect antibodies that the body produces to fight the virus. These antibodies are present in anyone who has recovered from COVID-19.

The antibodies exist in blood and tissues throughout the body. A serological test usually requires a blood sample.

Serological tests are particularly useful for detecting cases of infection with mild or no symptoms.

The Centers for Disease Control and Prevention (CDC) are currently developing a serological test for SARS-CoV-2, and they are looking for blood samples from anyone who has had COVID-19. The samples would be taken at least 21 days after symptoms first developed.

When Should You Get Tested?

Anyone with the following symptoms should contact a healthcare provider:

- a cough
- shortness of breath
- a fever

Tests are in short supply and are only available for people at risk of severe illness. A doctor will determine whether a person's symptoms necessitate a test.

Anyone with a chronic health condition and anyone over the age of 60 should receive a test.

Conclusion

This new virus outbreak has challenged the economic, medical and public health infrastructure of China and to some extent, of other countries especially, its neighbors. Time alone will tell how the virus will impact our lives here in India. More so, future outbreaks of viruses and pathogens of zoonotic origin are likely to continue. Therefore, apart from curbing this outbreak, efforts should be made to devise comprehensive measures to prevent future outbreaks of zoonotic origin.

SARS had a mortality rate of 9.5%, whilst the current novel coronavirus appears to have a mortality rate around 2%, based on the number of confirmed cases and deaths. Our study has several limitations, such limitations preclude the possibility of any deep analysis about potential prognostic imaging variables that could aid in the prediction of worse outcomes.

Moreover, it does not address the role of imaging in guiding or monitoring medical therapy in the infected individuals. Notwithstanding, our study continues to add knowledge about the disease in a growing number of centers apart from the epicentre of the outbreak in Wuhan.

Lastly, it also presents CXR findings in a small number of patients, information that has been lacking in most of the recent imaging reports of the disease. In conclusion, COVID 19 has a vast effect on society, where proper medication, sanitization and social distancing will help us.

COVID-19 is a major health challenge throughout the world. Experts and authorities are working to develop and administer vaccines and enact other preventive measures.

The goal is for everyone to have access to a COVID-19 vaccine. While waiting for it to become available, follow all guidance from public health authorities and medical experts.

References

1. Bandyopadhyay, S., 2020. Coronavirus Disease 2019 (COVID-19): we shall overcome. Clean Technologies and Environmental Policy, p.1.
2. Li, Q., Guan, X., Wu, P., Wang, X., Zhou, L., Tong, Y., Ren, R., Leung, K.S., Lau, E.H., Wong, J.Y. and Xing, X., 2020. Early transmission dynamics in Wuhan, China, of novel coronavirus–infected pneumonia. New England Journal of Medicine.
3. Sohrabi, C., Alsafi, Z., O'Neill, N., Khan, M., Kerwan, A., Al-Jabir, A., Iosifidis, C. and Agha, R., 2020. World Health Organization declares global emergency: A review of the 2019 novel coronavirus (COVID-19). International Journal of Surgery.
4. Meng, L., Hua, F. and Bian, Z., 2020. Coronavirus disease 2019 (COVID-19): emerging and future challenges for dental and oral medicine. Journal of Dental Research, 99(5), pp.481-487.
5. Han, Q., Lin, Q., Jin, S. and You, L., 2020. Coronavirus 2019-nCoV: A brief perspective from the front line. Journal of Infection, 80(4), pp.373-377.
6. Dhama, K., Sharun, K., Tiwari, R., Sircar, S., Bhat, S., Malik, Y.S., Singh, K.P., Chaicumpa, W., Bonilla-Aldana, D.K. and Rodriguez-Morales, A.J., 2020. Coronavirus disease 2019–COVID-19.
7. Singhal, T., 2020. A review of coronavirus disease-2019 (COVID-19). The Indian Journal of Pediatrics, pp.1-6.
8. PARIKH, P. and AMILKANTHWAR, R., REVIEW ON COVID-19 (CORONA VIRUS DISEASE).
9. Mounika, G., 2020. COVID-19 outbreak challenging dentist's safety. World Journal of Advanced Research and Reviews, 6(3), pp.216-121.
10. Agarwal, K.M., Mohapatra, S., Sharma, P., Sharma, S., Bhatia, D. and Mishra, A., 2020. Study and overview of the novel corona virus disease (COVID-19). Sensors International, p.100037.
11. Pandey, S. and Sarkar, S., Covid-19-A New Bane to the World.
12. Zafar, H., 2020. The Microbiology of Coronaviruses. diabetes, 2, p.8.
13. Di Gennaro, F., Pizzol, D., Marotta, C., Antunes, M., Racalbuto, V., Veronese, N. and Smith, L., 2020. Coronavirus diseases (COVID-19) current status and future perspectives: a narrative review. International journal of environmental research and public health, 17(8), p.2690.

14. Shereen, M.A., Khan, S., Kazmi, A., Bashir, N. and Siddique, R., 2020. COVID-19 infection: Origin, transmission, and characteristics of human coronaviruses. Journal of Advanced Research.
15. Parthasarathy, P. and Vivekanandan, S., 2020. An extensive study on the COVID-19 pandemic, an emerging global crisis: Risks, transmission, impacts and mitigation. Journal of Infection and Public Health.
16. Contini, C., Di Nuzzo, M., Barp, N., Bonazza, A., De Giorgio, R., Tognon, M. and Rubino, S., 2020. The novel zoonotic COVID-19 pandemic: An expected global health concern. The Journal of Infection in Developing Countries, 14(03), pp.254-264.
17. Duda-Chodak, A., Lukasiewicz, M., Zięć, G., Florkiewicz, A. and Filipiak-Florkiewicz, A., 2020. Covid-19 pandemic and food: Present knowledge, risks, consumers fears and safety. Trends in Food Science & Technology.
18. Gupta, A. and Kannojia, P., A Review on COVID-19 and its Prevention.
19. Prusty, A. and Padhi, S.K., 2020. COVID-19 Pandemic: Epidemiology, diagnosis, and treatment knowledge. Asian Journal of Pharmacy and Pharmacology, 6(3), pp.177-182.
20. Berhanu, G., Pal, M. and Koliopoulos, T., COVID-19: A Life Threatening Disease of Global Importance.
21. Pal, A., Singh, S. and Singh, A., Pandemic effect of COVID-19 in India: A review.
22. Hafeez, A., Ahmad, S., Siddqui, S.A., Ahmad, M. and Mishra, S., 2019. A Review of COVID-19 (Coronavirus Disease-2019) Diagnosis, Treatments and Prevention.
23. Sanyaolu, A., Okorie, C., Marinkovic, A., Patidar, R., Younis, K., Desai, P., Hosein, Z., Padda, I., Mangat, J. and Altaf, M., 2020. Comorbidity and its Impact on Patients with COVID-19. SN comprehensive clinical medicine, pp.1-8.
24. Wiersinga, W.J., Rhodes, A., Cheng, A.C., Peacock, S.J. and Prescott, H.C., 2020. Pathophysiology, transmission, diagnosis, and treatment of coronavirus disease 2019 (COVID-19): a review. Jama, 324(8), pp.782-793.
25. Tjendra, Y., Al Mana, A.F., Espejo, A.P., Akgun, Y., Millan, N.C., Gomez-Fernandez, C. and Cray, C., 2020. Predicting disease severity and outcome in COVID-19 patients: a review of multiple biomarkers. Archives of pathology & laboratory medicine, 144(12), pp.1465-1474.
26. Dai, W.C., Zhang, H.W., Yu, J., Xu, H.J., Chen, H., Luo, S.P., Zhang, H., Liang, L.H., Wu, X.L., Lei, Y. and Lin, F., 2020. CT imaging and differential diagnosis of COVID-19. Canadian Association of Radiologists Journal, 71(2), pp.195-200.